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Papier für photographische Anwendungen

Papier pour des applications photographiques

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Description

This invention relates to a method for preparing a paper for photographic purposes, such as a packaging material for photographic photosensitive materials and a support for photographic paper.

In general, unbleached kraft papers including speciality papers such as unbleached clupak paper and unbleached Duostress paper are inferior in photographic properties irrespective of the pH of the papers, for example neutral papers having a pH measured by the cool water extracting method (JIS P-8133) in the range of 6.5-9. Accordingly, unbleached kraft paper cannot be used in the portion to touch photographic photosensitive materials directly, and for example, it is used as the outer sheet of a double sheet bag shown in Japanese Patent KOKAI No. 62-53829. "Photographic properties" of a paper material means the influence of the material upon a photographic material, e.g. regarding fogging, slippage in the sensitivity and decrease in the developed density. Photographic materials are only insignificantly affected by (paper) materials having good photographic properties.

It is known to wash with a great quantity of well water in the pulp washing process and the paper making process. Further, it is known to add special additives (Japanese Patent KOKOKU No. 58-43730) and to remove or stabilize harmful substances affecting photographic properties.

RO 88160 describes antifoaming agents useful in pulp, paper and leather processing, containing polyethyleneglycol (a nonionic surfactant), polyethoxylated ricinoleic triglyceride (i.e., a fatty acid compound), 16 to 18 fatty alkyl ethers, a liquid hydrocarbon and water.

JP-A-75 059503 relates to pulp slurries containing a polyacrylamide in admixture with nonionic surfactants having an HLB of less than 12, fatty acids and fatty acid amides and/or fatty amines.

From US-A-4107073 an antifoam composition useful in pulping and paper making processes is known which consists of a water-based emulsion comprising amongst other components silica and paraffin oil.

US-A-3592731 and DE-C-3606806 relate to a photographic paper base comprising fatty acid and/or fatty acid salts and aluminium salts as well as anionic and cationic polyacrylamide and an epoxy fatty acid amide, the pH value of the paper pulp being in the range of 3.5 to 5.

Double sheet bags are expensive and their workability in a dark room is inferior, since the space between the outer sheet and the inner sheet is liable to be opened by hand instead of opening the inner sheet. Furthermore, the photographic properties of unbleached kraft paper, e.g. improved by adding a special additive, are still not sufficient. On the other hand, bleached kraft paper has excellent photographic properties, and can be used as a single sheet bag. However, it is expensive, and physical strength such as surface strength is insufficient.

It is the object of the invention to provide an inexpensive paper for photographic purposes which has excellent photographic properties and physical strength.

The inventors investigated the influences of various additives added through the manufacturing process of unbleached kraft paper, and found that certain antifoaming agents adversely affect the photographic properties. In the prior art the antifoaming agent used in the washer process of the manufacturing process of unbleached kraft paper is a nonionic mineral oil of which the principal component is silicone, and the antifoaming agent used in the screening process and in the mixer process is a nonionic surfactant of which the principal component is propylene oxide. The inventors found that the silicone and propylene oxide remained in the kraft paper, and affected the photographic properties.

Thus, the present invention provides a method of preparing a paper comprising subjecting unbleached kraft pulp to a washer process with a nonionic mineral oil antifoamer containing no silicone, then subjecting the thus obtained pulp to a screening process and to a mixing process with a nonionic surfactant antifoamer containing no propylene oxide.

Moreover, the inventors found that, when the nonionic surfactant of which the principal component is propylene oxide was absent, the adverse affect of silicone could be eliminated by adjusting the pH [measured by the cool water extracting method (JIS P-8133)] to 3.5 to 5.5.

The present invention therefore further provides a method of preparing a paper comprising subjecting unbleached kraft pulp to a washer process with a nonionic mineral oil antifoamer containing silicone or silicone-modified silica and then subjecting the thus obtained pulp to a screening process and a mixer process with a nonionic surfactant antifoamer containing no propyleneoxide wherein the pH value of the paper stock is adjusted to 3.5. to 5.5.

