

WIU CENTENNIAL HONORS COLLEGE
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Abstract

Poster

Major: Forensic Chem

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The Microwave Assisted Synthesis of Azo Dyes

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Azo dyes accounts for 60-70% of all dyes. They all contain an azo group, $-N=N-$. They are generally synthesized in two steps: the diazotization of aromatic primary amines followed by the coupling reaction between diazonium salts and phenols or aromatic amines. The color of azo dyes include different shades of yellow, red, orange, brown and blue by choosing different phenols and amines. In the traditional method, the first step usually requires low temperature such as 0-5 oC due to the unstableness of the diazonium salts formed. The overall reaction time is long and the procedure is tedious. In our project, we are going to use a simpler and faster method to make azo dyes which is assisted by microwave. The reaction will be carried out in one pot and solvent free condition. We are going to grind a mixture of an aromatic amine, sodium nitrite, potassium hydrogen sulfate and a phenol to fine powder using pestle and mortar. A drop of water will be added to the mixture to initiate the reaction. The mixture will be irradiated in a domestic microwave oven for several minutes until the completion of the reaction. In contrast to the conventional two-step synthesis of azo dyes, our method has a number of advantages, such as reducing the reaction time, improving the yields and simplifying the experimental procedures. The reaction will be carried out in solvent-free condition. Solvent-free reactions obviously reduce pollution, and bring down handling costs due to simplification of experimental procedure, work up technique and saving in labor. These would be especially important during industrial production.