The United States has set ambitious goals for the future, aiming to reduce greenhouse emissions by 50-52% below 2005 levels by 2030. Additionally, it is looking to reach 100% carbon pollution-free electricity by 2035. To meet these objectives, chemical processes that manufacture hydrogen from waste or natural gas must be modeled to optimality to satisfy product specifications, as well as safety, economic, and environmental constraints. However, classical optimization of a chemical process is challenging due to the number of variables and algebraic equations defining each unit operation, as well as the nonlinear complexity of these first principles models, which makes calculating the derivatives used in the optimization algorithm a difficult and resource-consuming task. To improve solver convergence reliability and reduce solve times, we demonstrate the implementation of data-driven optimization based on surrogate modeling.