

## **Using a mixture of polymers and Nano-silica to protect the walls of Al-Ahmadi Mosque in Tanta from the effect of moisture**

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### **Abstract**

The study aims to conduct an experimental study through which the efficiency and effectiveness of different methods and materials, whether known traditional or modern materials, are evaluated by making different experimental formulations of these traditional and modern materials in different proportions and different concentrations, as well as making treatments using multiple materials as a mixture or individually in successive steps that are standardized to achieve high effectiveness. Especially in the processes of surface insulation of the roofs of ancient buildings and their application by possible methods, whether traditional or modern methods, so that we can effectively overcome the problems of moisture in ancient buildings. Moisture, its types and its impact on ancient stone buildings, as well as various sources of moisture, have been studied and each source and its impact on ancient buildings has been known. Stone buildings, as well as the factors affecting the moisture content inside the walls of ancient stone buildings, as well as the dynamics and mechanisms of moisture movement inside ancient stone buildings, different methods of measuring moisture, as well as manifestations of damage caused by moisture on stone buildings, as well as the role of fungi, algae and lichens in the damage of ancient stone buildings, and an experimental study was prepared In order to reach the best materials For appropriate concentrations to reduce the rate of moisture absorption in stone buildings, and analyzes of building materials were carried out. The petrographic examination was done by preparing thin section sectors using a polarizing microscope. The examination was also done using X-ray diffraction (XRD) of limestone samples, and it was found that it consists of calcite  $\text{CaCO}_3$  along with The presence of  $\text{SiO}_2$  quartz and some other minerals. The experimental study included the use of three types of moisture-insulating materials, which varied between water-based materials and organic-based materials, in order to compare them and obtain the best results, in addition to the nano-silica material  $\text{SiO}_2$

## Keywords

Archaeological buildings - water repellent materials - chemical insulation - Nano silica

