



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(54) Title: STABLE HERBAL DENTIFRICE</p>		
<p>(57) Abstract</p>		
<p>A dentifrice gel comprising up to 60 % baking soda, up to 5 % natural ingredients and up to 2 % flavor in addition to other dentifrice ingredients.</p>		

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**STABLE HERBAL DENTIFRICE****BACKGROUND OF THE INVENTION****1. Field of the Invention**

5 This invention relates to oral health care products, particularly dentifrices, more particularly gel dentifrices, containing fluoride and baking soda. This invention also relates to methods of making dentifrices and methods of using dentifrices.

**10 2. Description of Related Art**

Dentifrices have long been known and used to clean teeth and to combat plaque. Formulators constantly seek new ways to improve the attractiveness of a dentifrice to encourage compliance with an oral health care regimen. In addition to flavor improvements that have been made over the years, various visual improvements over a traditional white paste have also been made.

20 One of the most striking improvements in visual appeal came with the introduction of dentifrice gels. In place of an opaque paste, the dentifrice offered a transparent or translucent gel, which provided strong appeal to the public and encouraged compliance with daily oral health care.

25 Another area of recent interest for consumers has been the use of increasing numbers of "natural" ingredients in products generally, including dentifrices. Thus, dentifrices have recently taken to using baking soda, a traditional dentifrice ingredient, as a cleaning agent in dentifrices.

30 One problem with baking soda as a dentifrice ingredient, however, is stability. Baking soda, sodium bicarbonate, has a tendency to break down when associated with water. Thus, shelf life of baking

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soda dentifrices can be unacceptably brief.

U.S. Patent No. 3,937,804 to Delaney et al., issued February 10, 1976, (along with its counterpart patent, U.S. Patent No. 3,943,240, issued March 9, 5 1976, both assigned to Colgate-Palmolive Company) is an example of a baking soda dentifrice in which at least about 20%, and preferably 30%, sodium bicarbonate is mixed with water, a polyol humectant, a gelling or thickening agent and fluoride. The 10 dentifrice has a granular textured appearance due to macroscopic crystalline bicarbonate granules in an otherwise smooth continuous matrix. Stability appears to be maintained because the baking soda is separated from the water by forming large granules.

U.S. Patent No. 5,326,554 to Fitz, Jr., issued July 5, 1994, is directed to oral compositions containing sodium bicarbonate with sodium carbonate as a stabilizing buffer. 15

U.S. Patent No. 4,623,536, issued November 20 18, 1986 and U.S. Patent No. 4,721,614, issued January 26, 1988, both to Winston et al., are directed to a toothpaste containing at least 60% sodium bicarbonate. At least 30% of the bicarbonate has a particle size of less than 25 microns, and bicarbonate is the sole 25 abrasive material in the dentifrice. The smaller particle size is asserted to be the basis for the claimed stability of the dentifrice. The Delaney patents discussed above were distinguished because those patents maintained stability by discontinuing 30 degassing of the dentifrice formulation prior to complete deaeration. Thus, the Delaney patents avoided unacceptable increases in pH levels.

U.S. Patent No. 4,943,429 to Winston et al., issued July 24, 1990, is directed to a dentifrice gel 35 containing sodium bicarbonate. The dentifrice comprises up to about 60% by weight sodium bicarbonate and at least about 22% of a humectant such as glycerol

or sorbitol. Coarser grades of bicarbonate are preferred at above 30% bicarbonate, since the coarser (>about 149 microns) grades allow higher concentrations of bicarbonate in a translucent gel.

5 Sodium bicarbonate and peroxide dentifrices have been provided in split-tube designs to avoid stability problems, as in U.S. Patent No. 5,456,902 to Williams et al., issued October 10,1995.

10 Baking soda can also affect other ingredients in the dentifrice, for good or ill. U.S. Patent No. 5,180,576, for example (issued January 19, 1993) and U.S. Patent No. 5,318,773, (issued June 7, 1994), both to Winston et al., are directed to a dentifrice incorporating pyrophosphate salts (tartar 15 control agents) and sodium bicarbonate in a dentifrice. The combination of sodium bicarbonate and pyrophosphate salts is asserted to have synergistic properties, permitting the use of reduced amounts of pyrophosphate salts. Both ingredients, however, are 20 found as separate solids in the dentifrice, because the bicarbonate "salts out" the pyrophosphate, leaving little pyrophosphate to dissolve in the dentifrice before use.

