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SYNTHESIS AND EVALUATION OF TOLBUTAMIDE ASSISTED BY MICROWAVE OVEN

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ABSTRACT

Microwave synthetic methods were devised for three lab reactions. The synthesis of tolbutamide. These reactions are all done in either general chemistry or organic chemistry. Under conventional heating methods, the tolbutamide synthesis requires heating at 55 °C for 30 minutes. The proposed microwave methods provide shorter reaction times (10 min. at 175 watts) while maintaining similar, if not better, yields. The tolbutamide synthesis was shortened to 7 minutes, and the Claisen condensation was shortened to 4.5 minutes. The microwave method produced 70.70% yield for tolbutamide, while conventional yield was 50.50%.

INTRODUCTION

Microwave chemistry allows such reactions to proceed at a fraction of the time, and boasts better yields. A microwave emits oscillating magnetic fields, causing polar molecules to rotate along with the magnetic field. This movement of molecules causes more interactions between molecules. Microwave reactions have been shown to be much faster, making these reactions useful. One such use is applying microwave chemistry in the undergraduate organic lab. Using a microwave in the organic chemistry lab can help students learn about optimization, while reducing wasted time in the lab. Students can run multiple reactions in the time it usually takes to run one reaction.^[1] Most of the peptide synthesis is carried out on a solid phase and it has been observed that microwave irradiation enhances the deprotection, coupling, cyclization, condensation, isomerization, oxidation, reduction, cycloaddition, rearrangement, nucleophilic substitution and cleavage of chemical reactions. Based on the

