

TRANSPORT CHARACTERISTIC OF SILICA MODIFIED NANOSCALE ZERO VALENT IRON IN POROUS MEDIA

STUDIUM VLIVU KŘEMÍKOVÉ STABILIZACE ELEMENTÁRNÍHO NANOŽELEZA NA JEHO MOBILITU VRSTVOU MODELOVÉ ZEMINY

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Abstract:

The transport characteristics of silica stabilized nanoscale zero valent iron NANOFER 25S (N25S) were investigated for experimental soil. Laboratory column experiments were conducted to compare the mobility of commercial product N25S and silica stabilized suspension Si-N25S. Moreover the effect of injected concentration was tested. Three different concentrations were used 100 mg.L⁻¹, 500 mg.L⁻¹ and 1000 mg.L⁻¹. The injection of N25S caused especially the enrichment of first 10 cm of the soil and iron was not detected in the outlet of the columns. In the case of Si-N25S injected iron particles were detected in greater distance from the point of injection and also in the outlet of the columns. The percentage of iron in the eluent during the injection of Si-N25S decreased with increasing injected concentrations. The largest amount of injected iron (75%) passed through the column in the case of the lowest injecting concentration of 100 mg.L⁻¹. Both N25S and Si-N25S caused decrease in redox potential at the output of the column. Our experiments showed positive effect of silica on the mobility of N25S in porous media.

Key words:

Nanoiron, stabilization, silicate, transport, in-situ, remediation