

Hydrogels for Paper Cleaning: the New Entries

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Restoration of paper artworks usually involves the removal of surface grime, cellulosic degradation by-products and naturally aged glues, not only for aesthetic reasons but because these components accelerate ageing processes. In this contest, wet cleaning is an important step in paper restoration, but the common procedure –water immersion– may not be the optimal one as it could induce paper fibres swelling and dissolution of components. Therefore, in the last years, the use of hydrogels (as Gellan gel) that allow a valid paper cleaning action by absorbing water-soluble degradation products, inducing, at the same time, a very reduced water uptake by paper, has been proposed and assessed [1]. Moreover, these gels could be loaded with opportune cleaning agents to improve their performances as paper restoration tools [2]. Highly retentive semi-IPN p(HEMA)PVP gels have been recently developed within the EU-funded NANOFORART project [3-4]. These hydrogels, which are nowadays commercially available, could be used for a residue-free and controlled cleaning intervention on water-sensitive works of art. Therefore, these systems have been tested for the selective removal of glues (starch paste and animal glue) from paper samples. In particular, gels capability of loading the hydrolytic enzymes needed for glue removal has been assessed. Data have been compared to those obtained with a well-established gel for paper cleaning artworks that is Gellan gel. To assess the effectiveness of the proposed method, the treated samples have been characterized by comparing the results obtained with different techniques, such as using UV-Vis and FTIR techniques, scanning electron microscopy, high performance liquid chromatography.

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