U.S. Patent No. 5,455,024 to Winston et al., 25 issued October 3, 1995, is directed to a combination of zinc oxide and sodium bicarbonate in a dentifrice.

In addition to baking soda, other natural ingredients have been incorporated into dentifrices. U.S. Patent No. 5,149,521 to Hirose et al., issued 30 September 22, 1992, for example, is directed to an oral care composition such as a dentifrice. It describes a composition comprising a powdery granule, menthol, and basil, laurel, lavender or a lactone. The combination produces a composition with a greatly 35 reduced powdery feeling during use.

An example of a dentifrice using "natural" ingredients is found in U.S. Patent No. 5,472,684 to

Nabi et al., issued December 5, 1995. In that patent, a combination of thymol, eugenol and optionally a sesquiterpene alcohol, such as farnesol, is claimed to have antibacterial properties. The combination is  
5 flavored with various natural agents such as:  
chamomile, myrrh gum, rhatany root, Australian Tea Tree oil, eucalyptol, sage oil, Tulsi oil, Neem oil, Eichinacea tincture, rosemary extract, goldenseed  
10 extract, passion flower extract, turmeric extract,  
betel nut extract, sunphenon tea extract, and  
dandelion root extract.

U.S. Patent No. 4,812,306 to Cocherell et al., issued March 14, 1989, is directed to a water-free toothpaste having anise oil, clove oil,  
15 sassafras, peppermint, glycerine, corn starch, fluoride, sweetener, sodium lauryl sulfate, sodium bicarbonate, and vegetable oil.

One problem with dentifrice gels containing natural ingredients is syneresis, the tendency of the  
20 liquid components to separate in a gel formulation. This problem can be especially acute with a formulation containing high solid levels, such as are found in dentifrices containing baking soda.

This search for natural therapies is not  
25 limited to dentifrices. U.S. Patent No. 4,670,264 to Warren et al., issued June 2, 1987, for example, discloses inhaled or transdermally delivered doses of Nutmeg oil, Mace extract, Neroli oil, Valerian oil, Myristicin, Isoelemicin or elemicin to reduce stress.

30 U.S. Patent No. 5,378,465 to Zeines, issued January 3, 1995, is directed to an aqueous mouthwash comprising echinacea, hydrastis canadensis, sanguinaria canadensis, quercus albe, grapefruit seed extract aloe vera juice, water, vegetable glycerin,  
35 and peppermint oil.

U.S. Patent No. 5,043,153 to Vidéki et al., issued August 27, 1991, is directed to a composition

for the prevention and treatment of parodontopathy.  
The composition comprises an aqueous solution of  
greater celandine, peppermint, marigold, thyme,  
millfoil, and optionally chamomile, melilot leaf, and  
5 clove or arnica.

U.S. Patent No. 4,670,263 to Noorlander,  
issued June 2, 1987, is directed to a nontoxic  
germicide comprising allantoin (comfrey extract) and  
optionally ascorbic acid, chlorophyll, or carotene.

10 Along with baking soda and other "natural"  
ingredients, dentifrice formulators continue to search  
for more effective dentifrice ingredients. U.S.  
Patent No. 5,578,294 to Lukacovic, issued November 26,  
1996, is directed to oral compositions containing a  
15 chelating agent and a hydrophobic anionic surfactant  
in the absence of an enzyme. The chelating agent can  
be a betaine and the surfactant is preferably a  
combination of a sarcosinate and a tartarate. The  
combination provides cleaning efficacy without soft  
20 tissue desquamation. The enzyme is added in U.S.  
Patent No. 5,320,831 to Majeti et al., issued June 14,  
1994, which is directed to oral compositions  
containing an enzyme, a surfactant, a chelating agent  
and a fluoride ion source.

25 Despite the continued interest in these  
areas, the art has yet to produce a stable, aqueous  
dentifrice gel containing baking soda and other  
natural ingredients combined with strong cleaning  
properties.

### 30 SUMMARY OF THE INVENTION

The principal object of the present  
invention therefore is to provide a stable, aqueous  
dentifrice containing baking soda.

35 It is another object of the invention to  
provide a dentifrice containing other natural  
ingredients combined with strong cleaning properties.

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It is an advantage of the invention that the dentifrice can be formulated as a gel.

