Abstract
This project studies the use of cyclododecane (CDD) as a tool for the treatment of acrylic paint films. Cyclododecane (C_{12}H_{24}) is a stable molecule that sublimes and does not leave residues. Cyclododecane has not been extensively used by painting conservators. CDD could be used as a temporary consolidant or a protection layer. The use of cyclododecane would allow conservators to perform treatments such as tear repairs, flattening and mechanical removal more safely by holding unstable layers in place.

Hypothesis
Using cyclododecane on acrylic paint films will be a safe tool for conservators, will not leave residues, will not alter the surface of acrylic paint films and will not induce surfactant migration.

Experiment
Cyclododecane was tested on two brands of acrylic paints: Golden Artists Colors Inc. and Winsor & NewtonTM as they are readily available in art supplies stores for artists to use. Three pigments for each brand were tested: Iron Oxide (Umber), Bone Black and Chromium Oxide Green. The samples used have been naturally aged to evaluate how CDD affects an aged paint-film.

For each pigment from each manufacturer, five strips of samples were divided into two series: a cyclododecane-coated series (A series) and non cyclododecane-coated series (B series)

Gloss and colour measurements were performed on cyclododecane-coated and uncoated samples. In addition, Fourier transform-infrared spectroscopy (FT-IR) was performed in order to evaluate possible migrating products and the presence of residues.

Results and Discussion

Colorimetry Results
The graph above presents the results for series A and B. The color difference unit delta E* was calculated in accordance with CIE 2000 L*a*b* color difference equation. Delta E* was less than one and no change in colour was perceptible in all cases but for Golden Artists Colors Inc. Bone Black (Carbonized Bone) and Chromium Oxide Green.

FT-IR Results
The acrylic samples were analysed for CDD residues by examining the CH\_2\_CH\_ bond absorption (c.717 cm\^\(^{-1}\)) where the coated sample showed strong absorption. The uncoated sample and the sample after sublimation showed no absorption in the 717 cm\^\(^{-1}\) position confirming there was no perceptible residues left in the sample after CDD sublimated.

Gloss Results
The graph above presents the results for the average gloss units calculated for series A and B. The results showed that for each series there was a perceptible change in surface gloss. In each case, the change in gloss was negative indicating a decrease in gloss. The surface is therefore matter after CDD was sprayed and sublimated from the surface.

Preliminary Conclusions
This study showed that the commercial cyclododecane spray used affected the acrylic samples analysed. Changes in gloss were perceptible consistently throughout the population. Residues and changes in colour were not perceptible by the methods of analyses used. This research opens up other avenues for further research on cyclododecane used in painting conservation and acrylic emulsion paint.

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