**High-temperature and quantitative XRD study of typical Westerwald clays (Germany)**

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Keywords: Westerwald, XRD, QPA, HTXRD

The Westerwald region is one of the largest and oldest clay mining area of Germany. Those deposits were formed during the Eocene and Oligocene as a result of the weathering, erosion and redeposition of Devonian rocks. During the Miocene, intense volcanic activities led to a large basalt cover, protecting the clays from the erosion. The fine fraction is mainly composed of kaolinite and illite, with the possible presence of interstratified I‑S. Other minerals such as quartz, feldspars, hematite, goethite or anatase are present in variable concentrations.

Four typical Westerwald clays were chosen for this study: kaolinite-rich clay, kaolinite-illite clay, a red and a yellow firing clays. The first goal is to perform quantitative XRD using two different methods and to compare them: reference intensity ratio (RIR) and Rietveld (using Topas and BGMN). The second goal is the study of those samples using high-temperature XRD (HTXRD). The samples were heated up to 1250°C and a XRD pattern was obtained *in situ* every 100°C. The results show the temperatures of vitrification and formation of mullite and cristobalite varying from one sample to another, which is mainly linked to their flux concentration.