

## Synthesis and Characterization of Zeolite/Fe<sub>3</sub>O<sub>4</sub> Nanocomposite Material and Investigation of Its Catalytic Reaction

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**Abstract :** In this paper, Fe<sub>3</sub>O<sub>4</sub>/NaY zeolite nanocomposite with different molar ratio were successfully synthesized and characterized using FT-IR, XRD, TGA, SEM and VSM techniques. The SEM graphs showed that much of Fe<sub>3</sub>O<sub>4</sub> was successfully coated by the NaY zeolite layer. Also, the results show that the magnetism of the products is stable with added zeolite. The catalytic effect of nanocomposite investigated for esterification reaction under solvent-free conditions. Hence, the effect of the catalyst amount, reaction time, reaction temperature and reusability of catalyst were considered and nanocomposite that created from zeolite and 16.6 percent of Fe<sub>3</sub>O<sub>4</sub> showed the highest yield. The catalyst can be easily separated from reaction with the magnet and it can also be used for several times.

**Keywords :** zeolite, magnetic, nanocomposite, esterification

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