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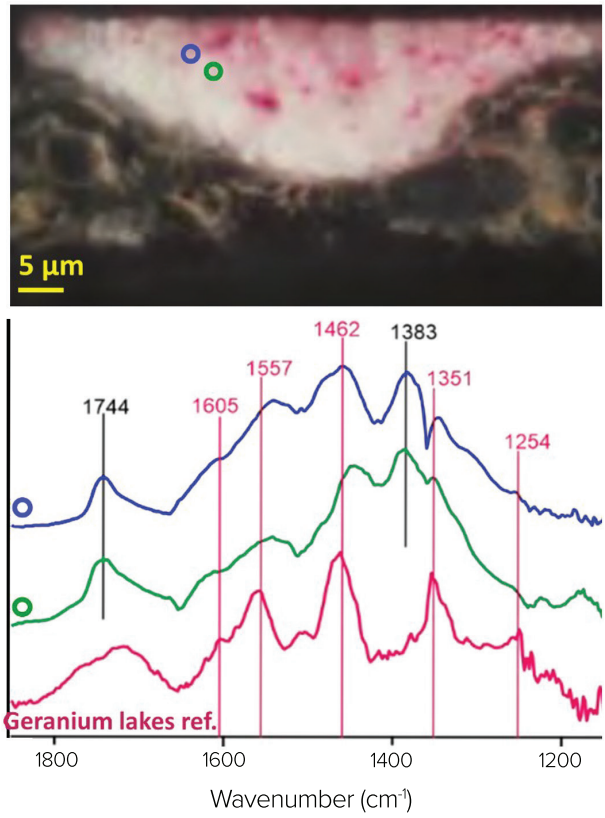
# Nanoscale analysis of historical paintings by means of O-PTIR spectroscopy: The identification of the organic particles in L'Arlésienne (portrait of Madame Ginoux)




For the first time, submicron O-PTIR spectroscopy has chemically identified 2µm pink pigment particles as geranium lake, in a tiny fragment of Van Gogh's painting, L'Arlésienne.

A study done by De Wael found the non-contact nature of O-PTIR data collection provides full compatibility to other analytical techniques, such as XRD and EDX, to enhance the understanding of Van Gogh's work—without altering surface morphology and chemistry.

It was discovered that the high resolution and sensitivity of the O-PTIR technique requires less material for a successful analysis, thus improving the overall integrity of invaluable artwork and increasing spectral purity (less overlap).

Due to the limited size of these particles, synchrotron FTIR was unable to identify them. Whilst Raman microscopy, even at 785nm, suffered from fluorescence.

In this research, submicron O-PTIR technique unmasks chemical analysis in details that are hidden within the paintings previously, due to limited spatial resolution. However, this time it is found without destroying the sample for cultural heritage and conservation applications, providing information that other state-of-the art techniques cannot.

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