ICOM-CC
17th Triennial Conference
2014 Melbourne
PAINTINGS

Investigating aged oil-medium phase separating and exuding as drips from a 1960s painting by Pierre Soulages

JAAP J. BOON*
JAAP Enterprise for Art Scientific Studies
Amsterdam, The Netherlands
molartadvice@jaap-enterprise.com
KRISTIN LISTER
Conservation Department
Art Institute of Chicago
Chicago IL, USA
klister@artic.edu
*Author for correspondence

Pierre Soulages (b. 1919!) is a very productive painter who is fascinated by the surface effects of black impasto paint on a teal or red background. He has explored these painterly effects in thousands of paintings. In 1965 the Art Institute of Chicago received a donation of a painting made by Soulages in 1960. Unfortunately, this painting now shows long drips of aged oil medium oozing from multiple spots in the thickly applied paint. Softening paint is a major conservation issue since the paint surface often becomes sticky and attracts dust, fibers and other airborne particles. More thickly applied paints may accumulate so many unattached medium components that they start to ooze and form drips. Removal of these drips is not impossible but actually disturbs the outer surface shine, leaving esthetically displeasing tracks. On paintings by Soulages, this disturbance of the surface is disastrous. Microsamples of the paint were taken from a higher point on the painting where ooze was accumulating and formed a drip about 20 cm long. The paints were black, but the drip material was light brown in color and transparent. The pigment of the black paint was bone black (EDX: Ca, P, O, C) with some lead drier. Direct temperature-resolved low-voltage electron ionization mass spectrometry (DTMS) showed a higher concentration of mass features pointing to diacids (m/z 152) and mid-chain oxygen functionalized (hydroxyl, epoxy and keto) stearic acids (m/z 155, 171, 280) in the drip compared to the paints. Paints show higher relative amounts of palmitic and stearic acids. Fourier transform infrared spectroscopy (FTIR) of the drip material shows a strong signature of aliphatic CH vibrations and CO vibrational features, pointing to preserved ester bonds. Direct transesterification methylation using tetramethylammonium hydroxide (25% TMAH) in combination with heat in a Foster pyrolysis system linked to a Varian gas chromatograph/mass spectrometer (GC/MS) gave further details on the composition. Palmitic and stearic acids are high peaks, but oleic acid is still preserved. A series of diacids (C6-C11) with a Gaussian distribution points to thermal prepolymerization of the original oil medium. A series of aliphatic saturated and monounsaturated moieties (C6-C9) and medium-chain aldehydic acids (C8, C9) in the GC/MS data also point to thermal prepolymerization. Electrospray MS further corroborates the DTMS and GC/MS results. It is plausible that the paints were made with prepolymerized oil and perhaps some semidrying oil. Soulages does not remember if he added some stand oil to the paint to facilitate his making brush strokes about 10 cm wide. Such an addition could have tipped the PVC. The authors believe that as the oils dried to a cross-linked viscous mass, the subsequent aging led to a higher concentration of acyl diacids and thus to a higher polarity of the aging medium. This increase in polarity is not compensated by adequate alkalinity for binding in the paint. Increasing acidic fractions phase separated and failed to find sufficient anchoring inside the paint. Presently, the painting is stored horizontally. Excessive accumulation of exuding medium accumulating on the reverse may be removable later with solvent gel techniques.