DENTIFRICE COMPOSITION

~~CROSS REFERENCE TO RELATED APPLICATIONS~~

FIELD

[0001]The present invention relates to a dentifrice composition and to a method of stabilizing metal ions in a dentifrice composition.

BACKGROUND

[0002]It is known to provide dentifrice compositions including a source of metal ions for delivery to the oral cavity during brushing of the teeth. Such metal ions can act as therapeutic agents. Some metal ions tend to be unstable in dentifrice compositions, particularly when the dentifrice composition includes components with which the metal ions may react during manufacture or storage of the dentifrice composition prior to use. This reduces the delivery and bioavailability of the metal ions at the oral surfaces during brushing of the teeth when using the dentifrice.

[0003]U. S. Patent No. 6,669,929 (Boyd et al.) and the related U.S. Patent Application Publication Nos. 2004/0126332 and 2008/0138369 disclose a dentifrice containing functional film flakes. The film flakes are formed of a water hydratable film which forms a matrix having entrained therein a constituent which may be a therapeutic material, or a cosmetic or decorative material. A number of therapeutic materials are disclosed, including fluoride salts as anticavities agents, calcium salts,anticalculus agents and other active agents including antibacterial agents, breath freshening agents, desensitizers, vitamins, herbs, whitening agents, high cleaning silica, preservatives, silicones or chlorophyll compounds. The breath freshening agents identified are zinc gluconate, zinc citrate and/or alpha ionone.

[0004]There is a need in the art to provide an improved dentifrice composition capable of enhancing the delivery and bioavailability of metal ions at the oral surfaces during brushing of the teeth when using the dentifrice.

[0005]There is a further need to enhance the delivery and bioavailability of metal ions such as zinc, stannous, and copper from a dentifrice, while maintaining stability in a low water dentifrice.

7. The dentifrice composition according to claim 1 wherein the dentifrice composition comprises at least one phosphate selected from at least one of sodium tripolyphosphate and tetrasodium polyphosphate.

8. The dentifrice composition according to claim 7~~8~~ wherein the dentifrice composition comprises sodium tripolyphosphate in an amount of from 1 to 5 wt% based on the total weight of the dentifrice composition and tetrasodium polyphosphate in an amount of from 0.25 to 5 wt% based on the total weight of the dentifrice composition.

9. The dentifrice composition according to claim 8 wherein the source of metal ions comprises zinc citrate which comprises from 20 to 60 wt% of the total weight of the polymer matrix and the at least one source of metal ions, and the polymer matrix and the at least one source of metal ions comprise from 1 to 5 wt% of the total weight of the dentifrice composition.

10. The dentifrice composition according to claim 1 wherein the dentifrice composition comprises at least one of zinc oxide and zinc citrate in the polymer matrix, the polymer matrix comprises a film, the dentifrice composition further comprises a carrier for the film, and the carrier comprises at least one phosphate selected from at least one of sodium tripolyphosphate and tetrasodium polyphosphate.

11. The dentifrice composition according to claim 10 wherein the carrier further comprises zinc citrate.

12. The dentifrice composition according to claim 1, which is a toothpaste or a gel.

13. A method of stabilizing at least one source of metal ions in a dentifrice composition comprising an orally acceptable vehicle including at least one phosphate compound, the method comprising the steps of: providing at least one source of metal ions in a polymer matrix, the metal being selected from zinc, stannous, copper or combinations thereof, the at least one source of metal ions comprising from 10 to 75 wt% of the total weight of the polymer matrix; and

combining the polymer matrix with the orally acceptable vehicle to form a stabilized dentifrice composition comprising less than 10 wt% water based on the total weight of the dentifrice composition.

14. The method according to claim 13 wherein the orally acceptable vehicle includes at least one phosphate compound, the at least one phosphate compound being selected from at least one of sodium tripolyphosphate and tetrasodium polyphosphate.

15. The method according to claim 14 wherein the dentifrice composition comprises sodium tripolyphosphate in an amount of from 1 to 5 wt% based on the total weight of the dentifrice composition and tetrasodium polyphosphate in an amount of from 0.25 to 5 wt% based on the total weight of the dentifrice composition.

16. The method according to claim 13 wherein the at least one source of metal ions comprises from 20 to 60 wt% of the total weight of the polymer matrix and the at least one source of metal ions.

17. The method according to claim 13, wherein the polymer matrix and the at least one source of metal ions comprise from 1 to 5 wt% of the total weight of the dentifrice composition.

18. The method according to claim 17, wherein the polymer matrix and the at least one source of metal ions comprise from 1 to 2 wt% of the total weight of the dentifrice composition.

19. The method according to claim 13 wherein the source of metal ions comprises at least one of zinc citrate, zinc lactate, zinc gluconate, zinc oxide, stannous chloride, stannous fluoride, stannous oxide or copper sulfate, or a combination thereof.