Cosmetic Minerals of Ancient Egypt

Minerals have been used for adornment for millennia. The Egyptians made an extensive use of many familiar minerals, and, according to recent discoveries, synthesized other compounds using relatively sophisticated chemical techniques.

Egyptians were fond of eye and face coloration of white, green and black. Generally these were mineral powders mixed into pastes with fats. Minerals commonly used to make black powders were galena (PbS), manganese oxides such as pyrolusite, magnetite (iron oxide), cuprite and tenorite (copper oxides), and stibnite (antimony sulfide).

Green eye paints used malachite (copper carbonate) and chrysocolla (hydrated copper silicate). White face paint often came often from cerussite (lead carbonate). One might speculate on the health effects of spreading such poisonous compounds thickly over one's face!

The above mentioned minerals are common in deposits accessible to the Egyptians. Recent work on cosmetic powders preserved in their original containers and stored in the Louvre has turned up several rare minerals used as pigments. These minerals were either very rare or are unknown in Egyptian deposits. These are phosgenite (a lead chlorocarbonate) and laurionite(a lead chlor-hydroxide). Both would be suitable for white pigments, if found in quantity. Laurionite is a famous mineral from the ancient deposits at Laurium Greece, where it formed by the action of salty water on slags. It also occurs rarely in other oxidized zones over ore deposits, such as in Cornwall, England. Phosgenite is a bit more common, and can form with laurionite and other minerals in oxidized zones. The conditions of preservation of these minerals in Egyptian cosmetics make it unlikely that they are the effects of subsequent weathering of the cosmetics, but were originally pigment components.

Walter et. al., in a recent article in Nature, speculate that the phosgenite and laurionite were synthesized by the Egyptians. Both could form from mixtures of smelted lead oxides in the presence of carbonate and salt water. Walker and colleagues were able to form these minerals using techniques accessible to the ancient Egyptians. They followed recipes for medicines described on papyrus. This called for lead oxide mixed in water with salt, natron. The reaction is slow and delicate, but produced laurionite that matches morphologically that found as face paint in Egyptian tombs. A similar technique should produce phosgenite. The delicacy of the process suggests a surprising knowledge of wet-chemical techniques 4,000 years ago. Clues for their formation could have come from observations of during the processing

of galena or weathering of lead articles. These papyrus list in addition, over 100 recipes using minerals or synthesized compounds or treatment of a variety of ailments.

It is apparent that ancient Egypt harbored its own creative scientists inspired by observations on minerals to create desired (if unhealthy) products.

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References:

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