

## Synthesis and characterization of Zeolite/Fe<sub>3</sub>O<sub>4</sub> nanocomposite by green quick precipitation method.

### ABSTRACT

A green quick precipitation method was successfully used for synthesis of magnetic iron oxide nanoparticles (Fe<sub>3</sub>O<sub>4</sub>-NPs) on the surface of sodium/potassium type zeolite. Ferric chloride, ferrous chloride and sodium hydroxide aqueous solutions were used in the synthesis and coating of the Fe<sub>3</sub>O<sub>4</sub>-NPs on the surface of the zeolite to produce the zeolite/magnetic iron oxide nanocomposite (zeolite/Fe<sub>3</sub>O<sub>4</sub> -NCs). The reaction was performed in aqueous suspension phase under the ambient condition as green chemistry method. Characterization with Fourier transforms infrared spectroscopy (FT-IR), powder X-ray diffraction (PXRD), scanning electron microscopy (SEM), energy dispersive X-ray fluorescence (EDXF) and transmission electron microscopy (TEM) confirmed the formation of Fe<sub>3</sub>O<sub>4</sub>-NPs with mean particle sizes of  $3.55 \pm 1.02$  nm on the surface of the zeolite.

**Keyword:** Nanocomposites; Zeolite; Iron oxide nanoparticles; X-ray powder diffraction; Transmission electron microscopy; Scanning electron microscopy; Energy dispersive X-ray fluorescence.