PHOTODEGRADATION OF CONGO RED IN AQUEOUS SOLUTION BY USING ADVANCED OXIDATION PROCESS (AOPs) TECHNIQUE

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This Final Year Project Report entitled **"Photodegradation of congo red in aqueous solution by using advanced oxidation process (aops) technique"** was submitted by Ninna Sakina Azman, in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons) Chemistry, in the Faculty of Applied Sciences, and was approved by

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ABSTRACT

Mn^{2+} AS A CATALYST IN THE PHOTODEGRADATION OF CONGO RED IN AQUEOUS SOLUTION

Congo Red (CR) is one of the complicated azo dyes which consist of three N=N double bonds. Significantly, to degrade the dyes contained in the waste water, it is necessary to choose the best method. The method that had been used in this project is advanced oxidation process or best known as AOPs method. The AOPs method used was divided into two which are Fenton process and Heterogeneous photocatalytic reaction. The Heterogeneous photocatalytic reaction which participate the present of TiO_2/UV shows a great degradation rate compared to the Fenton process with the present of Mn^{2+}/H_2O_2/UV. This is because, only small volume of TiO_2 needed to degrade the CR compared to the Mn^{2+}/H_2O_2. This is prove with 0.00133 mol of both TiO_2 catalyst and Fenton reagent, the present of TiO_2 catalyst already provide the 98.32% compared to Fenton reagent which only 87.58% of percentage degradation. The highest dye removal efficiency in both AOPs method were obtained in the acidic medium, pH 3 with time taken 90 minutes and with the highest concentration of Mn^{2+} and mass of TiO_2 which are 0.05 M, 99.92% and 0.339 g, 98.82% respectively. FTIR on the elimination of the N=N double bonds in chemical structure of CR also had been studied. Furthermore, factors that affect the photocatalytic degradation also been studied which were concentration of CR, concentration of H_2O_2, concentration of Mn^{2+}, mass of TiO_2 and lastly the effect of pH.