

PREPARATION AND CHARACTERIZATION OF MAGNETIC POLYURETHANE ELASTOMER NANOCOMPOSITES REINFORCED BY $\text{Fe}_3\text{O}_4@\text{SiO}_2$ NANOPARTICLES

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Abstract

In this study, magnetic polyurethane (PU) elastomer nanocomposites were synthesized by incorporating Superparamagnetic $\text{Fe}_3\text{O}_4@\text{SiO}_2$ nanoparticles into PU matrix through in situ polymerization method [1]. Fe_3O_4 nanoparticles were synthesized by co-precipitation of Fe^{+3} and Fe^{+2} as reaction substrates and NaOH as precipitant. The core-shell-structured nanoparticles ($\text{Fe}_3\text{O}_4@\text{SiO}_2$) were prepared by sol-gel method [2]. effect of surface modification of Fe_3O_4 nanoparticles on thermal and mechanical properties of magnetic polyurethane elastomer nanocomposite was investigated. The samples were characterized by Fourier Transform Infrared Spectrophotometer(FT-IR), Thermogravimetric analysis (TGA), and Vibrating Sample Magnetometer(VSM). The morphology and dispersion of the nanoparticles in the magnetic nanocomposites were studied by Scanning Electron Microscope(SEM).

Keywords: Polyurethane, nanomagnetic foam, Fe_3O_4

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