

AN ABSTRACT OF A THESIS

AN EXPERIMENTAL STUDY ON THE OXIDATION
OF COAL PYRITES USING
THERMOPHILIC MICROORGANISMS

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Master of Science in Chemical Engineering

Experiments were performed for the oxidation of two different kinds of coal pyrites using thermophilic microorganisms of the genus Sulfolobus. Variations in the microbial growth media and operating conditions with respect to agitation and aeration were examined for the microbial oxidation. The reaction products were analyzed for soluble sulfate and soluble iron.

Oxidation of either kinds of pyrite used in this study was absent using Sulfolobus acidocaldarius. S.brierleyi was found to oxidize pyrite with an efficiency of approximately 50 percent based on removal of pyritic sulfur. Variation in the microbial growth media caused precipitation of reaction products which apparently inhibited microbial oxidation. Improved oxidation was found in a biochemical reactor supplemented with accessories for agitation and aeration in comparison to a static flask. Uninoculated control experiments showed no signs of oxidation.

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