عنوان مقاله:

Mechanism and performance study of multi-wall carbonnanotubes decorated with nano-zero valent iron(nZVI@MWCNTs) for nitrate reduction

محل انتشار:

سومین کنفرانس بین المللی دستاوردهای نوین پژوهشی در شیمی و مهندسی شیمی (سال: 1395)

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خلاصه مقاله:

In this work, multi-wall carbon nanotubes (MWCNTs) were used as an supporter nano-zero valent iron (nZVI) particles to fabricating a composite known as nZVI@MWCNTs . The composite was then characterized and applied in the nitrate removal process in a batch system under the anoxic conditions. The influential parameters such as pH, various concentrations of nitrate and composite were investigated within 240 min of the reaction. The mechanism, kinetics and end-products of nitrate reduction were also evaluated. Results revealed that theremoval nitrate percentage for nZVI@MWCNTs composite was higher than that of nZVI and MWCNTs alone. Experimental data from nitrate reduction were fitted to the Langmuir-Hinshelwood kinetic model. The values of observed rate constant (kobs) decreased with increasing the initial concentration of nitrate. Our experiments proved that the nitrate removal efficiency was favorable once both high amounts of nZVI@MWCNTs and low concentrations of nitrate were applied. The predominant end-products of the nitrate reduction were ammonium(84%) and nitrogen gas (15%). Our findings also revealed that ZVI@MWCNTs is potentially a good composite for removal/reduction of nitrate from aqueous solutions.

کلمات کلیدی:

Zero valent iron nanoparticles, Carbon nanotubes, Nitrate, Supported, Magnetic composite

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