

STUDY OF THE DEGRADATION PROPERTIES OF THE MODIFIED SI-NANOIRON FOR IN-SITU REMEDIATION TECHNOLOGIES

STUDIUM DEGRADAČNÍCH VLASTNOSTÍ UPRAVENÉHO SI-NANOŽELEZA PRO IN-SITU SANAČNÍ TECHNOLOGIE

Petra Janouškovcová, Lenka Honetschlägerová, Jiří Burkhard

Institute of Chemical Technology in Prague, Department of Environmental Chemistry, Technická 5, 166 28 Praha 6, Czech Republic, e-mail: petra.janouskovcova@vscht.cz

Abstract:

This report deals with the study of surface modified nanoiron particles by silica oxides. The previous study confirmed a positive effect of the silica oxides on stability of the nanoiron particles. Generally, the particles of zero-valent nanoiron are able to decompose chlorinated ethylenes effectively. For this purpose, the verification of the degradation properties of the modified nanoiron particles towards these contaminants was necessary. The degradation properties of both the original and modified nanoiron particles were compared by using batch experiments. Our experiments revealed that the surface modification limits reactivity of the nanoiron particles. Characterisation of the nanoiron particles was carried out by scanning electron microscopy. During the experiments, a content of the zero-valent iron was measured. The measurements demonstrate that the used surface modification has no significant negative effect on the content of the zero-valent iron.

Keywords:

remediation, in-situ, nanoiron, stabilization, silica, degradation, chlorinated ethylenes