# A New Assessment of X-ray Diffraction Methods in Soil Mineralogy. (S09-harris084557-Oral)

Authors:

- W.G.Harris\* University of Florida
- G.N.White Texas A and M University

## Abstract:

X-ray powder diffraction (XRD) analysis continues to be the most definitive technique for soil mineral identification because it provides direct crystallographic information. The heaviest methodological emphasis has been placed on the < 2-micrometer fraction, though XRD is applicable to all size fractions; and to phyllosilicates, though a variety of other mineral types is found in soils. There are conceptual and methodological dichotomies between fine vs. coarse fractions and phyllosilicates vs. other mineral classes. Mounting dilemmas make it difficult to apply uniform procedures to all size fractions, so it is important to rigorously account for unavoidable mountrelated biasing of XRD data. Preferred orientation, differential sedimentation, intra-species variations, nonexchangeable interlayer polymers, and interstratification continue to confound identification and quantification of soil minerals. However, software for modeling phyllosilicate XRD patterns is useful in accounting for interstratification and compositional variation. Also, selective dissolution in conjunction with computer-based differential XRD analysis permits the identification of minerals that otherwise could be missed in routine XRD analysis.

#### Corresponding Author Information:

Willie Harris University of Florida 1029 NW 34th Terrace Gainesville, FL 32605 phone: 352-392-1951 fax: 352-392-3902 e-mail: apatite@ufl.edu

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