It is another advantage of the invention that it offers pleasant organoleptic qualities that encourage regular use of the dentifrice.

Additional objects and advantages of the invention will be set forth in part in the description that follows, and in part will be obvious from this description, or may be learned by practice of the invention. The objects and advantages of the invention may be realized and attained by means of the instrumentalities and combinations particularly pointed out in the appended claims.

To achieve the foregoing objects and following the purpose of the invention, as embodied and broadly described herein, the invention provides a water-based dentifrice comprising baking soda and a blend of natural ingredients.

To further achieve the foregoing objects and by the purpose of the invention, the invention further provides a method for making a dentifrice containing water, baking soda and a blend of natural ingredients.

#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

Reference will now be made in detail to the presently preferred embodiments of the invention.

It has been generally difficult to formulate a dentifrice or gel that contains a very high level of solids, especially baking soda. This is because such a high solid formulation is very prone to syneresis and separation. When combined with natural ingredients in liquid form, such as various tinctures and extracts, the problem becomes even more difficult.

To overcome this problem, the invention provides a dentifrice comprising baking soda, a blend of natural ingredients, a flavor and other dentifrice ingredients blended to form a stable dentifrice gel.

One of the ingredients in the invention is baking soda, sodium bicarbonate. The dentifrice of the invention may comprise up to 60% by weight baking soda. Preferably, however, the baking soda comprises  
5 from about 35% to about 55% by weight of the dentifrice and more preferably from about 40% to about 50% by weight of the dentifrice. In the most highly preferred embodiment of the invention, baking soda comprises about 45% by weight of the dentifrice.  
10 Although particle size of the baking soda is not critical to the invention, a preferred baking soda has a particle size classification based on sieve classification of 0-2% by weight retained on a No. 100 standard screen, 20-45% retained on a No. 200 standard  
15 screen, and 60-100% retained on a No. 325 standard screen.

In addition to baking soda, the dentifrice comprises various natural ingredients. As used herein, "natural" ingredients are those that are extracted or  
20 derived, typically, but not necessarily, from plants with minimal chemical alteration or processing. Many such ingredients are available commercially and include, but are not limited to, plant extracts, pressings from herbs and flowers and distillations of  
25 various materials.

One preferred combination of natural ingredients is found in Parodontax® brand toothpaste, which comprises a combination of echinacea, myrrh, chamomile, rhatany and sage.

30 Echinacea is also known as cone flower juice or extract, and is commercially available. It is described as the dried rhizome and roots of *Echinacea pallida*, and comprises inulin, sucrose, betaine and other ingredients.

35 Myrrh is described as being derived from various species of *Commiphora*, and is a combination of a gum, a volatile oil and a bitter principle. It is

commercially available as a tincture, an alcohol solution of a nonvolatile material.

Chamomile is made from the dried flower heads of *Anthemis nobilis*. Its tincture is  
5 commercially available and it comprises a bitter glucoside, anthesterol, anthemene and a volatile oil.

Rhatany is also known as *Krameria*, and is the dried root of *Krameria triandra* and other *Krameria* plants. It comprises *Krameriatannic acid* and is  
10 available commercially as a tincture.

Sage is also known as *Salvia* and is a widely known flavoring agent. It is commercially available, and its tincture is derived from dried leaves of *Salvia officinalis*. It comprises 1-2.5% volatile oil,  
15 resin, tannin, and bitter principles.

Although any natural ingredient, particularly a natural ingredient that has a tendency to separate or undergo syneresis with baking soda in a gel, is within the scope of the invention, a blend of  
20 natural ingredients is preferred. In a preferred embodiment of the invention, the natural ingredient blend is a combination of the Parodontax® brand dentifrice natural ingredients, although other natural ingredients may be included.

In a preferred embodiment, the natural ingredients may comprise up to about 5% by weight of the dentifrice. In a more preferred embodiment, the natural ingredients may comprise from about 1% by weight to about 4% by weight of the dentifrice. In a  
30 more preferred embodiment of the invention, the natural ingredients may comprise from about 2% to about 4% by weight of the dentifrice, and in a highly preferred embodiment of the invention, the natural ingredients may comprise about 3.6% by weight of the  
35 dentifrice. In the Examples below, the natural ingredients: Echinacea, Myrrh, Chamomile, Sage and Rhatany comprise 3.596% by weight of the dentifrice

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formulations. Those skilled in the art will recognize that 3.596% is well within the definition of "about 3.6%" as described herein.

