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Title:

Abstract:

The solar furnace research project at Valparaiso University utilizes a decoupled solar thermal electrolysis process for the production of H₂ from water. We are focusing on an iron oxide system, which involves the conversion of magnetite to hematite in a cyclical process. Our experimental study for the iron oxide system confirmed that the electrolytic oxidation and thermal reduction steps of the metal oxide occur in a laboratory scale environment. Unfortunately, some of the Fe⁺³ products for the magnetite system stays in solution when the electrolysis is done in a strong acid. We needed to develop methods to quantify the fraction of iron remaining in solution in order to maximize solid phase recovery. Our analyses provide data consistent with the expected Fe⁺²: Fe⁺³ ratio. We will continue with improving solid phase hematite recovery.