

SUMMARY

Increased textile industry activity can lead to greater use of synthetic dyes, which can harm the environment. One dye that is toxic and difficult to degrade is Methyl Orange (MO), due to the presence of azo groups contained in the dye. Therefore, a more effective waste treatment method is needed to reduce the content of these dyes. This study aims to decolorize Methyl Orange (MO) dye using the Fenton-like Method with a mixture of PbO and PbO₂ catalysts.

The research method was carried out by decolorizing 10 ppm Methyl Orange dye using a mixture of PbO and PbO₂ as catalysts and H₂O₂ as a Fenton reagent. The variations in treatment included the molar ratio of PbO:PbO₂, the mass of catalyst used, and the H₂O₂ concentration. The effectiveness of decolorization can be assessed by measuring the decrease in absorbance at a specific wave length using a UV-Vis spectrophotometer, supported by AAS analysis to determine the Pb²⁺ ion content, and COD analysis to determine the organic compound content in the solution.

The results obtained show that the use of a mixture of PbO and PbO₂ provides better decolorization efficiency, with the most optimal molar ratio of PbO:PbO₂ at 2:1. After that, the most optimal catalyst mass was obtained at 8:4, and the most optimal H₂O₂ concentration was at 9%. In the decolorization process using the Fenton method, the formation of hydroxyl radicals ([•]OH) plays an important role in the degradation of dyes.