In addition to the baking soda and the other  
5 natural ingredients, the dentifrice may contain other ingredients used in dentifrices, including gel dentifrices.

A fluoride source may be included in the dentifrice, such as sodium fluoride, stannous fluoride  
10 or sodium monofluorophosphate. The fluoride source typically comprises less than about 5%, more preferably less than about 2% and most preferably less than about 1% by weight of the dentifrice.

The dentifrice may comprise various  
15 surfactants and detergents to aid in cleaning teeth. Typical surfactants include betaines, such as cocamidopropyl betaine, sodium lauroylsarcosinate, lysolecithin and other detergents and surfactants known in the art. Typically, these surfactants and  
20 detergents are used in combinations and can comprise up to about 5%, preferably up to about 3%, by weight of the dentifrice.

The dentifrice of the invention may also comprise polishing agents and abrasives. Examples of  
25 such compounds include, but are not limited to, colloidal silicon dioxide and amorphous silica. Such compounds may be used alone or in combination, and generally comprise from about 5% to about 15% by weight of the dentifrice, preferably from about 6% to  
30 about 12% by weight of the dentifrice, and most preferably about 10% by weight of the dentifrice.

The dentifrice may also comprise a humectant, such as sorbitol solution and glycerin. The dentifrice may comprise from about 10% by weight  
35 to about 40% by weight of the dentifrice, preferably from about 20% to about 35% by weight of the dentifrice, and preferably about 27% by weight of the

dentifrice.

The dentifrice may also contain a binder, such as xanthan gum and a sweetener, such as sodium saccharin. The binder generally comprises less than  
5 about 1% by weight of the dentifrice, and the sweetener may be adjusted to taste.

One advantage of the invention is that a fairly large amount of a flavoring may also be incorporated into the dentifrice. While the flavoring  
10 may be a "natural" ingredient as discussed above, the primary purpose of such an ingredient in the dentifrice is to impart a pleasant flavor to the dentifrice. Typically flavors include various mint  
15 flavors, such as spearmint and peppermint. The invention, however, is not limited to mint-flavored dentifrices. The flavor may be up to about 5% by weight of the dentifrice, although the flavor is preferably up to about 3% by weight and more preferably up to about 2% by weight of the dentifrice  
20 formulation.

The dentifrice may also contain other known ingredients used in dentifrices including, but not limited to, whitening agents, anti-tartar agents and desensitizing compounds.

25 Surprisingly, the formulation made in accordance with the invention appears to be stable. Although the invention is not limited by any particular theory of operation, it appears that either the combination of ingredients and/or the processing  
30 of the ingredients make the product physically stable.

The dentifrice of the invention is made substantially in the method set out in Example 1. The water-soluble salts, i.e., the fluorides and the sweeteners, are mixed in water. The humectants are  
35 then added and the binder as well. The natural ingredients are then added, followed by the abrasives, detergents, and baking soda. Finally, the flavor oil,

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more detergent and additional natural ingredients are added.

Although the following examples are intended to illustrate some features and advantages of the invention, they are not intended to limit the scope of the appended claims.

#### Example 1

10 A three thousand kilogram (3,000 Kg) batch of a dentifrice in accordance with the invention was manufactured by charging 274 Kg. water into a mixing tank. 1.5 Kg of sodium saccharin and 9.3 Kg of sodium fluoride were added and stirred until dissolved. 300  
15 Kg. Glycerin and 510 Kg sorbitol were added to the tank with continuous stirring. 15 Kg. xanthan gum was slowly added with high shear mixing for about 30 minutes. 18.7 Kg myrrh tincture, 18.7 g chamomile tincture and 28.5 Kg echinacea were slowly added to  
20 the tank. 24 Kg. colloidal silicon dioxide was added under high shear mixing followed by 300 Kg. amorphous silica. Sodium sarcosinate (30 Kg) was then added followed by 700 Kg. of sodium bicarbonate, 6 Kg. coco-amidopropyl betaine, another 650 Kg. of sodium  
25 bicarbonate, 57.8 Kg. peppermint oil, 15 Kg. lysolecithin, 4.38 Kg. sage oil and 37.44 Kg. rhatany tincture. The entire product was mixed thoroughly and transferred for filling in suitable tubes. The dentifrice had the formulation set forth in Table 1.

