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Investigation of adsorption kinetics of Phenobarbital on Fe_3O_4/SBA-16-NH_2 nanocomposite

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In traditional drug delivery systems, the drug is distributed throughout the body through the circulatory system, and due to the distribution of the drug throughout the body, only a small percentage of the drug reaches the target tissues. The purpose of targeted drug delivery is to increase the drug concentration in the target tissue and decrease its concentration in other tissues. To achieve this goal, the designed systems must be such that the body's defense system is not stimulated and the carriers can stay longer in the bloodstream and reach the target tissue to a greater extent. In this study, the kinetics of phenobarbital drug absorption on Fe_3O_4/SBA-16-NH_2 magnetic nanocomposite as a drug carrier was investigated. For this purpose, Fe_3O_4/SBA-16-NH_2 magnetic nanocomposite was synthesized in the first step. Then, zero-order, pseudo-first-order, pseudo-second-order, and Higuchi models were investigated to find the best kinetic model of phenobarbital drug absorption on Fe_3O_4/SBA-16-NH_2 magnetic nanocomposite. The results showed that the loading process of phenobarbital in Fe_3O_4/SBA-16-NH_2 magnetic nanocomposite is consistent with the pseudo-first order model. Figure 1 shows the synthesis strategy of Fe_3O_4/SBA-16-NH_2 nanocomposite and its application in phenobarbital drug loading and release.

***Keywords*:** Adsorption; Response Surface Methodology; Phenobarbital; Fe_3O_4/SBA-16-NH_2; Drug Delivery.

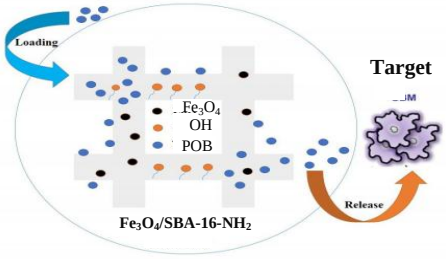


Figure 1- Synthesis strategy of Fe_3O_4/SBA-16-NH_2 nanocomposite and its application in phenobarbital drug loading and release

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