

Abstract

The Influence of Solvents on the Stability of Carbonated Hydroxyapatite [†]

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Hydroxyapatite is an inorganic consolidant used in the restoration of cultural heritage. For this reason, the study of the effects of different agents on hydroxyapatite is paramount [1,2]. In this paper, the effect of solvents (isopropyl and tert-Butyl alcohol) was investigated by measuring the stability of absorbance over time.

To this end, solutions containing water and alcohol in different proportions were prepared, starting from the binary solutions containing water: Alcohol (0–100%) with a constant mass of hydroxyapatite added, and the absorbance was measured over a period of time at a fixed wavelength, $\lambda = 600$ nm.

For this study, a JK-VS-721N visible spectrophotometer was used to measure the absorbance of 11 solutions containing water (0–100%) and isopropyl alcohol or tert-Butyl alcohol (0–100%) and hydroxyapatite.

For a hydroxyapatite suspension to be effective as a consolidant, the sedimentation rate of this solution should be as low as possible so that the respective suspension is homogeneous when applied to a stone surface [3]. In our case, with hydroxyapatite in the binary water mixture: Alcohol (60–40%) has the lowest sedimentation rate, thus being the most efficient solution for applying on the stone surface (Figure 1).

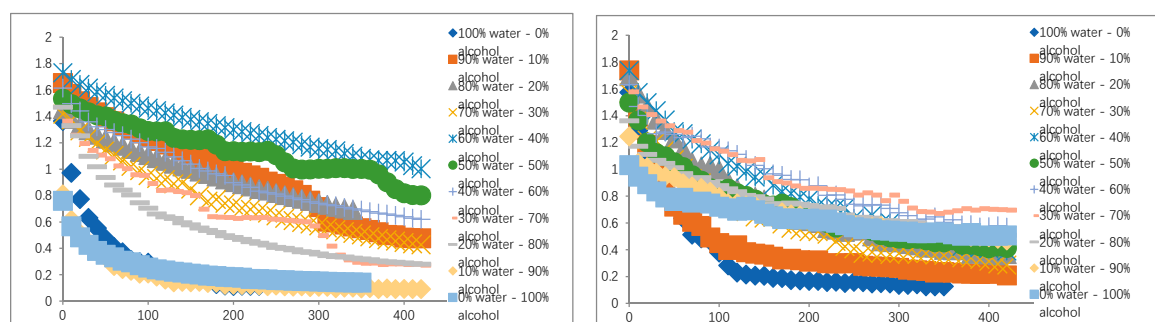


Figure 1. Absorbance variation in time for solutions containing water/isopropyl alcohol (left) and water/tert-Butyl alcohol (right).

In the case of hydroxyapatite in the binary water mixture: Alcohol (60–40%) has the lowest sedimentation rate, being the most efficient solution for application on the stone surface.

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