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(57) Abstract: Included are polymer compositions such as polyurethaneureas, polyamides and polyesters. The compositions may be in a variety of forms such as dispersions, powders, fibers, and beads. The compositions are useful in the preparation of many products including health and beauty products such as cosmetics, paint, household products such as fabric care compositions, apparel/footwear and textiles/furnishings.

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NON-TEXTILE POLYMER COMPOSITIONS AND METHODS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Application No. 60/865,091 filed on November 9, 2006, claims the benefit of U.S. Application No. 60/837,011 filed on August 11, 2006, claims the benefit of U.S. Application No. 60/759,853 filed on January 18, 2006, and claims the benefit of U.S. Application No. 60/955,928 filed on August 15, 2007, all of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

[0002] The present invention includes polymer compositions such as polyurethaneureas, polyamides and polyesters. The compositions may be in a variety of forms such as dispersions, powders, fibers, and beads. The compositions are useful in the preparation of many products including health and beauty products such as cosmetics, paint, household products such as fabric care compositions, apparel/footwear and textiles/furnishings.

SUMMARY OF RELATED ART

[0003] Polymers such as polyurethaneureas, polyamides, and polyesters have historically been used in preparing synthetic fibers. However, these polymers have other properties that may potentially offer benefits beyond the fiber form. Therefore, there is a need for polymer compositions and methods which emphasize these additional advantages.

[0004] One example of a suitable form for different polymers is a powder. Fine powders of synthetic polymers such as polyethylenes, polyamides, polyurethanes and polysiloxanes have been used in printing, coating and cosmetic applications. Although many particle size reduction techniques (such as solid state shear pulverization, cryogenic grinding, gas atomization, and high shear mixing and millings) are known in the art and have been applied in producing polymeric powders, the need exists for improved methods to produce fine, uniform particles especially for those elastomeric polymers such as segmented polyurethanes and polyurethaneureas.

[0005] There is a need for improved polymer compositions that may provide additional benefits not only for printing, coating, and cosmetic applications, but also for other applications such as painting and fabric care.

[0006] Fabric softeners are often used in addition to detergents to impart softness and/or fluffiness to washable fabrics. Fabric softeners also make fabrics feel smooth, decrease static cling, impart a pleasing fragrance, reduce drying time, reduce wrinkling and make ironing easier. However, the benefits of these properties generally decrease over time after washing.

[0007] The most common active components are based on long chain fatty type molecules called quaternary ammonium compounds, which are cationic in nature. Therefore, in order to prevent undesired reaction with detergents which may be anionic in nature, fabric softeners are generally introduced during fabric rinsing or drying.

[0008] In order to reduce the time and expense of fabric laundering, there is a need for fabric care compositions which may be added simultaneously with the detergent. There is also a need for fabric care compositions which extend the duration of the benefits of fragrance substantiation and ease of care associated with fabric softening compositions.

SUMMARY OF THE INVENTION

[0009] One embodiment provides a polyurethaneurea in the form of a powder or an aqueous dispersion. These powders or dispersions provide fabric care properties either alone or in combination with a detergent or fabric softener composition.

[0010] In one embodiment, a fabric care composition is in the form of a nonionic film-forming dispersion including a polyurethaneurea polymer and water. The polymer is the reaction product of a prepolymer with water as a chain extender where the prepolymer is the reaction product of a glycol or a mixture of glycols and 4,4'-methylenebis(phenyl isocyanate).

[0011] In another embodiment is a nonionic non-film-forming dispersion including water and a polyurethaneurea polymer. The polymer is the reaction product of a prepolymer and a chain extender including a diamine chain extender and water, where the polymer is the reaction product of a glycol (polyol) or a mixture of glycols and 4,4'-methylenebis(phenyl isocyanate). The polymer may then be filtered and ground or spray dried to provide a powder.

[0012] A further embodiment provides a method of extending perfume or fragrance substantiation on a fabric or garment. The method includes contacting the fabric or garment with a fragrance and a polyurethane urea composition in the form of a powder or an aqueous dispersion. The contact may occur in a variety of ways including, but not limited to, adding the fragrance and polyurethaneurea to a detergent or fabric softener prior to laundering and/or drying the fabric, adding them directly to the wash water, or introducing them during the rinsing cycle, either directly or in combination with a fabric softener composition.

[0013] A further embodiment provides a method of providing desired properties to a fabric or garment. The method includes contacting a fabric with a polyurethaneurea in the form of a powder or an aqueous dispersion. The desired properties which may be imparted to the fabric include, but are not limited to, shape retention, ease of care (i.e., ease of ironing), and anti-stain properties.

[0014] Also provided are segmented polyurethaneurea compositions in the form of fine powders. Methods to make such polyurethaneurea powders are also included. Additionally, in some embodiments are powders which provide water and/or oil absorbing properties.

[0015] Other polymer compositions and forms are provided. These compositions are useful for a variety of compositions including paints, cosmetics, and fabric care compositions, among others.

DETAILED DESCRIPTION OF THE INVENTION

[0016] As used herein, the term "powder" means a particulate material consisting of a loose aggregation of finely divided solid particles. For a fine powder the maximum dimension is smaller than 1 millimeter and the average particle size is less than 100 microns. However, larger particles sizes are also contemplated. For example a coarse powder may have particle sizes larger than 1 millimeter with an average particle size in the range from about 0.5mm to about 2mm.

[0017] As used herein, the term "film-forming" means that the material forms a continuous film in the absence of other reagents under the synthesis conditions disclosed herein.

[0018] As used herein, the term “non-film-forming” means that the material does not form a continuous film in the absence of other reagents under the synthesis conditions disclosed herein.

[0019] As used herein, the term “fabric” means any woven, non-woven, knit, tuft, felt, braid, or bonded material assembled from fibers and/or yarns, including, but not limited to, those used in garments (clothing), sheets, towels, curtains, upholstery, and carpets.

[0020] As used herein, the term “fabric care composition” refers to any composition that may be applied to a fabric, especially during washing or drying of the fabric, to impart beneficial properties to the fabric. These properties include cleaning, removing oily and greasy marks, making fabrics feel smooth, decrease static cling, impart a pleasing fragrance, reduce drying time, reduce wrinkling and make ironing easier.

[0021] As used herein, the term “easy care” with respect to fabric means that the fabric will have fewer wrinkles after washing, may not require ironing or will have more ease of ironing.

Polyurethaneurea Compositions

[0022] The polyurethaneurea compositions of some embodiments may be in the form of an aqueous dispersion, powder, fiber, or bead. When a powdered form is desired, it may be isolated from the aqueous dispersion by filtering, drying and grinding or by spray drying of the dispersion. The solids content of the dispersion may vary. For example, solids content may be from about 5 % to about 50 %, more specifically from about 20% to about 40% by weight of the dispersion. Powders may have an average particle size of less than 100 microns, such as from about 50 to about 80 microns with no particle size greater than 1.0 mm, such as less than about 0.5 mm.

[0023] Another suitable method of preparing the polyurethaneurea powders of some embodiments is according to U.S. Patent No. 6,475,412 to Roach, which is incorporated herein by reference. Roach discloses a method of extruding spandex under specific process conditions to provide a powder.

[0024] To prepare the anionic film-forming aqueous dispersion of some embodiments, a prepolymer is prepared which is a capped glycol. The prepolymer is the reaction product of:

at least one hydroxyl-terminated polymer such as a polyether (including copolyethers), polycarbonate or polyester polyol component having a number average molecular weight of about 600 to about 3,500, for example, a poly(tetramethylene ether) glycol having a number average molecular weight of about 1,400 to about 2,400;

a polyisocyanate, which is a mixture of 4,4'- and 2,4'-methylene bis(phenyl isocyanate) (MDI) isomers, with the ratio of the 4,4'-MDI to 2,4'-MDI isomers from about 65:35 to about 35:65; and

at least one diol compound with: (i) hydroxy groups capable of reacting with the mixture of MDI isomers of the polyisocyanate and (ii) at least one carboxylic acid group capable of forming a salt upon neutralization, wherein the at least one carboxylic acid group is incapable of reacting with the mixture of MDI isomers of the polyisocyanate.

[0025] The prepolymer is then neutralized to form a salt, for example by inclusion of triethylamine and finally chain extended with a diamine chain extender and water to form the aqueous dispersion. Additives such as surfactants, anti-/defoamers, antioxidants, and thickening agents may be included.

[0026] The MDI isomer mixture for the anionic dispersion achieves a reduction in the prepolymer viscosity without the addition of a solvent. The MDI isomer mixture also serves to reduce the rate of the reaction. The prepolymer may be prepared either in a batch process or in a continuous process.

[0027] When included in some embodiments, the diol including hydroxy groups and a carboxylic acid group may be described as an acidic diol. Examples of useful acidic diols include 2,2-dimethylolacetic acid, 2,2-dimethylolpropionic acid (DMPA), 2,2-dimethylolbutanoic acid, 2,2-dimethylolpentanoic acid, and combinations thereof.

[0028] The nonionic film-forming dispersion of some embodiments includes a prepolymer, which is an isocyanate-terminated polyurethane prepolymer. This prepolymer is the reaction product of a hydroxyl-terminated polymer such as a polyol, such as poly(tetramethylene-co-ethylene ether) glycol or a mixture of poly(tetramethylene ether) glycol with ethoxylated

polypropylene glycol and a diisocyanate such as 4,4'-methylenebis(phenyl isocyanate). This prepolymer is then chain extended with water and dispersed in water or dispersed in water followed by chain extension with water.

[0029] The nonionic non-film-forming dispersion of some embodiments includes a prepolymer, which is an isocyanate-terminated polyurethane prepolymer. This prepolymer is also the reaction product of a polyol such as a polybutadiene glycol or poly(tetramethylene ether) glycol and a diisocyanate such as 4,4'-methylenebis(phenyl isocyanate). This prepolymer may be chain extended with a combination of water and a diamine chain extender such as ethylene diamine or an amine-functional crosslinker such as polyvinylamine. Either a hydrophilic or hydrophobic glycol may be selected to produce a polymer powder having different water/oil absorbing capabilities. Also, the powder particle size can be adjusted by adjusting the viscosity of the prepolymer with the use of a solvent for dilution.

[0030] In some embodiments, a polyurethaneurea powder is made by high shear force dispersion of an isocyanate terminated prepolymer, with or without solvent, into a water medium containing a dispersant, and a chain extension reagent or a cross-linking agent. High shear force is defined as force sufficient to make particles no larger than 500 microns. The prepolymer can be made by reacting a polyol or a polyol copolymer or a polyol mixture, such as polyether glycols, polyester glycols, polycarbonate glycols, polybutadiene glycols or their hydrogenated derivatives, and hydroxy-terminated polydimethylsiloxanes, with a diisocyanate such as methylene bis(4-phenylisocyanate) (MDI) to form an NCO-terminated prepolymer or a "capped glycol". In a polymer composition, the molar ratio of NCO/OH is in the range of 1.2 to 5.0. An example of a chain extension reagent is an aliphatic diamine such as ethylene diamine (EDA). A chain cross-linking agent is an organic compound or a polymer with at least three primary amine or secondary amine functional groups capable of reacting with NCO groups. An organic solvent, soluble or insoluble in water, such as 1-methyl 2-pyrrolidinone (NMP) or xylenes can be used to dilute the prepolymer prior to the dispersion. The formed polyurethaneurea polymer fine particles dispersed in water can be used as such or isolated by filtration and drying into solid powders. Alternatively, a spray coating process which also provides a greater control of particle size may also be used.

[0031] The particle size of the powders of some embodiments may vary depending on the desired use. For example, the average particle size may be less than 1 millimeter (mm), also including an average particle size of less than 100 microns (μm).

[0032] In some embodiments, a segmented polyurethaneurea for making an elastomeric powder includes: a) a polyol or a polyol copolymer or a polyol mixture of number average molecular weight between 500 to 5000, including but not limited to polyether glycols, polyester glycols, polycarbonate glycols, polybutadiene glycols or their hydrogenated derivatives, and hydroxy-terminated polydimethylsiloxanes; b) a diisocyanate including aliphatic diisocyanates, aromatic diisocyanates and alicyclic diisocyanates; and c) an aliphatic diamine (i.e., a diamine chain extender) or its mixture with at least one diamine selected from the group consisting of an aliphatic diamine and an alicyclic diamine, each having 2 to 13 carbon atoms, or an amino-terminated polymer, or an organic compound or a polymer with at least three primary or secondary amine groups; and optionally a monoamine, primary or secondary, as a chain terminator.

[0033] Examples of polyether polyols that can be used in some embodiments include those glycols with two or more hydroxy groups, from ring-opening polymerization and/or copolymerization of ethylene oxide, propylene oxide, trimethylene oxide, tetrahydrofuran, and 3-methyltetrahydrofuran, or from condensation polymerization of a polyhydric alcohol, for example, a diol or diol mixtures, with less than 12 carbon atoms in each molecule, such as ethylene glycol, 1,3-propanediol, 1,4-butanediol, 1,5-pentanediol, 1,6-hexanediol, neopentyl glycol, 3-methyl-1,5-pentanediol, 1,7-heptanediol, 1,8-octanediol, 1,9-nonanediol, 1,10-decanediol and 1,12-dodecanediol. For example, a linear, bifunctional polyether polyol may be included, specifically, a poly(tetramethylene ether) glycol of molecular weight of about 1,700 to about 2,100, such as Terathane® 1800 (commercially available from INVISTA S.à r.l. of Wichita, KS and Wilmington, DE) with a functionality of 2.

[0034] Examples of polyester polyols that can be used include those ester glycols with two or more hydroxy groups, produced by condensation polymerization of aliphatic polycarboxylic acids and polyols, or their mixtures, of low molecular weights with no more than 12 carbon atoms in each molecule. Examples of suitable polycarboxylic acids are malonic acid, succinic acid, glutaric acid, adipic acid, pimelic acid, suberic acid, azelaic acid, sebacic acid, undecanedicarboxylic acid and dodecanedicarboxylic acid. Example of suitable polyols for

preparing the polyester polyols are ethylene glycol, 1,3-propanediol, 1,4-butanediol, 1,5-pentanediol, 1,6-hexanediol, neopentyl glycol, 3-methyl-1,5-pentanediol, 1,7-heptanediol, 1,8-octanediol, 1,9-nonanediol, 1,10-decanediol and 1,12-dodecanediol. For example, a linear, bifunctional polyester polyol with a melting temperature of about 5°C to about 50°C may be included.

[0035] Examples of polycarbonate polyols that can be used include those carbonate glycols with two or more hydroxy groups, produced by condensation polymerization of phosgene, chloroformic acid ester, dialkyl carbonate or diallyl carbonate and aliphatic polyols, or their mixtures, of low molecular weights with no more than 12 carbon atoms in each molecule. Example of suitable polyols for preparing the polycarbonate polyols are diethylene glycol, 1,3-propanediol, 1,4-butanediol, 1,5-pentanediol, 1,6-hexanediol, neopentyl glycol, 3-methyl-1,5-pentanediol, 1,7-heptanediol, 1,8-octanediol, 1,9-nonanediol, 1,10-decanediol and 1,12-dodecanediol. For example, a linear, bifunctional polycarbonate polyol with a melting temperature of about 5°C to about 50°C may be included.

[0036] Examples of suitable diisocyanate components are 1,6-diisocyanatohexane, 1,12-diisocyanatododecane, isophorone diisocyanate, trimethyl-hexamethylenediisocyanates, 1,5-diisocyanato-2-methylpentane, diisocyanato-cyclohexanes, methylene-bis(4-cyclohexyl isocyanate), tetramethyl-xylenediisocyanates, bis(isocyanatomethyl) cyclohexanes, toluenediisocyanates, methylene bis(4-phenyl isocyanate), phenylenediisocyanates, xylenediisocyanates, and a mixture of such diisocyanates. For example the diisocyanate may be an aromatic diisocyanate such as phenylenediisocyanate, tolylenediisocyanate (TDI), xylylenediisocyanate, biphenylenediisocyanate, naphthylenediisocyanate, diphenylmethanediisocyanate (MDI), and combinations thereof.

[0037] Examples of suitable diamine components (diamine chain extenders) are ethylenediamine, 1,2-propanediamine, 1,3-propanediamine, 2,2-dimethyl-1,3-propanediamine, 1,4-butanediamine, 1,5-pentanediamine, hexamethylene diamine, 1,7-heptanediamine, 1,8-octanediamine, 1,9-nonanediamine, 1,10-decanediamine, 1,12-dodecanediamine, 2-methyl-1,5-pentanediamine, cyclohexanediamines, cyclohexanebis(methylamine)s, isophorone diamine, xylylenediamines, and methylenebis(cyclohexylamine)s. A mixture of two or more diamines can also be used.

[0038] Examples of suitable amine-terminated polymers are bis(3-aminopropyl) terminated polydimethylsiloxane, amine terminated poly(acrylonitrile-co-butadiene), bis(3-aminopropyl) terminated poly(ethylene glycol), bis(2-aminopropyl) terminated poly(propylene glycol), and bis(3-aminopropyl) terminated polytetrahydrofuran.

[0039] Examples of suitable organic compounds or polymers with at least three primary or secondary amine groups are tris-2-aminoethyl amine, poly(amido amine) dendrimers, polyethylenimine, poly(vinylamine), and poly(allylamine).

[0040] Examples of the suitable monoamine component (d) include primary alkylamines such as ethylamine, butylamine, hexylamine, cyclohexylamine, ethanolamine and 2-amino-2-methyl-1-propanol, and secondary dialkylamines such as N,N-diethylamine, N-ethyl-N-propylamine, N,N-diisopropylamine, N-tert-butyl-N-methylamine, N-tert-butyl-N-benzylamine, N,N-dicyclohexylamine, N-ethyl-N-isopropylamine, N-tert-butyl-N-isopropylamine, N-isopropyl-N-cyclohexylamine, N-ethyl-N-cyclohexylamine, N,N-diethanolamine, and 2,2,6,6-tetramethylpiperidine.

[0041] In making a polyurethaneurea powder of some embodiments, a glycol is first reacted with a diisocyanate, optionally with a catalyst present, to form an NCO-terminated prepolymer or a "capped glycol". This reaction is typically carried out, in a molten form of uniformly blended mixture, with applied heat at temperatures of 45 to 98°C for a period of 1 hour to 6 hours. The amounts of each reaction component, the weight of the glycol (Wgl) and the weight of the diisocyanate (Wdi), are regulated by the capping ratio (CR), which is defined as the mole ratio of the diisocyanate to the glycol as shown below:

$$CR = (Wdi/MWdi) / (Wgl/MWgl)$$

[0042] Where MWdi is the molecular weight of the diisocyanate and MWgl is the number average molecular weight of the glycol. According to the present invention, the capping ratio is in the range of 1.2 to 5.0, specifically between 1.5 and 3.0.

[0043] After the capping reaction is complete when all of the hydroxy (-OH) groups from the glycol molecules are consumed by the isocyanate (-NCO) groups from the diisocyanate to form a urethane bond, a viscous polyurethane prepolymer with terminal NCO groups is formed. This

prepolymer is then added and dispersed into a water solution containing surface active reagents such as dispersants and anti-/defoamers and optionally chain-extending agents such as diamines. Alternatively, this prepolymer can be diluted with an organic solvent such as water-soluble N-methyl pyrrolidone (NMP) or water-insoluble xylenes before dispersed in the water medium. The solid polymer particles are formed under the high shear force during the dispersion and upon the chain extension with water and/or diamine extenders. These polyurethaneurea particles can then be filtered and dried.

[0044] Additives such as antioxidants, pigments, colorants, fragrances, anti-microbial agents (like silver), active components (moisturizers, UV-screens), surfactants, anti-/defoamers, solvents, anti static agent (silica) and the like can be blended into the polyurethaneurea particles before, during or after the dispersion of the prepolymer. In some cases it may be beneficial to put the additives in during the dispersion of the prepolymer to encapsulate the additive into the polyurethaneurea particles. Encapsulation of the additive may slow the diffusion of the additive out of the polymer matrix providing a delayed or time release of the additive. This delayed release is compared to the relatively faster release of an additive adsorbed on to the surface of a particle. Combinations of encapsulating and surface adsorbed additives may be included to provide quick release of one or more additives from the surface of a particle and a delayed release of the encapsulated additive.

[0045] Pigments may also be added to the polyurethaneurea compositions of some embodiments. Pigments may be added in a similar manner to other additives. Examples of pigments include carbon black and TiO₂. For a polyurethaneurea powder, the effect of pigments is shown in Table A below:

Pigment Type	Powder color
base, no added pigment	white
ultramarine blue	light blue
ultramarine pink	light pink
black oxide	gray
orange oxide	light orange
yellow oxide	yellow
chromium green oxide	light green

[0046] Additional examples of pigments are described hereinbelow.

Polyurethaneurea Beads

[0047] Some embodiments of the invention are polyurethaneurea beads. One useful method for preparing such beads is disclosed in U.S. Patent No. 5,094,914 to Figuly et al. ("Figuly"), which is incorporated herein by reference in its entirety. A segmented polyurethaneurea composition, which may be any of those described herein, (such as those based on polyethers or polyesters) can be prepared. A solution including the polyurethaneurea can be prepared with a solvent. A variety of useful solvents may be included such as amide solvents, including but not limited to dimethylacetamide (DMAc), dimethylformamide (DMF), and N-methylpyrrolidone (NMP). The polyurethaneurea solution can then be introduced as droplets into a coagulating bath which solidifies the polymer in bead form. The coagulating bath can include a liquid that extracts the solvent of the polymer solution, but is not a solvent for the polymer, such as water.

[0048] Thus beads can be prepared having a diameter from about 1mm to about 4mm, having a void content of 60% to 90%, and having no visible pores on the surface at 5000x magnification.

[0049] Some embodiments of the present invention are polyurethaneurea beads having a broader range of particle sizes, void content, and surface pores than previously disclosed.

[0050] The void content is based on the density of the beads:

$$\text{Voids} = [1 - (\text{bead density} / \text{bulk polymer density})] \times 100\%$$

[0051] In some embodiments are polyurethaneurea beads having a void content below 60%. These beads may be prepared by using a higher viscosity solution. For Example, solutions having Brookfield viscosities from about 1000 cps and above and solids content from about 12% and above produce beads that are denser, heavier, and smaller than beads made using the same bead making apparatus, but utilizing solutions having less than 1000cps. In some embodiments are beads prepared from solutions that have high viscosities (>1000 cps) but have relatively low solids content (i.e. <10%). This can be accomplished by utilizing a polymer with a high average molecular weight, is branched, or a polymer that associates

together in the solution through crystallization, hydrogen bonding, hard segment association, etc. For example, polyurethane urea based solutions will become more viscous with age.

[0052] Low viscosity solutions with relatively high solids content may be prepared through the use of polymers that shear thin, for example a liquid crystalline polymer or some spandex formulations or by using polymers that have low average molecular weight, or do not associate, hydrogen bond or crystallize in solution.

[0053] Another method of preparing smaller, more dense beads is to produce beads from solutions that produce void volumes of 60 to 90%, but in the coagulation and drying process to remove the solvent, some solvent is allowed to remain with the beads. The beads are then dried so that the residual solvent will redissolve and reprecipitate the polymer into a more dense structure.

[0054] Beads with void content above 90% may also be prepared. One method is to include polymers with low viscosities. However, as the viscosity is continuously lowered, within the same polymer formulation, a point is reached where the polymer is so dilute that it can not sustain the bead shape in the coagulation process and collapses (This process is disclosed in U.S. Patent No. 5,126,181 for the preparation of flattened microporous disks). On the other hand, it is possible to choose or formulate polymers, in particular polyurethaneureas, which are stiffer in nature so that even when diluted still have enough stiffness to hold the bead shape without collapsing. In particular, it is possible within the family of polyurethaneureas, to synthesize or choose a formulation that is stiffer, but still has the highly desirable elastomeric nature (stretch and recovery) inherent. For example, a polyurethane urea that uses a polyether glycol of low average molecular weight, such as an average molecular weight of less than 1000 or less than 700, as the soft segment will be sufficient to produce a bead having a void content of greater than 90% that maintains a spherical shape.

[0055] In addition, other reactants or co-reactants could be used to modify the stiffness of the final polyureaurethane bead, e.g. different extenders than EDA (ethylene diamine) or coextenders with EDA, or isomers of MDI (4,4'- vs. 2,4-) and mixtures thereof. 1,4-phenylene diisocyanate or 1,4-phenylene diamine or a combination or mixture thereof will also produce stiffer polyureaurethanes than corresponding polyureaurethanes based on "traditional" MDI and EDA. It should also be appreciated that mixtures of polyureaurethanes having different

stiffnesses could also be utilized to tailor or dial in the necessary stiffness required to attain void volumes greater than 90%. Other polymers or additives could be admixed into the solution to achieve the necessary stiffness and other requirements to make higher void volume beads.

[0056] In some embodiments are beads with controlled size pores on the surface. A micronized or nano-sized salt or other water-soluble material (e.g. polyethylene glycol) may be combined with the polyurethane solution prior to introduction to a coagulation bath. The water-soluble materials will leave a pore when the bead is coagulated and washed in water.

[0057] Also provided are methods for continuously or semi-continuously producing beads. In batch, stirred reactor process, solvent may build up in the water or polymer non-solvent. Excessive build up of solvent may lead to tackiness of the produced beads causing them to stick together or possibly even coalescing them. The buildup of solvent in the non-solvent (or water) may also slow down the coagulation of the beads due to insufficient thermodynamic incentive for the solvent to be "pulled" or diffuse into the non-solvent. The non-solvent is becoming more and more concentrated and nearly identical to the solvent as the solvent diffuses out of the beads or disks.

[0058] Even the semi-continuous process of some embodiments would allow for the production of about 500 grams of beads per 8-hour shift, a 10-fold increase over that of a batch, stirred reactor process. Beads can be "harvested" anytime after about 2-3 minutes after formation and moved to vessels other than that in which they were formed allowing for the continuous production of beads in the "process apparatus" for at least up to three 8 hour shifts.

[0059] In another embodiment, water in the "process apparatus" could be continuously flushed and the beads periodically or continuously harvested such that the beads could be produced continuously. A continuous or semi-continuous operation would be industrially favorable in comparison to a batch operation.

[0060] Harvesting or moving the beads from where they are formed to a different tank to be soaked and the residual DMAc solvent extracted can be accomplished by numerous methods. One method includes the use of a conveyer system including a conveyor belt. The belt could be a screen or include holes to allow water to pass through them, while retaining the beads thereon. Another method to transfer the beads away from the process apparatus is via a

"waterfall." The waterfall method allows for the beads to be collected at one end of the tank away from where they are formed, by allowing some water and a significant number of the beads to spill over the edge of the forming tank into another tank. Since the beads float in the water/solvent mixture, this can be easily accomplished.

