

Meta kaolinite: Si & Al Precursors for Kalsilite Synthesis

ABSTRACT

Metakaolinite has been used as a silica and alumina precursor to synthesise kalsilite via the hydrothermal method with the addition of potassium hydroxide (KOH) as the potassium source. The effects of the KOH concentrations and reaction temperatures have been investigated. X-ray diffraction (XRD) diffractograms and field emission scanning electron microscope (FESEM) images showed the formation of hexagonal kalsilite after the hydrothermal reaction of metakaolinite at 190 °C in 1.25 M KOH for 24 hours. Kalsilite formed as a minor crystalline phase at a KOH concentration of less than 1.0 M KOH, while, at a higher KOH concentration, the crystallinity of the product increases. On the other hand, 190 °C was sufficient to convert metakaolinite to kalsilite. Besides, zeolite F and muscovite have been found as the dominant products at a lower KOH concentration and temperature, respectively