

Aging of Oil Paintings: Pigment/Binder Interactions and the Formation of Metal Soaps



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Although metal soap inclusions in traditional oil paintings have been the subject of many studies, the precise mechanism of formation is still not fully understood. It is unclear how factors such as paint layer composition, presence of driers, varnishes, other layers and environmental fluctuations affect the process and why certain pigments go on to form soaps more readily than others. Moreover, the clustering of individual soap molecules into aggregates that eventually form protrusions and how quickly all this occurs, remains unknown. A better understanding of all these processes is therefore crucial in order to approach the preventive conservation of oil paintings at risk.

In order to address and investigate this problem using the NMR-MOUSE spectrometer, a new non-invasive technique now available to conservation studies, a series of CPMG experiments to measure the $T_{2\text{eff}}$ have been performed on samples composed of linseed, poppy and walnut oils with and without lead white, zinc white and titanium white. Through this technique, we have begun to develop a qualitative picture of the affect of age on oil mediums with and without pigments present through which we can gain insight into the initial mechanism of saponification.

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Topics in Museum Conservation

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