

Corrosion & Copper

Corrosion forms when the metal reacts with ions in the environment.

The amount and type of corrosion which forms on a copper-alloy object depends on its environment, whether in use, storage and/or burial.



Griffin Protome
Greek, 7th century BC
Bronze
MCCM 1986.010

Common Types of Copper Corrosion on Archaeological Objects:

- Copper Oxides (CuO , Cu_2O , $\text{Cu}(\text{OH})_2$)
- Copper Carbonates ($\text{Cu}_2(\text{OH})\text{CO}_3$, $\text{Cu}_3(\text{OH})\text{CO}_3$)
- Copper Chlorides (CuCl , $\text{Cu}_2(\text{OH})_3\text{Cl}$)
- Copper Sulfates (CuS , Cu_7S_4)
- Copper Acetates ($\text{Cu}(\text{CH}_3\text{COO})_2$)

Discus

Greece, 5th century BC
MCCM 1991.013



Copper Corrosion

By placing a copper object in an acidic environment, we can cause corrosion to form.

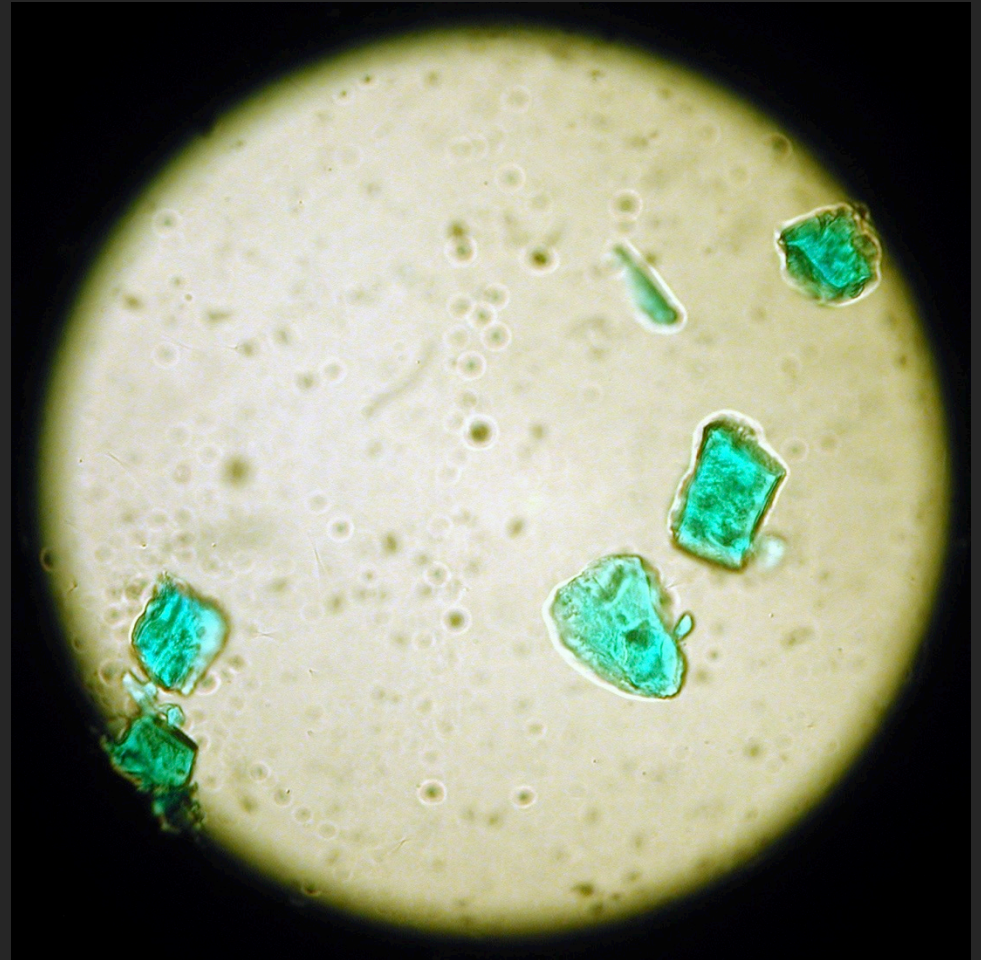


Acetic acid chamber



Copper corrosion on pennies

When copper acetate is used as a pigment, it is called verdigris.



How to Protect Copper Objects

Although corrosion products can be pretty and colorful, they can damage the metal.

Copper objects should be kept in a clean, dry environment to prevent corrosion.

The corrosion layers, however, are the only evidence of the original surface as well as of items buried with the object, such as the textile once wrapped around this tumi.

Thus, copper-alloy objects should never be cleaned to bare metal.



Tumi in the
Form of a Sican Lord
Peru, 1050-1100 CE
Copper-alloy
MCCM 1994.018.033