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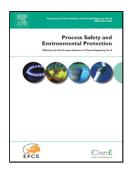
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Arsenic and Selenium removal from water using Biosynthesized Nanoscale zero-

valent iron: A factorial design analysis

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ABSTRACT

Environmentally friendly method is reported for the synthesis of nanoscale zero-valent iron

using plant extract as a reducing agent. The biosynthesized nanoparticles were characterized

using FESEM, EDS, XRD, FT-IR and TGA. A factorial design analysis was conducted to

determine the influence of different factors affecting the removal of arsenic (As) and selenium

(Se) from water using biosynthesized nanoscale zero-valent iron. The factors investigated

include; pH, adsorbent dosage, initial concentration, contact time and shaker speed. It was

observed that the effect of adsorbent dosage was most significant for the removal of arsenic

from water. At 95 % confidence level, dosage variation showed more than 30% increase in

removal efficiency when it was varied between 10 mg and 100 mg. About 95 % of arsenic

removal was recorded using 100 mg adsorbent at solution pH 3. For selenium removal, the

effect of adsorbent dosage showed a relatively positive influence. About 90 % removal

efficiency was recorded at Se solution of pH 3 which signifies the applicability of the material

for real samples.

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