

**SOLAR PHOTOCATALYTIC DEGRADATION OF METHYLENE  
BLUE(DYE) BASED ON TiO<sub>2</sub>**

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## ABSTRACT

### SOLAR PHOTOCATALYTIC DEGRADATION OF METHYLENE BLUE (DYE) BASED ON TiO<sub>2</sub>

Solar photocatalytic was a widely possibilities of energy sources that combine the solar or sunlight and chemical to acquire the chemical reaction. The reaction that produces had been identifying from this experiment. Based on this study, to remove the colour of wastewater pollution, a photocatalytic process was used to examine the rate of methylene blue (MB) degradation efficiency by using a TiO<sub>2</sub> as semiconductor and illuminated by solar light and UV light. The MB was used as an example of dye and the degradation process are totally depends on the MB decreasing colour. From this degradation, the chemical reaction between the semiconductor and dye can be illustrated and it undergoes the definition of solar photocatalytic itself. The chemical reaction was formed when the ·OH radical was attacked towards the MB or heteropolyaromatic and leading to hydroxylated metabolites. The reaction also involved when the TiO<sub>2</sub> semiconductor reacts with addition of energy such as solar irradiation and UV light to release heat. At this time, the holes of semiconductor trapped the ·OH radical to form a simple compound. According to the observation of experiment, the MB solution was almost completely degraded by the solar irradiation with the TiO<sub>2</sub> and for UV light 40% of dye was remained. Furthermore, the degradation efficiency of MB solution was higher in solar radiation than the artificial UV light even unnatural UV light consist a higher wavelength of light intensity which is 254 nm. Ahead to a photosensitization process receive and degradation efficiency encourages made this photocatalytic imputed that various visible light domain of solar irradiation was valuable for exciting the MB molecules to absorbed the TiO<sub>2</sub>. The result revealed that MB degradation under darkness also shown some changed on the color. These have proved in the experiment where MB degradation under dark consist 15.91% degradation while under UV light and solar radiation had 63.96% and 94.27% degradation.