

Improvement in Ni (II) Adsorption Capacity by Using Fe-Nano Zeolite

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Abstract : Fe-nano zeolite adsorbent was used for removal of Ni (II) ions from aqueous solution. The adsorbent was characterized by Fourier transform infrared spectroscopy (FT-IR), scanning electron microscopy (SEM) and the surface area Brunauer-Emmett-Teller (BET) using for analysis of functional groups, morphology and surface area. Bath adsorption experiments were analyzed on the effect of pH, time, adsorbent doses and initial Ni (II) concentration. The optimum pH for Ni (II) removal using Fe-nano zeolite was found at 5.0 and 90 min of reaction time. The maximum adsorption capacity of Ni (II) was 231.68 mg/g based on the Langmuir isotherm. The kinetics data for the adsorption process was fitted with the pseudo-second-order model. The desorption of Ni (II) from Ni-loaded Fe-nano zeolite was analyzed and even after 10 cycles 72 % desorption was achieved. These finding supported that Fe-nano zeolite with high adsorption capacity, high reuse ability would be utilized for Ni (II) removal from water.

Keywords : Fe-nano zeolite, adsorption, Ni (II) removal, regeneration

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