30 A portion of the formulation of Example 1 was placed into a 25 ml toothpaste tube and subjected to a standard freeze/thaw test. The results are reported in Table 2. Samples were also subjected to stability tests at 40°C for four months, and the  
35 results are reported in Table 3. "NR" in Tables 2 and 3 means no reading was taken. "Conforms" means that the tested property fell within the design

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specification for the product. For appearance and container integrity the design specification was no obvious defect. For Munsell color, the design specification was 7.5R 2/4; 7.5R 6/6.

5

### Examples 2 and 3

Dentifrices were prepared having the formulations set forth in Table 1 using the procedure set forth in Example 1. Portions of these formulations were placed in 25 ml toothpaste tubes and subjected to freeze/thaw tests and stability tests. The results are reported in Table 3. Example 3 was not tested for stability at 40° C.

10

Ingredient	Example 1 Weight %	Example 2 Weight %	Example 3 Weight %
Water	9.118	8.298	13.218
Sodium Fluoride	0.31	0.23	0.31
Sodium Saccharin	0.05	0.05	0.05
Coneflower Expressed Juice -- Stabilized	0.954	0.954	0.954
Myrrh Tincture	0.624	0.624	0.624
Chamomile Tincture	0.624	0.624	0.624
Rhatany Tincture	1.248	1.248	1.248
Sorbitol solution 70%	17	17	17
Colloidal Silicon Dioxide	0.8	1.7	1.7
Amorphous Silica	10	10	5
Glycerin 96%	10	10	10
Xanthan Gum	0.5	0.5	0.5
Cocamidopropyl Betaine	0.2	0.2	0.2
Sodium Lauroylsarcosinate	1	1	1
Lysolecithin	0.5	0.5	0.5
Sodium Bicarbonate	45	45	45
Sage Oil	0.146	0.146	0.146
Peppermint Oil	1.926	1.926	1.926
Total	100.000	100.000	100.000

Table 2 -- Freeze/Thaw Data				
Property Tested	Age: 0	5 Days	9 Days Ex. 3-10 Days	14 Days
Appearance	1: Conforms	1: Conforms	1: Conforms	1: Conforms
	2: Conforms	2: Conforms	2: Conforms	2: Conforms
	3: Conforms	3: Conforms	3: Conforms	3: Conforms
Munsell Color	1: Conforms	1: Conforms	1: Conforms	1: Conforms
	2: Conforms	2: Conforms	2: Conforms	2: Conforms
	3: Conforms	3: Conforms	3: Conforms	3: Conforms
pH	2: 8.76	2: 8.72	1: 8.2	1: 8.2
	3: 8.71	3: 8.40	2: 8.10	2: 8.29
	1: 1.56	1: 1.58	3: 8.59	3: 8.47
Viscosity (x 10 <sup>5</sup> ) cps	2: 1.76	2: 3.00	1: 1.72	1: 2.00
	3: 1.40	3: 1.24	2: 3.80	2: 5.20
	1: 1358	1: NR	3: 2.40	3: 1.80
Ionic Fluoride (ppm)	2: 1063	2: NR	1: NR	1: 1282
			2: NR	2: 1022
	3: 1501	3: NR	3: NR	3: 1433
Sodium Bicarbonate wt %	1: 46%	1: NR	1: NR	1: 45%
	2: 46.4%	2: NR	2: NR	2: 46.1%
	3: 46.7%	3: NR	3: NR	3: 46.3%
Container Integrity	1: Conforms	1: NR	1: NR	1: Conforms
	2: Conforms	2: Conforms	2: Conforms	2: Conforms
	3: Conforms	3: Conforms	3: Conforms	3: Conforms