[0061] The polyurethaneurea beads of some embodiments have a wide range of applicability. This includes use in textiles, apparel and shoes, home furnishings, cosmetics and other household uses. As a bedding material, they may be included as an alternative to fiberfill such as in pillows. In shoes, beads may be included as a cushion for the shoe sole. Additionally, a combination of different size beads may be included in the same shoe sole to accommodate for varying pressure points within the sole, as well as in the inner soles, outer and upper shoe portions, particularly where beads are included in a "sandwich" construction in pleated or quilted constructions. The cushioning effect is also useful for furniture cushions and carpet padding. For example, the beads may be included in fibrous batting materials. Cushioning effects are also beneficial in headgear such as helmets or hats, straps for clothing, straps for luggage, and comfort grip applications such as those found on clubs, ski poles, hammers, bicycles, lawnmowers, steering wheels, etc.

[0062] The beads have a plethora of useful properties. For example, after having been compressed for 24 hours to a quarter of the original diameter, the beads regain 85% of their volume immediate and about 97% of their volume after 10 minutes. The sizes of the beads may vary. Beads may have a diameter of greater than 0.1 mm to 10 mm, such as from about .05 mm to about 8 mm. Individual beads have been prepared which have diameters of 0.5 mm, 0.8 mm, 1.0 mm, 2.5 mm, 3.0 mm, 4.0 mm, 5.0 mm, and 8.0 mm.

[0063] Individual beads may have a density in any suitable range, such as from about 0.05 g/cc to about 0.5 g/cc, including about 0.1 g/cc. Also, the beads have unique absorptions properties. For example, when placed in water, a bead of approximately 3 mm in diameter will absorb approximately 14% of its weight in water. However, when the bead is squeezed and then released in water, the bead will absorb up to about 350% its weight in water. These absorption properties demonstrate additional utility such as a delivery vehicle for substances such as fragrances, ointments, and other fluid compositions.

Polyamide Compositions

[0064] A variety of different polyamides may be used with some embodiments. Examples of suitable polyamides include Nylon 6, Nylon 12, and Nylon 6,6. The polyamide may be present in any desired form including fibers and powders. One suitable process for the preparation of polyamide powder is disclosed in U.S. Patent No. 4,831,061 to Hilaire, which is incorporated herein by reference. Such powders are also commercially available under the trade name Orgasol® from ARKEMA. Of the commercially available powders, sizes range from about 5 microns to about 20 microns. Polyamide powders may also be provided in a broader range of sizes, such as having an average particle size in the range of about 50-100 microns to about 500 microns, including 100 microns. Coarser powders are also included such as those having an average particle size in the range of about 0.5 mm to about 5 mm, including about 1 mm.

Polyester Compositions

[0065] A variety of different polyesters are also useful for inclusion in some embodiments. Examples include polyalkylene terephthalate, polyalkylene naphthalate and polyalkylene isophthalate. Examples of polyalkylene terephthalates are fiber-forming linear condensation polymers having carboxyl linking radicals in the polymer chain such as polyethylene terephthalate ("2GT" or "PET"), polytrimethylene terephthalate ("3GT" or "PTT"), and polytetramethylene terephthalate ("4GT").

[0066] The polyester composition may be in any desired form including fibers, flock, and powders.

[0067] In the absence of an indication to the contrary, a reference to "polyalkylene terephthalate" is meant to encompass copolyesters, i.e., polyesters made using 3 or more reactants, each having two ester forming groups. For example, a copoly(ethylene terephthalate) can be used in which the comonomer used to make the copolyester is selected from the group consisting of linear, cyclic, and branched aliphatic dicarboxylic acids having 4 to 12 carbon atoms (for example butanedioic acid, pentanedioic acid, hexanedioic acid, dodecanedioic acid, and 1,4-cyclo-hexanedicarboxylic acid); aromatic dicarboxylic acids other than terephthalic acid and having 8 to 12 carbon atoms (for example isophthalic acid and 2,6-naphthalenedicarboxylic acid); linear, cyclic, and branched aliphatic diols having 3 to 8 carbon atoms (for example 1,3-propanediol, 1,2-propanediol, 1,4-butanediol, 3-methyl-1,5-pentanediol, 2,2-dimethyl-1,3-propanediol, 2-methyl-1,3-propanediol, and 1,4-cyclohexanediol); and aliphatic and aromatic

ether glycols having 4 to 10 carbon atoms (for example, hydroquinone bis(2-hydroxyethyl) ether, or a poly(ethylene ether) glycol having a molecular weight below about 460 daltons, including diethyleneether glycol). The comonomer typically can be present in the copolyester at a level in the range of about 0.5 to about 15 mole %.

Flock

[0068] In some embodiments are the polymer compositions in the form of flock. Flock is a very short precision cut or pulverized fiber used to produce a velvet like coating on cloth, rubber, film, or paper. Flock may be used as filler in plastic, paper, rubber, or similar compositions to increase impact strength, improve moldability, or add a decorative appearance to the finished product. Flock may be a fiber, generally between the length of about 0.040 inches to about 0.250 inches (1mm to 6.25mm). The diameter is generally between about 10 to about 100 microns. Flock of different colors may be prepared from a variety of different synthetic and natural fibers such as polyamides, polyesters, cotton, and rayon.

Dye Information

[0069] A variety of different dyes, colorants and pigments may be used to add color to the compositions of some embodiments. For example, certain dyes are most useful for adding color to the polyamide and polyester compositions while pigments may be added to the polyurethane compositions.

[0070] Among the colorants used for some embodiments, including cosmetic compositions are inorganic colorants and organic colorants which include synthetic and natural colorants. Inorganic colorants include TiO₂, iron oxides and ultramarines. Synthetic organic colorants include lakes, toners and pigments, such as those described in U.S. Patent No. 4,909,853, herein incorporated by reference. An example of a natural organic colorant is carmine.

[0071] One suitable method for preparing a colored nylon powder includes dyeing in a dye beaker heated on a hot plate with a magnetic stirrer. This ensures that powders are well agitated by the stirrers to prevent formation of lumps and ensuring even dye uptake throughout the batch:

1. Set dye bath to pH6.0 with phosphate buffers
2. Add 1% (on weight) of Levegal SER (Anionic levelling agent)
3. Add pre-dissolved dyestuff

4. Add nylon powder
5. Raise to boil at 2°C/min rate of rise. Hold at temperature for 30 minutes.
6. Add 1g/l Sandacid GBV (acid donor – slowly releases acid into dyebath to drop pH to pH 5.0 – 5.5)
7. Hold at temperature for 30 minutes.
8. Cool.
9. Pour dye-bath and powder through a fine filter and rinse.
10. Collect powder and dry in a heated cabinet.

[0072] For nylon of any form including fiber, flock, and powder, the most commonly used dyestuffs are non-metallized and metallized acid dyes. Both of these give a good shade range and a certain degree of colour fastness to both washing and UV. The metallized dyes will give the best fastness to UV and washing, but the shade range is limited to the more muted shades. Bright shades are only achieved either with the non-metallized acid dyes, which do not perform so well under UV and washing, or there is a limited range of special reactive acid dyes available which offer the best performance to washing, but which have similar fastness performance to UV as the non-metallized acid dyes. These reactive dyes tend to be more expensive and the shade depth is limited depending upon the available amine ends in the nylon powder/flock.

[0073] For polyester of any form including fiber, flock, and powder, disperse dyes are the only dyes that can dye standard disperse dyeable polyester. However, if you have cationic dyeable polyester, then either basic (cationic) or disperse dyes can be used.

[0074] All of these types of dye classes can be obtained from the major suppliers such as Huntsman (formerly Ciba Textile Effects) and DyStar. See table below for list of commercially available dyes by supplier and class.

Supplier	Acid non-metallized	Acid metallized	Reactive acid	Disperse	Cationic
Huntsman	Tectilon, Erionyl	Lanaset	Eriofast, Lanasol, Lanaset	Terasil	Maxilon
DyStar	Telon	Isolan	Stanalan	Dianix	Astazone

Fragrances

[0075] There is a range of fragrance materials that deposit well on, or are retained well on, spandex (i.e., segmented polyurethane). Such materials include, but are not limited to, the following two categories, Category A and Category B as set forth below.

[0076] Category A: hydroxylic materials which are alcohols, phenols or salicylates, with an octanol/water partition coefficient (P) whose common logarithm ($\log_{10} P$) is 2.5 or greater, and a gas chromatographic Kovats index (as determined on polydimethylsiloxane as non-polar stationary phase) of at least 1050.

[0077] The octanol-water partition coefficient (or its common-logarithm "logP") is well-known in the literature as an indicator of hydrophobicity and water solubility (see Hansch and Leo, Chemical Reviews, 71, 526-616, (1971); Hansch, Quinlan and Lawrence, J.Organic Chemistry, 33, 347-350 (1968). Where such values are not available in the literature they may be measured directly, or estimated approximately using mathematical algorithms. Software providing such estimations is available commercially, for example "LogP" from Advanced Chemistry Design Inc.

[0078] Materials having $\log_{10} P$ of 2.5 or more are somewhat hydrophobic.

[0079] Kovats indices are calculated from the retention time in a gas chromatographic measurement referenced to the retention time for alkanes [see Kovats, Helv.Chim.Acta 41, 1915 (1958)]. Indices based on the use of a non-polar stationary phase have been used in the perfumery industry for some years as a descriptor relating to the molecular size and boiling point of components. A review of Kovats indices in the perfume industry is given by T Shibamoto in "Capillary Gas Chromatography in Essential Oil Analysis", P Sandra and C Bicchi (editors), Huethig (1987), pages 259-274. A common non-polar phase which is suitable is 100% dimethyl polysiloxane, as supplied for example under a variety of tradenames such as RP-1 (Hewlett-Packard), CP Sil 5 CB (Chrompack), OV-1 (Ohio Valley) and Rtx-1 (Restek).

[0080] Materials of low Kovats index tend to be volatile and are not retained well on many fibers.

[0081] Category A includes alcohols of general formula ROH where the hydroxyl group may be primary, secondary or tertiary, and the R group is an alkyl or alkenyl group, optionally branched or substituted, cyclic or acyclic, such that ROH has partition coefficient and Kovats properties as defined above. Alcohols of Kovats index 1050 to 1600 are typically monofunctional alkyl or arylalkyl alcohols with molecular weight falling within the range 150 to 230.

[0082] Category A also includes phenols of general formula ArOH, where the Ar group denotes a benzene ring which may be substituted with one or more alkyl or alkenyl groups, or with an ester grouping $\text{-CO}_2\text{A}$, where A is a hydrocarbon radical, in which case the compound is a salicylate. ArOH has partition coefficient and Kovats index as defined above. Typically, such phenols with Kovats index 1050 to 1600 are monohydroxylic phenols with molecular weight falling within the range 150 to 210.

[0083] Examples of fragrance materials in category A are 1-(2'-tert-butylcyclohexyloxy)-butan-2-ol, 3-methyl-5-(2',2',3'-trimethylcyclopent-3-enyl)-pentan-2-ol, 4-methyl-3-decen-5-ol, amyl salicylate, 2-ethyl-4(2',2',3'-trimethylcyclopent-3'-enyl)but-2-enol, borneol, carvacrol, citronellol, 9-decenol, dihydroeugenol, dihydrolinalol, dihydromyrcenol, dihydroterpineol, eugenol, geraniol, hydroxycitronellal, isoamyl salicylate, isobutyl salicylate, isoeugenol, linalool, menthol, nerolidol, nerol, para tert-butyl cyclohexanol, phenoxanol, terpeneol, tetrahydrogeraniol, tetrahydrolinalol, tetrahydromyrcenol, thymol, 2-methoxy-4-methylphenol, (4-isopropylcyclohexyl)-methanol, benzyl salicylate cyclohexyl salicylate, hexyl salicylate, patchouli alcohol, and farnesol.

[0084] Category B esters, ethers, nitriles, ketones or aldehydes, with an octanol/water partition coefficient (P) whose common logarithm ($\log_{10} P$) is 2.5 or greater, and a gas chromatographic Kovats index (as determined on polydimethylsiloxane as non-polar stationary phase) of at least 1300.

[0085] Fragrances of Category B are of general formula RX, where X may be in a primary, secondary or tertiary position, and is one of the following groups: $\text{-CO}_2\text{A}$, -COA , -OA , -CN or -CHO . The groups R and A are hydrocarbon residues, cyclic or non-cyclic and optionally substituted. Typically, the materials of Category B with Kovats index not exceeding 1600 are monofunctional compounds with molecular weights in the range 160 to 230.

[0086] Examples of fragrance materials in category B are 1-methyl-4-(4-methyl-3-pentenyl)-3-cyclohexene-1-carbaldehyde, 1-(5', 5'-dimethylcyclohexenyl)-pent-en-1-one, 2-heptylcyclopentanone, 2-methyl-3-(4'-tert-butylphenyl)propanal, 2-methylundecanal, 2-undecenal, 2,2-dimethyl-3-(4'-ethylphenyl)-propanal, 3-(4'-isopropylphenyl)-2-methylpropanal, 4-methyl-4-phenylpent-2-yl acetate, allyl cyclohexyl propionate, allyl cyclohexyloxyacetate, amyl benzoate, methyl ethyl ketone trimers, benzophenone, 3-(4'-tert-butylphenyl)-propanal, caryophyllene, cis-jasmone, citral diethyl acetal, citronellal diethyl acetal, citronellyl acetate, phenylethyl butyl ether, alpha-damascone, beta-damascone, delta-damascone, gamma-decalactone, dihydroisojasmonate, dihydrojasmonone, dihydroterpinyl acetate, dimethyl anthranilate, diphenyl oxide, diphenylmethane, dodecanal, dodecen-2-al, dodecane nitrile, 1-ethoxy-1-phenoxyethane, 3-(1'-ethoxyethoxy)-3,7-dimethylocta-1,6-diene, 4-(4'-methylpent-3'-enyl)-cyclohex-3-enal, ethyl tricyclo[5.2.1.0-2,6]-decane-2-carboxylate, 1-(7-isopropyl-5-methylbicyclo[2.2.2]oct-5-en-2-yl)-1-ethanone, allyl tricyclodecenyl ether, tricyclodecenyl propanoate, gamma-undecalactone, n-methyl-n-phenyl-2-methylbutanamide, tricyclodecenyl isobutyrate, geranyl acetate, hexyl benzoate, ionone alpha, ionone beta, isobutyl cinnamate, isobutyl quinoline, isoeugenyl acetate, 2,2,7,7-tetramethyltricyclodecan-5-one, tricyclodecenyl acetate, 2-hexylcyclopentanone, 4-acetoxy-3-pentyltetrahydropyran, ethyl 2-hexylacetoacetate, 8-isopropyl-6-methylbicyclo[2.2.2]oct-5-ene-2-carbaldehyde, methyl 4-isopropyl-1-methylbicyclo[2.2.2]oct-5-ene-2-carboxylate, methyl cinnamate, alpha iso methyl ionone, methyl naphthyl ketone, nerolin, nonalactone gamma, nopyl acetate, para tert-butyl cyclohexyl acetate, 4-isopropyl-1-methyl-2-[1'-propenyl]-benzene, phenoxyethyl isobutyrate, phenylethyl isoamyl ether, phenylethyl isobutyrate, tricyclodecenyl pivalate, phenylethyl pivalate, phenylacetaldehyde hexylene glycol acetal, 2,4-dimethyl-4-phenyltetrahydrofuran, rose acetone, terpinyl acetate, 4-isopropyl-1-methyl-2-[1'-propenyl]-benzene, yara, (4-isopropylcyclohexadienyl)ethyl formate, amyl cinnamate, amyl cinnamic aldehyde, amyl cinnamic aldehyde dimethyl acetal, cinnamyl cinnamate, 1,2,3,5,6,7,8,8a-octathyro-1,2,8,8-tetramethyl-2-acetyl naphthalene, cyclo-1,13-ethylenedioxytridecan-1,13-dione, cyclopentadecanolide, hexyl cinnamic aldehyde, 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta[g]-2-benzopyran, geranyl phenyl acetate, 6-acetyl-1-isopropyl-2,3,3,5-tetramethylindane, and 1,1,2,4,4,7-hexamethyl-6-acetyl-1,2,3,4-tetrahydronaphthalene.

[0087] While this is an extensive list of fragrances and perfumes that work especially well with spandex compositions, it is recognized that a variety of other fragrances are also useful in some embodiments. Fragrances may include a substance or mixture of substances including

natural (i.e., obtained by extraction of flowers, herbs, leaves, roots, barks, wood, blossoms or plants), artificial (i.e., a mixture of different nature oils or oil constituents) and synthetic (i.e., synthetically produced) odoriferous substances.

[0088] A non-limiting examples of fragrances include: hexyl cinnamic aldehyde; amyl cinnamic aldehyde; amyl salicylate; hexyl salicylate; terpineol; 3,7-dimethyl-cis-2,6-octadien-1-ol; 2,6-dimethyl-2-octanol; 2,6-dimethyl-7-octen-2-ol; 3,7-dimethyl-3-octanol; 3,7-dimethyl-trans-2,6-octadien-1-ol; 3,7-dimethyl-6-octen-1-ol; 3,7-dimethyl-1-octanol; 2-methyl-3-(para-tert-butylphenyl)-propionaldehyde; 4-(4-hydroxy-4-methylpentyl)-3-cyclohexene-1-carboxaldehyde; tricyclodecenyl propionate; tricyclodecenyl acetate; anisaldehyde; 2-methyl-2-(para-isopropylphenyl)-propionaldehyde; ethyl-3-methyl-3-phenyl glycidate; 4-(para-hydroxyphenyl)-butan-2-one; 1-(2,6,6-trimethyl-2-cyclohexen-1-yl)-2-buten-1-one; para-methoxyacetophenone; para-methoxy-alpha-phenylpropene; methyl-2-n-hexyl-3-oxo-cyclopentane carboxylate; undecalactone gamma, orange oil; lemon oil; grapefruit oil; bergamot oil; clove oil; dodecalactone gamma; methyl-2-(2-pentyl-3-oxo-cyclopentyl) acetate; beta-naphthol methylether; methyl-beta-naphthylketone; coumarin; decylaldehyde; benzaldehyde; 4-tert-butylcyclohexyl acetate; alpha,alpha-dimethylphenethyl acetate; methylphenylcarbinyl acetate; cyclic ethyleneglycol diester of tridecandioic acid; 3,7-dimethyl-2,6-octadiene-1-nitrile; ionone gamma methyl; ionone alpha; ionone beta; petitgrain; methyl cedrylone; 7-acetyl-1,2,3,4,5,6,7,8-octahydro-1,1,6,7-tetramethyl-naphthalene; ionone methyl; methyl-1,6,10-trimethyl-2,5,9-cyclododecatrien-1-yl ketone; 7-acetyl-1,1,3,4,4,6-hexamethyl tetralin; 4-acetyl-6-tert-butyl-1,1-dimethyl indane; benzophenone; 6-acetyl-1,1,2,3,3,5-hexamethyl indane; 5-acetyl-3-isopropyl-1,1,2,6-tetramethyl indane; 1-dodecanal; 7-hydroxy-3,7-dimethyl octanal; 10-undecen-1-al; isohexenyl cyclohexyl carboxaldehyde; formyl tricyclodecan; cyclopentadecanolide; 16-hydroxy-9-hexadecenoic acid lactone; 1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylcyclopenta-gamma-2-benzopyran- e; ambroxane; dodecahydro-3a,6,6,9a-tetramethylnaphtho-[2,1b]furan; cedrol; 5-(2,2,3-trimethylcyclopent-3-enyl)-3-methylpentan-2-ol; 2-ethyl-4-(2,2,3-trimethyl-3-cyclopenten-1-yl)-2-buten-1-ol; caryophyllene alcohol; cedryl acetate; para-tert-butylcyclohexyl acetate; patchouli; olibanum resinoid; labdanum; vetiver; copaiba balsam; fir balsam; hydroxycitronellal and indol; phenyl acetaldehyde and indol; geraniol; geranyl acetate; linalool; linalyl acetate; tetrahydrolinalool; citronellol; citronellyl acetate; dihydromyrcenol; dihydromyrcenyl acetate; tetrahydromyrcenol; terpinyl acetate; nopol; nopyl acetate; 2-phenylethanol; 2-phenylethyl acetate; benzyl alcohol; benzyl acetate; benzyl salicylate; benzyl benzoate; styrallyl acetate; dimethylbenzylcarbinol; trichloromethylphenylcarbinyl methylphenylcarbinyl acetate; isononyl

acetate; vetiveryl acetate; vetiverol; 2-methyl-3-(p-tert-butylphenyl)-propanal; 2-methyl-3-(p-isopropylphenyl)-propanal; 3-(p-tert-butylphenyl)-propanal; 4-(4-methyl-3-pentenyl)-3-cyclohexenecarbaldehyde; 4-acetoxy-3-pentyltetrahydropyran; methyl dihydrojasmonate; 2-n-heptylcyclopentanone; 3-methyl-2-pentyl-cyclopentanone; n-decanal; n-dodecanal; 9-decenol-1; phenoxyethyl isobutyrate; phenylacetaldehyde dimethylacetal; phenylacetaldehyde diethylacetal; geranonitrile; citronellonitrile; cedryl acetal; 3-isocamphylcyclohexanol; cedryl methylether; isolongifolanone; aubepine nitrile; aubepine; heliotropine; eugenol; vanillin; diphenyl oxide; hydroxycitronellal ionones; methyl ionones; isomethyl ionones; irones; cis-3-hexenol and esters thereof; indane musk fragrances; tetralin musk fragrances; isochroman musk fragrances; macrocyclic ketones; macrolactone musk fragrances; ethylene brassylate, and combinations thereof.

Fabric Care Compositions

[0089] The polyurethaneurea compositions prepared by the methods described above deliver surprisingly improved shape retention properties to fabrics. Furthermore, they also provide ease of care or easy care properties to fabrics. In other words, fabrics treated with the polyurethaneurea compositions have fewer wrinkles after washing and are easier to iron.

[0090] The polyurethaneurea compositions of some embodiments also have surprisingly good water and oil absorption, especially when applied to a fabric. This is particularly important for anti-stain properties. After a fabric has been contacted with a polyurethaneurea composition of some embodiments, the polyurethaneurea will absorb moisture and oil from stain-causing sources and thereby limit the absorption of the fabric itself.

[0091] Due to the absorption properties, the polyurethaneurea compositions also assist in prolonging fragrance substantiation in a fabric which has been contacted by the composition. This results from the absorption and subsequent gradual release of the fragrance by the polyurethaneurea composition.

[0092] The fabric care composition of some embodiments may include a fabric softener or detergent to which the polyurethaneurea compositions may be added. These polyurethaneurea compositions may also be in any form such as a dispersion or powder. Alternatively, the polyurethaneurea composition may be added directly to the fabric, to a washing machine, wash water (for hand washing), or to an automatic dryer.

[0093] Furthermore, the powder or dispersion may be used as a replacement of fabric softener to deliver anti stain properties to garments via home laundering. Fabric softeners are frequently used to deliver perfume or fragrance to fabrics and secondarily to deliver fabric softness. The fabric softening aspect is not necessarily needed when tumble drying is used since fabrics which are tumble dried are already very soft.

[0094] The detergent compositions of some embodiments normally contains an anionic, nonionic, amphoteric or ampholytic surfactant or a mixture thereof, and frequently contains, in addition, an organic or inorganic builder.

[0095] Fabric softeners will generally include an active component such as a quaternary ammonium salt. Examples of non-cyclic quaternary ammonium salts include tallow trimethyl ammonium chloride; ditallow dimethyl ammonium chloride; ditallow dimethyl ammonium methyl sulfate; dihexadecyl dimethyl ammonium chloride; di(hydrogenated tallow) dimethyl ammonium chloride; dioctadecyl dimethyl ammonium chloride; dieicosyl dimethyl ammonium chloride; didocosyl dimethyl ammonium chloride; di(hydrogenated tallow) dimethyl ammonium methyl sulfate; dihexadecyl diethyl ammonium chloride; dihexadecyl dimethyl ammonium acetate; ditallow dipropyl ammonium phosphate; ditallow dimethyl ammonium nitrate; and di(coconut-alkyl) dimethyl ammonium chloride.

[0096] Other optional components of the fabric care compositions of some embodiments conventional in nature, and generally are present from about 0.1% to about 10% by weight of the composition. Such optional components include, but are not limited to, colorants, perfumes, bacterial inhibitors, optical brighteners, opacifiers, viscosity modifiers, fabric conditioning agents in solid form such as clay, fabric absorbency boosters, emulsifiers, stabilizers, shrinkage controllers, spotting agents, germicides, fungicides, anti-corrosion agents, etc.

[0097] The fabric care compositions of some embodiments can be prepared by conventional methods. Homogenizing is not necessary. A convenient and satisfactory method is to prepare a premix of softeners in water at about 150°F which is then added to a hot aqueous solution of the other components. Temperature-sensitive components can be added after the fabric conditioning composition is cooled to about room temperature.

[0098] The fabric care compositions of some embodiments may be used by adding to the rinse cycle of conventional home laundry operations. Alternatively, the fabric care compositions may be added to a detergent prior to the wash cycle, directly to the fabric, or with hand washing, either as part of a detergent or fabric softening composition or directly to the wash water.

[0099] The fabric care compositions may be applied in any form known in the art such as a powder, a liquid, a solid tablet, an encapsulate liquid (for example a composition encapsulated with polyvinylalcohol), or in the case of application for an automatic dryer, in a non-woven sheet.

[0100] The fabric care compositions of some embodiments may be added in any amount necessary to achieve the desired properties of the fabric. For example, the fabric care compositions may be added in an amount from about 0.05% to about 1.5%, for example, from about 0.2% to about 1%, by weight of the aqueous rinsing bath or wash water.

[0101] When present as an aqueous dispersion, the polyurethaneurea compositions of some embodiments may be present in the fabric care composition from about 0.1% to about 20% by weight of the fabric care composition, for example from about 5% to about 15%. When present as a powder, the polyurethaneurea compositions may be present in the fabric care composition from about 0.1% to about 20% by weight of the fabric care composition, for example from about 0.5% to about 10%, or from about 1% to about 5%.

[0102] Alternatively, the polyurethaneurea powder or dispersion may be added as a replacement for the fabric care composition instead of as a component of the fabric care composition, where the polyurethaneurea composition may be added as 100%. In this instance, the polyurethaneurea composition may be added directly to the wash water or rinsing water in amount from about 0.05% to about 1.5%, specifically, from about 0.2% to about 1%, by weight of the rinsing water or wash water.

Cosmetic Compositions

[0103] Nylon (polyamide) and polyurethaneurea (PUU) powders have many properties that make that useful for inclusion with cosmetic compositions. Among these properties are oil, water, and sweat absorbency. These properties are especially useful for applications such as

sweat absorbency for deodorants or anti-perspirants when in contact with skin. These properties are also useful for long lasting sebum and shine control for skin contact products, for skin care, and in decorative cosmetics, for young people skins or oily skins. Oil absorption property is also useful for sun tan lotions or creams, to reduce the greasy effect of the UV filter and their sticky texture. Water absorption property is also useful for providing long lasting moisture to the skin. The amphiphilic property is also useful for dispensability purposes in both O/W and W/O emulsions. Examples of compositions useful for the polyurethaneurea powders and dispersions of some embodiments include, without limitation, moisturizing creams and gels (which may be for body and/or face), wrinkle minimizer/reducer/eliminators, suntans/sunscreens/self-tanners, antiperspirant/deodorant, cleansers/soaps, body powder, and make-up including foundation, blush, pressed powders, lipstick/lip gloss, eye shadow, eyeliner and mascara. Specific examples of cosmetic compositions that include the nylon, PUU powders and PUU dispersions are set forth in the examples section hereinbelow.

