



# Egyptian cosmetics,... and crystallography!



Funerary mask of Tanekhatis emphasizing the importance of makeup  
© Col. Museum of Grenoble

Objects found in ancient burial sites are often made up of crystallized chemical materials. These crystals are, for those who know how to "read them", real archives.

## Egyptian make up, knowledge from crystals

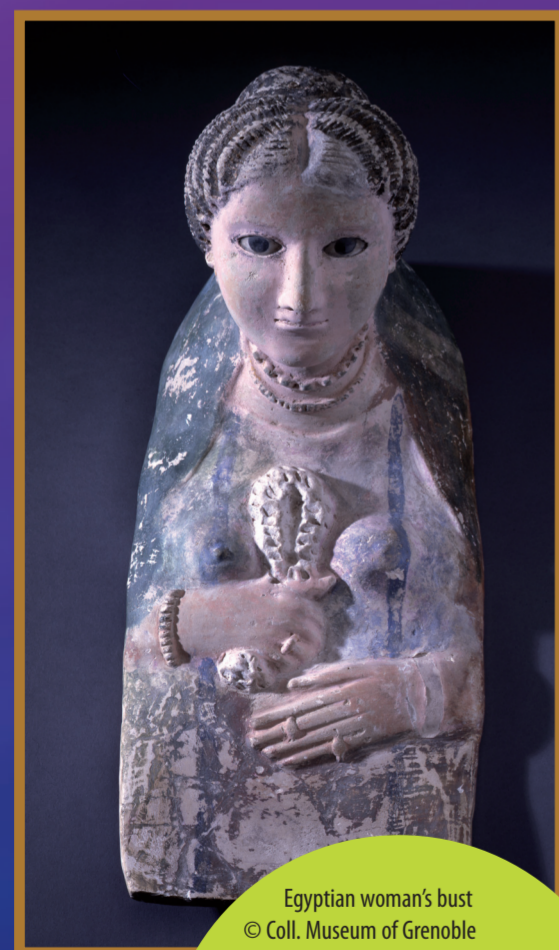
The use of kohl, black eye makeup, is recorded from ancient Egypt. Analysis of cosmetic powders taken from funerary objects preserved in the Louvre Museum, has identified the major component of these old cosmetics as a crystalline lead ore, galena (PbS) but also ... the presence of far rarer crystals....

## The first chemical solution synthesis invented by Man ?

Researchers have shown that these crystals are rare chlorinated compounds of lead. The synthesis method (in aqueous media) can be found in Greco-Roman texts. These texts reveal that the artificial white precipitates were highly valued for their medicinal properties, especially for the eyes. The **ancient Egyptians were thus the first to use soft chemistry** to develop cosmetic products to protect them from eye infections, common in the hot and humid climates along the Nile .... the cradle of their civilization...



X-rays of these bottles revealed the remains of Egyptian cosmetics  
Source : LC2RMF-CNRS, Le Louvre



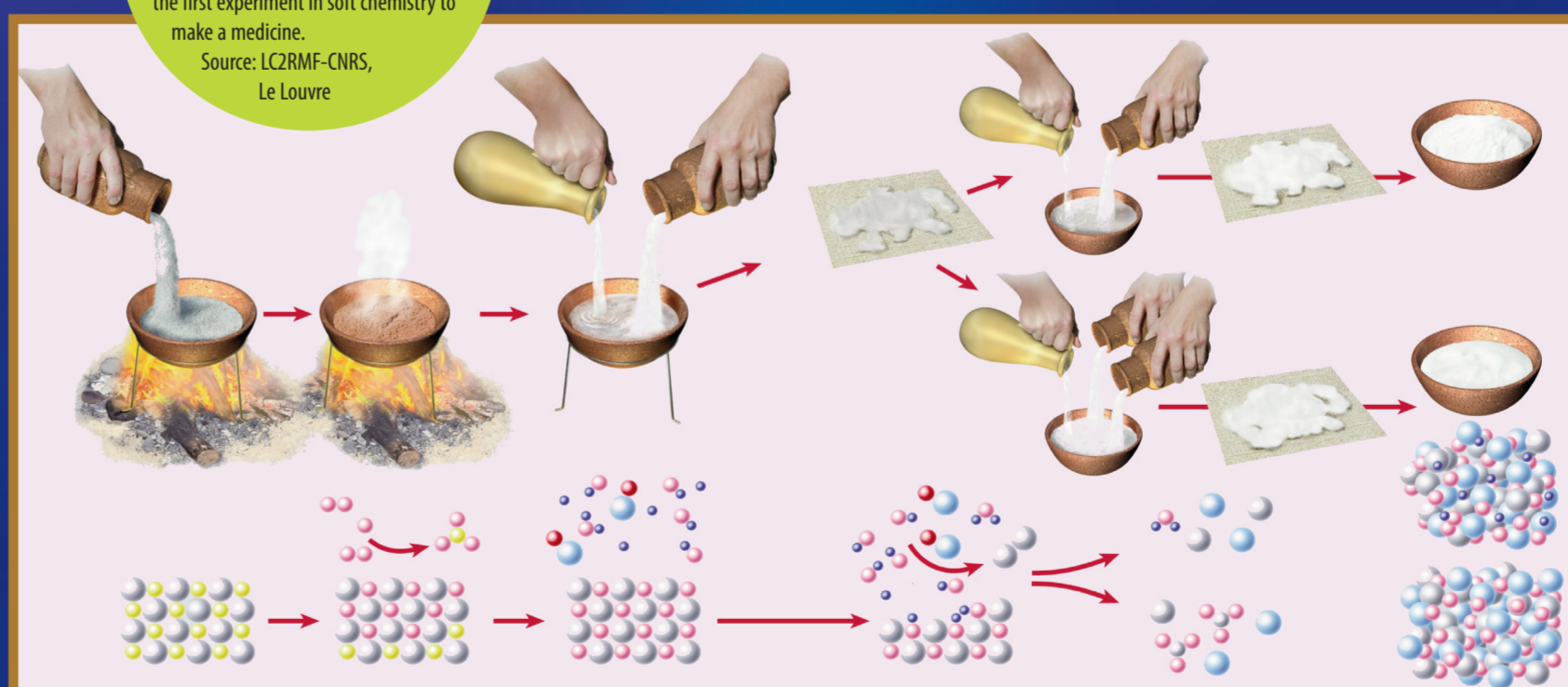
Egyptian woman's bust  
© Coll. Museum of Grenoble

In the tombs of Egypt from third to fifth centuries BC, grave goods, everyday items and toiletries were found. The materials and their crystals are examined by researchers using beams of light, X rays, neutrons and electrons. These studies, together with the evidence and interpretations of the archaeologist, lead to an understanding of their development and purposes.

Ancient texts (**Dioscoride, Pline**) describe a method for synthesis of these precipitates  $PbOHCl$  laurionite and phosgenite  $Pb_2Cl_2CO_3$ , with therapeutic properties. The long (3 month) process was perhaps the first experiment in soft chemistry to make a medicine.  
Source : LC2RMF-CNRS, Le Louvre



Natural minerals such as galena lead were extracted from Egyptian deposits, especially those of oil mountain "Gebel el-Zeit."  
Source : LC2RMF-CNRS, Le Louvre



Reconstituted preparation, by using galena (PbS), litharge (PbO), gemmed salt (NaCl) and water (H2O), then by adding natron (Na2CO3) to obtain laurionite (PbOHCl) and phosgenite (Pb2Cl2CO3)  
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