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Identification of minor amounts of anatase in kaolins by Raman spectroscopy

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ABSTRACT

The Raman spectra of anatase, rutile, and brookite consist of several intense bands, whereas kaolinite has only a weak Raman spectrum. Raman spectra of ten relatively pure kaolin and two halloysite samples that varied significantly in Ti content revealed the presence of anatase but neither rutile nor brookite in all samples. Comparison with chemical data indicates that Raman spectroscopy allows the detection of anatase in kaolin down to a concentration of 0.02%. The strongest Raman bands of many kaolins thus do not result from kaolinite but from ancillary anatase. Raman spectroscopy can therefore be recommended as a technique for the identification of anatase, rutile, and brookite in a variety of natural and synthetic materials over a wide range of concentrations.