[0104] In one embodiment are polymer powders having antimicrobial activity to reduce bacterial growth and malodor. With the addition of an odor absorber, such as zinc oxide, the powder may have increased odor prevention.

[0105] The powders of some embodiments have surprisingly good water and oil absorption and surprisingly fast absorption speeds. In one embodiment, polyurethaneurea powders are formed, by the method described above, which have a specific particle size and are suitable for application as water or sweat absorbers in deodorant and anti-perspirant compositions or oil (sebum) absorbers in skin care or make-up compositions. Additional embodiments include powders with antimicrobial additives for enhanced odor protection, powders with additive fragrances for pleasant aromas, and powders for cosmetic and body care end uses. Non-limiting examples of cosmetic compositions to which the powders, beads, fibers, and dispersions of some embodiments include deodorants such as spray, stick, or roll-on anti-perspirants; make-up and color cosmetics such as powder (blush/bronzer/highlighter), foundation, eye shadow, eye liner, mascara, lipstick/lip gloss, and nail polish; skin care compositions such as body and facial moisturizers, shaving and after shave gels and creams, bar soap, and body wash/cleanser; hair care such as shampoos, conditioners, and styling products; and oral care including toothpastes.

[0106] The polyamide and polyurethaneurea powders of some embodiments have great feel and touch properties. For example, they have good gliding with silky and smooth touch.

[0107] The polyurethaneurea powders of the invention show very high water and sweat absorption by mass properties and at the same time show good oil absorption values. Very high water absorption is defined to be values greater than three times higher versus NY-6 powder (from Arkema commercially available from Lehmann and Voss & Co. of Hamburg, Germany). Good oil absorption values are defined as comparable to nylon 12 (Arkema) and higher than polymethyl methacrylate, polyethylene and polyurethane from KOBO (Kobo Products of South Plainfield, New Jersey and St. Agne France). The polyurethaneurea powders of the invention show that the water or sweat absorption is extremely fast (immediate). Fast water absorption is defined to be 100 times faster than talc.

[0108] The fast and high mass of water absorption by the polyurethaneurea powders described herein also provide benefits for anti-aging and anti-wrinkle products. The powders may be used as fillers for skin wrinkles in anti-aging skin care compositions. The powders are hydrophilic, compressible micro-spheres with volumizing effects to stretch out the skin reducing or eliminating the appearance of wrinkles. Their elastic behavior provides a nice and smooth feel to the touch, offering high softness, cushioning texture, uniform film application and mechanical properties of micro-massage to improve wrinkle recovery of the skin.

[0109] For applications of powders in cosmetics and body care applications, particles smaller than 100 micron are suitable to feel smooth on the skin and be unnoticed by the wearer. Ideally average particle size should be less than 50 microns. In one embodiment, powders of polyurethaneurea were included 90% of particles smaller than 42 microns, which may be achieved by filtering or by controlling parameters of a spray drying process.

[0110] In another embodiment are polyurethaneurea beads or powders as exfoliating agents in cleanser, scrubs, shower gels, etc. They could be used to deliver dynamic massage thanks to their good rolling effect, soft and non aggressive feeling. Typically materials such as ground nuts including apricot kernel have been included as exfoliating/scrubbing/peeling agents in cosmetic compositions. However, these tend to be hard and have very sharp edges which result in an unpleasant feeling. By contrast, the polyurethaneurea beads and powders of some embodiments may have a very spherical shapes, rounded surfaces, and a silky feel making

them more "skin-friendly," while maintaining the effect of a hard material. The powders or beads may be added to a cleanser composition in any amount to achieve the desired effect. Particle sizes may also vary, generally greater than about 100 microns in order to be noticed by the consumer.

[0111] In another embodiment are polyurethaneurea dispersions which are film-forming for curl retention or anti-frizz properties in hair care compositions (gel, spray, shampoo, conditioner, etc.); for texture and skin lifting in make up or skin care. Colored or pigmented polyurethaneurea powders can be used for non-permanent coloration of the hair.

[0112] The polymer compositions may be included in any composition up to 100% by weight of the composition. Suitable ranges of nylon, polyester, and polyurethaneurea inclusion in compositions based on the weight of the composition include 1-20% by weight, 1-15% by weight 5-10% by weight, and 25-75% by weight. The amount used depends on the application and the desired effect.

Paint Compositions

[0113] In some embodiments are paint compositions including polyurethaneurea, polyester and polyamide compositions. The paint may be any of those known in the art including latex, acrylic and oil based paint including primers, sealers, and coatings. The polyurethaneurea, polyester and polyamide compositions may be added to paint in any form to achieve a desired effect.

[0114] The addition of the polymer in the powder, short fiber, or bead form, may be included to provide texture to the paint composition. Also, if the powders, fibers or bead have been dyed or colored, they will also achieve a different paint effect. Such effects are extremely desirable given the recent interest in alternate painting techniques and faux finishes. The compositions of the some embodiments provide alternative surface characteristics such as texture and color without additional painting steps. Furthermore, a dual color effect or multiple color effect may be achieved, by adding color to the base paint and one or more separate colors in the powder/beads/fibers.

[0115] In addition to the visible effects of color and texture, the addition of flock to paint compositions has additional benefits. Paint compositions that include these flock fibers provide

better coverage of uneven areas of walls/surfaces, higher flexibility, and resistance to cracking. Furthermore, they provide a wall paper effect through a paint application.

[0116] In addition to the visible effects of color and texture, the addition of polyurethaneurea dispersion to paint compositions has additional benefits. Paint compositions that include these dispersions may provide better coverage, especially on uneven surfaces, and resistance to cracking. This is demonstrated by the examples.

[0117] Alternatively, the addition of the polymer in the powder, short fiber, or bead form may be included to provide anti-skid properties to the paint compositions. This is accomplished by increasing the friction painted surface, in comparison to a traditional paint composition.

[0118] The features and advantages of the present invention are more fully shown by the following examples which are provided for purposes of illustration, and are not to be construed as limiting the invention in any way.

EXAMPLES

Example 1

[0119] Capped glycol prepolymer, formed from Terathane® E2538 glycol (Supplied by INVISTA, S.à r.l.) and Isonate® 125MDR and with a capping ratio of 1.696, was obtained from a developmental LYCRA® spandex production line. LYCRA® is INVISTA's registered trademark for spandex. This prepolymer of 300 grams was mixed with 150 grams of NMP solvent in a plastic bottle for 10 minutes to reduce the viscosity. The diluted mixture was poured into a steel tube to be injected into a stainless steel container for dispersing. The container had 2000 grams of de-ionized water, 30 grams of T DET N14 surfactant (commercially available from Harcros of Kansas City, Kansas) and 4.5 grams of ethylenediamine chain extender which were premixed and cooled to 5°C. The diluted prepolymer was injected under air pressure at about 40 psi through a tubing of 1/8 inch inner diameter, a high-speed laboratory disperser (model number, HSM-100LC commercially available from Charles Ross & Son Company of Hauppauge, New York) was operated at 5000 rpm. The addition of diluted prepolymer was completed within 15 minutes, the formed milky dispersion was continued to disperse for additional 5 minutes. Back weighing of the container gave the total amount of diluted capped glycol added into the dispersion being 328 grams, equivalent to 218.7 grams of capped glycol prepolymer added into the dispersion. Additive 65 foam controlling agent of 3 grams

(commercially from Dow Corning of Midland, Michigan) was added to the dispersion, and the dispersion was allowed for mixing at 5000 rpm for another 30 minutes before pouring into a plastic bottle.

[0120] The average particle size of the dispersion was determined to be 52.83 micron, with 95% of the particles below 202.6 microns, by the use of a Microtrac X100 particle size analyzer (Leeds, Northrup).

Example 2

[0121] The same components and dispersion procedures were used as in Example 1, except that 4.5 grams ethylenediamine chain extender was added after the diluted prepolymer was dispersed into water mixture. Back weighing of the container gave the total amount of diluted capped glycol added into the dispersion being 329 grams, equivalent to 219 grams of capped glycol prepolymer added into the dispersion. The average particle size of the dispersion was determined to be 33.45 micron, with 95% of the particles below 64.91 microns. The solid polymer particles do not form into films when isolated.

Example 3

[0122] Capped glycol prepolymer was prepared by reacting 500 grams of Krasol® HLB 2000 glycol (Supplied by Sartomer Company, Inc. at Exton, PA) and 105.86 grams of Isonate®125MDR at 90°C for 120 minutes in a 2000 ml reaction kettles equipped with a heating mantle and a mechanical agitator. The reaction was carried out in a nitrogen filled dry box. After the reaction, the prepolymer had a NCO group wt% of 2.98 as determined by titration method. This prepolymer was poured into a steel tube to be injected into a stainless steel container for dispersing. De-ionized water (2000 grams) was mixed at room temperature in the container with 30 grams of T DET N14 surfactant (commercially available from Harcros of Kansas City, Kansas) and 3 grams of Additive 65 foam controlling agent (commercially from Dow Corning of Midland, Michigan). The prepolymer was injected under air pressure at about 80 psi through a tubing of 1/8 inch inner diameter, a high-speed laboratory disperser (model number, HSM-100LC commercially available from Charles Ross & Son Company of Hauppauge, New York) was operated at 5000 rpm. The addition of diluted prepolymer was completed within 15 minutes, the formed milky dispersion was continued to disperse for additional 5 minutes. Back weighing of the container gave the total amount of diluted capped glycol added into the dispersion being 422 grams. Ethylenediamine chain extender of 4.5 grams was added to the

dispersion and the dispersion was allowed for mixing at 5000 rpm for another 30 minutes. The average particle size of the formed dispersion was determined to be 49.81 micron, with 95% of the particles below 309.7 microns.

Example 4

[0123] The procedures were the same as in Example 3, except that a mixture of glycols with 250 grams of Terathane® 1800 glycol and 250 grams of Krasol® HLB 2000 glycol was used to form the prepolymer. A total of 465 grams of prepolymer was dispersed. The average particle size of the formed dispersion was determined to be 13.67 micron, with 95% of the particles below 38.26 microns.

Example 5

[0124] The preparation of the prepolymers was conducted in a glove box with nitrogen atmosphere. A 2000 ml Pyrex® glass reaction kettle, which was equipped with an air pressure driven stirrer, a heating mantle, and a thermocouple temperature measurement, was charged with about 382.5 grams of Terathane® 1800 glycol (commercially available from INVISTA, S.à r.l., of Wichita, KS and Wilmington, DE) and about 12.5 grams of 2,2-dimethylpropionic acid (DMPA). This mixture was heated to about 50°C with stirring, followed by the addition of about 105 grams of Lupranate® MI diisocyanate (commercially available from BASF, Wyandotte, Michigan). The reaction mixture was then heated to about 90°C with continuous stirring and held at about 90°C for about 120 minutes, after which time the reaction was completed, as the %NCO of the mixture declined to a stable value, matching the calculated value (%NCO aim of 1.914) of the prepolymer with isocyanate end groups. The viscosity of the prepolymer was determined in accordance with the general method of ASTM D1343-69 using a Model DV-8 Falling Ball Viscometer, (sold by Duratech Corp., Waynesboro, VA.), operated at about 40 °C. The total isocyanate moiety content, in terms of the weight percent of NCO groups, of the capped glycol prepolymer was measured by the method of S. Siggia, "Quantitative Organic Analysis via Functional Group", 3rd Edition, Wiley & Sons, New York, pp. 559-561 (1963), the entire disclosure of which is incorporated herein by reference.

Example 6

[0125] A solvent-free prepolymer, as prepared according to the procedures and composition described in Example 5, was used to make the polyurethaneurea aqueous dispersion of the present invention.

[0126] A 2,000 ml stainless steel beaker was charged with about 700 grams of de-ionized water, about 15 grams of sodium dodecylbenzenesulfonate (SDBS), and about 10 grams of triethylamine (TEA). This mixture was then cooled with ice/water to about 5 °C and mixed with a high shear laboratory mixer with rotor/stator mix head (Ross, Model 100LC) at about 5,000 rpm for about 30 seconds. The viscous prepolymer, prepared in the manner as Example 1 and contained in a metal tubular cylinder, was added to the bottom of the mix head in the aqueous solution through flexible tubing with applied air pressure. The temperature of the prepolymer was maintained between about 50°C and about 70°C. The extruded prepolymer stream was dispersed and chain-extended with water under the continuous mixing of about 5,000 rpm. In a period of about 50 minutes, a total amount of about 540 grams of prepolymer was introduced and dispersed in water. Immediately after the prepolymer was added and dispersed, the dispersed mixture was charged with about 2 grams of Additive 65 (commercially available from Dow Corning®, Midland Michigan). The reaction mixture was then mixed for about another 30 minutes followed by the addition of about 6 grams of diethylamine (DEA) and additional mixing. The resulting solvent-free aqueous dispersion was milky white and stable. The viscosity of the dispersion was adjusted with the addition and mixing of Hauthane HA thickening agent 900 (commercially available from Hauthway, Lynn, Massachusetts) at a level of about 2.0 wt% of the aqueous dispersion. The viscous dispersion was then filtered through a 40 micron Bendix metal mesh filter and stored at room temperatures for film casting or lamination uses. The dispersion had solids level of 43% and a viscosity of about 25,000 centipoises.

Example 7

[0127] Capped glycol prepolymer, formed from Terathane® 1800 glycol and Isonate® 125MDR (commercially available from the Dow Company, Midland, Michigan) and with a capping ratio of 1.688, was obtained from a commercial LYCRA® spandex production line. LYCRA® is INVISTA's registered trademark for spandex. This prepolymer of 300 grams was mixed with 150 grams of NMP solvent in a plastic bottle for 10 minutes to reduce the viscosity. The diluted mixture was poured into a steel tube to be injected into a stainless steel container for dispersing. The container had 2000 grams of de-ionized water, 30 grams of T DET N14 surfactant (commercially available from Harcros of Kansas City, Kansas) and 3 grams of ethylenediamine chain extender which were premixed and cooled to 5°C. The diluted prepolymer was injected under air pressure at about 40 psi through a tubing of 1/8 inch inner

diameter, a high-speed laboratory disperser (model number, HSM-100LC commercially available from Charles Ross & Son Company of Hauppauge, New York) was operated at 5000 rpm. The addition of diluted prepolymer was completed within 15 minutes, the formed milky dispersion was continued to disperse for additional 5 minutes. Back weighing of the container gave the total amount of diluted capped glycol added into the dispersion being 347 grams, equivalent to 231 grams of capped glycol prepolymer added into the dispersion. Additive 65 foam controlling agent of 3 grams (commercially from Dow Corning of Midland, Michigan) was added to the dispersion, and the dispersion was allowed for mixing at 5000 rpm for another 30 minutes before pouring into a plastic bottle.

[0128] The average particle size of the dispersion was determined to be 32.59 micron, with 95% of the particles below 65.98 microns, by the use of a Microtrac X100 particle size analyzer (Leeds, Northrup). The solid polymer particles was filtered using a Buchner funnel with Whatman® filter paper under reduced pressure, rinsed the filter cake with water for three times, and dried at 60-65°C for 4 hours. The particles did not form into films during the filtration or drying. The dried filter cake was easily ground into fine powders with the use of a laboratory Waring® blender (Blender 700 Model 33BL79 manufactured by Dynamics Inc., New Hartford, Connecticut). In commercial practice, the solid particles would be isolated directly from the dispersion using known drying processes such as spray drying. The dried powder had a weight average molecular weight of 352,550 and a number average molecular weight of 85,200 as determined by GPC.

Example 8

[0129] In Example 8 the same components and dispersion procedures were used as in Example 7, except that the solvent used to dilute the capped glycol prepolymer was changed to xylenes, and the amount of ethylenediamine chain extender was increased to 4.5 grams. Back weighing of the container gave the total amount of diluted capped glycol added into the dispersion being 339 grams, equivalent to 226 grams of capped glycol prepolymer added into the dispersion.

[0130] The average particle size of the dispersion was determined to be 22.88 micron, with 95% of the particles below 46.97 microns. The solid polymer particles do not form into films when isolated.

Example 9

[0131] In Example 9 the same components and dispersion procedures were used as in Example 7, except that the ethylenediamine chain extender was replaced by the same amount of a branched polyethylenimine (Mn about 600 by GPC from Aldrich). Back weighing of the container gave the total amount of diluted capped glycol added into the dispersion being 340 grams, equivalent to 227 grams of capped glycol prepolymer added into the dispersion.

[0132] The average particle size of the dispersion was determined to be 58.12 micron, with 95% of the particles below 258.5 microns. The solid polymer particles did not form into films when isolated.

Example 10

[0133] A glove box with dry nitrogen atmosphere was used to prepare the prepolymer. In two separate 2000 ml Pyrex® glass reaction kettles, which was equipped with an air pressure driven stirrer, a heating mantle and a thermocouple temperature measurement, each was charged with 220.0 grams of Terathane® 1800 glycol (commercially available from INVISTA) and 220.0 grams of Pluracol® HP 4000D glycol (commercially available from BASF). This glycol mixture was heated to 50°C with stirring, followed by the addition of 75.03 grams of Isonate® 125MDR (commercially available from Dow Chemical). The reaction mixture was then heated to 90°C with continuous stirring and held at 90°C for 120 minutes. Samples were taken from the reactor, and determined to have 2.170 and 2.169 %NCO respectively, as measured by the method of S. Siggia, "Quantitative Organic Analysis via Functional Group", 3rd Edition, Wiley & Sons, New York, pp. 559-561 (1963).

[0134] A 3000 ml stainless steel beaker was charged with 1600 grams of de-ionized water, 15 grams of T DET N14 surfactant (commercially available from Harcros of Kansas City, Kansas) and 5 grams of Additive 65 (commercially available from Dow Corning). This mixture was then cooled with ice/water to 10°C and mixed with a high shear laboratory mixer with rotor/stator mix head (Ross, Model 100LC) at 5000 rpm for 30 seconds. The viscous prepolymers, as prepared above in two reactors, were poured into a metal tubular cylinder and was added to the bottom of the mix head in the aqueous solution through a flexible tubing with applied air pressure. The temperature of the prepolymer was maintained between 50-70°C. The extruded prepolymer stream was dispersed and chain-extended with water under the

continuous mixing of 5000 rpm. In a period of 5 minutes, a total amount of 616 grams of prepolymer was introduced and dispersed in water. After the prepolymer was added and dispersed, the dispersed mixture was mixed for another 40 minutes. The resulting solvent-free aqueous dispersion was milky white to pale blue color, with 28.84 wt% solids content and 44 centipoises viscosity. The dispersion was cast on a sheet of polyethylene and dried in a fume hood for overnight under ambient conditions to form an elastic continuous film. By GPC measurement, this film had a weight average molecular weight of 127,900 and a number average molecular weight of 41,000.

Example 11

[0135] The procedures and conditions were essentially the same as above mentioned Example 10, except that the surfactant was changed to Bio-soft® N1-9 (commercially available from Stepan of Northfield, Illinois). A total of 640 grams of prepolymer, with 2.156 and 2.136 %NCO from the two reactors, was dispersed into water. The formed solvent-free dispersion had a solids content of 26.12% and viscosity of 51 centipoises. The cast and dried elastic film had a weight average molecular weight of 133,900 and a number average molecular weight of 44,400.

Example 12

[0136] The solvent-free prepolymer, as prepared according to the procedures and composition described in Example 5, was used to make the polyurethaneurea aqueous dispersion of the present invention.

[0137] A 2,000 ml stainless steel beaker was charged with about 700 grams of de-ionized water, about 15 grams of sodium dodecylbenzenesulfonate (SDBS), and about 10 grams of triethylamine (TEA). This mixture was then cooled with ice/water to about 5°C and mixed with a high shear laboratory mixer with rotor/stator mix head (Ross, Model 100LC) at about 5,000 rpm for about 30 seconds. The viscous prepolymer, prepared in the manner as Example 1 and contained in a metal tubular cylinder, was added to the bottom of the mix head in the aqueous solution through flexible tubing with applied air pressure. The temperature of the prepolymer was maintained between about 50°C and about 70°C. The extruded prepolymer stream was dispersed and chain-extended with water under the continuous mixing of about 5,000 rpm. In a period of about 50 minutes, a total amount of about 540 grams of prepolymer was introduced and dispersed in water. Immediately after the prepolymer was added and dispersed, the dispersed mixture was charged with about 2 grams of Additive 65 (commercially

available from Dow Corning®, Midland Michigan) and about 6 grams of diethylamine (DEA). The reaction mixture was then mixed for about another 30 minutes. The resulting solvent-free aqueous dispersion was milky white and stable. The viscosity of the dispersion was adjusted with the addition and mixing of Hauthane HA thickening agent 900 (commercially available from Hauthway, Lynn, Massachusetts) at a level of about 2.0 wt% of the aqueous dispersion. The viscous dispersion was then filtered through a 40 micron Bendix metal mesh filter and stored at room temperatures for film casting or lamination uses. The dispersion had solids level of 43% and a viscosity of about 25,000 centipoises. The cast film from this dispersion was soft, tacky, and elastomeric.

Example 13 – Fabric Testing

[0138] Compositions of the present invention were tested in combination with cotton/LYCRA® fabric (97% cotton/ 3% LYCRA® spandex). The control for this example was fabric washed with non-concentrated Confort™ fabric softener by Unilever. Each of the compositions as shown in Table 1, were used with the cotton/LYCRA® fabric by washing with Ariel™ liquid detergent available from Procter and Gamble on program 4 at 40°C on a Schulthess® programmable automatic washing machine using standard load fabric to reach 2.5 kg load and rinsing with 18g of the fabric softener composition. After tumble drying, the fabrics were evaluated for any deposit on the surface. None of the three fabrics showed any deposition of powder or film.

[0139] The compositions in Table 1 are as follows:

- (a) Fabric treated with fabric softener only (control)
- (b) Fabric treated with fabric softener, 1% wt of the dispersion of example 6, a film forming anionic polyurethaneurea water, and 2% wt of Unimer (synthetic wax to improved dispersion)
- (c) Fabric treated with fabric softener, 1% wt of the polyurethaneurea powder of example 5, and 2% wt of Unimer (synthetic wax to improved dispersion).

[0140] Mixing of the compositions (b) and (c) including the fabric softener delivered a homogeneous dispersion (no sedimentation, nor agglomeration).

[0141] Each fabric was evaluated for easy care. Standard test method AATCC TM 124/ISO 15487 was used to determine the durable press rating ("DP rating") before and after ironing. "DP rating" is a measure of the three-dimensional smoothness of the fabric. Iron

gliding or ease of ironing was measured as the time for the iron to glide over a given length of fabric with the ironing board at an angle of approximately 20°. The easy care results are shown in Table 1.

Table 1: Easy Care			
Fabric	DP Rating before ironing	DP rating after ironing	ease of ironing (s)
(a)	1	1.5	5
(b)	1.5	2.5	3.5
(c)	1.5	2.5	3

[0142] From the results in Table 1, it is shown that both fabrics treated with powder or dispersion show a better improvement of DP rating (1 point gained after ironing) as compared to the control (0.5 point gained after ironing).

[0143] Also the fabrics (b) and (c) treated with the compositions of the present invention show a faster gliding of the iron on the fabric surface.

[0144] The compositions (a), (b), and (c) were also evaluated for perfume/fragrance substantiation. Three people were allowed separately to smell each of the fabrics. Each of these people observed a stronger fragrance in the treated fabrics (b) and (c) which were treated with the compositions of the present invention.

[0145] Absorption properties (moisture management) of fabrics including those treated with the compositions of the present invention have also been tested. These properties were measured to demonstrate the differences of fabrics after treatment with the powders or dispersions of the present invention as compared to untreated fabrics.

[0146] For each of the fabrics (a), (b), and (c) as described above, one drop (approximately 30 micro liters) each of linseed oil and water was applied to the surface of the fabric. The time until complete absorption of each droplet was measured and reported in seconds (s) in Table 2. The area of the drop surface at 60 seconds following complete absorption by the fabric was also measured and reported as square centimeters (cm²) in Table 2.

Table 2 – Moisture Management				
	absorbtion time (s)		planar wicking (cm ²)	
	water	oil	water	oil
(a)	138	434	7.28	7.56
(b)	105	382	4.64	6.75
(c)	81	320	4.50	6.41

[0147] As shown in Table 2, the dispersion (b) and powder (c) of the present invention offered improvement in comparison to the control (a) with respect to absorption. The use of the powder form (c) showed significant improvement.

Example 14 – 100% cotton woven fabric testing

[0148] A 100% cotton woven fabric was also tested after treatment with a composition of the some embodiments. The control for this example was a concentrated fabric softener, Softlan™ Ultra by Colgate Palmolive. Each of the compositions as shown in Table 3, were used with 100% cotton fabric by washing with Ariel™ liquid detergent on program 4 at 40°C on a Schulthess® programmable automatic washing machine using standard load fabric to reach 2.5 kg load and rinsing with 18g of the fabric softener compistion. After tumble drying (at moderate temperature), the fabrics were evaluated for any deposit on the surface. Neither of the fabrics showed any deposition of powder or film.

[0149] The compositions in Table 3 are as follows:

(e) Fabric treated with fabric softener only (control)

(f) Fabric treated with fabric softener and 10% wt of the dispersion of example 10, a non-ionic polyurethaneurea dispersion

[0150] Mixing of the composition (f) including the fabric softener delivered a homogeneous dispersion (no sedimentation, nor agglomeration).

[0151] In order to test the fabrics for growth, first the available stretch or maximum stretch was calculated. The available stretch was determined by first conditioning a fabric specimen followed by cycling three times on a constant-rate-of-extension tensile tester between 0-30N. The maximum stretch was calculated by the following formula:

$$\text{Maximum stretch \%} = (\text{ML} - \text{GL}) \times 100 / \text{GL}$$

where: ML is the length in mm at 30N; and

GL is the gauge length of 250mm.

[0152] Separate specimens of each fabric were then extended to 80% of the “available stretch” and held for about 30 min. The fabric specimens were then allowed to relax for about 60 min. and growth was measured and calculated. According to:

$$\text{Growth \%} = L2/L \times 100$$

where: “growth” is recorded as a percent after relaxation;

L2 = the increased length in cm after relaxation; and

L = the original length in cm.

[0153] Each of the fabrics (e) and (f) were measured for fabric growth. The results are shown in Table 3:

Table 3 – Fabric Growth (weft direction)	
fabric	growth (%)
(e)	7.4
(f)	5.8

[0154] Fabric growth is a measure of shape retention. Growth values represent the unrecovered elongation during wear. A lower value in growth demonstrates that the fabric has a better ability to recover its initial shape.

