

RESEARCH PROJECT

**DECOLOURIZATION OF HAZARDOUS DYES USING
BENTONITE-TiO₂ COMPOSITE**



Submitted by:

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SURABAYA
2017**

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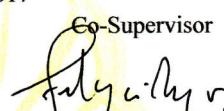
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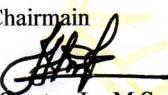

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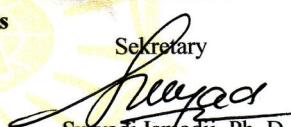

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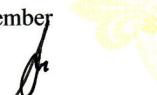
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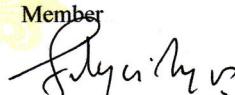
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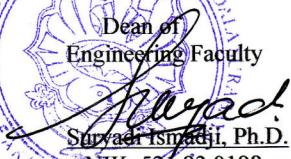

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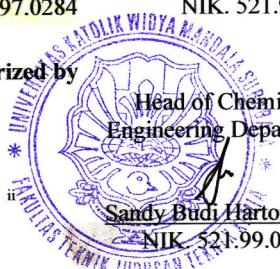
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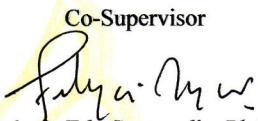
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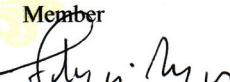
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ABSTRACT

The organic dyes from textile has become a common problem in environment. Wastewater containing dyes usually toxic and difficult to be degraded by water, microbes, light and chemical. To solve this problem waste water treatment needs to be done in proper away. One technique dyes wastewater treatment that is easy and low cost to do is adsorption process. The adsorption process usually uses bentonite as adsorbent because bentonite has the ability for ion exchange and swelling. However bentonite as adsorbent is not effective in term of adsorption capacity and not reusable. Organic dyes are difficult for direct adsorption using bentonite, so it should be modified with photocatalysts compounds which can increase the adsorption capacity and accelerate the rate of adsorption.

TiO₂ is the most preferred photocatalyst, because it has been regarded as an efficient photocatalyst for degradation of organic pollutants from water due to its high stability, low cost and environmental friendliness. In this study, bentonite was combined with TiO₂ to produce a composite, which called bentonite titanium dioxide composite (BTC). In this research BTC was applied to adsorb dyes as adsorbent. BTC used as adsorbent because has high adsorbtion capacity. This research is aimed to study the mass of ratio TiO₂ and bentonite in the preparation of adsorbent composite for cationic dyes adsorption in various temperature, pH, with/without UV irradiation on the adsorption capacity. This research best composite was obtain (based on highest adsorption capacity) using BTC 10%. This composite can adsorb dyes as much as 0.3571 mmol/g at under UV radiation using 200ppm as initial concentration in 120 minutes at 70°C. The composites were characterized using FTIR to analyse the functional group.