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Determination of the refractive index of particles in the clay and sub-micrometer size range

Peter G. Weidler* and Frank Friedrich

Division of Nanomineralogy, Institute for Technical Chemistry-Water- and Geotechnology (ITC-WGT), Forschungszentrum Karlsruhe GmbH, Germany

Abstract

This paper describes a quick and simple method for the determination of the refractive index (RI) of very small particles by measuring the light intensity passing through a suspension of particles. Any commercial spectrophotometer and regular capillaries can be used. Since the RI of the liquid in which the particles are suspended can be prepared as requested, there are almost no limitations with respect to the range of the RI. The only limitations arise from the liquids that are available as well as their properties (e.g., viscosity, health risks). A Gauss-function describes the measured data that simplifies the determination of the RI of the mineral. Because the refractive index depends on the wavelength applied, the use of spectrophotometers allows for the determination of the variation of the RI at different wavelengths.

Keywords: Clay, refractive index, dispersion coefficient, layer silicates, nanocomposites, optical properties, small particles