

Synthesis of NaA zeolite from kaolin

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Zeolites are hydrated aluminosilicates of alkali metals and alkaline earth metals, which may be natural or synthetic. They have large applications such as organic catalysts, ion exchangers, and has a large adsorption capacity and also serve as molecular sieve. These properties are originate from their microporous structure. Due to its peculiar characteristics, zeolites are widely used in various industrial activities, especially in the petrochemical refining process of oil. The objective of this work is the synthesis of zeolite NaA by hydrothermal method, and clay kaolin group was used as a source of silicon (Si) and aluminum (Al) as crystallizing agent and a source of alkali metal was used the sodium hydroxide (NaOH). The methodology for the synthesis of zeolite NaA began with the process of thermal activation of kaolin at 900°C for two hours, temperature and time required for the activation process of transformation of kaolin into metakaolin. The metakaolin and kaolin samples were analyzed by infrared spectroscopy (IR) in the medium infrared range ($4000 - 400\text{cm}^{-1}$) and, also, by X-ray diffraction (XRD), confirming the degradation of the crystal structure of kaolin for the phase amorphous, the metakaolin. The sample of metakaolin was added to a concentrated solution of the mineralizing agent, NaOH, and placed in a reactor of teflon coated with aluminum and taken to an oven at 100°C for 18h, time required for one to complete the reaction. Finally the sample was washed successively until constant pH and dried in a furnace at 100°C for 4h. Then, tests were performed for characterization by infrared spectroscopy, and X-Ray Diffraction. Spectra and diffraction patterns obtained from the samples were compared later with the current literature.