A sizing agent and a paper strengthening agent are generally added in order to improve the surface strength and delamination resistance of a paper. Further a water-soluble aluminum salt is added in order to improve the retention of the sizing agent and the paper strengthening agent. However, when the quantity of the water-soluble aluminum salt is increased in order to improve the retention effectively, the manufactured paper is rendered acidic, and the photographic properties become worse. The inventors investigated the influences of various sizing agents and paper strengthening agents, and found that certain sizing agents and paper strengthening agents do not adversely affect the photographic properties under acidic conditions, though they adversely affect said properties under neutral conditions. This means that rosin sizing agents and paper strengthening agents of polyacrylamides and polyamide-epoxy resins

do not adversely affect photographic properties within the pH range of 3.5. to 6.0.

Therefore, the present invention additionally provides a method of preparing a paper comprising adding to unbleached kraft pulp a water-soluble aluminium salt and at least one of a rosin sizing agent, a polyacrylamide and a polyamide-epoxy resin, and adjusting the pH value of the paper stock to 3.5 to 6.0.

The paper obtained according to the methods of the present invention can be used for photographic purposes, such as a packaging material for photographic photosensitive materials, light-shielding paper, support for photographic papers, pads, carton boxes, cores, guard sheets, leader paper and materials for composing instant photographs.

The nonionic antifoaming agent, which does not contain silicone or propylene oxide, includes mixtures of a nonionic surfactant and a fatty acid and/or a fatty acid compound such as a fatty acid amide, a fatty acid ester or a fatty acid metal salt, mixtures of a polyglycol and a fatty acid and/or fatty acid compound such as a fatty acid amide, a fatty acid ester or a fatty acid metal salt, emulsifying pine oils, and nonionic fatty acids. Preferable nonionic antifoaming agents are mixtures of a nonionic surfactant and a fatty acid compound, and particularly preferred nonionic antifoaming agents contain a mixture of an anionic surfactant and a fatty acid amide as the principal component. Polyoxyethylene sorbitan laurate is also particularly preferred. Preferable nonionic surfactants contain halides of hydrocarbons or a mixture thereof as the principal component.

The silicones harmful for photographic properties are, for example, diorganopolysiloxanes, polyoxyalkylene-modified polysiloxanes, dimethylpolysiloxanes, dimethyldichlorosilane, diethylpolysiloxanes, methylphenylpolysiloxanes, polydimethylpolydiphenylsiloxane copolymers, polymethyl-3,3,3-trifluoropropylsiloxanes and polydimethylchloropropylmethylsiloxanes.

Propylene oxide also called 1,2-epoxypropane is reactive, and it is e.g. miscible with water and ethanol. When propylene oxide is heated with alumina, it produces propionaldehyde which adversely affects photographic photosensitive materials.

In the first method of the present invention, a suitable quantity of the antifoaming agent is in the range of 10 to 1500 g/pulp ton in the pulp washer process, 5 to 600 g/pulp ton in the pulp screening process and less than 1 % per pulp weight in the mixer process.

The paper for photographic purposes obtained according to the first method of the present invention does not adversely affect photographic photosensitive materials regardless of the pH thereof, because the antifoaming agent does not contain silicone or propylene oxide which otherwise cause sensitivity slippage and fogging. This paper is inexpensive, and its physical strength is great.

The nonionic mineral oil antifoaming agent used in the second method of the present invention contains silicone or silicone-modified silica and a nonionic surfactant. The silicone may be selected from those mentioned previously, and the silicone-modified silica is a fine powder of silica treated with the silicone. A particularly preferred nonionic mineral oil antifoaming agent is polyoxyalkylene-modified polysiloxane blended with dimethylpolysiloxane, silica and a nonionic surfactant in view of excellent foam-extinguishing ability and foam-breaking ability.

A suitable quantity of the nonionic mineral oil antifoaming agent is in the range of 100 to 1000 g(stock solution)/pulp ton. When the quantity is less than 100 g/pulp ton, the foam-extinguishing effect is insufficient. On the other hand, when the quantity is beyond 1000 g/pulp ton, the photographic properties are adversely affected.

In the above paper for photographic purposes obtained according to the second method of the present invention, the adverse affects of silicone and silicone-modified silica upon the photographic properties are reduced by adjusting the pH within the prescribed range, and necessary foam-extinguishing effects in the paper manufacturing process are secured by the silicone or silicone-modified silica.