Table 3 -- Stability Testing				
Property Tested	Age: 0 Months	1 Month	3 Months	4 Months
Appearance	1: Conforms	1: Conforms	1: Conforms	1: Conforms
	2: Conforms	2: NR	2: Conforms	2: Conforms
Munsell Color	1: Conforms	1: NR	1: NR	1: NR
	2: Conforms	2: NR	2: Conforms	2: Conforms
pH	1: 8.3	1: 8.8	1: 8.4	1: 8.2
	2: 8.76	2: NR	2: 8.18	2: 8.71
Viscosity (x 10 <sup>5</sup> ) cps	1: 1.56	1: 1.98	1: 2.44	1: 3.00
	2: 1.76	2: NR	2: 6.30	2: 7.75
Ionic Fluoride (ppm)	1: 1358	1: 1344	1: 1346	1: 1368
	2: 1063	2: NR	2: 1000	2: 1042
Sodium Bicarbonate wt %	1: 46%	1: 46%	1: 47%	1: 48%
	2: 46.4%	2: NR	2: 47.7%	2: 47%
Container Integrity	1: Conforms	1: Conforms	1: Conforms	1: Conforms
	2: Conforms	2: NR	2: Conforms	2: Conforms

5                   The purpose of the above description is to  
illustrate some embodiments of the present invention  
without implying a limitation. It will be apparent to  
those skilled in the art that various modifications  
and variations may be made in the apparatus or  
10                   procedure of the invention without departing from the  
scope or spirit of the invention.

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What is claimed is:

1. An oral health care formulation comprising: (a) sodium bicarbonate; (b) a blend of natural ingredients; and (c) a flavor.
2. The oral health care formulation of claim 1, wherein said blend of natural ingredients comprises at least one ingredient selected from the group consisting of: echinacea, myrrh, chamomile, rhatany and sage.
3. A dentifrice comprising: (a) sodium bicarbonate; (b) a blend of natural ingredients; and (c) a flavor.
4. The dentifrice of claim 3, wherein sodium bicarbonate comprises up to about 60% by weight of the dentifrice.
5. The dentifrice of claim 4, wherein sodium bicarbonate comprises from about 35% to about 55% by weight of the dentifrice.
6. The dentifrice of claim 5, wherein sodium bicarbonate comprises from about 40% to about 50% by weight of the dentifrice.
7. The dentifrice of claim 6, wherein sodium bicarbonate comprises about 45% by weight of the dentifrice.
8. The dentifrice of claim 3, wherein said blend of natural ingredients comprises at least one ingredient selected from the group consisting of: echinacea, myrrh, chamomile, rhatany and sage.

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9. The dentifrice of claim 8, wherein said blend of natural ingredients comprises up to about 5% by weight of the dentifrice.

10. The dentifrice of claim 9, wherein said blend of natural ingredients comprises from about 1% to about 4% by weight of the dentifrice.

11. The dentifrice of claim 10, wherein said blend of natural ingredients comprises from about 2% to about 4% by weight of the dentifrice.

12. The dentifrice of claim 11, wherein said blend of natural ingredients comprises about 3.6% by weight of the dentifrice.

13. The dentifrice of claim 3, further comprising a fluoride source.

14. The dentifrice of claim 13, further comprising: at least one surfactant, at least one abrasive polishing agent, at least one humectant, at least one binder, at least one sweetener and water.

15. A dentifrice gel comprising: (a) up to about 60% by weight sodium bicarbonate; (b) up to about 5% by weight of a blend of natural ingredients; and (c) up to about 2% by weight of a flavor.

16. The dentifrice gel of claim 15, further comprising: (d) less than about 5% by weight of a fluoride source; (e) up to about 5% by weight of at least one surfactant; (f) from about 5% by weight to about 15% by weight of at least one abrasive polishing agent; (g) from about 10% by weight to about 40% by weight of a humectant; and (h) less than about 1% by weight of a binder.

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17. A dentifrice gel comprising: (a) about 45% by weight sodium bicarbonate; (b) about 3.6% by weight of a blend of natural ingredients; (c) about 5% by weight of a flavor; (d) less than about 1% by weight of a fluoride source; (e) up to about 3% by weight of at least one surfactant; (f) about 10% by weight of an abrasive polishing agent; (g) about 27% by weight of a humectant; (h) less than 1% of a binder; (i) less than about 1% by weight of a sweetener; and (j) water.

18. A method of making a dentifrice comprising the steps of: (a) mixing a sweetener and a fluoride source in water to form a first mixture; (b) adding at least one humectant to said first mixture; (c) adding at least one natural ingredient, a binder and at least one abrasive polishing agent to said first mixture to form a second mixture; (d) combining sodium bicarbonate, at least one surfactant, a flavor, and at least one additional natural ingredient to said second mixture to form a dentifrice.

19. The method of claim 18, wherein said dentifrice is a gel.