

ABSTRACT

Water pollution caused by dye waste from textile industry activities is one of the environmental issues that can lead to various human health and aquatic ecosystem problems if left unaddressed for too long. One of the dyes used is Naphthol Blue Black. Naphthol Blue Black is an azo dye that has the potential to be difficult to degrade naturally in the environment due to its resistance to heat and light radiation. Applying photocatalytic methods to degrade Naphthol Blue Black dye is an appropriate and effective approach. In this study, a GO/CuO composite was synthesized as a photocatalyst with good synergistic properties and the potential to serve as a reusable catalyst for degrading Naphthol Blue Black dye. The process began with the synthesis of graphene oxide (GO) using the Hummer's method, with graphite as the precursor. Then, CuO was synthesized using the precipitation method with copper (II) acetate monohydrate as their precursor and sodium hydroxide as the precipitating agent. Subsequently, the GO/CuO composite was synthesized using as simple dispersion method. Material characterization was performed using FTIR, XRD, SEM-EDX Mapping, UV-DRS Spectrophotometer, and photodegradation testing of Naphthol Blue Black dye using a UV-Vis Spectrophotometer. The photodegradation test results for Naphthol Blue Black dye reached an optimal level of 82.56% in the GO/CuO-1 composite, making the GO/CuO-1 composite a reusable catalyst for three consecutive cycles with results of 82.16% in cycle 2 and 81.15% in cycle 3. When compared to other materials, such as GO/CuO-2 (77.22%), GO/CuO-3 (70.87%), CuO (62.60%), and GO (23.39%), the GO/CuO-1 composite was far more optimal for degrading Naphthol Blue Black dye.

Keywords: *GO/CuO composite, naphthol blue black, photocatalyst, reusable catalyst*