
Kaolinite Particle Sizes in the <2 μM Range Using Laser Scattering

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Abstract: The Clay Minerals Society Source Clay kaolinites, Georgia KGa-1 and KGa-2, have been subjected to particle size determinations by 1) conventional sedimentation methods, 2) electron microscopy and image analysis, and 3) laser scattering using improved algorithms for the interaction of light with small particles. Particle shape, size distribution, and crystallinity vary considerably for each kaolinite. Replicate analyses of separated size fractions showed that in the <2 μm range, the sedimentation/centrifugation method of Tanner and Jackson (1947) is reproducible for different kaolinite types and that the calculated size ranges are in reasonable agreement with the size bins estimated from laser scattering. Particle sizes determined by laser scattering must be calculated using Mie theory when the dominant particle size is less than $\sim 5 \mu\text{m}$. Based on this study of two well-known and structurally different kaolinites, laser scattering, with improved data reduction algorithms that include Mie theory, should be considered an internally consistent and rapid technique for clay particle sizing.

Key Words: Kaolinite • Laser scattering • Particle size

Clays and Clay Minerals; October 1993 v. 41; no. 5; p. 613-623; DOI: [10.1346/CCMN.1993.0410512](https://doi.org/10.1346/CCMN.1993.0410512)

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