



Cairo University
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**Study of Technology, Treatment
and Conservation of Archaeological
Islamic Ceramic Lamps with Application
on some Seleceted Objects**

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SUMMARY ملخص باللغة الانجليزية

There is no doubt that ceramic lamps played an important role in the social life in Islamic periods, that we can find many types of lamps such as pointed –oral, Bowl, Box and dish shapes.

The study consists of 6 chapters:

Chapter one: This chapter a theoretical study for the used raw materials and techniques of ceramic lamps. Clay is the base of body in addition to some additives like sand, grog, fossils. The glaze layer consists mainly of sand, Alumina and fluxes " Lead- Alkaline, Earthen oxides " beside some colorant's materials.

Clay, sand, grog have been mixed to prepare the paste of lamps, these lamps were formed on the potter's wheel or by mould or by hand made, also glaze raw materials have mixed and applied by brushing or dipping on the lamps surface.

Firing process is playing an important role in body components that it changes to stable materials, also firing " Atmosphere, temperature and duration " have a great effect on the colors of glaze.

Chapter two: This chapter is studying the properties of ceramic bodies. Porosity is one of the most important property that affects on all properties, strength of materials is very important for ceramic durability,

color may refer the presence of Iron compounds or organic materials, besides the role of firing atmosphere and the temperature of firing.

Thermal properties are very important because ceramic lamps suffer from heat during firing and heat during utilization which causes thermal stresses.

The chapter also includes a theoretical study of thermal properties through thermal expansion, thermal conductive and thermal shock, also factors which affect on thermal properties.

The chapter also studies other properties such as hardness, bulk density, microstructure, texture and thickness.

Chapter three: There is no doubt that ceramic lamps suffer from many deterioration factors that divided into four stages, the first stage is related to the heterogeneity of body components.

The second stage is related to the utilization. the repeated heating cycles every day causes many deterioration phenomena. The next stage has been done during burial according to the presence of moisture, salts, acidity and alkalinity of soil that may destroy ceramic lamps.

The last stage comes after the exposure to the environmental shock and climatic changes in open environment beside the wrong handling and restoration.

The second section of this chapter includes a study of the deterioration phenomenon of ceramic lamps. These phenomena are divided to cracks in

body, warping. Dunting, crazing, crackle, crawling, peeling, bloating, pin holing, friability, blackening, stains and corrosion.

Chapter Four: This chapter studies restoration and conservation of ceramic lamps. This process started with documentation, cleaning may be mechanically, chemically or by using enzymes, by ultrasonic and by laser, the next stage includes removal of soluble and insoluble salts. The next stage is bonding with best adhesives. Consolidation by solution of 5% of Paraloid B72 and completion by plaster of paris , poly filla and paste of grog and adhesive.

Chapter Five: This chapter includes methods used in analysis and investigation. The Polarizing microscope is a useful technique in determining minerals, slips, ratio of inclusions in matrix, 14 samples from Fustat have been studied.

X-Ray diffraction analysis is used in determining the present minerals in ceramic lamps. This method is used to study 14 samples from Fustat and 7 samples from the Islamic museum" Faculty of Archaeology ". Scanning Electron Microscope " SEM" is also used to study the body and the glaze layer of the ceramic lamps, SEM played an important role in studying conservation materials such as cleaning and consolidation materials.

Chapter six: This chapter includes the applied study. 24 ceramic lamps were chosen from the Islamic Museum " Faculty of Archaeology, Cairo University". This group had many features of deterioration.

The restoration process started with the mechanical cleaning, then chemical cleaning by Calgon solution. The next stage is the completion with a mixture of grog and paraloid B-72 solution. After that consolidation with a solution of paraloid B-72 (5%) not only applied for weak body but also for the glazed surface.