When the nonionic mineral oil antifoaming agent is used, the pH measured by the cool water extracting method (JIS P-8133) is adjusted to 3.5 to 5.5. When the pH is lower than 3.5, the increase of sensitivity is great. On the other hand, when the pH is higher than 5.5, the increase of sensitivity is also great. The pH is adjusted by the quantity of additives, such as aluminum sulfate. An acid, such as chloric acid, sulfuric acid, citric acid or oxalic acid, may be added, if necessary.

According to the third method of the present invention, a water-soluble aluminum salt and at least one of a rosin sizing agent, a polyacrylamide and a polyamide-epoxy resin are used. Therein the water-soluble aluminum salt is added for fixing the sizing agent and the paper strengthening agent on the fibers of the pulp. Examples of the water-soluble aluminum salt are aluminum sulfate, aluminum chloride, poly(aluminum chloride) and poly(aluminum hydroxide).

The quantity of the water-soluble aluminum salt is determined so that the pH measured by the cool water extracting method (JIS P-8133) of the paper for photographic purposes is within the range of 3.5 to 6.0. It is for example influenced by the pH of the pulp, the quantity of various additives and the kind of the water-soluble aluminum salt. A usual quantity of the water-soluble aluminum salt is 0.5 to 10 wt. %, preferably 1 to 6 wt. %, of the dry weight of pulp.

The rosin sizing agents are divided into three groups, which are gum rosin, tall oil rosin and wood rosin. Maleic anhydride or fumaric anhydride is added to the rosin with heating to produce maleinized rosin or fumaric-induced rosin. An alkali is added to obtain a solution of a fortified rosin sizing agent. The maleinized rosin or fumaric-induced rosin is

suspended in water with an emulsifier to obtain an emulsion-type rosin sizing agent.

Polyacrylamide acts as a paper strengthening agent, and exhibits additional effects such as the improvement in the fixation of fillers and fine fibers and the improvement in drainage ability. In order to improve the fixation to the pulp, a part of the amide groups is changed to carboxyl groups. The carboxyl group-induced polyacrylamide is fixed on the fibers of the pulp through aluminum sulfate. In order to obtain a suitable modification rate of the polyacrylamide, about 10 % of the amide groups are changed to carboxyl groups.

Polyamide-epoxy resin is used as a non-formaldehyde resin. It exhibits a high ability as a wet paper strengthening agent.

The quantity of the rosin sizing agent, polyacrylamide and polyamide-epoxy resin is suitably 0.05 to 10 wt. %, preferably 0.2 to 5 wt. %, of the dry weight of the pulp.

The pH measured by the cool water extracting method (JIS P-8133) is 3.5 to 6.0. When the pH is lower than 3.5, the increase of sensitivity is great. On the other hand when the pH is higher than 6.0, the increase of sensitivity is also great. The pH is adjusted by the quantity of additives, such as aluminum sulfate. An acid, such as chloric acid, sulfuric acid or oxalic acid, may be added, if necessary.

In the paper for photographic purposes obtained according to the third method of the present invention, the water-soluble aluminum salt improves the retention of the sizing agent and the paper strengthening agent, and adjusts the pH within the range of 3.5 to 6.0. The rosin sizing agent, polyacrylamide and polyamide-epoxy resin improves the surface strength. The adjustment of the pH within the range of 3.5 to 6.0 renders compounds, such as the rosin sizing agent, harmless for the photographic properties.

As indicated above, the paper for photographic purposes, obtained according to the methods of the invention is used for packaging materials for photographic photosensitive materials, light-shielding paper, support for photographs, pad, carton box, core, guard sheet, leader paper and materials for composing instant photographs. Preferably, the paper is used as the inner surface layer of the laminated film formed in a single sheet bag to touch the emulsion face of the photosensitive materials.

In the following, the invention is described in more detail by way of examples.

