

ARCHAEOLOGICAL CHARACTERIZATION AND CONDITION ASSESSMENT OF ANCIENT ROMAN COINS FROM EGYPT

This paper presents scientific investigations of three ancient Roman coins excavated from Al Sheikh Zuweid, Sinai city in 2002. A punch of examination and analytical techniques consists of stereo microscope, optical microscope, scanning electron

microscopy (SEM) coupled with energy dispersive X-ray (EDX) and X-ray diffraction (XRD) are used to study the morphological characteristics of the coins patina, to identify the chemical composition of the metallic core, to determine the corrosion products and to understand the corrosion mechanism. The results indicate that copper is the major element of the three coins with small proportion of silver and tin. The presence of tin in the composition of two coins refers to bronze alloy.

The identification of the exact corrosion products is determined by XRD analysis. The results reveal that the corrosion products consist mainly of cuprite and tenorite. Also, the results indicate that the coins were buried in a soil rich in chloride ions due to the

presence of copper hydroxylchlorides such as paratacamite and atacamite. Metallographic investigation is used to reveal the coins manufacture and identify spatial distribution of the alloy components and phases. Also, metallographic investigation indicates pitting corrosion resulted from the attack of chloride and the occurrence of a “bronze disease” phenomenon. The results of this study can provide valuable information that helping in conservation and preservation of the archaeological coins.