[0155] Fabrics (e) and (f) were also tested for difference in release of perfume after a washing and rinsing cycle. One to two grams of each fabric sample was placed in a sealed gas sampling vessel. Fabric stressing was conducted by shaking with steel ball bearings. The volatile compounds released from the sample were drawn out of the headspace of the gas sampling vessel through a TenexTM sampling tube using a gas sampling pump operating at 50 cc per minute for 20 minutes. The TenexTM tube trapped the volatile organic compounds (VOC) for analysis. The TenexTM tube was then thermally desorbed with the volatile organics directed into a GC/MS for analysis. The results of the VOC measures in Table 3a show that more perfume released from the fabric rinsed with the fabric softener which contains the dispersion of example 10, a non-ionic polyurethaneurea dispersion

Table 3a – VOC testing	
Fabric	Volatile concentration ng/L/g
(e)	7
(f)	48

Example 15 – Spandex/Cotton Blend fabric testing

[0156] A spandex/cotton blend woven fabric was also tested after treatment with a composition of the some embodiments. The control for this example was a concentrated fabric softener, Softlan™ Ultra by Colgate Palmolive. Each of the compositions as shown in Table 4, were used with cotton/spandex blend fabric by washing with Ariel™ liquid detergent on program 4 at 40°C on a Schutless® programmable automatic washing machine using standard load fabric to reach 2.5 kg load and rinsing with 18g of the fabric softener composition. After tumble drying (at moderate temperature), the fabrics were evaluated for any deposit on the surface. Neither of the fabrics showed any deposition of powder or film.

[0157] The compositions in Table 4 are as follows:

(g) Fabric treated with fabric softener only (control)

(h) Fabric treated with fabric softener and 10% wt of the dispersion of example 10, a non-ionic polyurethaneurea dispersion

[0158] Mixing of the composition (h) including the fabric softener delivered a homogeneous dispersion (no sedimentation, nor agglomeration). Each of the fabrics (g) and (h) were measured for fabric growth. The results are shown in Table 4:

Table 4 – Fabric Growth (weft direction)	
fabric	growth (%)
(g)	4.8
(h)	3.8

[0159] Fabric growth is a measure of shape retention. Growth values represent the unrecovered elongation during wear. A lower value in growth demonstrates that the fabric has a better ability to recover its initial shape

[0160] Two LYCRA® spandex /cotton blend fabrics were also tested after treatment with a composition of some embodiments. The control for this example was a concentrated fabric softener, Soupline™ Ultra by Colgate Palmolive. Each of the compositions as shown in Tables 4a and 4b, were used with cotton and LYCRA® spandex blend fabric by washing with Dixan® gel detergent available from Henkel Corporation at 40°C with standard program on a Miele™ commercial washing, using standard load fabric to reach 2.5 kg load and rinsing with 30ml of fabric softener composition. After tumble drying (at moderate temperature), the fabrics were evaluated for any deposit on the surface. Neither of the fabrics showed any deposition of powder or film. For the fabrics below, CK is a circular knitted fabric with 95% cotton - 5% LYCRA® spandex and WOV is a gray weft stretch woven fabric, with 97% cotton - 3% LYCRA® spandex.

[0161] The compositions in Table 4a and 4b are as follows:

- (i)) fabric treated with fabric softener only (control-CK)
- (j)) fabric treated with fabric softener and 10% wt (3 % active component) of the dispersion of example 10, a non-ionic polyurethaneurea dispersion (treated – CK)
- (k) fabric treated with fabric softener only (control-WOV)
- (l) fabric treated with fabric softener and 10% wt (3 % active ingredient) of the dispersion of example 10, a non-ionic polyurethaneurea dispersion (treated – WOV)

Table 4a – Fabric growth CK	
fabric	Growth (%)
(i) length direction	7.5
(j) length direction	7.2
(i) width direction	6.9
(j) width direction	6.4

Table 4b – Fabric growth WOV	
fabric	Growth %
(k) weft direction	7.29
(l) weft direction	6.97

Example 16 - Paint anti-skid

[0162] Compositions of some embodiments were tested for “anti-skid” properties. These tests were completed according to ASTM D4518-91 with modification as described below. The paint tested (which was also the control) is a solvent free matte white vinyl acetate base paint commercially available from Akzo Nobel. Compositions and average particle sizes as shown in the table below were added with the goal of increase static friction. The results are the coefficient of static friction as calculated according to the test method and shown in Table 5.

[0163] The procedure for measurement of static friction on coated surface was done to determine the resistance to sliding on a coated surface (paint) by measuring the static friction. For each paint sample, a paint layer was prepared by application with a paint roller. The paint included particles as shown in Table 5. The paint was then allowed to dry for one day. This was followed by the application of a second layer of paint which was allowed to dry for one day.

[0164] ASTM D4518-91 was modified by using a rounded edge aluminum block instead of a steel block with the same weight and polished surface. The block was placed on the painted surface on an inclined plane. Between measurements, the aluminum block was cleaned with acetone.

[0165] To obtain the same constant speed for the inclination of the plane, an INSTRON dynamometer was used with the following program:

Absolute ramp- 0 to 300% extension at 480mm/min (~ 1.5 +/- 0.5° /s)

Kevlar yarn was used to avoid yarn extension and provide good reproducibility.

[0166] The angle of inclination (α) was calculated by trigonometry based on the height of the plane (h) and the length of the plane (X), which was 30cm. The coefficient of static friction was measured as:

Static friction = $\tan \alpha$; and

Static friction = $\tan (\sin^{-1} h/X)$

Table 5 – Friction testing		
	10% wt	5% wt
control	0.314	0.289
Softsand®* 100 µm	0.390	0.328
Polyurethaneurea flock	0.386	0.378
Example 2 (polyurethaneurea powder) 90 µm	0.361	0.353
Example 7 (polyurethaneurea powder) 19 µm	0.346	0.381
Example 1 (polyurethaneurea powder) 100 µm	0.354	0.375
Nylon flock		0.392
* Softsand is a rubber texturizing agent commercially available from Soft Point Industries, Copley, OH.		

[0167] Table 5 demonstrates that the polymer compositions of some embodiments provide comparable or superior anti-skid properties as compared to the control or to the rubber texturizing agent. Superior results are noted for all inventive compositions at the 5% additive level.

Example 17 – Paint Cracking

[0168] Testing for flexibility of paint compositions was conducted based on BS EN ISO 6860:1995. Paint compositions were prepared as shown in Table 6 including a commercially available matte white base paint from Akzo Nobel. Each paint was coated to a thickness of approximately 30mils on a cardboard substrate. Then each substrate was folded over a conical mandrel to determine the minimum bending diameter that was achieved without cracking of the paint.

[0169] As can be seen from the results in Table 6, there is significant flexibility of the paints including the dispersions of some embodiments.

Table 6 – Paint cracking testing	
Addition	minimum bending diameter without cracks (mm)
None (control)	> 24
5%wt dispersion of Example 12	12
5%wt dispersion of Example 6	15

Example 18 – Elongation at Break and Young's Modulus

[0170] Samples of paint were mixed according to the compositions described in Tables 7 and 8. The paint compositions were coated on a releasable substrate to form films. Samples were cut from these films that were of 1 cm width and 5 cm length for each sample. Three films were tested for each composition using an Instron® dynamometer. Initial tests were done to measure the elongation and force at break for each material. From this data, the constrain and the Young's modulus (or module of elasticity) were calculated. The results are shown in Table 7 and 8.

Table 7 – Elongation at Break				
	Break elongation %			
	Sample			
Paint composition	1	2	3	average
Paint 1-control	1.32	1.62	1.94	1.63
Paint 1 + 5%wt dispersion of Example 12	1.76	1.55	1.83	1.71
Paint 1 + 5%wt dispersion of Example 6	1.69	1.62	1.43	1.58
Paint 1 + 50%wt dispersion of Example 12	51.50	41.03	38.33	43.62
100% dispersion of Example 12	198.77	126.20	176.90	167.29
100% dispersion of Example 6	> 300	266.60		> 300
Paint 2 - control	188.23	185.30	176.43	183.32
Paint 2 + 5%wt dispersion of Example 12	200.40	201.40	177.00	192.93
Paint 2 + 5%wt dispersion of Example 6	174.13	164.63	200.10	179.62
Paint 3 - control	3.19	3.09	3.12	3.13
Paint 3 + 5%wt dispersion of Example 12	3.54	2.87	2.19	2.87
Paint 3 + 5%wt dispersion of Example 6	3.83	2.80	2.87	3.17
Paint 1 – matte white solvent free commercially available from Akzo Nobel				
Paint 2 – acrylic emulsion clear gloss paint commercially available from Akzo Nobel				
Paint 3 – acrylic emulsion matte white paint commercially available from Akzo Nobel				

Table 8 – Young's Modulus				
	Young's modulus (N/mm ²)			
	Sample			
Paint composition	1	2	3	average
Paint 1-control	1086.56	1097.16	1139.03	1107.58
Paint 1 + 5%wt dispersion of Example 12	762.36	648.53	714.56	708.48
Paint 1 + 5%wt dispersion of Example 6	590.19	743.91	577.56	637.22
Paint 1 + 50%wt dispersion of Example 12	20.73	25.72	26.06	24.17
100% dispersion of Example 12	3.66	4.05	4.00	3.90
100% dispersion of Example 6	2.60	4.26	3.61	3.49
Paint 2 - control	0.55	0.57	0.52	0.55
Paint 2 +5%wt dispersion of Example 12	0.49	0.52	0.54	0.52
Paint 2 +5%wt dispersion of Example 6	0.49	0.52	0.48	0.50
Paint 3 - control	709.92	694.21	645.91	683.35
Paint 3 +5%wt dispersion of Example 12	629.13	606.13	634.43	623.23
Paint 3 +5%wt dispersion of Example 6	629.02	606.13	534.91	590.02
Paint 1 – matte white solvent free commercially available from Akzo Nobel				
Paint 2 – acrylic emulsion clear gloss paint commercially available from Akzo Nobel				
Paint 3 – acrylic emulsion matte white paint commercially available from Akzo Nobel				

[0171] As can be seen from Tables 7 and 8, the inventive compositions showed improvement over the control, which was the base paint. Specifically, the inventive compositions had a lower Young's modulus which indicates higher material elasticity.

Example 19 - Elongation

[0172] Each of three paint samples including the dispersions of some embodiments were also tested to determine the maximum elongation at 4N for paints 1 and 3 and 1N for paint 2 at the 3rd cycle using an Instron® materials testing machine. The maximum force was chosen from the previous elongation test as set forth in Example 18, in order to be in the elastic domain of the material (flat zone of the stress strain curve). The testing was to measure the difference in elongation when same force is applied. The results are shown in Table 9.

Table 9 – Elongation 3rd cycle	
	Average max. elongation 3rd cycle %
Paint 1 – control	0.60
Paint 1 + 5%wt dispersion of Example 12	1.45
Paint 1 + 5%wt dispersion of Example 12	1.44
Paint 2 – control	40.13
Paint 2 + 5%wt dispersion of Example 12	102.00
Paint 2 + 5%wt dispersion of Example 6	129.58
Paint 3 – control	0.93
Paint 3 + 5%wt dispersion of Example 12	2.49
Paint 3 + 5%wt dispersion of Example 6	3.29
Paint 1 – matte white solvent free commercially available from Akzo Nobel Paint 2 – acrylic emulsion clear gloss paint commercially available from Akzo Nobel Paint 3 – acrylic emulsion matte white paint commercially available from Akzo Nobel	

[0173] Table 9 demonstrates that the addition of the inventive polyurethaneurea dispersions improved the elongation properties of all three base paints. At a minimum, the elongation of the base paint is doubled after the addition of the inventive dispersions.

Example 20 – Oil and Water Absorption - Time

[0174] In order to test the absorption properties of inventive powder compositions in comparison to commercially available powder compositions, several compositions were tested to determine the time required for the absorption of a drop each of linseed oil, water and artificial perspiration. In each of the tests, a drop of linseed oil, water, or artificial perspiration was placed on each of the inventive and commercially available powders. The time until absorption of the drop was noted as shown Table 10.

Table 10 – Time for Absorption				
		average time for absorption /drop		
sample	average particle size	Linseed oil	Water	Artificial Perspiration
	μm	sec	sec	sec
Nylon Powder ¹	20	377	-- ⁵	-- ⁵

Silica ²	12	750	28	25
Talc ⁶	14-18	52	2700	
BPD-500 ²	12	54	9	7
BPD-800 ²	6	75	18	15
PUU Powder of Example 7	19	37	38	38
Powder of Example 1	90	14	3	2
Powder of Example 1	77	10	3	
Powder of Example 1 ³	34	12	9	
Powder of Example 1 ⁴	33	23	3	
¹ Nylon 6 powder commercially available from Arkema ² Polyurethane powder commercially available from KOBO ³ Spun dyed with green pigment ⁴ Spun dyed with blue pigment ⁵ Sample unable to absorb on its own ⁶ Ultra Talc 2000 commercially available from KISH				

[0175] As shown in Table 10, the inventive powders provided a faster absorption time for oil and water as compared with the nylon and silica and provided similar or improved absorption time as compared with the commercially available polyurethane powders.

Example 21 Oil and Water Absorption – Mass

[0176] In order to test the absorption properties of inventive powder compositions in comparison to commercially available powder compositions, several compositions were tested to determine the mass of either linseed oil, water and artificial perspiration, which was absorbed according to Test method ASTM D281-95 (modified for water and artificial perspiration). The results are shown in Table 11.

Table 11 – Mass of Absorption				
		Linseed oil	Water	Artificial Perspiration
sample	Average particle size	mass absorption		
	µm	g/g	g/g	g/g
Nylon Powder ¹	20	0.69	0.82	0.84
Silica ²	12	1.05	1.10	1.16

Talc ⁵	14-18	0.46	0.55	
BPD-500 ²	12	0.54	0.63	0.67
BPD-800 ²	6	0.64	0.74	0.77
PUU Powder of Example 7	19	0.68	0.68	0.66
Powder of Example 1	90	Not performed	Not performed	0.94
Powder of Example 1	77	1.49	1.18	
Powder of Example 1 ³	34	1.55	1.30	
Powder of Example 1 ⁴	33	1.08	1.11	
¹ Nylon 6 powder commercially available from Arkema ² Polyurethane powder commercially available from KOBO ³ Spun dyed with green pigment ⁴ Spun dyed with blue pigment ⁵ Ultra Talc 2000 commercially available from KISH				

[0177] As shown in Table 11, the inventive compositions were able to absorb as well as or better than the commercially available powders.

Example 22 - Exfoliating Compositions:

[0178] Incorporating physical exfoliants into cosmetic cleansing preparations is increasingly popular. Early products relied on the abrasive effect of broken nut shells in standard cosmetic bases and were as appealing to the consumer as sandpaper. Currently, there are many exfoliants available to the cosmetic chemist from both natural and synthetic sources. The particle size and abrasive qualities of each type can be strictly controlled enabling the desired level of exfoliation to be precisely formulated and a better understanding of rheological properties enables stable, elegant products to be made with the exfoliant distributed evenly throughout.

[0179] Polyethylene (PE) Spheres are some of the most common polymer exfoliating agents: they are available in different size range. Commercial samples of Polyethylene (PE) Spheres are available from A&E Connock (Perfumery & Cosmetics) Ltd, in the following grades:

- 65/100 mesh size (approx 150-230 μm) ,
- 35/48 mesh size (approx 300-500 μm),
- 24/32 mesh size (approx 600-700 μm),
- 14/16 mesh size (approx 1200-1400 μm).

[0180] The following polyurethane powders with the following particle sizes have been prepared to compare with PE spheres:

Polyurethane urea powders prepared by Roach's process: 25-200 μm

Polyurethaneurea powders of Example 7: 300-800 μm

Polyurethaneurea powders of Example 3: 500-1000 μm

[0181] Each powder was added at 15% by weight to a shower gel (Silk Glow Softening Silk Shower by Dove) and compared with an already made exfoliating product which contains oxidized polyethylene as exfoliating agent (Silk Glow Douche Gommage Quotidienne Soie by Dove).

[0182] The compositions with Polyurethane urea powders prepared by Roach's process did not provide any real peeling effect, as the particle size of the powder is too small. By comparison, the powders of Examples 3 and 7 mixed nicely with the shower gel and delivered an exfoliating effect. Because of the compressibility of the polyurethaneurea powders, they have a much softer touch and deliver a much gentler peeling effect on the skin.

Example 23 - Film Forming Polymers

[0183] In the cosmetic industry, many film forming polymers are used, especially in nail polish, mascara -eye liners, face make up, sunscreen products and hair care formulations. The chemical composition can vary from acrylate copolymers, polyurethane, polyvinylpyrrolidone vinyl acetate, polyacrylic acid (carbomer). These can be used as styling polymer or as thickeners and provide transparent flexible films with different level of gloss, adhesion, abrasion resistance and flexibility. The polyurethaneurea water borne dispersions of Examples 5, 6 and 10 can also be used to provide these effects.

[0184] The great advantage of these compositions will be the improved elasticity and flexibility, the soft and pleasant touch and the good abrasion resistance. Two polyurethane polymer dispersions, commercially available from Noveon: Avalure® UR 425 and UR 450 were tested and compared to the polyurethaneurea compositions as described herein.

[0185] Films were cast at 20mil thickness for the commercially available dispersions as well as the inventive dispersion of example 6. These were compared for elastic properties which are shown in Table 12.

Table 12 – Elastic Properties of Films			
	max. elongation at break %	max. constraint at break (N/mm ²)	Young's modulus (N/mm ²)
	average		average
UR425	426.00	13.08	41.11
UR450	210.00	12.98	128.97
Dispersion of Example 6	443.50	7.20	6.18

[0186] The Dispersion of Example 6 clearly exhibits a very elastic behavior in comparison to the commercially available materials, as the Young modulus is much lower. This dispersion will allow high formula elasticity and will better follow the movements of the skin. It also delivers a surprising texture, because of its elastic behavior.

Example 24 – Moisturizing Cream

[0187] A moisturizing skin cream/lotion is prepared by conventional methods from the following components in Table 13.

Table 13 – Moisturizing Cream					
Component	I	II	III	IV	V
Phase A					
Water	qs	qs	qs	qs	qs
Allantoin	0.2000	0.2000	0.2000	0.2000	0.2000
Disodium EDTA	0.1000	0.1000	0.1000	0.1000	0.1000
Ethyl Paraben	0.2000	0.2000	0.2000	0.2000	0.2000
Propyl Paraben	0.1000	0.1000	0.1000	0.1000	0.1000
Butylated Hydroxytoluene	0.0150	0.0150	0.0150	0.0150	0.0150
Panthenol	1.0000	0.5000	1.0000	1.0000	1.0000
Glycerin	7.5000	10.000	15.000	7.5000	5.0000
N-Undecylenoyl-L- Phenylalanine	2.0000	0.5000	1.0000	4.0000	1.0000
Hexamidine Isethionate	0.0000	0.1000	0.1000	0.0000	1.0000
Niacinamide	0	3.5000	5.0000	2.0000	2.0000
Palmitoyl-Pentapeptide ¹	0	0	0	0.0004	0.0003
Phenylbenzimidazole Sulfonic Acid	0	0	0	0	1.0000

Benzyl Alcohol	0.2500	0.2500	0.2500	0.2500	0.2500
Triethanolamine	0.8000	0.2000	0.4000	1.6000	1.0000
Green Tea Extract	1.0000	1.0000	1.0000	1.0000	1.0000
N-Acetyl Glucosamine	0.0000	5.0000	2.0000	1.0000	5.0000
Sodium Metabisulfite	0.1000	0.1000	0.1000	0.1000	0.1000
Phase B					
Cyclopentasiloxane	15.000	15.000	18.000	15.000	15.000
Titanium Dioxide	0.5000	0.5000	0.7500	0.5000	0.5000
Phase C					
C12-C15 Alkyl Benzoate	1.5000	0	0	1.5000	1.5000
Dipalmitoyl Hydroxyproline	0	1.0000	0	0	1.0000
Salicylic Acid	1.5	0	0	0	0
PPG-15 Stearyl Ether	4	0	0	0	0
Vitamin E Acetate	0.5000	0	1.0000	0.5000	0.5000
Retinyl Propionate	2.0000	0	0	0.2000	0.2000
Phytosterol	0.0000	1.0000	1.0000	5.0000	3.0000
Phase D					
KSG-21 Silicone Elastomer ²	20.5000	26.0000	26.0000	20.5000	20.5000
Silicone Non- Emulsifying Elastomer	0	1.0000	1.0000	0	0.5000
Abil EM-97 Dimethicone Copolyol ³	0.5000	0	0	0.5000	0.5000
Clarinol A-80®	0.5000	0.5000	1.0000	1.0000	1.5000
PUU Powder of Example 7	2.5000	2.5000	2.0000	2.5000	2.5000
Fragrance	0.2000	0.2000	0.2000	0.2000	0.2000

¹Palmitoyl-pentapeptide = palmitoyl-lysine-threonine-threonine-lysine-serine available from Sederma.

²KSG-21, an emulsifying silicone elastomer available from Shin Etsu.

³Abil EM-97 available from Goldschmidt Chemical Corporation.

Procedure: In a suitable vessel, the Phase A components are blended together with a suitable mixer (e.g. Tekmar model RW20DZM) and mixing is continued until all of the components are dissolved. Then, the Phase B components are blended together in a suitable vessel and are milled using a suitable mill (e.g. Tekmar RW-20) for about 5 minutes. The Phase C components are then added to the Phase B mixture with mixing. Then, the Phase D components are added to the mixture of Phases B and C and the resulting combination of Phase B, C, and D components is then mixed using a suitable mixer (e.g. Tekmar RW-20) for about 1 hour. Then, Phase A is slowly added to the mixture of Phases B, C and D with mixing. The resulting mixture is continually mixed until the product is uniform. The resulting product is then milled for about 5 minutes using an appropriate mill (e.g. Tekmar T-25).

Example 25 - O/W Emulsion (white cream)

[0188] An example of a cream of oil in water emulsion is shown in Table 14.

Table 14		
Component	% w/w	Supplier
Phase A (oily phase)		
Mixture of arachidyl polyglucoside and of arachidyl and behenyl alcohols (15/85) (Montanov 202)	1.5%	SEPPIC
Mixture of glyceryl mono-or distearate and of potassium stearate (TEGIN)	1.5%	Goldschmidt
Apricot oil	5%	
Cyclohexadimethylsiloxane	10%	
Phase B (aqueous phase)		
Glycerine	5%	
Ammonium polyacryldimethyltauramide (Hostacerin AMPS)	1%	Clariant
Preservative	gs	
Water	gs 100%	
Phase C		
Powder of example 7	2%	
Phase D		
HMW2220 (aqueous dispersion at 60% of A.M.) (that is, 1.2% of A.M.)	2%	Dow Corning

Procedure: Phases A and B are prepared with the use of heat (about 80°C) and Phase A is incorporated into Phase B, with stirring. After cooling to 40°C, Phase C is added. Phase D is then added, with low shearing. A powdered white homogeneous cream is obtained which is smooth on application and easy to spread.

Example 26 - Daily Moisturizer

[0189] An example of a daily moisturizer is shown in Table 15.

Table 15		
Component	% w/w	Supplier
Phase A		
Deionized Water	50.09	
Disodium EDTA	0.10	American Int.
Lucentite SWN Lithium Magnesium Sodium Silicate	0.70	Kobo Products
Glycerin-96% Glycerin	10.00	RITA Corp.
Keltrol CG Xanthan Gum	0.15	Kelco
SP-10L Nylon 12	1.00	Kobo Products
PUU Powder of Example 7	1.00	
Phase B		
Lipomulse 165 Glyceryl Stearate (and) PEG-100 Stearate	4.00	Lipo Chemicals

Parsol MCX Ethylhexyl Methoxycinnamate	7.50	Roche
RITA SA Stearyl Alcohol	2.00	RITA Corp.
Stearic Acid Stearic Acid	1.00	Lipo Chemicals
RITA Cetearyl Cetearyl Alcohol Alcohol 50/50	0.75	RITA
Crodamol ICS Isocetyl Stearate	4.00	Croda
SF1256 Cyclopentasiloxane (and) Cyclohexasiloxane	5.00	GES/Kobo Products
Phase C		
Water Water	2.00	
RITA TEAlan 99 Triethanolamine	0.25	RITA
Phase D		
CM3K40T4 Cyclopentasiloxane (And) Titanium Dioxide (And) PEG-10 Dimethicone (And) Alumina (And) Methicone	5.50	Kobo Products
Phase E		
Phenonip Phenoxyethanol (and) Methylparaben (and) Propylparaben (and) Ethylparaben (and) Butylparaben (and) Isobutylparaben	1.25	Nipa Labs
Phase F		
Sodium Hyaluronate 1% SolutionSodium Hyaluronate	0.50	TAOS
AC DRF 25% Saccharomyces Lysate Extract	1.00	Active Concepts
RITAlloe 1X Aloe Barbadensis Juice	1.00	RITA
Fragrance	0.20	
HV45-PM20 Mica (and) Titanium Dioxide (and) Polymethylmethacrylate	1.00	Kobo Products
D&C Red 33 1% sol.(W 083) Red 33	0.01	LCW

Manufacturing Procedure: Charge water to main tank and begin mixing with propeller agitation. Add Disodium EDTA and Lucentite. Continue mixing. Pre-blend Glycerin and Keltrol. Add to main tank and continue mixing. Begin heating to 75-78°C. Add the powders and stir for 15 minutes. Combine Phase B in side container and heat to 78-82°C. Mix with propeller agitation to insure uniformity. When both Phase A and Phase B have reached temperature, charge Phase B into Phase A. Continue mixing with propeller agitation for 15 minutes maintaining temperature. Begin cooling. Combine Phase C in side container and mix until solution is clear. When batch temperature has cooled to 65°C, add TEA. Batch will slightly thicken. When batch temperature has cooled to 60°C, switch mixing to homogenization. Charge TiO₂ dispersion into batch and mix for 15 minutes. Continue cooling. Add preservative to batch and continue homogenization. When batch temperature is at or below 50°C, charge remaining components and continue to homogenize for 10 minutes. Switch to side sweep agitation for remainder of cool down.

Example 27 – Cream for Sensitive Skin

[0190] A suitable moisturizing cream for sensitive skin is prepared with the components set forth in Table 16. The components are combined by any suitable method such as that in Example 26.

Table 16	
Component	% w/w
Phase A	
Isododécane	8%
Soya Lecithin	12%
Acid glycyrrhétinique	2%
PUU Powder of Example 7	0.2%
Perfume	0.4%
Phase B	
Preservatives	0.6%
Glycerin	4%
Séricoside	0.2%
Water	Up to 100%

Example 28 - Shine-Control Facial Lotion

[0191] A facial lotion which provides long lasting shine control properties is prepared with the components of Table 17.