Example 1

A nonionic antifoaming agent containing a fatty amide and silicone as the principal components ("PRONAL K-302N", trade name) was rendered water-soluble by removing the silicone. An unbleached kraft pulp was prepared wherein 500 g/pulp ton of the above nonionic antifoaming agent were added in the pulp washer process and 200 g/pulp ton of the same antifoaming agent was further added in the pulp screening process of the pulp washing process. The unbleached kraft pulp was beaten up to a CPPA standards drainage rate of 450 ml to produce a pulp slurry. Polyacrylamide was added to the pulp slurry in an amount of 1.0 wt. % of the pulp and aluminum sulfate was added in an amount of 3.0 wt. % of the pulp. A handmade paper of pH 4.5 having an areal weight of 70 g/m² was prepared from the above paper stock by using a TAPPI type handmaking machine.

Example II

A paper was prepared as in Example 1, except that the amount of aluminum sulfate was 0.3 wt. % of the pulp and the pH was adjusted to 7.2.

Comparative Example I

An unbleached kraft paper of pH 4.3 was prepared in the same manner as in Example I, except that 500 g/pulp ton of the nonionic antifoaming agent ("PRONAL K-302N") without the water-solubilization treatment was added in the pulp washer process of the pulp washing process instead of the water-soluble antifoaming agent obtained from "PRONAL K-302N" in Example I. Further, 200 g/pulp ton of a nonionic antifoaming agent containing propylene oxide and ethylene oxide as the principal components ("PRONAL S-121", trade name) were added in the process instead of 200 g/pulp ton of the water-soluble antifoaming agent.

Comparative Example II

An unbleached kraft paper of pH 7.0 was prepared in the same manner as in Comparative Example I before and in the pulp washer process, and in the same manner as in Example II after the pulp washer process.

The photographic properties and surface strength of the above products were measured. The results are summarized in Table 1.

Table 1

	Invention		Comparative	
	I	II	I	II
pH of Paper	4.5 Acidic	7.2 Neutral	4.3 Acidic	7.0 Neutral
Photographic Properties (Contact)				
Slippage in Sensitivity of Green Coloring Layer	0	0	+0.02	+0.02
Slippage in Sensitivity of Blue Coloring Layer	+0.01	0	+0.04	+0.04
Slippage in Sensitivity of Red Coloring Layer	0	0	+0.03	+0.03
Surface Strength (Wax No.)	12A	10A	12A	10A

Test Method:

pH of Paper:

Measured by the cool water extracting method according to JIS P-8133

Photographic Properties (Contact):

The emulsion face of a color photographic printing paper was contacted with the handmade paper, and kept at 50°C for 3 days without humidity conditioning. Then, each photographic printing paper was developed in a conventional manner, and each color concentration was measured by using a densitometer. Each numerical value in the table is the difference do the value of the paper not contacted with the reagent.

Surface Strength:

Measured according to JIS wax method of JIS P-8129

Example III

500 g/pulp ton of a nonionic antifoaming agent ("PRONAL K-302N") was added to an unbleached kraft pulp, and the unbleached kraft pulp was beaten up to a CPPA standards drainage rate of 450 ml. The pH measured by the cool water extracting method (JIS P-8133) of the beaten pulp was adjusted to 4.5 by adding aluminum sulfate. A handmade unbleached kraft paper having an areal weight of 70 g/m² was prepared from the above paper stock by using a TAPPI type handmaking machine.

Comparative Example III

An unbleached kraft paper prepared in the same manner as the product of Example III, except that the pH of the beaten pulp was adjusted to 7.0 by adding aluminum sulfate.

The photographic properties of the above products were measured, and the results are shown in Table 2.

Table 2

	Invention III	Comparative III
pH of Paper	4.5	7.0
Photographic Properties (Contact)		
Slippage in Sensitivity of Blue Coloring Layer	+0.01	+0.05
Slippage in Sensitivity of Green Coloring Layer	0	+0.03
Slippage in Sensitivity of Red Coloring Layer	0	+0.02
Photographic Properties (Gas)		
Slippage in Sensitivity of Blue Coloring Layer	0	+0.02

Table 2 (continued)

	Invention III	Comparative III
Photographic Properties (Gas)		
Slippage in Sensitivity of Green Coloring Layer	+0.01	+0.02
Slippage in Sensitivity of Red Coloring Layer	0	+0.01

Test Method:

Photographic Properties (Gas):

The emulsion face of a color photographic printing paper was faced to the handmade paper through a perforated sheet, and kept at 50°C for 3 days without humidity conditioning. Then, each photographic printing paper was developed in a conventional manner, and each color concentration was measured by using a densitometer. Each numerical value in the table is the difference to the value of the paper not contacted with the reagent.

