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Title of thesis/

Experimental Studies on Some Materials and Methods used for the Treatment of Damage Resulting from the Interaction Between Vegetable Tanned Leather Covers of Books and Paper – Application on Some Selected Objects

Thesis Summary

The thesis is intended to provide a basic understanding of the interaction which occurs between vegetable tanned leather book covers and paper in terms of the resultant damage forms which may appear on the paper and/or the leather; as a result of the presence of these two components. The diverse nature of the component materials i.e, paper which is a cellulosic material and leather which is a proteinous material, may cause some mutual influences to take place between both materials the influences an increase of acidity, which acts on changing the mechanical properties and/or causes change in color. And is intended Analysis Study of the Different Damage Forms found in Historical Paper and Leather Samples and accelerating aging technique for paper and leather and Neutralization of paper, leather acidity with methods of Consolidation paper and leather using new materials .in Experimental Study This part includes the proposed aging processes for studying the mutual effects between paper and leather. Samples used were treated with different materials prior artificial aging. This chapter include:

Preparation of paper and leather samples.

Artificial accelerated aging processes. The researcher used a combination of conditions: thermal aging at 105 °C, thermal aging and humidity at 75°C and 65%RH, and aging by heat, humidity, and light at 50 °C, 65%, and 220-230V for a period of 18 days. Evaluation of aging methods by measuring mechanical properties, pH value, color change, change in amino acid composition. Evaluation using FT-IR spectroscopy was also carried out. And Consolidation of paper using funori-polyisoprene-graft-maleic anhydride

-Neutralization of paper acidity using potassium carbonate and potassium sodium tartrate.

- Consolidation of leather using polyisoprene-graft-maleic anhydride (12% -5% - 3%), and styrene butadiene in toluene (1%- 2%- 3%- 4%- 5%)

-Neutralization of leather acidity using sodium lactate in ethyl alcohol (3%-5%) and potassium sodium tartrate in petroleum ether (8%-12%)

Assessment of treatments methods through the measurement of mechanical properties, pH value, and color change, with special reference to materials and concentrations which have visually shown good results after aging.

Two manuscripts from Al Azhar mosque library were selected for this study, namely:

1. A manuscript of a part of the holly Quran registered under special No. 833 and general No. 88914.
2. A manuscript of a part of the holly Quran registered under special No. 838 and general No. 88919.

-The treatment processes were carried out according to the results reached from the experimental study. The following steps illustrate the main stages of the treatment process:

-Photographic documentation, descriptive study, and condition assessment. Before, during and after treatment images were taken to asses in the evaluation of the status of the selected objects.

- Examination and analysis was undertaken to identify the components of the manuscript, the nature of the damage, and the need for specific treatments such as consolidation and deacidification. Accurate diagnosis of the problem leads to making correct treatment and conservation choices. Examination and analysis methods used include: