

Quantification of quartz-kaolinite mixtures by XRD - Evaluation of different sample preparation techniques and calculation methods

WESTPHAL, T., GÖSKE, J. & PÖLLMANN, H. (Dept. of Mineralogy, Martin-Luther-University Halle-Wittenberg, Germany, gffci@mlugeos1.geologie.uni-halle.de)

China clay especially “pure” kaolinite is an important raw product for ceramical, pharmaceutical, and paper products. Natural resources of pure kaolinite are limited and do not meet the growing demand. High accuracy analytical methods for the quantification of accessories like quartz, hematite and goethite are required for evaluation of existing as well as exploration for new deposits. One of the leading producers of pure kaolinite is Brazil.

Kaolinites were analyzed from 1. Rio Capim / Belém / Pará, 2. Itacoatiara / Manaus / Amazonas and 3. Fortaleza dos Nogueiras / Imperatriz / Maranhão with a focus on samples from Rio Capim using powder diffraction methods. Different approaches to preparation techniques were checked on reproducibility. Calculations with linear and non-linear models had been successfully tested. The two basic steps for both methods are:

1. Selection of 2θ -range giving best reproducibility for the quartz-kaolinite mixtures
2. Calibration of quartz-kaolinite mixtures

Once established, the non-linear calculation method seems to be easier to use than the linear calculation method. On the other hand better accuracy can be obtained with linear calculation.