**Physico-Chemical nanomaterials science**

**Removal of anionic dye from aqueous solutions using Fe3O4 / OMt magnetic nanoparticles**

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In the present study, the adsorption process was employed for the removal of Reactive Yellow 81 (RY81) from aqueous solutions using a magnetically separable Fe3O4/OMt nanocomposite as a novel adsorbent. The synthesized Fe3O4/OMt material was characterized by using XRD, scanning electron microscopy (SEM) and Fourier transform infrared spectroscopy (FTIR). Analysis results confirmed that the well incorporation of the Fe3O4 nanoparticles together DTAB molecules between the clay galleries. The influencing parameters of the adsorption system including the adsorbent amount, initial dye concentration, initial solution pH and contact time were investigated at 293K. The results showed that the removal efficiency decreased with the increasing initial dye concentration, and pH[1]. Optimum adsorbent dosage was found to be 1.25 g/L. Experimental adsorption data were modeled by different equilibrium isotherms such as Langmuir, BET, Freundlich, Temkin, Dubinin-Radukevich isotherms. The adsorption process fitted well to pseudo-second-order and intraparticle diffusion kinetics and the Langmuir model. Based on the obtained results, it was concluded that the adsorption occurs through both the physical interactions and by trapping the dye molecules in a similar effect to the cage effect[2]. In addition, it was understood that the Fe3O4/OMt is a promising adsorbent for the applications of dye removal from aqueous solutions.

1. Acisli, O., et al., *Ultrasound-assisted Fenton process using siderite nanoparticles prepared via planetary ball milling for removal of reactive yellow 81 in aqueous phase.* Ultrasonics Sonochemistry, 2017. **35**(Part A): p. 210-218.

2. Chang, J., et al., *Adsorption of methylene blue onto Fe3O4/activated montmorillonite nanocomposite.* Applied Clay Science.