

Phase Transition of Natural Clinoptilolite to Phillipsite at Presence of Alkaline Solution

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Abstract: Clinoptilolite transforms to phillipsite under hydrothermal conditions in the presence of alkaline fluids. The effect of Na⁺ and K⁺ concentrations, temperature and time are the variable parameters in the present study. Alkaline solutions of KOH and NaCl were used in concentrations of 1.25 up to 7.5mol/lit at temperatures of 100 and 150 °C. Results of this study show that phillipsite has been synthesized at 100 and 150 °C and high concentration of K⁺ at the expense of clinoptilolite dissolution. With increasing K⁺ content of the fluids and reaction time, the amount of phillipsite increases drastically. Powder X-ray diffraction study has revealed a monoclinic (pseudo-orthorhombic) symmetry with the unit-cell parameters as follows for phillipsite: a: 10.104 Å, b: 14.305 Å, c: 14.618 Å, β: 91.401°.

Keyword: *clinoptilolite, phillipsite, hydrothermal synthesis, alkaline solutions*