

ABSTRACT

Decolorization of remazol black B dye solution using the Fenton-like Method with PbO_2 from battery waste and new batteries has been carried out. The decolorization process in this study was carried out in several stages starting with the characterization of PbO_2 powder from battery waste using XRF, preparation of remazol black B dye solution, determination of the maximum wavelength of remazol black B, making a calibration curve, the decolorization process of remazol black B using the Fenton-like Method with PbO_2 from battery waste with variations in volume and concentration of H_2O_2 and also the number of moles of PbO_2 to determine the optimum conditions, the decolorization process of remazol black B using the Fenton-like Method with PbO_2 from new batteries at optimum conditions. Decolorization of the remazol black B solution was carried out by testing the UV-Vis spectra with the remazol black B solution before decolorization, COD analysis, and AAS analysis to determine the Pb metal content. The results showed that the decolorization of remazol black b solution with PbO_2 from battery waste was more effective than PbO_2 from new batteries. Decolorization of remazol black b was carried out under optimum conditions with a concentration of 100 ppm in a volume of 50 mL with variations in volume and concentration of 15% H_2O_2 as much as 25 mL and the amount of PbO_2 of 4 mmol. Fenton-like Method using PbO_2 from battery waste produced a final concentration of 1.9 ppm, with a decolorization percentage reaching 98.02% and a decrease in COD value of 65,64%. The results of the UV-vis spectrum of the Fenton-like Method using PbO_2 powder from battery waste showed a fairly good decrease compared to before decolorization. This study shows that PbO_2 from battery waste can be an alternative catalyst that is environmentally friendly and sustainable in the processing of textile dye waste.

Keywords: Fenton-like Method, decolorization, remazol black B, lead dioxide, hydrogen peroxide, COD