Example IV

An unbleached kraft pulp was beaten up to a CPPA standards drainage rate of 450 ml by a mill, and to the beaten pulp was added 0.3 wt. % of a rosin sizing agent (fortified rosin sizing agent), 2 wt. % of an anionic polyacrylamide as the paper strengthening agent and 3 wt. % of aluminum sulfate as the water-soluble aluminum salt. A handmade paper of pH 4.5 (measured by the cool water extracting method of JIS P-8133) having an areal weight of 70 g/m² was prepared from the above paper stock by using a TAPPI type handmaking machine.

Comparative Example IV

This paper was a handmade paper of pH 7 measured by the cool water extracting method prepared in the same manner as the product of Example IV, except that the amount of aluminum sulfate was changed to 1.5 wt. %.

Comparative Example V

A handmade paper of pH 7 measured by the cool water extracting method was prepared in the same manner as the product of Example IV, except that the amount of aluminum sulfate was changed to 1.5 wt. % and that polyacrylamide was not added.

Comparative Example VI

A handmade paper of pH 4.5 measured by the cool water extracting method was prepared in the same manner as the product of Example IV, except that 2 wt. % of a melamine resin was added instead of polyacrylamide.

Example V

A handmade paper of pH 4.7 (measured by the cool water extracting method) having an areal weight of 70 g/m² was prepared in the same manner as the product of Example IV, except that no rosin-sizing agent was added.

Comparative Example VII

A handmade paper of pH 4.6 (measured by the cool water extracting method) was prepared in the same manner as the product of Example V, except that 2 wt. % of modified starch ("PEPARIN", trade name) was used instead of polyacrylamide.

The photographic properties of the above products were measured, and the results are shown in Table 3.

Table 3

	Invention	Comparative			Invention	Comparative
	IV	IV	V	VI	V	VIII
pH of Paper	4.5	7.0	7.0	4.5	4.7	4.6
Photographic Properties (Contact)						
Slippage in Sensitivity of Green Coloring Layer	+0.01	+0.08	+0.04	+0.05	+0.01	+0.03
Slippage in Sensitivity of Blue Coloring Layer	0	+0.06	+0.05	+0.07	+0.02	+0.03
Slippage in Sensitivity of Red Coloring Layer	+0.01	+0.03	+0.02	+0.06	+0.01	+0.07

Claims

1. A method of preparing a paper comprising subjecting unbleached kraft pulp to a washer process with a nonionic mineral oil antifoamer containing no silicone, then subjecting the thus obtained pulp to a screening process and to a mixing process with a nonionic surfactant antifoamer containing no propyleneoxide.
2. The method according to claim 1 wherein said nonionic mineral oil antifoamer is present in an amount of 10 to 1500 g/pulp ton in the pulp washer process and said nonionic surfactant antifoamer is present in an amount of 5 to 600 g/pulp ton in the screening process.
3. A method of preparing a paper comprising subjecting unbleached kraft pulp to a washer process with a nonionic mineral oil antifoamer containing silicone or silicone-modified silica and then subjecting the thus obtained pulp to a screening process and a mixer process with a nonionic surfactant antifoamer containing no propyleneoxide wherein the pH value of the paper stock is adjusted to 3.5 to 5.5.
4. The method of claim 3 wherein the quantity of the antifoamer is 100 to 1000 g (stock solution)/pulp ton.
5. A method of preparing a paper comprising adding to unbleached kraft pulp water-soluble aluminium salt and at least one of a rosin sizing agent, a polyacrylamide and a polyamide-epoxy resin, and adjusting the pH value of the paper stock to 3.5 to 6.0.
6. The method of claim 5 wherein the quantity of the water-soluble aluminium salt is 0.5 to 10 wt. %, of the dry weight of the pulp, and the quantity of the rosin sizing agent, polyacrylamide and the polyamide-epoxy resin is 0.05 to 10 wt. % of the dry weight of the pulp.
7. The use of an unbleached kraft paper containing a nonionic antifoamer which does not include silicone and propyleneoxide for photographic purposes.
8. The use of an unbleached kraft paper containing a nonionic mineral oil antifoamer which includes silicone or silicone-modified silica and which has a pH value of 3.5 to 5.5 measured by the cool water extracting method (JIS P-8133) for photographic purposes.
9. The use of an unbleached kraft paper which contains a water-soluble aluminium salt and at least one of a rosin sizing agent, a polyacrylamide or a polyamide-epoxy resin and which has a pH value of 3.5 to 6.0 measured by the cool water extracting method (JIS P-8133) for photographic purposes.
10. The use of any one of claims 7 to 9 wherein the paper is used as a packaging material for photographic photo-sensitive materials, light-shielding paper, support for photographic papers, pads, carton boxes, cores, guard sheets, leader paper and materials for composing instant photographs.

