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(54) Title: COMPOSITION

(57) Abstract: Hair care composition comprising from 1.2 to 3% wt. particulate anti-dandruff active and a hydrophobically modified cross-linked acrylate copolymer.



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COMPOSITION

The present invention relates to hair care compositions comprising high levels of pyrithione.

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Despite the prior art there remains a need for improved anti-dandruff hair care compositions.

Accordingly, the present invention provides a hair care composition comprising
10 from 1.2 to 3% wt. particulate anti-dandruff active and a hydrophobically modified cross-linked acrylate copolymer.

We have surprisingly found that compositions comprising elevated levels of particulate anti-dandruff actives are often unstable. Surprisingly, we also found
15 that such compositions are more stable in the presence of a hydrophobically modified cross-linked acrylate copolymer.

Preferably, the particulate anti-dandruff active is a salt of pyrithione.

20 Preferably, the pyrithione salt is a zinc salt. Zinc pyrithione is the preferred anti-dandruff active.

Preferably, the pyrithione salt comprises from 1.7 to 2.3% wt. of the composition.

25 Preferably, the pyrithione salt comprises from 1.9 to 2.1% wt. of the composition.

Preferably, the hydrophobically modified cross-linked acrylate copolymer is a copolymer of C10-30 alkyl acrylate and a monomer of acrylic acid. Commercially available acrylate/C10-30 alkyl acrylate copolymers include Carbopol® Ultrez 20

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ex. Lubrizol.

Preferably, the copolymer comprises from 0.01 to 5% wt. of the composition.

- 5 Preferably, the copolymer comprises from 0.05 to 1% wt. of the composition.

Preferably, the copolymer comprises from 0.1 to 0.5% wt. of the composition.

Preferably, the composition comprises less than 0.2% wt. of a methyl cellulose.

- 10 More preferably, the composition comprises less than 0.1% wt. and most preferably less than 0.01% wt. methyl cellulose.

Preferably, the composition comprises from up to 0.27% wt. cationic deposition polymer. Preferred cationic deposition polymers include cationic cellulose

- 15 derivatives, cationic starch derivatives, and cationic guar gum derivatives. More preferably, the composition comprises from 0.001 to 0.25% wt cationic deposition polymer.

Cationic deposition polymers suitable for use in compositions of the invention

- 20 include monomers of the formula:



wherein: A is an anhydroglucose residual group, such as a starch or cellulose

- 25 anhydroglucose residual. R is an alkylene, oxyalkylene, polyoxyalkylene, or hydroxyalkylene group, or combination thereof. R¹, R² and R³ independently represent alkyl, aryl, alkylaryl, arylalkyl, alkoxyalkyl, or alkoxyaryl groups, each group containing up to about 18 carbon atoms. The total number of carbon atoms for each cationic moiety (i.e., the sum of carbon atoms in R¹, R² and R³) is
- 30 preferably about 20 or less, and X is an anionic counterion.

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The composition may be any hair care composition for example a shampoo, conditioner, styling composition, mask and whether it be a leave on treatment or a rinse off treatment. Preferably, the composition is a shampoo composition. Preferably, the composition is a pourable shampoo composition with a viscosity
5 between 4000cps and 7000cps using a Brookfield viscometer using spindle RV5 at 30°C.

Shampoo compositions comprise from 5 to 50% wt. cleansing surfactant where the cleansing surfactant is selected from anionic and amphoteric surfactants.

10 Preferably, the cleansing surfactant comprises a mixture of anionic and amphoteric surfactants. Preferred anionic surfactants include the alkali-metal alkyl ether sulphates such as SLES where the average EO number is from 1 to 3, preferably 1. Preferred amphoteric surfactants include cocamidopropyl betaine and CMEA.

15

EXAMPLE 1

Compositions comprising varying levels of carbomer and copolymer with C10-30 alkyl groups were tested for their stability in the presence of 2% ZPTO and 0.2%
20 wt. cationic modified guar.

Sample		6 month stability test
1	0.7% wt. acrylate/C10-30 alkyl acrylate copolymer*	Stable
2	0.7% wt. Carbomer**	Unstable

* Carbopol Ultrez 20

** Carbopol 980

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The test results show that whereas the compositions suspended with carbomer were unstable those suspended with acrylate/C10-30 alkyl acrylate copolymer were stable.

5 **EXAMPLE 2**

1. Five glass containers (diameter 4cm, height 5.5cm) are filled with about 80gm shampoo respectively, to monitor phase separation/cracking, color. They are separately placed at 4°C, 25°C, 37°C, 45°C and 50°C (Torture test).
10
2. In parallel, the other five glass containers were fully filled respectively, to monitor pH and Viscosity (measured at 30°C), and functional active (e.g. ZPTO)/claim and microbiology. They are separately placed at 4°C, 25°C, 15 37°C, 45°C and 50°C(Torture test), too.
3. At Fresh($\pm$ 2days), 1wks(for torture test only), 4wks, 8wks and 12wks, all the glass containers would be taken out to be assessed as mentioned in item 1 and 2.
20
 - a. pH and viscosity should be within product specification limits after 12wks at 25°C and 45°C.
 - b. Functional ingredient (e.g. ZPTO) should be within functional range after 12wks at 25°C and 45°C.
 - c. Phase separation, transparent liquid from top level should be within 25 0.3cm, and over 0.3cm will not be acceptable after 12wks at 25°C, 37°C and 45°C. For torture test, it should be within 0.3cm after 1wk at 50°C.
 - d. Cracking in shampoo texture (AD shampoo) should be less than 50% after 12wks at 25°C, 37°C and 45°C.

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- e. The color change perceived significantly is not acceptable after 12wks.

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CLAIMS

1. Hair care composition comprising from 1.2 to 3% wt. particulate anti-dandruff active characterized by a hydrophobically modified cross-linked acrylate copolymer.
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2. Composition according to claim 1 wherein the particulate anti-dandruff active is a pyrithione salt.
- 10 3. Composition according to claim 2 wherein the pyrithione salt is a zinc salt.
4. Composition according to any preceding claim wherein the particulate anti-dandruff active comprises from 1.7 to 2.3% wt. of the composition.
- 15 5. Composition according to any of claims 1 to 3 wherein the pyrithione salt comprises from 1.9 to 2.1% wt. of the composition.
6. Composition according to any preceding claim wherein the hydrophobically modified cross-linked acrylate copolymer is a copolymer of C10-30 alkyl acrylate and a monomer of acrylic acid.
20
7. Composition according to any preceding claim wherein the copolymer comprises from 0.01 to 5% wt. of the composition.
- 25 8. Composition according to any preceding claim wherein the copolymer comprises from 0.05 to 1% wt. of the composition.
9. Composition according to any preceding claim wherein the copolymer comprises from 0.1 to 0.5% wt. of the composition.
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10. Composition according to any preceding claim comprising less than 0.2% wt. of a methyl cellulose.