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(71) Applicant: THE PROCTER & GAMBLE COMPANY [US/US]; One Procter & Gamble Plaza, Cincinnati, OH 45202 (US).

(72) Inventors: KALLA, Karen, Kay; 653 Rushton Road, Cincinnati, OH 45226 (US). HUNT, Julie, Marie; 6187 Shawna Court, Middletown, OH 45044 (US).

(74) Agents: REED, T., David et al.; The Procter & Gamble Company, 5299 Spring Grove Avenue, Cincinnati, OH 45217 (US).

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(54) Title: SHAMPOO COMPOSITIONS WITH IMPROVED DEPOSITION OF ANTIMICROBIAL AGENTS

(57) Abstract

Disclosed are antidandruff shampoo compositions with improved deposition of antimicrobial agents, which compositions comprise (a) from about 7 % to about 30 % by weight of a detersive surfactant selected from the group consisting of anionic surfactant, amphoteric surfactant, zwitterionic surfactant, and combinations thereof; (b) from about 0.1 % to about 10 % by weight of an antimicrobial agent; (c) from about 0.5 % to about 10 % by weight of a suspending agent; (d) from about 0.01 % to about 1.0 % by weight of a cationic guar polymer having a charge density of from about 0.01 meq/g to about 3 meq/gm; and (e) from about 40 % to about 92 % by weight of water; wherein at least about 50 % by weight of the cationic guar polymer is in coacervate form, said coacervate comprising detersive surfactant and cationic guar polymer.

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SHAMPOO COMPOSITIONS WITH IMPROVED DEPOSITION OF ANTIMICROBIAL AGENTS

FIELD OF THE INVENTION

The present invention relates to shampoo compositions containing antimicrobial agents which provide antidandruff activity. In particular, the present invention relates to shampoo compositions containing antimicrobial agents, preferably particulate antimicrobial agents, in combination with a cationic guar polymer as an antimicrobial agent deposition aid.

BACKGROUND OF THE INVENTION

Various anti-dandruff shampoo compositions are commercially available or otherwise known in the shampoo art. These compositions typically comprise particulate, crystalline antimicrobial agents dispersed and suspended throughout the composition. Antimicrobial agents used for this purpose include sulfur, selenium sulfide and heavy metal salts of pyridinethione. During the shampooing process, these antimicrobial agents deposit on the scalp to provide anti-dandruff activity.

Many anti-dandruff shampoos, however, do no provide sufficient antimicrobial agent deposition during the shampooing process. Without such deposition, the antimicrobial agents simply rinse away during shampooing and therefore provide little or no anti-dandruff activity. In addition, the detersive surfactants in these shampoo compositions which are designed to remove oil, grease, dirt, and particulate matter will also carry away particulate antimicrobial agents during rinsing, thus further decreasing deposition and anti-dandruff activity.

Deposition of particulate antimicrobial agents is especially difficult in anti-dandruff shampoo compositions containing crystalline suspending agents. These suspending agents help disperse and suspend particulate antimicrobial agents in the shampoo composition. These suspending agents, however, adversely affect lathering performance. It has therefore become conventional practice to enhance the lathering performance of these shampoos by increasing detersive surfactant concentrations or by adding foam boosters, both of which further decrease deposition of particulate antimicrobial agents from the shampoo compositions.

It has now been found that select cationic deposition polymers are especially effective in providing enhanced deposition of antimicrobial agents, especially particulate antimicrobial agents, from a shampoo composition. The select polymers

are cationic derivatives of guar gum which have been found to be most effective when used in combination with crystalline suspending agents and high levels of anionic, amphoteric or zwitterionic surfactant in an anti-dandruff shampoo composition.

It is therefore an object of the present invention to provide an anti-dandruff shampoo composition with improved deposition of antimicrobial agents, especially particulate antimicrobial agents, and further to provide for such improved deposition in the presence of crystalline suspending agents and high concentrations of detersive surfactant. It is yet another object of the present invention to provide anti-dandruff shampoo compositions with excellent anti-dandruff activity and reduced concentration of antimicrobial agents.