Table 17		
Component	% w/w	Supplier
Phase A		
SF1528 Cyclopentasiloxane (and) PEG/PPG-20/15 Dimethicone	10.00	GES/Kobo Products
SF1202 Cyclopentasiloxane	20.00	GES/Kobo Products
SFE839 Cyclopentasiloxane (and) Dimethicone/Vinyl Dimethicone Crosspolymer	10.00	GES/Kobo Products
SF1550 Phenyl Trimethicone	10.00	GES/Kobo Products
Phase B		
SF1642 C30-45 Alkyl Dimethicone	2.00	GES/Kobo Products
PUU Powder of Example 7	5.00	
Phase C		
Deionized Water Water	40.30	
Silica Shells Silica	1.50	Kobo Products
RITAbate 20 Polysorbate-20	0.20	RITA Corp.
Sodium Chloride Sodium Chloride	1.00	Morton Salt
Preservative and Fragrance	q.s	

Procedure: Combine the components of Phase A, in order shown, thoroughly mixing each component until homogenous before adding the next component. When the mixture is homogenous, heat to 60-65°C and add SF 1642 and powder (Phase B). In a separate vessel combine components of Phase C in order shown. Slowly add Phase C to Phase A and B and mix well. Pour into suitable containers.

Example 29 - Moisturizing Facial Gel

[0192] A moisturizing facial get is prepared with the components of Table 18.

Table 18		
Component	% w/w	Supplier
Phase A		
Deionized Water Water	70.30	
Carbopol 940 Carbomer	0.10	B.F. Goodrich
Glycerin Glycerin	5.00	Procter and Gamble
Keltrol F Xanthan Gum	0.10	Kelco
Methylparaben NF Methylparaben	0.20	Protameen
SP-10 Nylon-12	0.50	Kobo Products
PUU Powder of Example 7	2.00	
Phase B		
Emersol 132 Stearic Acid	2.50	Cognis Corp.
Emerest 2400 Glyceryl Stearate	1.00	Cognis Corp.
Velvesil 125 Cyclopentasiloxane (and) C30-45 Alkyl Dimethicone/Polycyclohexene Oxide Crosspolymer	15.00	GES/Kobo Products
Vitamin A Palmitate Retinyl Palmitate	0.10	BASF
Phase C		
TEAlan 99% Triethanolamine	q.s. to pH 6.5	Rita Corp.
Phase D		
Germall 115 Imidazolidiny Urea	0.20	ISP
Deionized Water	2.00	
Phase E		
Actiphyte of Chamomile, Chamomilla Recutita (Matricaria) Flower Extract	1.00	Active Organics

Procedure: Combine Phase A components slowly sifting in the Nylon SP-10 and powder; heat and stir to 70°C. Slowly add the xanthan gum and carbopol to the aqueous phase. Heat and stir Phase B to 70°C. Slowly add the oil phase to the water phase with stirring. Homogenize through the entire cooling stage. At 40°C adjust the pH to 6.5. Add the Germall solution; cool to 35°C add the Chamomile. Cool to 30°C and fill.

Example 30 - Wrinkle and Line Minimizer

[0193] A composition for providing reduction and/or minimization of wrinkles and/or lines may include the components of Table 19.

Table 19		
Component	% w/w	Supplier
Phase A		
SF 1528 Cyclopentasiloxane (and) PEG/PPG-20/15 Dimethicone	11.50	GES/Kobo Products
SF1202 Cyclopentasiloxane	8.50	GES/Kobo Products
SF1214 Cyclopentasiloxane (and) Dimethicone	7.50	GES/Kobo Products
Fragrance	0.10	Bell Flavors & Fragrances
Phase B		
PUU Powder of Example 7	7.50	
Phase C		
Deionized Water	50.60	
Dowicil 200 Quaternium-15	0.10	Dow Chemical
RITabate 80 Polysorbate 80	0.20	RITA Corp.
Sodium Chloride	1.00	Morton Salt
Glycerin	13.00	Procter & Gamble

Procedure: Combine Phase A liquid components into main tank and homogenize for 15 minutes. Sift in powder slowly. Continue homogenization for 15 minutes after complete addition of microsphere. In a side container using propeller agitation, mix Phase C components until solution is homogenous and clear. Add Phase C to main tank in quarter parts mixing at least 15-20 minutes between each addition. (Batch temperature will increase while mixing.) When the batch is homogenous, fill into appropriate units.

Example 31 – Anti-Aging Emulsion

[0194] An anti-aging cream in the form of an emulsion may be prepared with the components of Table 20.

Table 20		
Component	% w/w	Supplier
Phase A		
Ethylhexyl stearate - Tegosoft	6.5	Degussa
Mineral oil (paraffin oil)	6	
Stearic acid	1	
Phase B - Anti-aging active component:		
Dermaxyl*	2	Sederma/Croda
Phase C		
Cetearyl glucoside – Tego care CG90	1	Degussa

Glycerin	3	
Water	75.1 (qsp 100)	
Carbopol – Ultrez10	0.1	Noveon
Phase D		
Preservatives	0.3	
Water	3.5	
Phase E		
PUU Powder of Example 7	1.5	
Phase F		
NaOH 10% (sodium hydroxide, pH 6)	q.s. if necessary	

*C12-15 alkyl benzoate (and) tribehenin (and) ceramide 2 (and) PEG-10 rapeseed sterol (and) palmitoyl oligopeptide

Procedure: Disperse TegoCare CG90 in water, then add carbopol. Heat Phases A, B and C to 75°C. Under stirring, add Phase B to Phase A and homogenize. Maintaining this temperature, add Phases (A-B) to Phase C and homogenize. Cool to 35°C and add Phase D. Add progressively Phase E under stirring. Adjust the PH with Phase F if necessary.

Example 32 - Suntan Lotions

[0195] Table 21 provides a composition for a suntan lotion, with reduced greasy effect. The composition may be prepared by any suitable method such as that in Example 33, below.

Table 21	
Component	% w/w
Phase A	
Isododécane	18
Filter UV	4
Soya Lecithin	8
Extract of Plectanthrus barbatus	0.5
PUU Powder of Example 7	1
Perfume	0.5
Copolymer bloc (Elfacos ST37®)	2
Phase B	
Theophylline	0.2
Preservative	0.5
Vitamin E Phosphate	0.2
Water	up to 100%

Example 33 - Water-Resistant Sunscreen

[0196] Table 22 sets forth a composition useful as a non-oily, water-resistant sunscreen.

Table 22		
Component	% w/w	Supplier
Phase A		
Koboguard 5400 IDD Hydrogenated Polycyclopentadiene (and) Isododecane	14.29	Kobo Products
Permethyl 99A Isododecane	0.35	Presperse
Phase B		
Lucentite SAN Lithium Magnesium Silicate	2.00	Kobo Products
Phenoxyethanol Phenoxyethanol	0.66	NIPA Labs
Phase C		
PM9P50M170 Titanium Dioxide (and) Isododecane (and) Alumina (and) Dimethicone (and) Polyhydroxystearic Acid	30.00	Kobo Products
PUU Powder of Example 7	3.38	
SF1540 Cyclomethicone (and) PEG/PPG-20/15 Dimethicone	6.80	GE/Kobo Products
Covi-Ox T70 Tocopherol	0.25	Cognis
Phase D		
Arlacel 80 Sorbitan Oleate	0.75	Uniqema
Crill 6 Sorbitan Isostearate	0.75	Croda
Propylparaben Propylparaben	0.10	ISP Sutton
Phase E		
Sodium Chloride Sodium Chloride	1.00	Morton Salt
Deionized Water Water	17.70	
Methylparaben Methylparaben	0.10	Protameen
Phase F		
Syncrowax HGL-C C18-36 Triglycerides	1.65	Croda
Syncrowax BB-4 Synthetic Beeswax	1.10	Croda
Vitamin E Acetate dl-alpha Tocopherol	0.10	Roche
Phase G		
Velvesil 125 Cyclopentasiloxane (And) C30-45 Alkyl Cetearyl Dimethicone Crosspolymer	17.70	GE/Kobo Products
Phase H		
Vanillin FCC Vanillin	0.02	Citrus/Allied Essence
Phase I		
Deionized Water Water	1.00	
dl-Panthenol Panthenol	0.30	Roche

Procedure: Combine Phase A materials. Add the Lucnetite SAN slowly to Phase A. Stir with a Cowles Dissolver in a stainless steel beaker at high speed for 20 minutes. Add the Phenoxyethanol and stir an additional 20 minutes. Combine all the components in Phase C to a stainless steel beaker and stir at high speed with a Cowles Dissolver for 30 minutes. Add gel Phase 1 and 2 to Phase 3 to form the base. Add Phase D components to the base and

homogenize for 15 minutes. Combine aqueous Phase E components and stir until clear. Add Phase E slowly to the base and continue homogenizing while heating to 75°C. Add the waxes (Phase F) to the base and continue to homogenize. Begin air cooling. At 70°C add the Velvessil and QS solvent loss. Add Phase H (vanillin) to the main batch at 55°C. At 42°C add the panthenol solution. Continue homogenizing and cool till 25°C. Fill into appropriate containers.

Example 34 - Antiperspirant Gel Powder Stick

[0197] An antiperspirant composition may be prepared by the components in Table 23.

Table 23		
Component	% w/w	Supplier
Phase A		
SF1202 Cyclopentasiloxane	10.05	GES/Kobo Products
SF96-50 Dimethicone	7.50	GES/Kobo Products
Propylparaben NF Propylparaben	0.10	Protameen
Phase B		
ASO-12 Aluminum Starch Octenylsuccinate (And) Isopropyl Titanium Triisostearate	5.00	Kobo Products
MSS-500W Silica	5.00	Kobo Products
PUU Powder of Example 7	2.50	
SF1528 Cyclopentasiloxane (and) PEG/PPG-20/15 Dimethicone	12.50	GES/Kobo Products
Phase C		
Tween 80 Polysorbate 80	0.25	ICI / Uniqema
Methylparaben NF Methylparaben	0.10	Protameen
Glycerin USP Glycerin	10.00	Rita Corp.
Phase D		
Zirkonal AP 4 G Aluminum Zirconium Terachlorohydrate Glycine	20.00	BK Giulini Corp.
Deionized Water Water	17.50	
Phase E		
Syncrowax HGL-C C18-36 Triglycerides	5.00	Croda
Syn. Beeswax BB-4 Synthetic Beeswax	2.00	Croda
Castorwax Hydrogenated Castor Oil	2.50	CasChem

Procedure: Add Phase A raw materials to main tank (SS 1200 ml beaker) under a fume hood. Mix until homogenous using a homogenizer. Add the powder mixture to Phase A and homogenize for 15 minutes. Combine the methylparaben and glycerin; stir until dissolved. Combine the water and Zr complex to form the salt solution. Combine Phase C and D to form the aqueous phase. Add the Aqueous Phases C and D very slowly to Silicone Powder Parts 1+2 with mixing (Homogenizer:3,500rpm); increase to 7000 rpm as viscosity builds. Add a

water bath. Continue to homogenize the batch for 15 minutes (Homogenizer:7,000rpm). Heat batch to 77-80°C. Make sure top is covered with aluminum foil. Internal heat is generated via mixing that will produce temps in excess of 75°C. Add Phase E to the batch at 75-80°C. Continue to homogenize rpm for 5 minutes. Q.S solvent SF1202. Mold into appropriate stick containers. Cool in refrigerator for 15 minutes.

Example 35 – Cleansing

[0198] A cleansing composition may be prepared which includes the components of Table 24.

Table 24	
Component	Wt %
SEFA* Cottonate	57.5
Citric acid	0.30
Cocamidopropyl betaine	3.5
Sodium lauroyl sarcosinate	10.7
Ethylene vinyl acetate polymer (Elvax 40W)	8.0
PUU Powder of Example 7	20.0

*SEFA is an acronym for sucrose esters of fatty acids,

Procedure: Melt the ethylene vinyl acetate polymer into the SEFA cottonate at 90°C and high shear mix. Add the surface powders and citric acid and mix. Add the PUU polymer microbeads, mix, and cool to set. The composition is remelttable and easily impregnates into or coat onto cloths.

Example 36 - Cleansing

[0199] The personal cleansing compositions illustrated in the following table illustrate specific embodiments of the personal cleansing compositions of the present invention, but are not intended to be limiting thereof. Other modifications can be undertaken by the skilled artisan without departing from the spirit and scope of this invention. These exemplified embodiments of the personal cleansing composition of the present invention provide cleansing of hair and/or skin and improved conditioning and volumizing benefits.

[0200] The exemplified compositions can be prepared by conventional formulation and mixing techniques. Component amounts are listed as weight percents and exclude minor materials such as diluents, filler, and so forth. The listed formulations, therefore, comprise the listed components and any minor materials associated with such components.

Example 37 – Cleansing Compositions

Table 25a							
Component	I	II	III	IV	V	VI	VII
Ammonium Laureth Sulfate (AE ₃ S)	6.50	2.50					6.50
Ammonium Lauryl Sulfate (ALS)	5.75	2.50					5.75
Sodium Laureth Sulfate (SE ₃ S)		2.50	5.00	5.50	5.00		
Sodium Lauryl Sulfate (SLS)	1.75	2.50	5.00	6.50	5.00	10.00	1.75
Sodium Lauroamphoacetate ²⁷		2.00	2.00				
Cocaminopropionic Acid ²⁸					2.00	2.00	
Cocamidopropyl Betaine ²⁹					1.50	1.50	
Cocamide MEA	1.00	0.75	0.75	0.75	0.50	0.50	1.00
Cetyl Alcohol	0.35	0.50	0.50	0.50	0.75	0.75	0.35
Lauryl Alcohol	0.20	0.25	0.50	0.50	0.25	0.20	0.20
Dehydrogenated Tallowamidoethyl Hydroxyethylmonium Methosulfate ³⁰		0.10	0.10	0.10	0.10	0.15	0.15
1-Propanaminium, N,N,N-trimethyl- 3-[(2-methyl-1-oxo-2-propenyl)- amino]-, chloride; (Poly- (Methacrylamidopropyl trimethyl ammonium chloride)) ^{1,2}	0.40 ¹	0.50 ²					
Methacryloamidopropyl-pentamethyl- 1,3-propylene-2-ol-ammonium dichloride ³			0.75				
1-Propanaminium, N,N,N-trimethyl- 3-[(1-oxo-2-propenyl)amino]-, chloride; (Poly(Acrylamidopropyl trimethyl ammonium chloride)) ⁴				0.50			
[3-methacryloylamino)propyl] dimethylethylammonium ethylsulfate homopolymer ⁵					0.75		
[(2-methacryloyloxy)-ethyl]trimethyl- ammonium methylsulfate homopolymer ⁶						1.50	
Trimethylammonio-propylmethacryl- amide chloride-N-Hydroxyethyl acrylate copolymer ^{7,8,9}							0.50 ⁷
Trimethylammonio-propylmethacryl- amide chloride-N-vinylpyrrolidone copolymer ^{10,11}							
Dimethyldiallyl ammonium chloride-N-b-Hydroxyethyl acrylate copolymer ¹²							
Trimethylammonio-propylmethacryl- amide chloride-N-Methacrylamido-propyldimethyl- ammonium							

methylcarboxylate copolymer ¹³							
Silica ^{14,15,16,17}		1.25 ¹⁴	2.25 ¹⁵	0.50 ¹⁶	0.25 ¹⁷		
PUU Powder of Example 7 ¹⁸	1.20 ¹⁸					3.00 ¹⁸	1.50 ¹⁸
Ethylene Glycol Distearate		0.25	0.75	1.50	0.75	0.25	
Trihydroxystearin ²⁰	0.25						0.25
Polyethylene Glycol (14000) ⁽²¹⁾		0.05	0.15	0.40	0.15	0.05	0.20
Fragrance	0.55	1.00	1.00	1.00	1.00	1.00	0.50
Sodium Chloride	0.25	1.00	0.75	0.50	0.25		
Ammonium Xylenesulfonate				0.25	0.50	1.00	
Citric Acid	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Sodium Citrate	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Sodium Benzoate	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Ethylene Diamine Tetra Acetic Acid	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Dimethicone ^{22,23,24}		0.25 ²²	2.00 ²²	0.25 ²³	2.00 ²³	1.00 ²⁴	
Polydecene ⁽²⁵⁾		0.25	2.00	1.00		2.00	
Trimethylolpropane Tricaprylate/Tricaprate ²⁶		0.10	2.00		1.00	2.00	
Water							
(QS to 100%)							

¹ HMW MAPTAC (Rhodia) [charge density = 4.5 meq/g, molecular weight Å860,000]

² HHMW MAPTAC (Rhodia) [charge density = 4.5 meq/g, molecular weight Å1,500,000]

³ Diquat (Rhodia) [charge density = 5.60 meq/g, molecular weight Å252,000]

⁴ APTAC (Rhodia) [charge density = 4.88 meq/g, molecular weight Å1,916,000]

⁵ Homopolymer of DMAPMA + DES (Rhodia) [charge density = 3.09 meq/g, molecular weight Å180,000]

⁶ Homopolymer of METAMS (Rhodia) [charge density = 3.53 meq/g, molecular weight Å313,000]

⁷ 1:9 HEA:MAPTAC (Rhodia) [charge density = 4.29 meq/g, molecular weight Å276,000]

⁸ 3:7 HEA:MAPTAC (Rhodia) [charge density = 3.71 meq/g, molecular weight Å648,000]

⁹ 3:7 HEA:MAPTAC (Rhodia) [charge density = 3.71 meq/g, molecular weight Å1,200,000]

¹⁰ 1:9 VP:MAPTAC (Rhodia) [charge density = 4.30 meq/g, molecular weight Å242,000]

¹¹ 3:7 VP:MAPTAC (Rhodia) [charge density = 3.74 meq/g, molecular weight Å503,000]

¹² 1:9 HEA:DMDAAC (Rhodia) [charge density = 5.75 meq/g, molecular weight Å274,000]

¹³ 1:1 AP:MAPTAC (Rhodia) [charge density = 3.95 meq/g, molecular weight Å243,000]

¹⁴ Sipernat 22LS (Degussa) [avg. particle size = 3 µm, specific surface area = 190 m²/g]

¹⁵ MSS-500/H (General Electric Silicones) [avg. particle size = 11 µm, specific surface area = 37m²/g]

¹⁶ MSS-500/N (General Electric Silicones) [avg. particle size = 12 µm, specific surface area = 700m²/g]

¹⁷ Syloid 244FP, Silica (Grace Davison)

¹⁸ PUU Powder of Example 7

²⁰ Thixcin® (Rheox)

²¹ PEG 14M (Dow Chemical)

²² Viscasil 330M (General Electric Silicones)

²³ Dow Corning® 1664 Emulsion (Dow Corning)

²⁴ Dow Corning® 2-1865 Microemulsion (Dow Corning)

²⁵ Puresyn 6, MCP-1812 (Mobil)

²⁶ Mobil P43 (Mobil)

²⁷ Miranol Ultra L32 (Rhodia)

²⁸ MACKAM 151C (McIntyre)

²⁹ Tegobetaine F-B (Goldschmidt)

³⁰ Varisoft 110 (Witco)

Table 25b						
Component	VIII	IX	X	XI	XII	XIII
Ammonium Laureth Sulfate (AE ₃ S)	6.50	6.50	5.50	7.50		
Ammonium Lauryl Sulfate (ALS)	5.75	5.75	6.50	8.50		
Sodium Laureth Sulfate (SE ₃ S)					5.50	7.50
Sodium Lauryl Sulfate (SLS)	1.75	1.75			6.50	8.50
Sodium Lauroamphoacetate ²⁷				1.00		1.00
Cocaminopropionic Acid ²⁸						
Cocamidopropyl Betaine ²⁹						
Cocamide MEA	1.00	1.00	1.00			
Cetyl Alcohol	0.35	0.35	0.50	0.25		1.00
Lauryl Alcohol	0.20	0.20		0.25	0.25	
Dehydrogenated Tallowamidoethyl Hydroxyethylmonium Methosulfate ³⁰	0.15	0.15				
1-Propanaminium, N,N,N-trimethyl- 3-[(2-methyl-1-oxo-2-propenyl)- amino]-, chloride; (Poly- (Methacrylamidopropyl trimethyl ammonium chloride)) ^{1,2}						
Methacryloamidopropyl-pentamethyl- 1,3-propylene-2-ol- ammonium dichloride ³						
1-Propanaminium, N,N,N-trimethyl- 3-[(1-oxo-2-propenyl)amino]-, chloride; (Poly(Acrylamidopropyl trimethyl ammonium chloride)) ⁴						
[3-methacryloylamino)propyl] dimethylethylammonium ethylsulfate homopolymer ⁵						
[(2-methacryloyloxy)-ethyl]trimethyl- ammonium methylsulfate homopolymer ⁶						
Trimethylammonio-propylmethacryl- amide chloride-N-Hydroxyethyl acrylate copolymer ^{7,8,9}	0.50 ⁸	0.50 ⁹				
Trimethylammonio-propylmethacryl- amide chloride- N-vinylpyrrolidone copolymer ^{10,11}			1.00 ¹⁰	2.00 ¹¹		
Dimethyldiallyl ammonium chloride-N-b- Hydroxyethyl acrylate copolymer ¹²					5.00 ¹²	
Trimethylammonio-propylmethacryl- amide chloride-N- Methacrylamido-propyldimethyl- ammonium methylcarboxylate copolymer ¹³						5.00 ¹³

Silica ^{14,15,16,17}						3.00 ¹⁷
PUU Powder of Example 7 ¹⁸	1.50 ¹⁸	1.50 ¹⁸	1.25 ¹⁸	5.00 ¹⁸	0.25 ¹⁹	
Ethylene Glycol Distearate			1.00	2.00		
Trihydroxystearin ²⁰	0.25	0.25			1.00	2.00
Polyethylene Glycol (14000) (²¹)	0.20	0.20				
Fragrance	0.50	0.50	1.00	1.00	1.50	2.00
Sodium Chloride			0.50	0.50	0.75	0.75
Ammonium Xylenesulfonate						0.25
Citric Acid	0.04	0.04	0.04	0.04	0.04	0.04
Sodium Citrate	0.40	0.40	0.40	0.40	0.40	0.40
Sodium Benzoate	0.25	0.25	0.25	0.25	0.25	0.25
Ethylene Diamine Tetra Acetic Acid	0.10	0.10	0.10	0.10	0.10	0.10
Dimethicone ^{22,23,24}			0.50 ²²	1.00 ²²	1.00 ²³	1.00 ²⁴
Polydecene ⁽²⁵⁾						
Trimethylolpropane Tricaprylate/ Tricaprate ²⁶						
Water						
(QS to 100%)						

¹ HMW MAPTAC (Rhodia) [charge density = 4.5 meq/g, molecular weight $\sim 860,000$]

² HHMW MAPTAC (Rhodia) [charge density = 4.5 meq/g, molecular weight $\sim 1,500,000$]

³ Diquat (Rhodia) [charge density = 5.60 meq/g, molecular weight $\sim 252,000$]

⁴ APTAC (Rhodia) [charge density = 4.88 meq/g, molecular weight $\sim 1,916,000$]

⁵ Homopolymer of DMAPMA + DES (Rhodia) [charge density = 3.09 meq/g, molecular weight $\sim 180,000$]

⁶ Homopolymer of METAMS (Rhodia) [charge density = 3.53 meq/g, molecular weight $\sim 313,000$]

⁷ 1:9 HEA:MAPTAC (Rhodia) [charge density = 4.29 meq/g, molecular weight $\sim 276,000$]

⁸ 3:7 HEA:MAPTAC (Rhodia) [charge density = 3.71 meq/g, molecular weight $\sim 648,000$]

⁹ 3:7 HEA:MAPTAC (Rhodia) [charge density = 3.71 meq/g, molecular weight $\sim 1,200,000$]

¹⁰ 1:9 VP:MAPTAC (Rhodia) [charge density = 4.30 meq/g, molecular weight $\sim 242,000$]

¹¹ 3:7 VP:MAPTAC (Rhodia) [charge density = 3.74 meq/g, molecular weight $\sim 503,000$]

¹² 1:9 HEA:DMDAAC (Rhodia) [charge density = 5.75 meq/g, molecular weight $\sim 274,000$]

¹³ 1:1 AP:MAPTAC (Rhodia) [charge density = 3.95 meq/g, molecular weight $\sim 243,000$]

¹⁴ Sipernat 22LS (Degussa) [avg. particle size = 3 μm , specific surface area = 190 m^2/g]

¹⁵ MSS-500/H (General Electric Silicones) [avg. particle size = 11 μm , specific surface area = 37 m^2/g]

¹⁶ MSS-500/N (General Electric Silicones) [avg. particle size = 12 μm , specific surface area = 700 m^2/g]

¹⁷ Syloid 244FP, Silica (Grace Davison)

¹⁸ PUU Powder of Example 7

²⁰ Thixcin® (Rheox)

²¹ PEG 14M (Dow Chemical)

²² Viscasil 330M (General Electric Silicones)

²³ Dow Corning® 1664 Emulsion (Dow Corning)

²⁴ Dow Corning® 2-1865 Microemulsion (Dow Corning)

²⁵ Puresyn 6, MCP-1812 (Mobil)

²⁶ Mobil P43 (Mobil)

²⁷ Miranol Ultra L32 (Rhodia)

²⁸ MACKAM 151C (McIntyre)

²⁹ Tegobetaine F-B (Goldschmidt)

³⁰ Varisoft 110 (Witco)

Example 38 – Self Tanning

[0201] Water-resistant silicone-containing self-tanning compositions having the following compositions (in g) shown in Table 26 may be prepared:

Table 26		
Component	I	II
Phase A		
Silicone oil (AK 500 000 from Wacker)	10.00	--
Polydimethylsiloxane at a concentration of 12-14% in cyclomethicone (Q2-1401 from Dow)	6.64	12.30
Polyphenylsiloxane at a concentration of 15% in cyclopentadimethylsiloxane (Silbione 71634 from Rhone-Poulenc)	--	40.00
Phase B		
TiO ₂ + iron oxides*	3.36	7.7
Phase C		
Crosslinked silicone powder (KSG 16 from Shin Etsu)	20.00	10.00
Phase D		
Gelling agent (Bentone gel VS38 from Rhéox)	--	18.00
Phase E		
PUU Powder of Example 7	--	5.00
Phase F		
Cyclopentadimethylsiloxane	60.00	qs 100

*Non-coated pigments.

[0202] Colored and water-resistant self-tanning compositions are obtained in the form of gels.

[0203] Examples 39-46 provide compositions suitable for foundations including the components of Tables 27-34, respectively

Example 39 - Foundation O/W

Table 27	
Component	% w/w
Phase A	
Cyclopentadimethylsiloxane	4
Cyclohexadimethylsiloxane	10
Non-volatile silicone oils (polyphenylmethylsiloxane and polycetylmethylsiloxane)	12
Polyethylene glycol stearate	0.6
Glyceryl stearate	0.3
Stearic acid	1.9
Coated yellow iron oxide	1.6

Brown iron oxide	0.5
Black iron oxide	0.3
PUU Powder of Example 7	6
Polyethylene powder	4
Phase B (aqueous phase)	
Propylene glycol	6.5
Polyethylene glycol 32 EO (PEG-32)	10
Preservative	qs
Ammonium polyacryldimethyltauramide (Hostacerin AMPS from the company Clariant)	1.5
Water	qs
Phase C	
HMW2220 (Dow Corning) (aqueous dispersion at 60% of A.M.) (that is 1.2% of A.M.)	2

Procedure: The composition is prepared by heating the constituents of the oily Phase A, apart from the volatile oils, to 65°C and by mixing. The volatile oils are then added at 60°C. In parallel, the aqueous Phase B is prepared at 80°C. The mixture is allowed to cool to 30°C. The two phases are mixed, with Moritz stirring, by pouring the oily phase into the aqueous phase. Next, Phase C is added, with low stirring.

