

Design and Implementation of Protective Layer for Protecting Cultural Heritage Wooden Artifacts

Hanan Elhaes¹, Medhat Ibrahim^{2,3}

¹*Physics Department, Faculty of Women for Arts, Science and Education, Ain Shams University, 11757, Egypt*

²*Spectroscopy Department, National Research Centre, 33 El-Bohouth St., 12622, Dokki, Giza, Egypt*

³*Molecular Modeling and Spectroscopy Laboratory, Centre for Excellence for Advanced Science, National Research Centre, 33 El-Bohouth St., 12622, Dokki, Giza, Egypt*

Email: hanan.elhaes@women.asu.edu.eg

The cultural heritage of Egypt is well known with its richness and diversity; besides the numerous archaeological and historical sites all over Egypt. The preservation of cultural heritage is of concern both in Egypt and globally.

In this presentation we are going to point out the efforts done in our project in the field of cultural heritage. We believe that this field needs several efforts from scientists in different fields of science and technology.

So that, in this presentation an attempt is presented to determine the efficiency of nano-metal oxides to act as protective layers. Molecular modeling using density functional method level indicated that both silicon dioxide and magnesium oxide could act as protective layer against light and moisture. Later on, bimetallic SiO₂/MgO structure was prepared as powder and colloids following co-precipitation method. Then the physical and surface properties of the material are characterized with different characterization tools. The prepared samples were tried as protective layers for aged Coptic icons indicating the ability to be applied for wooden artifacts.

Keywords: Cultural Heritage; Molecular modeling; Nano metal Oxides; Protective layers; Coptic Icons.