

## ABSTRAK

### POTENSI TANAH SAWAH SEBAGAI ADSORBEN BERBIAYA MURAH DENGAN MODEL ADSORBAT ZAT WARNA METILEN BIRU

Indonesia dikenal sebagai negara agraris yang memiliki luas lahan sawah mencapai sekitar 10,41 juta hektar. Tanah sawah mengandung mineral silika, silikat dan aluminosilikat. Tanah sawah memiliki kemampuan dalam mengadsorpsi bahan kimia baik senyawa organik maupun anorganik. Tujuan penelitian adalah untuk menganalisis komposisi mineral yang terkandung dalam tanah sawah, menganalisis daya adsorpsi adsorben tanah sawah terhadap zat warna metilen biru dan model isoterm adsorpsinya. Sampel tanah sawah diambil pada 8 titik acak di kedalaman 20 cm dan dilakukan pemanasan pada suhu  $110^{\circ}$  C selama 24 jam. Komposisi mineral tanah sawah dikarakterisasi dengan difraksi sinar-X (XRD). Daya adsorpsi adsorben tanah sawah terhadap metilen biru diketahui menggunakan menggunakan spektrofotometer ultraviolet- sinar tampak (UV-Vis). Komposisi mineral yang terdapat pada sampel tanah sawah yaitu mineral kaolinit, dickit, nacrit, kuarsa dan kristobalit. Kondisi optimum proses adsorpsi tanah sawah terhadap zat warna metilen biru yaitu pada waktu kontak selama 6 menit 41 detik, dengan massa adsorben 0,0363 gram dan konsentrasi larutan metilen biru 101,7677 ppm. Adapun model isoterm yang cocok digunakan pada adsorben tanah sawah terhadap zat warna metilen biru ialah model isoterm *Langmuir*.

Kata-kata kunci: adsorben; tanah sawah; adsorpsi; metilen biru; mineral.



## **ABSTRACT**

### ***THE POTENTIAL OF RICE FIELDS AS A LOW-COST ADSORBENT WITH A METHYLENE BLUE DYE ADSORBATE MODEL***

*Indonesia is known as an agricultural country that has a rice harvest area of rice fields reaching around 10.41 million hectares. Rice paddy soil contains silica, silicate and aluminosilicate minerals. Rice fields have the ability to adsorb chemicals both organic and inorganic compounds. The purpose of the study was to analyze the mineral composition contained in rice field soil, to analyze the adsorption power of rice field adsorbents on methylene blue dye and its adsorption isotherm model. Rice field soil samples were taken at 8 random points at a depth of 20 cm and heated at 110 °C for 24 hours. The mineral composition of rice paddy soil is characterized by X-ray diffraction (XRD). The adsorption power of paddy soil adsorbent on methylene blue was determined using an ultraviolet-visible spectrophotometer (UV-Vis). The mineral composition found in the paddy soil samples were the minerals kaolinite, dickite, nacrite, quartz and cristobalite. The optimum conditions for the adsorption process of paddy soil on methylene blue dye were 6 minutes 41 seconds contact time, with an adsorbent mass of 0.0363 gram and a concentration of methylene blue solution has 101.7677 ppm. The isotherm model that is suitable for use in paddy soil adsorbents for methylene blue dye is the Langmuir isotherm model.*

*Keywords: adsorbent; rice fields; adsorption; methylene blue; mineral.*