SUMMARY OF THE INVENTION

The present invention is directed to high lathering, anti-dandruff shampoo compositions with improved deposition of antimicrobial agents, which compositions comprise (a) from about 7% to about 30% by weight of a detersive surfactant selected from the group consisting of anionic surfactant, amphoteric surfactant, zwitterionic surfactant, and combinations thereof; (b) from about 0.1% to about 10% by weight of an antimicrobial agent; (c) from about 0.5% to about 10% by weight of a suspending agent; (d) from about 0.01% to about 1.0% by weight of a cationic guar polymer having a charge density of from about 0.1 to about 3meq/gm, and (e) from about 40% to about 92% by weight of water; wherein at least about 50% by weight of the cationic guar polymer is in coacervate form, said coacervate comprising detersive surfactant and cationic guar polymer.

DETAILED DESCRIPTION OF THE INVENTION

The shampoo compositions of the present invention can comprise, consist of, or consist essentially of the essential elements and limitations of the invention described herein, as well any of the additional or optional ingredients, components, or limitations described herein.

All percentages, parts and ratios are based upon the total weight of the shampoo compositions of the present invention, unless otherwise specified. All such weights as they pertain to listed ingredients are based on the active level and, therefore, do not include carriers or by-products that may be included in commercially available materials.

Detersive Surfactant

The shampoo compositions of the present invention comprise a detersive surfactant selected from the group consisting of anionic surfactants, amphoteric surfactants, zwitterionic surfactants, and combinations thereof. The shampoo compositions preferably comprise an anionic surfactant. The detersive surfactant provides the shampoo compositions with cleaning performance.

Anionic surfactant

The detersive surfactant component of the shampoo compositions is preferably an anionic surfactant. Concentrations of anionic surfactant can range from about 7% to about 30%, preferably from about 10% to about 25%, more preferably from about 12% to about 22%, by weight of the shampoo compositions.

Anionic surfactants for use in the shampoo compositions include alkyl and alkyl ether sulfates. These materials have the respective formulae $ROSO_3M$ and $RO(C_2H_4O)_xSO_3M$, wherein R is alkyl or alkenyl of from about 8 to about 30 carbon atoms, x is an integer from 1 to 10, and M is a hydrogen, alkali metal (e.g., lithium, sodium, potassium), alkali earth metal (e.g., beryllium, magnesium, calcium, strontium, barium) ammonium or substituted ammonium.

Preferably, R has from about 10 to about 18 carbon atoms in both the alkyl and alkyl ether sulfates. The alkyl ether sulfates are typically made as condensation products of ethylene oxide and monohydric alcohols having from about 8 to about 24 carbon atoms. The alcohols can be derived from fats, e.g., coconut oil or tallow, or can be synthetic. Lauryl alcohol and straight chain alcohols derived from coconut oil are preferred. Such alcohols are reacted with between about 0 and about 10, and especially about 3, molar proportions of ethylene oxide and the resulting mixture of molecular species having, for example, an average of 3 moles of ethylene oxide per mole of alcohol, is sulfated and neutralized.

Specific examples of alkyl ether sulfates which may be used in the shampoo compositions of the present invention are sodium and ammonium salts of coconut alkyl triethylene glycol ether sulfate; tallow alkyl triethylene glycol ether sulfate, and tallow alkyl hexaoxyethylene sulfate. Highly preferred alkyl ether sulfates are those comprising a combination of individual compounds, the combination having an average alkyl chain length of from about 10 to about 16 carbon atoms and an average degree of ethoxylation of from about 1 to about 4 moles of ethylene oxide.

Other suitable anionic surfactants are the water-soluble salts of organic, sulfuric acid reaction products of the general formula [R_1-SO_3-M] where R_1 is

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