

ABSTRACT

This study developed the synthesis of lead oxide (PbO) material using a green chemistry approach with red shoot leaf extract (*Syzygium Myrtifolium*) as a capping agent, which plays a role in the formation of eco-friendly material. The primary objective of this study is to decolorize Remazol Black B (RBB) dye solution using a Fenton Like Reaction method with PbO from green synthesis approach as a catalyst. In addition, this study evaluates the effects of variations in H₂O concentration, H₂O₂ volume, and the mass of green synthesis PbO on the decolorization process in order to determine the optimum operating conditions. The research stages include sample preparation, green synthesis of PbO, material characterization, analysis using UV-Vis Spectrophotometry, Chemical Oxygen Demand (COD) analysis, Atomic Absorption Spectroscopy (AAS), and Fluorescence analysis. The research results showed that the highest decolorization efficiency reached 69,99% in *Remazol Black B* solution with a concentration of 20 ppm (25 ml) after a contact time of 1 hour. The findings demonstrate the potential of green synthesized PbO as an effective catalyst for dye waste water treatment and contribute to the development of sustainable nanomaterials based on green chemistry principles.

Keywords: Green synthesis, red shoot leaf extract, lead oxide (PbO), decolorization, Fenton Like Reaction, Remazol Black B.