Removal of Fe and Zn from strong acid industrial residues with iron oxides. (S09-costa044737-Oral)

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Abstract:

Strong acid liquid residues (SALR) produced within the galvanization industry contain large amounts of heavy metals, very dangerous to the environment. A SALR loaded with Fe and Zn was successfully neutralized with NaOH 0,5M in the presence of different pure synthetic iron oxides (ferrihydrite, goethite, maghemite, magnetite and lepidocrocite) used as catalysts surfaces. Fe and Zn were precipitated in different steps of the neutralization process due to their differences in Ksp and pKa. Chemical and mineralogical analysis of the solution and solid phases, independent of the iron oxide used, showed that the Fe content from the solution was over 90% coprecipitated with some of the other metals up to pH 5-6. The remaining Zn solution was coprecipitated with the left over metals up to pH 10, leaving a very clear and almost free of heavy metals solution. The coprecipitation of the iron oxides with the other dissolved metals changed their X-rays diffraction patterns and mostly their specific surface area (SSA). The iron oxides (hematite, maghemite and magnetite) mostly increased their SSA after the dissolution procedures while the hydroxides (ferrihydrite, goethite and lepidocrocite) decreased.

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