Patentansprüche

1. Verfahren zur Herstellung eines Papiers, das das Unterwerfen von ungebleichtem Kraftzellstoff unter ein Wäscher-Verfahren mit einem nicht ionischen kein Silikon enthaltenden Mineralöl-Antischaummittel, dann das Unterwerfen
5 des so erhaltenen Zellstoffs unter ein Siebverfahren und ein Mischverfahren mit einem nicht ionischen grenzflächenaktiven Antischaummittel, das kein Propylenoxid enthält, umfaßt.
2. Verfahren nach Anspruch 1, wobei das nicht ionische Mineralöl-Antischaummittel in einer Menge von 10 bis 1500
10 g/Tonne Zellstoff in dem Zellstoff-Wäscher-Verfahren vorliegt und das nicht ionische grenzflächenaktive Antischaummittel in dem Siebverfahren in einer Menge von 5 bis 600 g/Tonne Zellstoff vorliegt.
3. Verfahren zur Herstellung eines Papiers, das das Unterwerfen von ungebleichtem Kraftzellstoff unter ein Wäscher-Verfahren mit einem nicht ionischen Mineralöl-Antischaummittel, das Silikon oder mit Silikon modifiziertes Siliziumdioxid enthält, und dann Unterwerfen des so erhaltenen Zellstoffs unter ein Siebverfahren und ein Mischver-
15 fahren mit einem nicht ionischen grenzflächenaktiven Antischaummittel umfaßt, das kein Propylenoxid enthält, wobei der pH-Wert des PapierAusgangsmaterials auf 3,5 bis 5,5 eingestellt wird.
4. Verfahren nach Anspruch 3, wobei die Menge des Antischaummittels 100 bis 1000 g (Ausgangsmateriallösung)/
20 Tonne Zellstoff beträgt.
5. Verfahren zur Herstellung eines Papiers, das das Zusetzen eines in Wasser löslichen Aluminiumsalzes und mindestens eines Terpentinleims, eines Polyacrylamids und eines Polyamid-Epoxidharzes zu einem ungebleichten Kraftzellstoff und Einstellen des pH-Werts des Papierausgangsmaterials auf 3,5 bis 6,0 umfaßt.
- 25 6. Verfahren nach Anspruch 5, wobei die Menge des in Wasser löslichen Aluminiumsalzes 0,5 bis 10 Gew.-% des Trockengewichts des Zellstoffs und die Menge des Terpentinleims, des Polyacrylamids und des Polyamid-Epoxidharzes 0,05 bis 10 Gew.-% des Trockengewichts des Zellstoffs beträgt.
7. Verwendung eines ungebleichten Kraftpapiers, das ein nichtionisches Antischaummittel enthält, welches kein Si-
30 likon und Propylenoxid enthält, für fotografische Zwecke.
8. Verwendung eines ungebleichten Kraftpapiers, das ein nichtionisches Mineralöl-Antischaummittel enthält, das Si-
35 likon oder mit Silikon modifiziertes Siliziumdioxid enthält und das einen mit dem Kaltwasserextraktionsverfahren (JIS P-8133) gemessenen pH-Wert von 3,5 bis 5,5 aufweist, für fotografische Zwecke.
9. Verwendung eines ungebleichten Kraftpapiers, das ein in Wasser lösliches Aluminiumsalz und mindestens einen
40 Terpentinleim ein Polyacrylamid oder ein Polyamid-Epoxidharz enthält und das einen mit dem Kaltwasserextraktionsverfahren (JIS P-8133) gemessenen pH-Wert von 3,5 bis 6,0 aufweist, für fotografisch Zwecke.
10. Verwendung nach einem der Ansprüche 7 bis 9, wobei das Papier als Packmaterial für fotografische lichtemp-
findliche Materialien, Lichtschutzpapier, Träger für fotografische Papiere, Kissen, Kartonkästen, Innenteile,
Schutzblätter, Führungspapier (leader paper) und Materialien zum Erstellen von Sofortphotografien verwendet
wird.

