

Test of reducing power of nano zero-valent iron particles using nitrate as a chemical probe

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Abstract

Nano zero-valent iron (NZVI) has been extensively researched for treatment of hazardous and toxic wastes. In particular, it can be applied to remediate contaminated sites directly. In this study, the NZVI was synthesized by using chemicals of NaBH_4 and FeCl_3 . The conditions for NZVI synthesis were varied by these parameters such as air exposure, feeding rate of NaBH_4 (3.3-10 mL/min), and agitation power (200-300 rpm). Right after completion of NZVI particles of different varieties, nitrate of 100 ppm was used to probe its reducing power. Of these three parameters investigated, it appears that the agitation of reaction solution plays a major role in determining its reducing power of NZVI particles. Besides, air exposure of reaction also posed noticeable change on the final residue of nitrate, whereas the synthesis with the studied range of NaBH_4 feeding rate exhibited no significant effect on nitrate reduction.

Keywords: environmental nanotechnology, nanoparticles, nitrate, zero-valent iron