

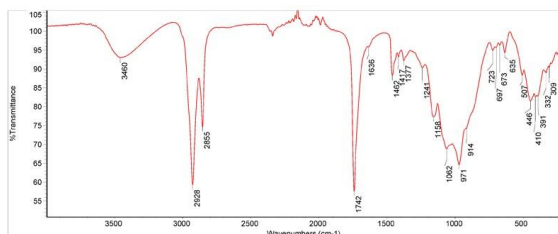
CHEMISTRY AND ART

Chemistry can be used to date paintings, conserve precious artworks or even spot fakes. Analytical techniques like FTIR can reveal differences which can't be seen with the naked eye.

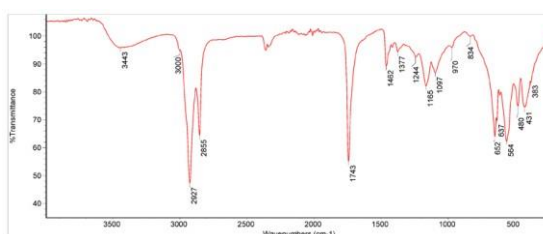
The science

The precise paints, pigments and varnishes used in a painting can tell art historians a lot about when, where and how it was made, as well as the culture of the time. For example, a paint which looks 'blue' to the naked eye could in fact be any one of a number of different blue pigments, perhaps ultramarine, azurite, Prussian blue, Egyptian blue or cobalt blue. A chemical technique called FTIR can distinguish between these different blues. The pigments absorb certain wavelengths of infra-red radiation depending on their structure. FTIR (fourier transform infrared) spectroscopy can measure this and produce a characteristic spectrum, a bit like a unique 'fingerprint' for a particular molecule. So FTIR can tell the difference between super-expensive medieval ultramarine and the cheaper modern alternatives like cobalt blue, even if our eyes cannot.

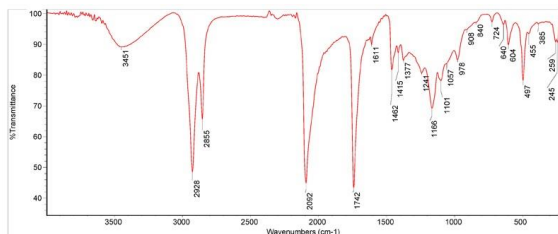
IR spectrum for ultramarine



IR spectrum for cobalt blue



IR spectrum for Prussian blue



IR spectrum for azurite