Revendications

1. Procédé de préparation d'un papier comprenant les étapes consistant à soumettre de la pâte kraft non blanchie
50 à un procédé de cylindre à laver avec un agent antimoissant d'huile minérale non ionique ne contenant pas de silicone, et à soumettre ensuite la pâte ainsi obtenue à un procédé d'épuration et à un procédé de mélange avec un agent antimoissant tensioactif non ionique ne contenant pas d'oxyde de propylène.
2. Procédé selon la revendication 1, dans lequel ledit agent antimoissant d'huile minérale non ionique est présent
55 dans une quantité de 10 à 1500 g/t de pâte dans le procédé de cylindre à laver la pâte et ledit agent antimoissant tensioactif non ionique est présent dans une quantité de 5 à 600 g/t de pâte dans le procédé d'épuration.
3. Procédé de préparation d'un papier comprenant les étapes consistant à soumettre de la pâte kraft non blanchie
à un procédé de cylindre à laver avec un agent antimoissant d'huile minérale non ionique contenant de la silicone

ou de la silice modifiée à la silicone et à soumettre ensuite la pâte ainsi obtenue à un procédé d'épuration et à un procédé de mélange avec un agent antimoissant tensioactif non ionique ne contenant pas d'oxyde de propylène, dans lequel la valeur du pH de la pâte à papier est ajustée entre 3,5 et 5,5.

- 5 4. Procédé selon la revendication 3, dans lequel la quantité de l'agent antimoissant est de 100 à 1000 g (solution stable)/t de pâte.
- 10 5. Procédé de préparation d'un papier comprenant l'addition à de la pâte kraft non blanchie d'un sel d'aluminium soluble dans l'eau et d'au moins un constituant parmi un agent de collage de colophane, un polyacrylamide et une résine de polyamide-époxy et l'ajustement de la valeur du pH de la pâte à papier entre 3,5 et 6,0.
- 15 6. Procédé selon la revendication 5, dans lequel la quantité du sel d'aluminium soluble dans l'eau est de 0,5 à 10% en poids du poids sec de la pâte et la quantité de l'agent de collage de colophane, de polyacrylamide et de la résine de polyamide-époxy est de 0,05 à 10% en poids du poids sec de la pâte.
- 20 7. Utilisation du papier kraft non blanchi contenant un agent antimoissant non ionique qui ne comprend pas de silicone et d'oxyde de propylène pour des applications photographiques.
- 25 8. Utilisation du papier kraft non blanchi contenant un agent antimoissant d'huile minérale non ionique qui comprend de la silicone ou de la silice modifiée à la silicone et qui présente une valeur de pH de 3,5 à 5,5 mesurée par le procédé d'extraction à l'eau froide (JIS P-8133) pour des applications photographiques.
- 30 9. Utilisation du papier kraft non blanchi qui contient un sel d'aluminium soluble dans l'eau et au moins un constituant parmi un agent de collage de colophane, un polyacrylamide ou une résine de polyamide-époxy et qui présente une valeur de pH de 3,5 à 6,0 mesurée par le procédé d'extraction à l'eau froide (JIS P-8133) pour des applications photographiques.
- 35 10. Utilisation de l'une quelconque des revendications 7 à 9, dans laquelle le papier est utilisé en tant que matériau d'emballage pour des matières photographiques photosensibles, papier faisant écran à la lumière, support pour papiers photographiques, blocs, boîtes en carton, tubes, feuilles de protection, papier amorce et matériaux de composition de photographies à développement instantané.
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