

Abstract:

Golden pigment is one of the most important pigments used in illumination of Persian manuscripts. There are many old treatises in regard to preparation of golden paint and different types of illuminations. In this research, golden pigment investigated in three manuscripts from the Qajar period. SEM-EDS analyses showed that golden pigments was made from alloy of copper, zinc and tin which imply using copper-based alloy as an imitation gold. Degradation of the alloy pigment is observable through alteration of golden colour to greenish colour in this research. Degradation processes of the pigments were studied with the examination of greenish degradation residues by Raman Spectroscopy. Copper carboxylates were recognized as degradation product in golden pigment. Organic carbonyl pollutants as well as high relative humidity may were the main factors of this kind of deterioration. In addition, degradation of golden colour caused discoloration, brittleness and crumble in paper substrate in the painted areas. Damages in these papers were comparable to decomposition of paper due to usage of verdigris in illuminated manuscripts and miniatures. One of the reasons for severe damage of paper in degraded golden painted area could be copper ions-catalyzed oxidation of cellulose. Results showed significant differences in molecular weight and molecular weight distribution between the samples which can be due to hydrolytic cleavage of cellulose chain in golden pigment area.

Keywords: Gilding Imitations, Degradation, Paper, Illuminated Manuscripts, Corrosion