Junior Endowed Professorship in Chemical Engineering – Annual Report, 2018-19

Timothy C. Eisele, Associate Professor, Dept. of Chemical Engineering

Funds provided for the Junior Endowed Professorship were used as seed money for an iron electrowinning project. Work done in the past year has been collecting proof-of-concept data to determine conditions where iron(II) can be dissolved in an aqueous solution while suppressing the formation of iron(III), and then determining the conditions where metallic iron can be produced by electrolysis. In particular, the effects of glycerin, sucrose, and carbonate on the solubility of iron(II) ions are being determined, as well as their ability to maintain a reducing environment that retards oxidation to iron(III).

Work is continuing in the current semester. Once sufficient initial data is collected, this will be used as the basis for a research proposal to develop a commercially feasible process that can be used to sustainably produce metallic iron without consuming coal or other fossil fuels.