

**ADSORPTION KINETICS BANANA PEEL
AND CORNCOB BIO ADSORBENT IN REDUCING
NAPHTHOL YELLOW S DYE**

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ABSTRACT

Naphthol Yellow S is a textile dye waste that causes environmental pollution. Naphthol Yellow S contains chromophore and auxochrome groups which are difficult to degrade so that processing is necessary. Banana peels and corn cobs contain cellulose which can be used as a bioadsorbent. The research objective was to analyze the adsorption kinetics of banana peel and corn cobs bioadsorbent in reducing the dye Naphthol Yellow S in wastewater.

The type of this research is a true experiment with a one group pretest-posttest design. The research object used was artificial Naphthol Yellow S solution with an initial concentration of 80 mg/l applied to the adsorbent mass of 2 gr; 4 gr; 6 gr and contact time of 3 hours; 6 hours; 9 hours; 12 hours. Measurement of dye levels was carried out before and after treatment using the spectrophotometry method.

The results showed that the best adsorption test occurred in banana peel bioadsorbent with a concentration of 6 g/l with a stirring time of 3 hours. The adsorption study of banana peel and corn cobs bioadsorbent followed the Langmuir isothermal model with adsorption kinetics following the second order.

This study concluded that the bioadsorbent of banana peels and corn cobs was able to reduce the dye Naphthol Yellow S. Further research is needed by combining the bioadsorbents of banana peels and corn cobs to achieve maximum dye reduction.

Keywords : Banana Peel, Corn cob, Bio adsorbent, *Naphthol Yellow S*

**KINETIKA ADSORPSI BIOADSORBEN
KULIT PISANG DAN TONGKOL JAGUNG DALAM
MENURUNKAN ZAT WARNA *NAPHTHOL YELLOW S***

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ABSTRAK

Naphthol Yellow S merupakan salah satu limbah zat warna tekstil yang menyebabkan pencemaran lingkungan. *Naphthol Yellow S* mengandung gugus kromofor dan auksokrom yang sulit terdegradasi sehingga perlu dilakukan proses pengolahan. Kulit pisang dan tongkol jagung mengandung selulosa yang dapat digunakan sebagai bioadsorben. Tujuan penelitian adalah menganalisis kinetika adsorpsi bioadsorben kulit pisang dan tongkol jagung dalam menurunkan zat warna *Naphthol Yellow S*.

Jenis penelitian ini adalah *true experiment* dengan *pretest-posttest controlled group design*. Objek penelitian yang digunakan adalah larutan *Naphthol Yellow S* buatan dengan konsentrasi awal 80 mg/l diaplikasikan pada massa adsorben 2 gr; 4 gr; 6 gr dan waktu kontak 3 jam; 6 jam; 9 jam; 12 jam. Pengukuran konsentrasi zat warna dilakukan sebelum dan sesudah perlakuan menggunakan metode spektrofotometri.

Hasil penelitian menunjukkan uji adsorpsi terbaik terjadi pada bioadsorben kulit pisang dengan konsentrasi 6 gr/l dengan waktu pengadukan selama 3 jam. Studi adsorpsi bioadsorben kulit pisang dan tongkol jagung mengikuti model isothermal Langmuir dengan kinetika adsorpsi mengikuti orde dua.

Penelitian ini menyimpulkan bahwa bioadsorben kulit pisang dan tongkol jagung mampu menurunkan zat warna *Naphthol Yellow S*. Perlu dilakukan penelitian lebih lanjut dengan cara menggabungkan bioadsorben kulit pisang dan tongkol jagung untuk mencapai penurunan zat warna yang maksimal.

Kata Kunci : Kulit Pisang, Tongkol Jagung, Bioadsorben, *Naphthol Yellow S*