Experimental investigation on synthesis of merlinoite and gismondine zeolites by lithium alkaline solution under hydrothermal condition

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Abstract: This research was carried out to study hydrothermal synthesis of merlinoite and gismondine zeolites from perlite, as the raw material for the production of essential silica and aluminum, under alkaline condition, at a constant temperature of 150°C during 3 days. All experiments were performed on the same sample of perlite powder without any purification and all reactions were carried out into the teflon hydrothermal autoclaves. The phase compositions of resultant products were analyzed by X-ray diffractometer (XRD) and their morphology were examined by scanning electron microscope (SEM). According to experimental data, at a concentration of 0.25 mol/liter LiOH, only synthetic merlinoite crystallized, at the first phase. By increasing LiOH concentration to 0.5 mol/liter, gismondine was formed along with merlinoite, and then with more increasing LiOH concentration to 3 mol/liter, the production rate of gismondine has been overcome to the production rate of merlinoite.

Keywords: perlite; zeolite; phase transition; merlinoite; gismondine.

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