[0204] A smooth foundation is thus obtained. This foundation is fluid, colored and has a very smooth texture; it spreads well and can be applied uniformly.

Example 40 - Cast Foundations

Table 28	
Component	% w/w
Phase A	
Uniclear 100	11
Isononyl isononanoate	10
Phase B	
Coated yellow iron oxide*	2.2
Coated red iron oxide*	0.5
Coated black iron oxide*	0.3
Titanium oxide*	7
Phase C	
Filler	10
Phase D	
Isododecane	qs 100

*The coating is aluminium stearoylglutamate.

Procedure: The Uniclear® 100 is incorporated into the isononyl isononanoate, with the aid of a Rayneri mixer for 10 min., in a heating vessel heated to 110°C. The stirring is continued until the Uniclear has fully dissolved (Phase A).

[0205] In parallel, a pigmentary, phase is prepared by incorporating 30 g of pigments (iron oxide+titanium oxide) into 8.8 g of isododecane, followed by milling using a three-roll mill. This pigmentary phase (Phase B) is then introduced into Phase A and the mixture is stirred until completely homogeneous, for 30 min., at 110°C. Next, the temperature is lowered to 95°C and the volatile phase D is then added to the above mixture. After stirring the resulting mixture for 15 min., the filler (Phase C) is incorporated and stirring of this mixture is then continued for 20 min. Next, the final mixture obtained is cast in foundation molds preheated to 45°C and the mixture is then left to cool to room temperature (25°C). The fillers are PUU powders of Example 7.

Example 41 - Foundation

Table 29		
Component	% w/w	Supplier
Phase A		
Cyclopentasiloxane and Dimethicone Copolyol	8.00	Dow Corning DC5225C
Polyglyceryl-4-isostearate and Hexyl Laurate and Cetyl PEG/PPG-10/1 Dimethicone	3.50	ABIL WE 09
Treated Pigments	9.90	
Phase B1		
Volatile Oil	16.10	
Siloxane based polyamide	1.00	Dow Corning DC2-8179 (DP = 100)
Silicone Acrylates	12.00	KP545
Phase B2		
PUU Powder of Example 7	6.00	
Phase B3		
Preservative	0.40	
Disteardimonium Hectorite	0.60	
Propylene Carbonate	0.20	
Phase C		
Water	40.00	
Magnesium Sulfate	1.00	
Preservatives	0.70	
Non-ionic emulsifier	0.50	
	100.00	

[0206] Phase A components are mixed well and ground with a Silverson homogenizer at a speed of 6000 rpm. Separately the phase B1 components are heated to 80 to 85°C with

stirring for 10-15 minutes or until dissolution of the siloxane based polyamide. Phase A and B1 are then combined in the main beaker and mixed well at 70 to 75°C. Phase B2 is added to the main beaker and is mixed well or until uniform. In a separate side beaker, Phase C is heated to 70 to 75°C. Emulsification is carried out by adding Phase C to main beaker with the use of a homogenizer at medium/high speed. The batch is cooled to room temperature with a paddle stirring.

[0207] This composition exhibit good wear, excellent transfer-resistance after drying, good water resistance and felt cushiony.

Example 42 - Foundation

Table 30		
Component	% w/w	Supplier
Phase A		
Cyclopentasiloxane and Dimethicone Copolyol	8.00	Dow Corning DC5225C
Polyglyceryl-4-isostearate and Hexyl Laurate and Cetyl PET/PPG-10/1 Dimethicone	3.50	ABIL WE 09
Pigments	9.90	
Phase B1		
Volatile Oil	26.10	
Siloxane based polyamide	3.00	Dow Corning DC2-8179 (DP = 100)
Phase B2		
PUU Powder of Example 7	6.00	
Phase B3		
Preservative	0.40	
Disteardimonium Hectorite	0.60	
Propylene Carbonate	0.20	
Phase C		
Water	40.00	
Magnesium Sulfate	1.00	
Preservatives	0.70	
Non-ionic emulsifier	0.50	
	100.00	

[0208] Phase A components are mixed well and ground with a Silverson homogenizer at a speed of 6000 rpm. Separately the phase B1 components are heated to 80 to 85°C with stirring for 10-15 minutes or until dissolution of the siloxane based polyamide. Phase A and B1 are then combined in the main beaker and mixed well at 70 to 75°C. Phase B2 is added to the main beaker and is mixed well or until uniform. Disteardimonium Hectorite is added to the main beaker and dispersed well before adding the rest of Phase B3 components. In a separate

side beaker, Phase C is heated to 70 to 75°C. Emulsification is carried out by adding Phase C to the main beaker with the use of a homogenizer at medium/high speed. The batch is cooled to room temperature with a paddle stirring.

[0209] This composition exhibited good transfer-resistance after drying, good water resistance and felt cushiony.

Example 43 - Foundation

Table 31		
Component	% w/w	Supplier
Phase A		
Cyclopentasiloxane and Dimethicone Copolyol	8.00	Dow Corning DC5225C
Polyglyceryl-4-isostearate and Hexyl Laurate and Cetyl PEG/PPG-10/1 Dimethicone	3.50	ABIL WE 09
Treated Pigments	9.90	
Phase B1		
Volatile Oil	26.10	
Siloxane based polyamide	2.00	Dow Corning DC2-8179 (DP = 100)
TiO ₂ /Silicone-Acrylates	12.00	SPD-T1S: Silicone acrylate treated TiO ₂
Phase B2		
PUU Powder of Example 7	6.00	
Phase B3		
Preservative	0.40	
Disteardimonium Hectorite	1.00	
Propylene Carbonate	0.30	
Phase C		
Water	40.00	
Magnesium Sulfate	1.00	
Preservatives	0.70	
Laureth-4	0.50	
	100.00	

[0210] Phase A components are mixed well and ground with a Silverson homogenizer at a speed of 6000 rpm. Separately the Phase B1 components are heated to 80 to 85°C with stirring for 10-15 minutes or until dissolution of the siloxane based polyamide. Phase A and B1 are then combined in the main beaker and mixed well at 70 to 75°C. Phase B2 is added to the main beaker and is mixed well or until uniform. Disteardimonium Hectorite is added to the main beaker and dispersed well before adding the rest of phase B3 components. In a separate side beaker, Phase C is heated to 70 to 75°C. Emulsification is carried out by adding phase C to the

main beaker with the use of a homogenizer at medium/high speed. The batch is cooled to room temperature with a paddle stirring.

[0211] This composition exhibited good transfer-resistance after drying, good water resistance and felt cushiony.

Example 44

Table 32		
Component	% w/w	Supplier
Phase A		
Oil Soluble Sunscreen	4.00	
Cyclopentasiloxane and Dimethicone Copolyol	8.00	Dow Corning DC5225C
Treated Pigments	9.90	
Phase B		
Volatile Oil	26.10	
Siloxane based polyamide	3.00	Dow Corning DC 2-8179 (DP = 100)
Polyglyceryl-4-isostearate and Hexyl Laurate and Cetyl PEG/PPG-10/1 Dimethicone	3.50	ABIL WE 09
Preservative	0.20	
Phase C		
PUU Powder of Example 7	6.04	
Phase D		
Water	42.16	
Magnesium Sulfate	1.00	
Preservatives	0.30	
Laureth-4	0.50	
Phase E		
Water	1.00	
Preservative	0.30	
	100.00	

[0212] Phase A components are mixed well and ground with a Silverson homogenizer at a speed of 6000 rpm. Separately the phase B components are heated to 80 to 85°C with stirring for 10-15 minutes or until dissolution of siloxane polyamide. Phase A and B are then combined in the main beaker and mixed well at 60 to 65°C. Phase C components (powders) are added to the main beaker and are mixed until uniform. Phase D is heated to 65 to 70°C. in a separate side beaker. Emulsification is carried out by adding Phase D to main beaker with the use of a homogenizer at medium/high speed. Cool the batch to 40 to 45°C, then add Phase E slowly with good mixing. The batch is then cooled to room temperature with a paddle stirring.

[0213] This composition had good wear, exhibited transfer resistance and water resistance while feeling cushiony.

Example 45 - Foundation

Table 33		
Component	% w/w	Supplier
Phase A		
Oil Soluble Sunscreen	4.00	
Cyclopentasiloxane and Dimethicone Copolyol	8.00	Dow Corning DC5225C
Cyclopentasiloxane and Diphenyl Dimethicone	8.00	Mirasil C-DPDM
Treated Pigments	10.00	
Phase B1		
Volatile Oil	18.00	
Siloxane based polyamide	3.00	Dow Corning DC2-8179 (DP = 100)
Polyglyceryl-4-isostearate and Hexyl Laurate and Cetyl PEG/PPG-10/2 Dimethicone	3.50	ABIL WE 09
Preservative	0.20	
PUU Powder of Example 7	6.04	
Phase D		
Water	42.16	
Emollient	10.00	
Magnesium Sulfate	1.00	
Preservatives	0.30	
Laureth-4	0.50	
Phase E		
Water	1.00	
Preservative	0.30	
	100.00	

[0214] Phase A components are mixed well and ground with a Silverson homogenizer at a speed of 6000 rpm. Separately the phase B components are heated to 80 to 85°C with stirring for 10-15 minutes or until dissolution of siloxane polyamide. Phase A and B are then combined in the main beaker and mixed well at 60 to 65°C. Phase C components (powders) are added to the main beaker and are mixed until uniform. Phase D is heated to 65 to 70°C in a separate side beaker. Emulsification is carried out by adding Phase D to main beaker with the use of a homogenizer at medium/high speed. Cool the batch to 40 to 45°C, then add Phase E slowly with good mixing. The batch is then cooled to room temperature with a paddle stirring.

[0215] This composition exhibited good wear, transfer resistance and water resistance.

Example 46 - Foundation

[0216] A composition in the form of a cast foundation, prepared by reacting together the components indicated in the following table. The cast foundation composition is prepared as follows. A heating vessel is charged with ETPEA and isononyl isononanoate, the mixture is heated to 110°C, and stirred with a Rayneri mixer for about 10 minutes, until the ETPEA has fully dissolved. This mixture can be designated "Phase A."

[0217] In parallel, a pigmentary phase can be prepared by incorporating pigments (for example, iron oxide+titanium oxide) into isododecane, followed by milling using a three-roll mill. This pigmentary phase ("Phase B") can then be introduced into phase A and the mixture can be stirred until completely homogeneous, in one aspect for about 30 minutes at about 110°C. The temperature of the mixture can then be lowered to about 95°C, before adding isododecane ("Phase D") to the mixture. After stirring the resulting mixture for about 15 minutes, the filler ("Phase C") can be incorporated with stirring for about 20 minutes more. The final mixture can then be cast in foundation molds (in one aspect preheated to about 45°C), and the mixture can be left to cool to ambient temperature. Preferably, the composition exhibits good stability (i.e., no phase separation) at about 4°C, ambient temperature, and about 45°C, over a length of time spanning about one month, and more preferably about two months. Also preferably, the composition is easy to spread and has a pleasant, non-greasy, light and fondant feel on the fingers. The composition also preferably provides a homogeneous, smooth, natural, and light make-up effect. These sticks illustrate, e.g., the use of at least one inert filler in a composition of the present invention.

Table 34			
Component	% w/w		
	I	II	III
Phase A			
ETPEA	11	11	11
Isononyl isononanoate	10	10	10
Phase B			
Coated yellow iron oxide*	2.2	2.2	2.2
Coated red iron oxide*	0.5	0.5	0.5
Coated black iron oxide*	0.3	0.3	0.3
Titanium oxide*	7.0	7.0	7.0
Phase C			
PUU Powder of Example 7	10	--	--
Nylon particles	--	10	--
PMMA particles (10 to 12 µm	--	--	10
Wackherr COVABEAD® LH-85)			

Phase D			
Isododecane	q.s.	q.s.	q.s.
	100.0	100.0	100.0

*The coating is aluminum stearoylglutamate.

Example 47 - Solid Foundation

[0218] A solid foundation is made according to the components of Table 35:

Table 35	
Component	% w/w
Phase A	
Sorbitan Isostearate	4.50
(Uniqema ARLACEL® 987) Preservative	0.20
Phase B	
ETPEA	15.00
Octyl-2-dodecanol	3.60
Isododecane	5.00
Hydrogenated Isoparaffin (Parleam)	6.00
Phase C	
Titanium Dioxide	4.10
Hydrogenated Isoparaffin (Parleam)	7.00
PUU Powder of Example 7	8.00
Iron Oxide	1.30
Phase D	
Perfume	0.65
Phase E	
Propylene Glycol	3.00
Magnesium Sulfate	0.70
Preservative	0.30
Water	qs
	100.00

Example 48 – Foundation

[0219] A foundation is made according to the components of Table 36:

Table 36	
Component	% w/w
Phase A	
Sorbitan Isostearate	6.00
(Uniqema ARLACEL® 987) Preservative	0.20
Phase B	
ETPEA	15.00

Octyl-2-dodecanol	3.60
Isododecane	22.50
Cyclohexadimethylsiloxane (8 cSt) (Dow Corning DC246)	5.00
Hydrogenated Isoparaffin (Parleam)	11.00
Phase C	
Titanium Dioxide	4.10
Hydrogenated Isoparaffin (Parleam)	3.30
PUU Powder of Example 7	4.00
Iron Oxide	10.70
Phase D	
Perfume	0.65
Phase E	
Magnesium Sulfate	0.70
Preservative	0.20
Water	qs
	100.00

Example 49 – Fluid Foundation (oil in water emulsion)

[0220] A foundation is made according to the components of Table 37:

Table 37	
Component	% w/w
Phase A	
Xanthan Gum	0.2
Cellulose Gum	0.2
Propylene Glycol	2.0
Water	63.3 (qs 100)
Phase B	
Triethanolamine (TEA 99%)	0.65
PEG-7 Glyceryl Cocoate (Cetiol HE)	6.0
Phase C	
Titanium Dioxide	7.0
Iron Oxide Red	0.35
Iron oxide Yellow	1.5
Iron oxide Black	0.1
Polyurethane Powder	1.5
Phase D	
Cetearyl Isononanoate	3.5
Isopropyl Myristate	1.0
Mineral Oil	2.0
Lanolin Alcohol	2.5
Oleyl Alcohol	6.5
Stearic Acid	1.0
Phase E	
Preservatives	0.7

Procedure: Phase A - Disperse gums into warm water using high shear mixing until a homogeneous fluid gel is formed. Add Phase B to Phase A until smooth. Pulverize Phase C and add to Phase A-B using high shear mixing until smooth. Heat Phase D to 75°C +/- 5°C with gentle agitation. Add Phase D to Phase A-B-C with gentle agitation, maintaining temperature at 75°C +/- 5°C. Maintain constant agitation and at around 40°C. Add Phase E and maintain agitation until 30°C; store and fill appropriate containers.

Example 50 –Liquid Make-Up

[0221] A liquid make-up is made according to the components of Table 38:

Table 38		
Component	% w/w	Function
Phase A		
Mineral Oil	6.0	Emollient
Stearic Acid	2.2	Emulsifier
Glyceryl Stearate	1.8	Emulsifier
Lanolin Alcohol	3.0	Emollient
Cetearyl Isononanoate	1.0	Emollient
Isostearic Acid	0.5	Emulsifier
Phase B		
Cellulose Gum	0.2	Thickener
Xanthan Gum	0.2	Thickener
Propylene Glycol	4.5	Humectant
Triethanolamine	0.9	pH Buffer, Neutralizer
Deionized Water	qs	
Phase C		
Iron Oxides, Brown (CI 77492, 77491, 77499)	0.2	Abrasive
Titanium Dioxide	2.0	Opacifying Pigment
Talc	4.8	Powder/Texturing Agent
PUU Powder of Example 7	3.0	Powder/Texturing Agent
Phase D		
Phenoxyethanol, Methylparaben, Ethylparaben, Propylparaben, Butylparaben, Isobutylparaben	0.7	Preservative

Procedure: Phase A - Heat components to 80°C until completely uniform. Phase B - Disperse gums into water under intensive stirring until complete dispersion, then add propylene glycol and TEA. Heat Phase B to the same temperature as Phase A while mixing gently. Pulverize Phase C and add to Phase B under moderate stirring until it is homogeneous. Then add Phase A to (B+C) under intensive stirring. Maintain gentle agitation while it is being cooled until 40-30°C. Add preservative. Mix gently until it is completely cooled.

Example 51 – Powder Foundation

[0222] A powder foundation is made according to the components of Table 39:

Table 39	
Component	% w/w
Phase A	
Talc	6.6
Titanium Dioxide	19.2
Mica (and) Titanium Dioxide	4.8
Iron Oxides	11.2
Zinc Oxide	6.2
Barium Sulfate	13.7
Phase B	
Dimethicone (SF96-5)	5.5
Lanolin	8.2
Petrolatum	1.4
Mineral Oil	1.4
Isopropyl Myristate	1.4
Phase C	
PUU Powder of Example 7	20.4
Phase D	
Fragrance	qs
Preservative	qs

Procedure: Mill all of the pigments in Phase A. Add Phase B, Phase C, and Phase D to Phase A with high shear mixing. Press into suitable containers.

Example 52 – Foundation Make-Up

[0223] A foundation is made according to the components of Table 40:

Table 40		
Component	% w/w	Supplier
Phase A		
SF1528 Cyclopentasiloxane (and) Dimethicone Copolyol)	7.83	GES/Kobo Products
SFE839 Cyclopentasiloxane Dimethicone/ Vinyl dimethicone Crosspolymer	0.78	GES/Kobo Products
SF1202 Cyclopentasiloxane	10.64	GES/Kobo Products
SF1555 Bis-Phenylpropyl Dimethicone	0.63	GES/Kobo Products
PUU Powder of Example 7	3.13	
SS4230 Cyclomethicone (and) Trimethylsiloxysilicate	2.50	GES/Kobo Products
Phenonip Phenoxyethanol (and) Methylparaben (and) Propylparaben (and) Ethylparaben (and)	1.00	NIPA Labs

Butylparaben (and) Isobutylparaben		
Phase B		
CM3K40T4 Cyclopentasiloxane (and) Titanium Dioxide (and) PEG-10 Dimethicone (and) Alumina (and) Methicone	25.00	Kobo Products
FA50YSI Yellow Iron Oxide (and) Decamethyl Cyclopentasiloxane (and) Dimethicone Copolyol (and) Triethoxy Caprylylsilane	6.00	Kobo Products
FA55RSI Red Iron Oxide (and) Decamethyl Cyclopentasiloxane (and) Dimethicone Copolyol (and) Triethoxy Caprylylsilane	1.00	Kobo Products
FA60BSI Black Iron Oxide (and) Decamethyl Cyclopentasiloxane (and) Dimethicone Copolyol (and) Triethoxy Caprylylsilane	0.40	Kobo Products
Phase C		
Water	26.07	
Butylene Glycol	7.83	
RITAbate 20 Polysorbate 20	0.31	RITA Corp.
Sodium Chloride	0.63	
Glycerin 96%	1.25	RITA Corp.
Phase D		
SD 39C Ethanol	5.00	Metro Price LLC

Procedure: Combine Phase A liquid components into main tank and homogenize for 15 minutes. Sift in powder and continue homogenization for 15 minutes. Check a small sample to insure proper dispersion. Add color dispersions of Phase B to main tank individually mixing well between each addition. In a side container using propeller agitation, mix Phase C components until solution is homogenous. (Phase may be slightly turbid looking). Add Phase C to main tank in quarter parts mixing at least 15-20 minutes between each addition. Add ethanol to batch.

Example 53 –SPF Foundation

[0224] A foundation with sun protection (SPF) is made according to the components of Table 41:

Table 41		
Component	% w/w	Supplier
Phase A		
Soltrol 130 C10-13	5.71	Isoparaffin Chevron-Phillips
Koboguard 5400 IDD Hydrogenated Polycyclopentadiene (and) Isododecane	14.29	Kobo Products
Covi-OX T70 Tocopherol	0.25	Cogins
Phase B		
Lucentite SAN Quarternium-18 (and) Lithium Magnesium Silicate	2.00	Kobo Products
Ethyl Alcohol 39C (95%)	1.00	Kobo Products
Phase C		
BTD-TTS2 Titanium Dioxide (and) Isopropyl Titanium Triisostearate/Triethoxycaprylsilane Crosspolymer	10.00	Kobo Products
PM9P50M170 Titanium Dioxide (and) Isododecane (and) Alumina (and) Dimethicone (and) Polyhydroxystearic Acid	10.00	Kobo Products
PUU Powder of Example 7	3.50	
GMS-11S2 Mica (and) Triethoxy Caprylsilane	0.50	Kobo Products
BGYO-TTS2 Iron Oxide (CI77492) (and) Isopropyl Titanium Triisostearate/Triethoxycaprylsilane Crosspolymer	0.51	Kobo Products
BGRO-TTS2 Iron Oxide (CI77491) (and) Isopropyl Titanium Triisostearate/Triethoxycaprylsilane Crosspolymer	0.21	Kobo Products
BGBO-TTS2 Iron Oxide (CI77492) (and) Isopropyl Titanium Triisostearate/Triethoxycaprylsilane Crosspolymer	0.06	Kobo Products
KTZ Interfine Gold Mica (and) Titanium Dioxide	0.75	Kobo Products
KTZ Interfine Red Mica (and) Titanium Dioxide	0.75	Kobo Products
SP-10L Nylon 12	0.75	Kobo Products
Soltrol 130 C10-13 Isoparaffin	4.42	Chevron-Phillips
SF1540 Cyclopentasiloxane (and) PEG/PPG-20/15 Dimethicone	6.80	GES/Kobo Products
Permethy 99A Isododecane	2.83	Presperse
Covi-OX T70 Tocopherol	0.25	Cogins
Phase D		
Arlacel 80 Sorbitan Oleate	0.75	Unigema
Propylparaben Propylparaben ISP	0.10	Sutton
Crill 6 Sorbitan Isostearate	0.75	Croda
Phase E		
Sodium Chloride Sodium Chloride	1.00	Morton
Deionized Water	17.00	
Methylparaben Methylparaben	0.10	Protameen
Phase F		
yncrowax HGL-C C18-36 Triglycerides	1.65 S	Croda
yncrowax BB-4 Synthetic Beeswax	1.10 S	Croda

dl-alpha Tocopherol dl-alpha Tocopherol	0.25	Roche
Phase G		
Velvesil 125 Cyclopentasiloxane (and) C30-45 Alkyl Cetearyl Dimethicone Crosspolymer	10.00	GES/Kobo Products
Phase H		
Vanillin FCC Vanillin	0.02	Citrus & Allied Essence
Phenoxyethanol Phenoxyethanol	0.10	NIPA Labs
Phase I		
Deionized Water	2.00	
dl-Panthenol	0.35	Roche
Germall 115 Imidazolidinyl Urea	0.25	ISP

Procedure: Add Phase A raw materials to a beaker under a fume hood. Mix until homogenous at room temperature until dissolved. Add the Lucentite SAN to Phase A and disperse for 20 minutes; add the alcohol and continue dispersing for a minimum of 30 minutes or until gelled. Combine and add pre-dispersed Phase C to gel mixture and homogenize for 15 minutes. Add Phase D raw materials. Combine the water and sodium chloride; add the methylparaben. Add the Aqueous Phase E very slowly to the external phase. Heat batch to 77-80°C. Add Waxes (Phase F) at 75-80°C; begin cooling the batch to 60°C. At 60°C add Phase G. Add Germall 115 solution to the batch at 42°C and continue mixing and cooling to 25°C. Fill into appropriate containers.

Example 54 - Gel SPF Foundation

[0225] A gel foundation with sun protection (SPF) is made according to the components of Table 42:

Table 42		
Component	% w/w	Supplier
Phase A		
Soltrol 130 C10-13 Isoparaffin	5.71	Chevron-Phillips
Koboguard 5400 IDD Hydrogenated Polycyclopentadiene (and) Isododecane	14.29	Kobo Products
Phase B		
Lucentite SAN Quarternium-18 (And) Lithium Magnesium Silicate	2.00	Kobo Products
Ethyl Alcohol 39C (95%) SD Alcohol-39C	1.00	Warner-Graham
Phase C		
BTD-TTS2 Titanium Dioxide (And) Isopropyl Titanium Triisostearate/Triethoxycaprylsilane Crosspolymer	10.00	Kobo Products
CAMFP40TBAS Titanium Dioxide (and) Caprylyl Methicone (and) Iron Oxide (and) PEG-9 Polymethylsiloxylethyl (and) Polyhydroxystearic	15.00	Kobo Products

Acid (and) Dimethicone/Methicone Copolymer		
PUU Powder of Example 7	3.50	
GMS-11S2 Mica (and) Triethoxy Caprylsilane	0.50	Kobo Products
BGYO-TTS2 Iron Oxide (CI 7492) (and) Isopropyl Titanium Triisostearate/Triethoxycaprylylsilane Crosspolymer	0.51	Kobo Products
BGRO-TTS2 Iron Oxide (CI77491) (and) Isopropyl Titanium Triisostearate/Triethoxycaprylylsilane Crosspolymer	0.21	Kobo Products
BGBO-TTS2 Iron Oxide (CI77492) (and) Isopropyl Titanium Triisostearate/Triethoxycaprylylsilane Crosspolymer	0.06	Kobo Products
KTZ Interfine Gold Mica (and) Titanium Dioxide	0.75	Kobo Products
KTZ Interfine Red Mica (and) Titanium Dioxide	0.75	Kobo Products
SP-10L Nylon 12	0.75	Kobo Products
Soltrol 130 C10-13 Isoparaffin	2.87	Chevron-Phillips
SF1540 Cyclopentasiloxane (and) PEG/PPG-20/15 Dimethicone	6.80	GES/Kobo Products
Phase D		
Arlacel 80 Sorbitan Oleate	0.75	Unigema
Propylparaben Propylparaben	0.10	ISP Sutton
Crill 6 Sorbitan Isostearate	0.75	Croda
Phase E		
Sodium Chloride Sodium Chloride	1.00	Morton
Deionized Water Water	17.00	
Methylparaben Methylparaben	0.10	Protameen
Phase F		
Syncrowax HGL-C C18-36 Triglycerides	1.65	Croda
Syncrowax BB-4 Synthetic Beeswax	1.10	Croda
dl-alpha Tocopherol dl-alpha Tocopherol	0.25	Roche
Phase G		
Velvesil 125 Cyclopentasiloxane (and) C30-45 Alkyl Cetearyl Dimethicone Crosspolymer	10.00	GES/Kobo Products
Phase H		
Deionized Water Water	2.00	
dl-Panthenol Panthenol	0.35	Roche
Germall 115 Imidazolidinyl Urea	0.25	ISP

Procedure: Add Phase A raw materials to a beaker under a fume hood. Mix until homogenous at room temperature until dissolved. Add the Lucentite SAN to Phase A and disperse for 20 minutes; add the alcohol and continue dispersing for a minimum of 30 minutes or until gelled. Combine and add pre-dispersed Phase C to gel mixture and homogenize for 15 minutes. Add Phase D raw materials. Combine the water and sodium chloride; add the methylparaben. Add the Aqueous Phase E very slowly to the external phase. Heat batch to 77-80°C. Add Waxes (Phase F) at 75-80°C; begin cooling the batch to 60°C. At 60°C add Phase G. Add Germall

115 solution to the batch at 42°C and continue mixing and cooling to 25°C. Fill into appropriate containers.

