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Part I: Acrylic Emulsion Paint

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Abstract

Unilateral NMR was used to monitor the penetration of water into acrylic emulsion paint-outs on canvas during cleaning simulations with five thickened conservation treatment systems – agarose gels, methylcellulose paste, Pemulen-TR2, poly(vinyl alcohol)-borax gels, and Velvesil Plus - and water-moistened swabs. Studies were also carried out to measure the rate of water penetration from the different treatment methods into acrylic paints during continuous exposure. Unilateral NMR is shown to be an effective technique for comparing depth penetration of water during cleaning treatments; the volume of paint occupied by water can be extracted from these measurements. The results show that young paint films (1 month) are more prone to swelling than aged paint films (2-50 years), with light aged paints having the highest resistance to water penetration during treatments. Aged organic pigmented acrylic paint (Hansa yellow light) shows a higher propensity for swelling during cleaning than aged titanium dioxide white paint. Cleaning simulations using water-moistened swabs and agar gels deposit approximately equivalent amounts of water into the paint films, while all other

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