

Chapter 71

Zirconium Compounds

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Although zirconium is a fairly abundant element in the earth's crust, little use was made of its compounds in cosmetic practice until the recent employment of certain complex salts as deodorants, as synergists to recognized antiperspirants and as buffers in antiperspirant preparations. An early German patent mentions their value in deodorants. (Weiss 1911) Of the many compounds of zirconium available, only a few have cosmetic significance.

Antiperspirant/Deodorant Ingredients

The citrate and tartrate are specifically mentioned by Van Mater (1950), along with hydroxyaliphatic acid salts, as deodorant and antiperspirant ingredients.

Carbonated hydrous zirconia (zirconium carbonate) is said to react with decomposition products of perspiration. (Wainer 1950)

Sodium zirconium lactate and gluconate are ingredients of another antiperspirant. (Carter Products, Inc. 1955) A mixture of sodium zirconium lactate and zirconium lactate retards perspiration. (Berger and Plechner, 1959) Sodium zirconium lactate is compatible with sodium stearate alcohols, forming the basis of a patented stick antiperspirant. (Teller 1958a, b)

Zirconyl hydroxychloride is superior to the oxychloride as an antiperspirant ingredient. (Grad 1958, 1960)

Zirconium diketones have the same uses as aluminum diketones, i.e., as antiperspirants.

Cosmetic Color and Other Uses

Zirconium dioxide is used as an opacifying agent.

Zirconium silicate is an abrasive and opacifier.

Zirconium oxide has a covering power about equal to titanium dioxide and has been recommended as a replacement for it in make-up preparations. It is somewhat harder and hence more abrasive than titanium dioxide.

Zirconium color lakes are said to be superior to ordinary color lakes for cosmetic use.

Zirconium stearate, although made, has found practically no use in cosmetics to date.

Safety Concerns

It is thought that the difference in size of the ions in sodium zirconium lactate and zirconium "oxy" or "hydroxy" chlorides accounts for the tendency of the lactate complex to form granulomas in the axillae of individuals using deodorant-antiperspirant alcolgel sticks. This subject has been summarized through 1958 in a review of the work (Schimmel Briefs) reported in seven publications. The problem appears to be a case of acquired sensitivity to zirconium.

Blumenthal (1953) has discussed zirconium salt toxicity, reporting them to be nontoxic and "harmless when applied topically." However, in view of the number of granulomas so far reported, it will be necessary to re-examine the whole subject to be certain of the safety of zirconium compounds on the skin.

References

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