Example 55 – Powder

[0226] A facial pressed powder is prepared according to the components of Table 43:

Table 43	
Component	% w/w
Talc, g	63.2
Mg Stearate, g	3.98
PUU Powder of Example 7, g	1.99
Titanium Dioxide, g	7.96
Iron Oxide, g	17.91
Absorbent calcium silicate, g	0.50
Methylparaben, g	0.20
Propylparaben, g	0.20
Imidazolidinyl Urea, g	0.10
PEG-4 Diheptanoate, g	3.98

Example 56 - Powder

[0227] A powder is made according to the components of Table 44:

Table 44	
Component	% w/w
Phase A	
Talc	23
Mica	22
Bismuth Oxychloride	8
Zinc Stearate	3
PUU Powder of Example 7	20
Titanium Dioxide	2
Phase B	
Iron Oxides	15.5
Phase C (Binder)	
Isocetyl Stearate	3.5
HMW2220 (Dow Corning) (Aqueous Dispersions at 60% of A.M.) (that is 1.8% of A.M.)	3

Procedure: Phases A and B are mixed, and then premixed Phase C is added dropwise thereto. The whole is then ground in a toothed roll mill, and then sieved. This powder is then compacted into dishes.

[0228] A very smooth compact powder is obtained which is applied with a sponge or with a brush either directly to the skin or over a foundation in order to obtain a velvety make-up.

Example 57 – Bronzer (pressed powder for face)

[0229] A bronzer is made according to the components of Table 45:

Table 45		
Component	% w/w	Supplier
Phase A		
Talc (qsp 100)	32.4	
Zinc Stearate	7	
Mica	20	
Boron Nitride (Grade CCS402)	7	Advanced Ceramics
Polyurethane Powder	0.5	
Titanium Dioxide	6.5	
Iron Oxide (C33-315 Cosmetic Russet)	9	Sun Chemical
Iron Oxide (C33-225 Cosmetic Brown)	6.5	Sun Chemical
Iron Oxide (C33-1700 Cosmetic Yellow)	3.5	Sun Chemical
Iron Oxide (C33-4799 Cosmetic Black)	0.9	Sun Chemical
Phase B		
Fragrance	0.5	
Antioxidant	0.2	
Mineral Oil	3.5	
UV Filter : Octyl Methoxycinnamate (Parsol MCX)	2.5	Roche

Procedure: Thoroughly blend and disperse Phase A in appropriate dry blending/dispersing equipment. Add Phase B components into a support vessel. Heat and mix until uniform. Add Phase B to Phase A by spraying into the premixed Phase A and continue blending. Press the obtained powder in appropriate containers.

Example 58 – Lipstick/Gloss

[0230] A lipstick is made according to the components of Table 46:

Table 46		
Component	% w/w	Supplier
Phase A		
Dimethicone 20 cst DC200 20 cs	20.0	Dow Corning
Polyglyceryl-2-diisostearate Dermol DGDIS	20.5	
Diisostearyl malate Schercemol DSIM	6.0	
Phenyltrimethicone Belsil PDM 1000	20.0	
Phenyltrimethicone DC 556	10.0	
Phase B		
Polyamidodimethylsiloxane ¹ DC2-8179	20.0	Dow Corning
Phase C		
Pigments	1.5	
PUU Powder of Example 7	2.0	

Procedure: Phase A components are added one by one in a mixing kettle heated to 90-95°C and mixed until homogeneous. Phase B is added and mixed until homogeneous at 90-95°C. Phase C is added and mixed well. The resulting mixture is poured into molds and allowed to cool to form sticks. This composition is supple and elastic.

Example 59 - Lipstick

[0231] A liquid lipstick is made according to the components of Table 47:

Table 47		
Component	% w/w	
1 Shellac Wax	1.000	(wax)
1 Synthetic Wax	0.750	(wax)
1 PVP/Hexadecene Copolymer	2.000	(Synthetic Polymer)
1 Neopentyl Glycol Dioctanoate	5.600	(Diester)
1 Trioctylododecyl Citrate	3.000	(Triester)
1 Cetyl Dimethicone	10.000	(MD _b D' _c D'' _d M-liquid)
1 Stearyl Dimethicone	1.500	(MD _b D' _c D'' _d M-waxy solid)
1 PPG-51/SMDI Copolymer	7.000	(Synthetic Polymer)
1 Octyl methoxycinnamate	2.200	(Sunscreen)
1 Methyl Paraben	0.300	(Preservative)
1 Propyl Paraben	0.100	(Preservative)
1 Butylated Hydroxy Anisole	0.200	(Antioxidant)
1 Sorbic Acid	0.200	(Antioxidant)
5 Cyclomethicone/Trimethylsiloxy Silicate (50:50)	34.68	(D _a liquid + M _q Q _h solid)
1 Cetyl Dimethicone Copolyol/Polyglyceryl-4-Isostearate/Hexyl Laurate (33:34:33)	3.350	(MD _b D' _c D'' _d M liquid + monoester) surfactant
3 D&C Red #7 Calcium Lake	0.180	(Pigment)
3 FD&C Yellow #5 Aluminum Lake	0.120	(Pigment)

3 Red Iron Oxide	0.420	(Pigment)
3 Black Iron Oxide	0.180	(Pigment)
2 Dimethicone	4.800	(MD _b D' _c D'' _d M-liquid)
2 Acrylates Copolymer	1.200	(Powder)
4 Titanium Dioxide, Mica, Iron Oxides	3.500	(Pigment + Powder)
4 Bismuth Oxychloride	3.500	(Powder)
4 PUU Powder of Example 7	3.000	(Powder)
4 Mica	11.320	(Powder)

Procedure: Separately, the Sequence 2 components are roller milled together. Separately, the Sequence 3 components are roller milled in a portion of the Sequence 5 components. The Sequence 1 components are combined and heated to 95°C with mixing until the components are mixed. The Sequence 2 and Sequence 3 premixes are added to the Sequence 1 mixture. The batch is covered for the remainder of the procedure. The temperature of the mixture is reduced to 85°C. The Sequence 4 components are then added, followed by the Sequence 5 components. The temperature is further reduced to 80°C. The composition is poured into vials and allowed to cool to room temperature.

Example 60 - Lipstick

[0232] A lipstick in the stick form is made according to the components in Table 48:

Table 48		
Component	% w/w	
1 Synthetic Wax	4.00	(wax)
1 Ozokerite	0.80	(wax)
1 Shellac Wax	1.50	(wax)
1 Diisostearyl Malate	8.00	(Diester)
1 Cetyl Dimethicone	12.00	(MD _b D' _c D'' _d M)
1 PPG-51/SMDI Copolymer	6.00	(Synthetic Polymer)
1 Octyl Methoxycinnamate	2.20	(Sunscreen)
1 Propyl Paraben	0.10	(preservative)
1 Butylated Hydroxyl Anisole	0.10	(Antioxidant)
1 Stearyl Dimethicone	1.55	(MD _b D' _c D'' _d M)
1 Vitamin E Acetate	2.00	(Vitamin)
1 Aloe Extract	1.00	(Biological Additive)
2 Pigments	10.45	(Pigment)
3 Titanium Dioxide/Mica	5.00	(Powder)
3 Bismuthoxychloride	2.00	(Powder)
3 PUU Powder of Example 7	4.00	(Powder)
3 Mica	5.10	(Powder)
5 Lanolin Oil	1.00	(Oil)
5 Dimethicone	3.00	(MD _b D' _c D'' _d M)
6 Cyclomethicone/Trimethylsiloxysilicate (50:50)	25.20	(MD _b D' _c D'' _d M + M _q Q _h)
4 Isododecane	5.00	(Hydrocarbon)

Procedure: The Sequence 2 components are roller milled into a portion of the Sequence 6 components. The mixture is combined with the Sequence 1 components and heated with mixing to a temperature of 95°C until uniform. The remaining Sequence 2 components are added to the mixture. The batch is covered for the remainder of the procedure. The heat is reduced to 85°C. The Sequence 3 and Sequence 4 components are added and mixed well. The Sequence 5 components are combined and added to the mixture, followed by the Sequence 6 components. The mixture is poured into lipstick molds when the temperature reached 85°C and allowed to cool to form sticks.

Example 61 - Lipstick

[0233] In one aspect, the present invention provides a composition in the form of a lipstick prepared, for example, in the following manner. ETPEA is solubilized at about 100°C, in a mixture of melted oils and wax, followed by addition of pigments and fillers. The mixture can then be further mixed using, for example, a deflocculating turbomixer (Raynerie), before being encased in lipstick molds. Preferably the resulting composition has good stability (as indicated by, for example, the absence of exudation at ambient temperature, 45°C and 47°C, both after one month and after two months. Percents (by weight) of the components of the composition reaction mixture are indicated in the following table. This composition illustrates, e.g., the use of a solid substance in a composition of the present invention.

Table 49	
Component	% w/w
Rosin/Colophonium	0.6
Barium Sulfate	0.6
Titanium Dioxide	1.2
Red 7 Lake	1.8
PUU Powder of Example 7 (Spherical Filler)	4.0
Iron Oxides	4.0
Polyglyceryl-2-diisostearate	5.9
Polyethylene Wax	12.0
Diisostearyl Malate	12.0
ETPEA	15.0
Isononyl Isononanoate	qs
	100.0

Example 62 - Lipsticks with an Oil-Soluble Cationic Polymer

[0234] In one aspect, the present invention provides a composition in the form of a lipstick with an oil-soluble cationic polymer and/or an oil-soluble ester, prepared, for example, by mixing the components as indicated in the following table. In one aspect, the composition is mixed until homogeneous, then poured into a suitable container or mold. Preferably the compositions have good stability and no exudation, even at elevated temperatures such as about 47°C.

Table 50		
Component	Example 5	Example 6
	% w/w	% w/w
Hydroxyhydrocinnamate	0.05	0.05
Rosin/Colophonium Tetrabutyl/ Pentaerythritol	0.6	0.6
Barium Sulfate	0.6	0.6
Titanium Dioxide	1.2	1.2
Red 7 Lake	1.8	1.8
PUU Powder of Example 7	3.0	4.0
Iron Oxides	4.0	4.0
Polyethylene	3.0	12.0
ETPEA	15.0	15.0
Polyglycerol-2 Diisostearate	5.9	5.9
Octyldodecanol	10.0	--
Isononyl Isononanoate	5.9	qs 100.00
Diisostearyl Malate	qs 100.0	12.0

Example 63 – Lipstick

[0235] With reference to the following table, ETPEA is dissolved in octyldodecanol and parleam oil, at about 100° C, before adding pigments and fillers. This mixture is then combined with a preheated mixture of the waxes and oils (preheated to about 90°C). All other components are added, and the entire mixture is mixed with the aid of a deflocculating (Raynerie) turbine, then poured into lipstick molds.

Table 51	
Component	% w/w
ETPEA	22.6
Parleam oil	32.7
Octyldodecanol	11.3
Poly(1,2-hydroxystearic) Acid	2.5
Pigments	10.9
Lanolin (Pasty)	6.3
Waxes	3.8
PUU Powder of Example 7	3.8
Phenyl Silicone (Oil)	6.3

Example 64 – Smooth Lipstick

Table 52		
Component	% w/w	Supplier
Phase A		
Ricinus Communis (castor) Seed Oil	8	CasChem
Phase B1		
Titanium Dioxide	1	
D&C Red 27 Aluminum Lake	0.6	
D&C Red 7 Calcium Lake	0.9	
Iron Oxide – Cosmetic Russet	0.24	Sun Chemical
Phase B2		
Polyurethane Powder	0.3	
Phase C		
Beeswax – White Beeswax N.F.	6	Koster Keunen
Candellila Wax – SP75	7	Strahl & Pitch
Carnauba Wax - #1	3	Koster Keunen
Ozokerite	1	
Phase D		
Ricinus Communis (Caster) Seed Oil	39.81	CasChem
Isoeicosane – Pomerethyl 102A	4	Presperse
Tridecyl Trimellitate – Liponate TDTM	10	Lipo Chemicals
PEG-4 Diheptanoate – Liponate 2-DH	4	Lipo Chemicals
Phase E		
Propylparaben – (ISP)	0.1	
BHT	0.05	Eastman Chemical

Procedure: Pulverize Phase B1 and mix well with phase A. Grind 3 times this mixing through a three roll mill. Heat Phase C to 80-85°C and mix with a proper mixing. Add Phase D to Phase C, mix and add the mixing preparation phase (A-B1) and Phase B2. Mix until completely dispersed and uniform, maintaining the 80°C temperature. Then add Phase E. Mix. Once

uniform, pour batch into a proper mold at 70°-72°C. Put the lipstick in a cold fridge (6°C) during 30mn. Remove from molds at ambient temperature.

Example 65 – Eye Shadow

[0236] In one aspect, the present invention provides a composition in the form of an eye shadow prepared according to the weight percentage values indicated in the following table. In one aspect, the increased presence of fibers, optionally combined with fillers, improves the transfer-resistance property compared with a composition not containing any fibers. In a further aspect, the combination of spherical fillers with fibers improves the disintegration of the product and thus makes it easier for the make-up to be deposited on the skin.

Table 53	
Component	% w/w
ETPEA	11
Parleam	10
Blue 1 Al lake	0.1
Polyamide fiber (3 mm long 0.9 Dtex)	0 to 5
PUU Powder of Example 7 (spherical filler)	0 to 10
Isododecane	q.s.

Example 66 - Smooth Creamy Eye Shadow

Table 54		
Component	% w/w	Supplier
Phase A		
Propylene Glycol	8	
Sodium Polyacrylate	0.7	LCW Sensient
Phase B		
Glycerin	8	
Phase C		
Water	42	
Preservatives (mixture of parabens)	0.3	
Phase D		
Silicone Emulsion	6	Dow Corning
Acrylates Copolymer	20	LCW Sensient
Phase E		
Mica (and) Titanium Dioxide (and) Chromium Oxide (Greens Cloisonne Nu-Antique Green 828 CB)	1.5	Engelhard Corporation
Titanium Dioxide (and) Mica (Pearl Base No. 12)	6.5	LCW Sensient
PUU Powder of Example 7	1	

Procedure: Predisperse Phase A adding sodium polyacrylate in propylene glycol , then add Phase B under agitation. Add this mixture to Phase C under agitation. Add Phase D. Mix until homogeneous. Add Phase E to the mixture (A+B+C+D). Mix until homogeneous.

Example 67 – Powder Eye Shadow

Table 55	
Component	% w/w
Phase A	
Mica (and) Titanium Dioxide	6.4
Mica	32.0
Iron Oxides	3.0
Ultramarines	12.7
Ferric Ammonium Ferrocyanide	18.9
Phase B	
PUU Powder of Example 7	19.5
Phase C	
Dimethicone (SF96-5)	2.5
Squalene	2.5
Petrolatum	2.5
Fragrance	qs
Preservative	qs

Procedure: Mix pigments in Phase A except titanium dioxide and mica. Add the titanium dioxide, mica, Phase C (except fragrance and preservative), and Phase B to Phase A with high shear mixing. Add the fragrance and preservative with the same high shear mixing. Press into suitable containers.

Example 68 - Mascara

Table 56		
Component	% w/w	Supplier
Phase A		
Water	57.3 (qsp 100)	
Hydroxyethylcellulose	0.5	
Tiethanolamine	2	
Butylene Glycol	8	
Phase B		
Flamenco Gold 220 C (Mica (and) Titanium Dioxide)	2	Engelhard
Black Iron oxide (C33-4799 Cosmetic Black)	6	Englehard
PUU Powder of Example 7	0.5	
Phase C		

Glyceryl Stearate	2.5	
Carnauba Wax	4	
Beeswax	5	
Candellila Wax	1	
Stearic Acid	5	
Phase D		
Acrylate Copolymer	5	
Dimethicone	0.5	
Preservative (mix of parabens)	0.7	

Procedure: Add slowly hydroxyethylcellulose in warm water (40°C). Mix until uniformly dispersed. Add the triethanolamine, mix until the gel is homogeneous, and add butylene glycol. This Phase A has to be heated until 75°C. Mix all the components of Phase C and melt to 75°C-80°C. Add the Phase B to C and mix until powders are completely wetted and uniform. Combine this Phase (B-C) with Phase A to form the emulsion; continue mixing slowly and begin cooling. Add dimethicone, acrylate copolymer and preservatives. Continue stirring and cooling to room temperature. Fill into appropriate containers.

Example 69 - Mascara

Table 57		
Component	% w/w	Supplier
Phase A		
Permethyl 99A Isododecane	26.91	Presperse
Koboguard 5400IDD Hydrogenated Polycyclopentadiene (and) Isododecane	14.29	Kobo Products
Phase B		
Lucentite SAN Lithium Magnesium Silicate	2.00	Kobo Products
Ethanol SD 39C (95%) SD Alcohol- 39C	1.00	Warner-Graham
Phase C		
Black NF Iron Oxide (C.I. 77499)	7.00	Kobo Products
PUU Powder of Example 7	3.00	INVISTA™
KTZ Interfine Blue Mica (and) Titanium Dioxide Taizhu	1.25	Kobo Products
SF1540 Cyclopentasiloxane (And) PEG/Ppg-20/15 Dimethicone	3.00	GES/Kobo Products
Permethyl 99A Isododecane	10.00	Presperse
Phase D		
Sodium Chloride Sodium Chloride	0.25	Morton Salt
Deionized Water Water	11.50	
Methylparaben Methylparaben	0.10	Protameen
Phase E	5	
Syncrowax HGL-C C18-36 Tryglycerides	5.00	Croda
Beeswax SP422 Beeswax	6.00	Strahl & Pitsch
Carnauba Wax Copernicia Cerifera (Carnauba)	3.00	Frank B. Ross

Wax		
Polyethylene 617A Polyethylene	3.00	Honeywell
Propylparaben Propylparaben	0.10	ISP Sutton
Phase F		
Deionized Water Water	2.00	
dI-Panthenol Panthenol	0.35	Roche
Germall 115 Imidazolidinyl Urea	0.25	Sutton Labs

Procedure: Add Phase A raw materials to a beaker under a fume hood. Mix until homogenous at room temperature until dissolved. Add the Lucentite SAN to Phase A and disperse for 20 minutes; add the alcohol and continue dispersing for a minimum of 30 minutes or until gelled. Combine and add pre-dispersed Phase C to gel mixture and homogenize for 15 minutes. Combine the water and sodium chloride; add the methylparaben. Add the Aqueous Phase D very slowly to the external phase. Begin heating batch to 85-87°C, adding the waxes (Phase E) at 70°C. Stir until homogenous and begin cooling the batch to 63-65°C. Q.S. volatiles. Add Germall 115 solution to the batch at 42°C and continue mixing and cooling to 37°C. Fill into appropriate containers.

Example 70 – Skin Care – Suntan Lotions

(UV-A & B Very Water-Resistant Sunscreen Lotion (SPF-30), with soft texture)

Table 58		
Component	% w/w	Function
Phase A		
Deionized Water	63.10	Diluent
Disodium EDTA, <i>Protacide NA-2</i>	0.05	Chelating Agent
Acrylates/C10-30 Alkyl Acrylate Crosspolymer, Carbopol® * Ultrez 21 Polymer	0.25	Rheology Modifier
Acrylates/C10-30 Alkyl Acrylate Crosspolymer, Pemulen® * TR-2 Polymer	0.15	Polymeric Emulsifier
Propylene Glycol	3.00	Humectant
Phase B		
Ethylhexyl Methoxycinnamate, <i>Neo Heliopan™, Type AV</i>	5.00	UV-B Absorber
Ethylhexyl Salicylate, <i>Neo Heliopan™, Type OS</i>	3.00	UV-B Absorber
Butyloctyl Salicylate, <i>HallBrite™ BHB</i>	5.00	Photostabilizer
Butyl Methoxydibenzoylmethane (Avobenzene), Parsol® 1789	3.00	UV-A Absorber
Cetearyl Alcohol (and) Ceteareth-20, Promulgen™ * D Emulsifier	1.50	Co-emulsifier
Cetearyl Octanoate, Schercemol™ * 1688 Ester	2.00	Emollient
Tocopheryl Acetate	0.50	Antioxidant

Phase C		
PEG-60 Almond Glycerides, <i>Crovol</i> [®] A-70	0.50	Co-emulsifier
Cyclopentasiloxane, Cyclotetrasiloxane, (and) Dimethiconol, <i>Dow Corning</i> [®] 1401 Fluid	1.50	Emollient
PEG-33, PEG-8 Dimethicone (and) PEG-14, <i>SilSense</i>[™]* <i>Copolyol-1 Silicone</i>	1.50	Moisturizer/ Detackifier
Phenoxyethanol, Methyl-, Ethyl-, Propyl-, Butyl-, and Isobutylparaben, <i>Phenonip</i> [®]	1.00	Preservative
Tapioca Starch, <i>Tapioca Pure</i>	4.00	Detackifier
Sodium Hydroxide (18%)	1.00	Neutralizer
INVISTA [™] PUU dispersion (4A, or 5G or 7P)	3.95	Film-former
Deionized Water	63.10	Diluent
Disodium EDTA, <i>Protacide</i> NA-2	0.05	Chelating Agent
Acrylates/C10-30 Alkyl Acrylate Crosspolymer, <i>Carbopol</i>[®]* <i>Ultrez 21 Polymer</i>	0.25	Rheology Modifier
Acrylates/C10-30 Alkyl Acrylate Crosspolymer, <i>Pemulen</i>[®]* <i>TR-2 Polymer</i>	0.15	Polymeric Emulsifier
Propylene Glycol	3.00	Humectant
Phase D		
Ethylhexyl Methoxycinnamate, <i>Neo Heliopan</i> [™] , Type AV	5.00	UV-B Absorber
Ethylhexyl Salicylate, <i>Neo Heliopan</i> [™] , Type OS	3.00	UV-B Absorber
Butyloctyl Salicylate, <i>HallBrite</i> [™] BHB	5.00	Photostabilizer
Butyl Methoxydibenzoylmethane (Avobenzene), <i>Parsol</i> [®] 1789	3.00	UV-A Absorber
Cetearyl Alcohol (and) Ceteareth-20, <i>Promulgen</i>[™]* <i>D Emulsifier</i>	1.50	Co-emulsifier
Cetearyl Octanoate, <i>Schercemol</i>[™]* <i>1688 Ester</i>	2.00	Emollient
Tocopheryl Acetate	0.50	Antioxidant
Phase E		
PEG-60 Almond Glycerides, <i>Crovol</i> [®] A-70	0.50	Co-emulsifier
Cyclopentasiloxane, Cyclotetrasiloxane, (and) Dimethiconol, <i>Dow Corning</i> [®] 1401 Fluid	1.50	Emollient
PEG-33, PEG-8 Dimethicone (and) PEG-14, <i>SilSense</i>[™]* <i>Copolyol-1 Silicone</i>	1.50	Moisturizer/ Detackifier
Phenoxyethanol, Methyl-, Ethyl-, Propyl-, Butyl-, and Isobutylparaben, <i>Phenonip</i> [®]	1.00	Preservative
Tapioca Starch, <i>Tapioca Pure</i>	4.00	Detackifier
Sodium Hydroxide (18%)	1.00	Neutralizer
INVISTA [™] PUU dispersion (4A, or 5G or 7P)	3.95	Film-former
Deionized Water	63.10	Diluent

Procedure: Phase A - dissolve disodium EDTA in warm water (~40°C). Disperse ***Carbopol*[®]* *Ultrez 21 & Pemulen*[®]* Polymers** in batch and allow to mix in for about fifteen minutes or until

uniform. Add propylene glycol. Heat Phase A to ~70°C. Phase B - Blend components and heat to ~80°C, making sure solid components are dissolved. Add Phase B to Phase A with vigorous agitation. Mix until uniform. Allow batch to start cooling. Add the first 3 Phase C components (13, 14, 15) to batch in order, mixing during and between each addition. Cool batch to <60°C, add Phenonip[®]. Add tapioca starch. Mix until uniform. Add sodium hydroxide to batch. Mix until uniform. Add INVISTA[™] PUU dispersion (4A, or 5G or 7P). Mix until uniform.

Example 71 - Natural Look Mascara

Table 59		
Component	% w/w	Function
Phase A		
Water	Q.S.	
Hydroethylcellulose	0.50	Thickener
Triethanolamine	2.00	PH Buffer/ Neutralizer
Butylene glycol	8.00	Humectant
Phase B		
Iron oxides (CI 77499)	10.0	Pigment
Phase C		
Glyceryl stearate	2.50	Emulsifier
Carnauba Wax	4.00	Consistency factor
Beeswax	5.00	Consistency factor
Candelilla Wax	1.00	Consistency factor
Stearic acid	5.00	Emulsifier
Phase D		
INVISTA [™] PUU dispersion (4A, or 5G or 7P)	5.00	Film former
Dimethicone	0.5	Waterproofing agent
Phenoxyethanol, methylparaben, ethylparaben, propylparaben, butylparaben, isobutylparaben	0.7	Preservative

Procedure: Phase A - Add slowly hydroxyethylcellulose in warm water (40°C). Mix until uniformly dispersed. Add the triethanolamine, mix until the gel is homogeneous, and add butylene glycol. Mixture has to be heated until 75°C in order to be combined with Phase C. Mix all the components of Phase C and melt to 75-80°C. Then add the pigments (Phase B) to Phase C and mix until the pigments are completely wetted and uniform. Combine with Phase A to form the emulsion. Continue mixing (slowly) and begin cooling. Add dimethicone, PUU polymer and preservative. Continue cooling to room temperature.

