
Thin-Film Analysis of Clay Particles Using Energy Dispersive X-ray Analysis¹

G. N. White, V. E. Berkheiser, F. N. Blanchard and C. T. Hallmark

Soil Science Department, University of Florida, Gainesville, Florida 32611
Department of Geology, University of Florida, Gainesville, Florida 32611
Department of Soil and Crops Science, Texas A&M University College Station, Texas 77843

¹ Contribution from the Agricultural Experiment Station, University of Florida, Journal Series No. 3342.

Abstract: A standardless method of energy dispersive X-ray fluorescence in conjunction with scanning electron microscopy was used to analyze selected areas of clay-size particles of talc, pyrophyllite, and kaolinite supported by a carbon planchet. Peak intensity ratios of fluorescing elements relative to silicon were converted directly to weight or mole ratios using conversion factors determined theoretically. The conversion factors depend upon particle thickness and mass adsorption coefficients of the sample for the elements analyzed. The effects of particle thickness become significant above $\sim 0.1 \mu\text{m}$. Without using particle thickness corrections, the mean molar ratios of metal to Si agreed to within 6.1, 0.5, and 9.7% of the theoretical ratios for kaolinite, pyrophyllite, and talc, respectively.

Key Words: Chemical analysis • Energy dispersive X-ray analysis • Kaolinite • Particle thickness • Pyrophyllite • Scanning electron microscopy • Talc

Clays and Clay Minerals; October 1982 v. 30; no. 5; p. 375-382; DOI: [10.1346/CCMN.1982.0300508](https://doi.org/10.1346/CCMN.1982.0300508)

© 1982, The Clay Minerals Society

Clay Minerals Society (www.clays.org)
