

### **Abstract**

Saccharin is a synthetic sweetener otherwise known as Sweet n' Low. Saccharin is produced for consumer consumption as a tool for managing weight, weight loss, and diabetes. Since saccharin is a mass produced product, it is important to develop a greener way of synthesizing it to decrease harmful byproducts, and to increase the efficiency of synthesis. In this experiment, the starting material, toluene, was converted to 2-methyl benzene-1-sulfonic acid using the electrophilic aromatic addition of sulfuric acid. This was followed by converting the sulfonic acid functional group to a sulfonamide group using sodium hydroxide (NaOH), thionyl chloride (SOCl<sub>2</sub>), Dimethylformamide (DMF), ammonium hydroxide (NH<sub>4</sub>OH), and tetrahydrofuran (THF). Lastly, the oxidation of o-toluenesulfonamide yields the final product, saccharin. In order to make this experiment more green, the original solvent tetrahydrofuran (THF) is replaced with the less irritating methyl tertiary butyl ether (MTBE). This replacement reduces the health hazards on individuals coming into contact with the solvent. The second green revision replaces thionyl chloride (SOCl<sub>2</sub>) for a less flammable and less hazardous halogenating agent phosphorus tribromide (PBr<sub>3</sub>).