

Depyritization of US Coal Using Iron-Oxidizing Bacteria: Batch Stirred Reactor Study

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Abstract : Microbial depyritization of coal using chemoautotrophic bacteria is gaining acceptance as an efficient and eco-friendly technique. The process uses the metabolic activity of chemoautotrophic bacteria in removing sulfur and pyrite from the coal. The aim of the present study was to investigate the potential of *Acidithiobacillus ferrooxidans* in removing the pyritic sulfur and iron from high iron and sulfur containing US coal. The experiment was undertaken in 8 L bench scale stirred tank reactor having 1% (w/v) pulp density of coal. The reactor was operated at 35°C and aerobic conditions were maintained by sparging the air into the reactor. It was found that at the end of bio-depyritization process, about 90% of pyrite and 67% of pyritic sulfur was removed from the coal. The results indicate that the bio-depyritization process is an efficient process in treating the high pyrite and sulfur containing coal.

Keywords : *At.ferrooxidans*, batch reactor, coal desulfurization, pyrite

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