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Synthesis of nano-analcime with potassic hornblende syenite by direct alkali-hydrothermal treatment**Qi Yuxiang**

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Synthesis analcime with natural minerals and rocks has the characteristics of low raw material price and short synthesis time. The synthetic analcime was considered as promising materials for in situ recovery of contaminated soils. Analcime zeolite in nanometer scale was synthesized using alkali-hydrothermal treatment with potassic hornblende syenite as source of silica and alumina. Both the raw materials and the final products were characterized using X-ray diffraction (XRD), scanning electron microscope (SEM), Fourier transform infrared spectroscopy (FTIR). XRD results of the hornblende syenite exhibited microcline and plagioclase as main mineral components. Nano-analcime (nano-ANA) was obtained after 4 h hydrothermal-treatment at temperature of 240°C in 3.5 M NaOH solution. Higher NaOH concentration and longer reaction time led to decrease in the amount of analcime phase with corresponding increase in hydroxycancrinite. SEM images of the analcime crystals showed the formation of trapezohedral morphology with the size ranging from 300 nm to 600 nm. The dynamic light scattering (DLS) analysis demonstrated the average crystal size of the synthesized analcime was 410 nm. The results showed that the readily available potassic syenite could be used to prepare nano-ANA with good crystallinity in a short reaction time as well as leaching potassium to solve the problem of potassium resources deficiency in China. The results also indicate that the crystalline analcime can be prepared using natural quartz syenite as an economic raw material.

Biography

Qi Yuxiang is pursuing his Master's degree from the China University of Geoscience. His research focuses on comprehensive utilization of mineral resources, such as hydrothermal synthesis of zeolite, stabilization of heavy metals in soils or waste water using synthetic zeolite.

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