

Cahyani, Novia Indah, 2019, “Graphene Oxide (GO) from Corncobs and Its Application as Go-Fe₃O₄ Catalyst for Tetracycline Degradation by Fenton-Like Process”, Thesis, under Supervisor Dr.rer.nat. Ganden Supriyanto, M.Sc. and Ahmadi Jaya Permana, S.Si., M.Si. Chemistry Bachelor Degree, Department of Chemistry, Faculty of Science and Technology, Universitas Airlangga, Surabaya

ABSTRACT

Antibiotics has a role in treating various diseases that affect death and reduce the quality of aquaculture product. Tetracycline is one of the antibiotics mostly found in aquaculture wastewater obtained from the results of aquaculture livestock metabolism. Extensive use of this antibiotic results in damage to aquatic ecosystems, and induce the generation of gene resistance. Degradation of the tetracycline antibiotic removal was done using GO- Fe₃O₄ catalyst by Fenton-like Process. GO-Fe₃O₄ catalyst was synthesized by attaching the magnetite Fe₃O₄ into the surface of graphene oxide (GO). GO was obtained from the synthesis of corncob-based graphite and synthesized by PAOM method. The results of FTIR characterization indicated the presence of O-H, C=O, C=C, and C-O functional groups which are the main functional groups of GO. The XRD result showed peak of 2θ at 23,67° indicated the presence of GO. The characterization of GO-Fe₃O₄ showed the presence of Fe-O functional group indicated that Fe₃O₄ binds to GO on its surface. The degradation parameters were decided to determine the optimal conditions of pH, GO-Fe₃O₄ catalyst mass, and H₂O₂ concentration. The results of the study showed the optimum degradation obtained at pH 4, the mass of GO-Fe₃O₄ 0.15 g/L, and 15mM H₂O₂ concentration. The degradation of tetracyclines which has added into aquaculture waste water was done in optimal conditions, resulting in the efficiency of tetracycline degradation of 51,92%. The high rate of degradation shows that GO- Fe₃O₄ is able to degrade tetracycline effectively by Fenton-like Process.

Keywords : corncob, graphene oxide, catalyst, GO-Fe₃O₄, degradation, tetracycline