Example 72 – Flexible Mascara

Table 60		
Component	% w/w	Function
Phase A		
Deionized Water	59.50	Diluent
Methylparaben, <i>Methylparaben NF</i>	0.10	Preservative
Hydroxypropyl Methylcellulose, <i>Methocel</i> [®] 40-202	0.20	Thickener
Triethanolamine (99%)	2.80	Neutralizer
Panthenol, <i>DL-Panthenol USP</i>	0.50	Conditioner
INVISTA [™] PUU dispersion (4A, or 5G or 7P)	6.00	Film Former
PVP (100%), <i>PVP K-30</i>	2.00	Film Former
Phase B		
Iron Oxides / CI 77499, <i>Iron Oxide Black – 34PC3068</i>	10.00	Pigment
Phase C		
Stearic Acid, <i>Emersol</i> [®] 132	5.50	Emulsifier
Myrica Cerifera (Bayberry) Fruit Wax, <i>Bayberry Wax</i>	1.80	Structurant
Glyceryl Stearate, <i>Protachem GMS-450</i>	1.70	Surfactant/ Emulsifier
Beeswax, <i>Beeswax, White</i>	4.50	Structurant
Copernicia Cerifera (Carnauba) Wax, <i>Carnauba Wax No. 1 Yellow, Refined Flakes</i>	2.70	Structurant
Rosin, <i>WW Gum Rosin</i>	1.80	Tackifier
Propylparaben, <i>Propylparaben NF</i>	0.10	Preservative
Phase D		
Simethicone, <i>Mirasil</i> [®] SM	0.10	Defoamer
Triticum Vulgare (Wheat) Germ Oil, <i>Lipovol</i> [®] WGO	0.10	Conditioner
Phenoxyethanol, Methyl-, Butyl-, Ethyl-, Propyl-, Isobutylparaben, <i>Phenonip</i> [®]	0.10	Preservative
Propylene Glycol, Diazolidinyl Urea, Methylparaben, Propylparaben, <i>Germaben</i> [®] II	0.50	Preservative
Deionized Water	59.50	Diluent
Methylparaben, <i>Methylparaben NF</i>	0.10	Preservative
Hydroxypropyl Methylcellulose, <i>Methocel</i> [®] 40-202	0.20	Thickener
Triethanolamine (99%)	2.80	Neutralizer
Panthenol, <i>DL-Panthenol USP</i>	0.50	Conditioner
INVISTA [™] PUU dispersion (4A, or 5G or 7P)	6.00	Film Former
PVP (100%), <i>PVP K-30</i>	2.00	Film Former
Phase E		
Iron Oxides / CI 77499, <i>Iron Oxide Black – 34PC3068</i>	10.00	Pigment

Procedure: Phase A - Add the deionized water to a suitable kettle and begin heating the water to 40°C. Add the methylparaben and mix until dissolved. Turn the heat off and add the Methocel[®]. Mix until uniformly dispersed and until no lumps appear. Add the triethanolamine and mix until the gum is hydrated and clear. Add the panthenol and mix until dissolved. Add the INVISTA[™] PUU dispersion (4A, or 5G or 7P) and continue mixing until the mixture is uniform. Add the PVP powder and mix until all of the powder is in the solution and Phase A is uniform. Maintain the temperature but raise it to 75°C just before combining with Phase B and C. Phase B and C - Mix all of the components of Phase C (oil phase) in a suitable kettle and melt to 75°C. When all of Phase C has been melted, add the pigment of Phase B to it and mix until the pigment is completely wetted and uniform. Continue mixing and begin cooling and at 50°C add simethicone, wheat germ oil and preservatives. Continue cooling to room temperature

Example 73 – Water-Resistant Mascara

Table 61		
Component	% w/w	Function
Phase A		
Beeswax, <i>Beeswax White Pure, batch #481</i>	5.00	Structurant
Copernicia Cerifera (Carnauba) Wax, <i>Carnauba Wax T1, batch #161</i>	5.00	Structurant
Euphorbia Cerifera (Candelilla) Wax, <i>Candelilla Wax Refined</i>	3.00	Structurant
Stearic Acid, <i>Long Chain type Stearic Acid</i>	2.00	Emulsifier
Glyceryl Stearate, <i>Geleol[®]</i>	5.00	Emulsifier
Isopropyl Myristate, <i>Crodamol[®] IPM</i>	3.00	Emollient
Petrolatum	4.00	Emollient
Cyclopentasiloxane, <i>Dow Corning[®] 245 Fluid</i>	3.00	Emollient
Phase B		
Carbomer, <i>Carbopol[®]* ETD 2050 Polymer</i>	0.10	Rheology Modifier
Magnesium Aluminum Silicate, <i>Veegum[®] Ultra</i>	0.50	Rheology Modifier
Phenoxyethanol, Methyl-, Butyl-, Ethyl-, Propyl-, Isobutylparaben, <i>Phenonip[®]</i>	0.90	Preservative
Iron Oxides/CI 77499, <i>Iron Oxide Black 34-PC-3069</i>	12.00	Pigment
Deionized Water	41.00	Diluent
INVISTA [™] PUU dispersion (4A, or 5G or 7P)	15.00	Film Former
PEG-12 Dimethicone, <i>Dow Corning[®] 193 Surfactant</i>	0.50	Plasticizer
Phase C		
Triethanolamine (99%)	q.s. up to pH 7.50	Neutralizer

Beeswax, <i>Beeswax White Pure, batch #481</i>	5.00	Structurant
Copernicia Cerifera (Carnauba) Wax, <i>Carnauba Wax T1, batch #161</i>	5.00	Structurant
Euphorbia Cerifera (Candelilla) Wax, <i>Candelilla Wax Refined</i>	3.00	Structurant
Stearic Acid, <i>Long Chain type Stearic Acid</i>	2.00	Emulsifier
Glyceryl Stearate, <i>Geleol[®]</i>	5.00	Emulsifier
Isopropyl Myristate, <i>Crodamol[®] IPM</i>	3.00	Emollient
Petrolatum	4.00	Emollient
Cyclopentasiloxane, <i>Dow Corning[®] 245 Fluid</i>	3.00	Emollient
Phase D		
Carbomer, <i>Carbopol[®] * ETD 2050 Polymer</i>	0.10	Rheology Modifier
Magnesium Aluminum Silicate, <i>Veegum[®] Ultra</i>	0.50	Rheology Modifier
Phenoxyethanol, Methyl-, Butyl-, Ethyl-, Propyl-, Isobutylparaben, <i>Phenonip[®]</i>	0.90	Preservative

Procedure: Prepare **Carbopol[®] ETD 2050 Polymer** and Veegum[®] Ultra dispersion (Phase B): mix the two powders together and add into deionized water while stirring at 800 -1,000 rpm for 60 minutes. Add preservative, black pigment INVISTA™ PUU dispersion (4A, or 5G or 7P) and Dow Corning[®] 193 Surfactant to this dispersion and homogenize. This is Phase B. Heat Phase B to 60°C. Pre-combine Phase A components without the cyclopentasiloxane and heat up to 85°C. Add now the cyclopentasiloxane to the melted oil phase. Add Phase A to Phase B and homogenize. Compensate for water loss. Adjust the pH with triethanolamine to 7.5. Complete cooling with gentle stirring.

Example 74 - Long Lasting, Soft Texture Foundation Cream

Table 62		
Component	% w/w	Function
Phase A		
PEG-6 Stearate, Ceteth-20, Steareth-20, <i>Tefose[®] 2000</i>	5.00	Emulsifier
Isostearyl Isostearate	4.00	Emollient
Cetearyl Alcohol, <i>Lanette[®] O</i>	1.70	Co-Emulsifier
Hydrogenated Castor Oil, <i>Cutina[®] HR Powder</i>	1.00	Emollient
Triisostearin PEG-6 Esters, <i>Labrafil[®] Isostearique</i>	2.40	Emollient
Cetearyl Ethylhexanoate	2.00	Emollient
Phenoxyethanol, Methyl-, Ethyl-, Butyl-, Propyl-, Isobutylparaben, <i>Phenonip[®]</i>	0.70	Preservative
Cyclopentasiloxane, <i>Dow Corning[®] 245 Fluid</i>	10.00	Emollient
Phase B		
Deionized Water	29.49	Diluent

Acrylates/C10-30 Alkyl Acrylate Crosspolymer, Carbopol®* ETD 2020 Polymer	0.10	Rheology Modifier
Phase C		
Aminomethyl Propanol, AMP-95®	0.12	Neutralizer
Phase D		
Deionized Water	5.00	Diluent
Disodium EDTA	0.10	Chelating Agent
Phase E		
Titanium Dioxide, CI 77891, <i>Titanium Dioxide 34-PC-0748, Oil</i>	6.60	Pigment
Iron Oxides/CI 77492, <i>Iron Oxide Yellow 34-PC-3170</i>	1.55	Pigment
Iron Oxides/CI 77499, <i>Iron Oxide Black 34-PC-3069</i>	0.11	Pigment
Iron Oxides/CI 77491, <i>Iron Oxide Red 34-PC-3511</i>	0.93	Pigment
INVISTA™ PUU dispersion (4A, or 5G or 7P)	7.00	Film Former / Pigment Disperser
Deionized Water	8.00	Diluent
Phase F		
Steareth-21, Brij® 721	2.00	Emulsifier
Deionized Water	5.00	Diluent
Phase G		
Dimethicone PEG-8 Polyacrylate, Silsoft® Surface™	7.20	Plasticizer
Titanium Dioxide, CI 77891, <i>Titanium Dioxide 34-PC-0748, Oil</i>	6.60	Pigment
Iron Oxides/CI 77492, <i>Iron Oxide Yellow 34-PC-3170</i>	1.55	Pigment

Procedure: Prepare Phase E by dispersing the pigments in the mixture of INVISTA™ PUU dispersion (4A, or 5G or 7P) and water. Add Phase F (Steareth-21 is solubilized in deionized water by using moderate heat) to the pigment dispersion and stir until homogeneous. Prepare Phase B: Disperse **Carbopol®* ETD 2020 Polymer** into deionized water. Mix until polymer is dispersed. Pre-combine Phase A components without cyclopentasiloxane and heat up to 85°C. Add the cyclopentasiloxane to the melted oil phase. Add the **Carbopol®* ETD 2020 Polymer** dispersion (Phase B), heated to 60°C, to Phase A and homogenize. Neutralize Phase A and B mixture with the given amount of AMP-95® and homogenize. Prepare Phase D: Solubilize disodium EDTA in deionized water and add to batch. Add the emulsion (step 3 - 7) to the pigment dispersion and homogenize. Compensate for water loss. Add Silsoft® Surface™ and homogenize. Adjust the pH with AMP-95® to 7.5. Complete cooling with gentle stirring.

Example 75 – Anti-Aging - Special Treatment – Eye Contour/Concealer

Component	% w/w	Supplier
Phase A		
Water	64.7 (QSP 100)	
Magnesium Aluminum Silicate	3.0	Veegum – RT VANDERBILT COMPANY, Inc.
Phase B		
Propylene Glycol	8.0	
Triethanolamine (TEA 99%)	1.5	Dow Chemical Co.
Cellulose Gum	1.0	CMC-7LF – AQUALON
Preservatives (water soluble)	q.s.	
Phase C		
PUU Powder of Example 7	3.0	
Boron Nitride	5.0	
Titanium Dioxide	4.3	
Iron Oxides (C33-1700 Cosmetic Yellow)	0.3	Sun Chemical Corp.
Iron Oxides (C33-8098 Cosmetic Russet)	0.1	Sun Chemical Corp.
Iron Oxides (C33-225 Cosmetic Brown)	0.1	Sun Chemical Corp.
Phase D		
Stearic Acid	3.0	
Glyceryl Stearate	2.0	
Mineral Oil	2.0	
Ipropyl Lanolate	1.5	Amerlate P – AMERCHOL Corporation
Isostearic Acid	0.5	
Preservatives (oil soluble)	q.s.	

Procedure: Disperse Veegum® into water using high shear mixing until smooth. Add Phase B slurry to Phase A and mix until smooth. Pulverize Phase C and add to Phases A-B using high shear mixing until smooth. Heat Phases A-B-C to 75°+/-5°C. In a support vessel heat Phase D components to 75°+/-5°C with gentle agitation. Add Phase D to Phases A-B-C with gentle agitation, maintaining temperature at 75°+/-5°C. Maintain constant agitation and cool batch to 35°+/-5°C. Store or fill into appropriate containers.

Example 76 – Suntan Lotion

Component	% w/w	Supplier
Phase A		
PVP/Eicosene Copolymer	4.10	Ganex V-220 - ISP
Stearic Acid	3.50	
Triisostearyl trilinoleate	3.30	Schercemol TIST – SCHER CHEMICALS
Isononyl Isononoate	3.50	
Octyl Methoxycinnamate	2.62	Parsol MCX – ROCHE

		VITAMINS AND FINE CHEMICALS
Cetyl Alcohol	1.00	
Benzophenone-3	0.75	Uvinul-M40 – BASF Corporation
Preservatives (oil soluble)	q.s.	
Phase B		
DEA-Cetyl Phosphate	2.03	Amphisol – ROCHE VITAMINS AND FINE CHEMICALS
Water	57.20 (qsp 100)	
Glycerin	4.12	
Preservatives (water soluble)	q.s.	
Carbomer 940 (2% aqueous solution)	4.60	ENGELHARD Corporation
Phase C		
Triethanolamine	0.30	
Water	1.00	
Phase D		
PUU Powder of Example 7	2.00	

Procedure: Separately heat Phase A and Phase B to 80°C+/-3°C, while mixing until completely uniform. Stir Phase A into Phase B until homogeneous. Add premixed Phase C to Phases A-B and then cool to 40°C with slow stirring. Add Phase D with stirring. Cool to 30°C and fill.

Example 77 - Cleansing

Mild Exfoliating Skin Cleansing Wash

Component	Description	% w/w	Supplier
Phase A			
DEIONISED WATER	Aqua	62.50	
C47-056	CI 77891	0.25	Sun Chemical
TITRIPLEX III	Disodium EDTA	0.05	Merck
Phase B			
CARBOPOL® ETD 2020	Acrylates/C10-C30 Alkyl Acrylate Crosspolymer	1.25	BF Goodrich
Phase C			
TRIETHANOLAMINE 99%	Triethanolamine	0.10	Merck
Phase D			
PROPYLENE GLYCOL	Propylene Glycol	1.50	
GERMABEN II	Methylparaben, Propylparaben, Diazolidinyl Urea, Propylene Glycol	1.20	
Phase E			
DISODIUM LAURETH SULFOSUCCINATE	Disodium Laureth Sulfosuccinate	13.00	
ANFOLIN IM/AL-35	Disodium Lauroamphoacetate	5.00	E&V
SORBITAL T-20-P	Polysorbate 20	1.50	E&V
LEXAINE C	Cocamidopropyl Betaine	3.00	Inolex
SODIUM LAURETH	Sodium Laureth Sulfate, Aqua	4.00	

SULFATE 28%			
Phase F			
TRIETHANOLAMINE 99%	Triethanolamine	1.45	Merck
Phase G			
FRAGRANCE	Parfum	0.20	
PUU Powder of Example 7 (100 micron size)	PUU powder	5.00	

Procedure: Premix Phase A. Add Phase B slowly to Phase A ensuring the Carbopol® is fully hydrated before continuing. Add Phase C slowly. Premix Phase D and add to Phase A. Add Phase E to Phase A in order. Add Phase F to Phase A. Add Phase G slowly to Phase A in order.

Example 78 - Clear Exfoliating Skin Cleansing Wash

Component	Description	% w/w	Supplier
Phase A			
DEIONISED WATER	Aqua	56.30	
TITRIPLEX III	Disodium EDTA	0.05	Merck
CARBOPOL® ETD 2020	Acrylates/C10-C30 Alkyl Acrylate Crosspolymer ₂	1.25	
Phase B			
GERMABEN II	Methylparaben, Propylparaben, Diazolidinyl Urea, Propylene Glycol	1.20	
PROPYLENE GLYCOL	Propylene Glycol	1.00	
BUTYLENE GLYCOL (801964)	Butylene Glycol	2.00	BG Goodrich
Phase C			
MACKANATE DC-30	Disodium Dimethicone Copolyol Sulfosuccinate, Aqua (Water)	25.00	McIntyre
SODIUM LAURETH SULFATE 28%	Sodium Laureth Sulfate, Aqua	8.00	
LEXAINE C	Cocamidopropyl Betaine	2.00	Inolex
SORBITAL T2-20P	Polysorbate 20	1.50	E&V
Phase D			
TRIETHANOLAMINE 99%	Triethanolamine	1.00	Merck
Phase E			
Powder of Example 7	PUU powder	0.35	
NEOSIL CBT 72	Silica, CI 77289	0.35	Ineos Silicas

Procedure: Premix Phase A ensuring the Carbopol® is fully hydrated before continuing. Premix Phase B and add to Phase A. Add Phase C to Phase A in order. Add Phase D slowly to Phase A. Premix Phase E and add to Phase A.

Example 79 - Clear Exfoliating Skin Cleaning Gel

Component	Description	% w/w	Supplier
Phase A			
DEIONISED WATER	Aqua	30.68	
CARBOPOL® ULTREZ 10	Carbomer	1.75	BF Goodrich
Phase B			
TRIETHANOLAMINE 99%	Triethanolamine	1.75	Merck
Phase C			
AMMONIUM LAURYL SULFATE (28%)	Ammonium Lauryl Sulfate, Aqua	50.00	
LEXAINE C	Cocamidopropyl Betaine	15.00	Inolex
BRONOPOL	2-Bromo-2-Nitropropane-1,3-Diol	0.02	Danil
Phase D			
FRAGRANCE	Parfum	0.10	
PUU Powder of Example 7	PUU powder	0.70	

Procedure : Premix Phase A. Add Phase B (add as necessary). Add Phase C in order. Add Phase D. Specification: pH Min: 6.00: Max: 6.50

Example 80 - Antiperspirant/Deodorant O/W Roll-On

Component	Description	% w/w	Supplier
Phase A			
BRIJ 721	Steareth-21	2.50	Uniquema
BRIJ 72	Steareth-2	1.50	Uniquema
ARLAMOL E	PPG-15 Stearyl Ether	4.00	Uniquema
OLETRON	Triclosan	0.20	Sino Lion
Phase B			
WATER UP TO	Aqua	100.00	
W200-50%	Aqua, Aluminium Chlorhydrate	32.00	Westwood
Dispersion of Example 7	PUU powder dispersion in water	2.00 solids	
Phase C			
TAGRAVIT E1	Tocopherol, Polymethyl Methacrylate	0.25	Tagra
Phase D			
PERFUME DEO-FEM 6874	Parfum	qs	Cia Gral de Esencias

Procedure : Add powder dispersion to water and mix for 30 min. Add the rest of components of Phase B and heat to 75°C. Dissolve Oletron with Arlamol® E and add to the rest of components of Phase A. Heat to 70°C. Add A to B stirring slowly. Homogenize AB for 1 ½ minutes (Silverson: 3.000 rpm). Allow to cool down to 60°C stirring slowly. Add Phase C. Add the perfume below 45°C. Cool down to room temperature stirring slowly.
-> Viscosity (20°C): 5.950 mPas (Brookfield LVT, Spindle D, 12 rpm) pH=3.42.

Example 81 - Stick Deodorant

Component	Description	% w/w	Supplier
Phase A			
STEARYL ALCOHOL NF	Stearyl Alcohol	13.13	Protameen
LIOVAC 1112	Hydrogenated Castor Oil	5.05	Miracema
LEXEMUL 561	Glyceryl Stearate, PEG-100 Stearate	1.01	Inolex
Phase B			
DC 245 FLUID	Cyclomethicone	48.48	Dow Corning
ALUMINIUM CHLOROHYDRATE 50% SOLUTION	Aqua, Aluminium Chlorohydrate	20.20	
NEOSIL CT11	Silica	1.01	Ineos Silicas
Phase C			
PUU Powder of Example 7	PUU powder	5.59	
NANOX 500	Zinc Oxide	5.00	Elementis
BHT (822021)	BHT	0.01	Merck
Phase D			
FRAGRANCE	Parfum	0.50	
FD & C BLUE NO 1 (0.5% SOLUTION)	CI 42090, Aqua	0.02	

Procedure: Heat Phase A to 80°C. Premix Phase B and add to Phase A. Add Phase C with high shear mixing (mix until homogenous between each addition). Cool to 60°C and add Phase D. Fill and cool.

Example 82 - Anti-Perspirant Body Powder

Component	Description	% w/w
Phase A		
J-68 BC	Talc 1	80.70
TECH-O 11-070	Avena Sativa 2	7.00
ALUMINIUM CHLOROHYDRATE POWDER	Aluminium Chlorohydrate	10.50
Powder of Example 7	PUU powder	1.50
METHYLPARABEN	Methylparaben 4	0.20
PROPYLPARABEN	Propylparaben 4	0.10

Procedure: Blend Phase A components together.

Example 83 - O/W After-Shave Balm (refreshing)

Component	Description	% w/w	Supplier
Phase A			
BRIJ 721	Steareth-21	1.00	Uniquema
BRIJ 72	Steareth-2	2.00	Uniquema
ARLAMOL HD	Isohexadecane	6.00	Uniquema
QUESTICE PLUS	Menthyl PCA, Menthol, DipropyleneGlycol	2.00	Quest CI
Phase B			
WATER UP TO	Aqua	100.00	
ALPANTHA	Panthenol, Allantoin	1.00	Uniquema

PRICERINE® 9091	Glycerin	4.00	Uniquema
RHODICARE® S	Xanthan Gum	0.20	Rhodia
Dispersion of Example 7	PUU powder dispersed in water	3.00	
Phase C			
GRAMBEN II	Propylene Glycol, Diazolinyl Urea, Methylparaben, Propylparaben	1.00	Sinerga
Phase D			
PERFUME CREAM 13897	Parfum	qs	Cia Gral de Esencias

Procedure: Add PUU dispersion to water and mix for 10 min. Heat to 40-45°C. Mix glycerin + xanthan gum and add to water. Mix for 20-30 minutes. Add the rest of components of Phase B and heat to 75°C. Heat A (without Questice® Plus) to 70-75°C. Add A to B stirring slowly. Homogenize AB for 1 ½ minutes (Silverson: 3.000 rpm). Allow to cool down to 60°C stirring slowly. Add Questice® Plus. Add Phase C below 45°C. Add perfume. Cool down to room temperature stirring slowly. Viscosity (21°C): 12.750 mPa s (Brookfield LVT, Spindle E, 12 rpm) pH=6.74 (NaOH, 25%).

Example 84 - Body Slimming Gel

Component	%w/w	Supplier
Phase A		
Ceteareth-20	25.0	Eumulgin B2 – COGNIS
Cyclomethicone	4.0	DC 345 Fluid – DOW CORNING
Preservatives	0.5	Phenonip – CLARIANT (phenoxyethanol, methyl-, ethyl-, propyl-, and butyl-parabens)
Mineral oil	6.0	Klearol – WITCO Corporation
PEG-7 Glyceryl Cocoate	10.0	
Silicone Elastomer Blend	8.0	DC 9546 – DOW CORNING (cyclopentasiloxane; dimethicone crosspolymer; dimethicone/Vinyl dimethicone crosspolymer and dimethiconol)
Phase B		
PUU Powder of Example 7	2.0	
Phase C		
Regu-SLIM – PENTAPHARM	2.0	Maltodextrin; caffeine; Paullinia seed Extract; Carnitine; microcrystalline cellulose; cysteic acid and Pantetheine sulfonate
Water	29.5 (qsp 100)	
Glycerin	4.0	
Propylene Glycol	9.0	

Procedure: In the main mixer, heat Cetareth - 20 to 80°C with gentle mixing, to melt completely. Add the remaining components of Phase A, one at a time, maintaining the temperature at 70°C to 80°C. Keep the mixer covered. Increase agitation. The use of scraping action and high speed dispersing action is recommended. In a separate vessel, combine and heat components of Phase C to 80°C, with gentle mixing. Add Phase B to Phase A in the mixer. Disperse the powder under agitation, maintaining the temperature. Add Phase C to Phases A and B. Pour slowly and maintain temperature. Stir Phase C occasionally during addition. Continue to use strong mixing with scraping action and dispersing action in the main mixer. As Phase C is added, the batch will become increasingly thick and waxy. It may be necessary to add Phase C in increments, stopping to scrape the material off the mixing equipment and stirring the batch manually before completing the addition of Phase C. After the addition is complete, mix for an additional 10mn.

Example 85 – Moisturizing Body Butter

Component	%w/w	Supplier
Phase A		
Water	19.2 (qsp 100)	
Acrylate/C ₁₀₋₃₀ Alkyl Acrylate crosspolymer	0.6	Carbopol® ETD 2020 – NOVEON Inc
Petrolatum Blend HIP Emulsion- 7-3111 - Petrolatum (and) Dimethicone (and) Ceteth-10 (and) Steareth-21 and Poloxamer 335	69.9	Dow Corning
Triethanolamine	0.2	
Phase B		
Bis-PEG-18 Methyl Ether Dimethyl Silane - DC2501 Cosmetix wax	8.1	Dow Corning
Phase C		
PUU Powder of Example 7	2.0	

Procedure: Disperse the acrylate polymer into the water and mix until uniform. Mix Phase A components together. Heat Phase A components to 70-75°C. Heat Phase B to 70-75°C. Add Phase B to Phase A with gentle mixing. Add Phase C while stirring. Remove from the heat and continue mixing while cooling to room temperature, and fill appropriate containers.

[0237] While there have been described what are presently believed to be the preferred embodiments of the invention, those skilled in the art will realize that changes and modifications may be made thereto without departing from the spirit of the invention, and it is intended to include all such changes and modifications as fall within the true scope of the invention.

What is claimed is:

1. A composition comprising:
 - (a) a polyurethaneurea dispersion, beads or powder; and
 - (b) at least one cosmetic composition selected from the group consisting of makeup, hair care, and body care.
2. The composition of claim 1, further comprising an additive selected from the group consisting of fragrance, color, pigment, fillers and combinations thereof.
3. The composition of claim 1, wherein the cosmetic composition is a makeup selected from the group consisting of mascara, foundation, pressed powder, eye liner, eye shadow, and lipstick/lip gloss.
4. The composition of claim 1, wherein the cosmetic composition is a hair care composition selected from the group consisting of styling products, shampoo, and conditioner.
5. The composition of claim 1, wherein the cosmetic composition is a body care composition selected from the group consisting of facial moisturizer, body lotion, cleanser, scrub, shower gel, suntan lotion, and deodorant.
6. The composition of claim 3, wherein said polyurethaneurea composition comprises beads or powder having a particle size less than 50 microns.
7. The composition of claim 4, wherein said polyurethaneurea composition comprises beads or powder having a particle size less than 50 microns.
8. The composition of claim 5, wherein said polyurethaneurea composition comprises beads or powder having a particle size less than 50 microns.
9. The composition of claim 5, wherein said polyurethaneurea composition comprises beads or powder having a particle size greater than 100 microns.

A. CLASSIFICATION OF SUBJECT MATTER***A61K 8/87(2006.01)i, A61K 31/40(2006.01)i***

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC A61K, C08J, C08G, C11D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKIPASS in KIPO

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007/0185003 A1 (CHARLES FRANK IAVARONE) 09 August 2007 See [0003], [0017], [0018]- [0127], and [0221]-[0223]	1-9
A	US 2002/0146382 A1 (3M INNOVATIVE PROERTIES COMPANY) 10 October 2002 See[0011]-[0020] and examples	1-9
A	US 2003/0021815 A9 (JEAN MONDET) 30 January 2003 See [0001]- [0005], [0014]-[0023] and examples	1-9
A	US 2002/0147268 A1 (ISABELLE ROLLAT) 10 October 2002 See the abstract and examples	1-9
A	US 6649727 B1 (3M INNOVATIVE PROERTIES COMPANY) 18 November 2003 See the abstract and examples	1-9



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

29 JANUARY 2009 (29.01.2009)

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

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