



UTILIZATION OF A-KERATIN OF WASTE CHICKEN FEATHERS IN ENVIROMENTAL AS ADSORBEN OF PROCION RED AND REMAZOL YELLOW DYE

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*Peer-review under responsibility of 3rd Asia International Multidisciplanry Conference 2019 editorial board
(<http://www.utm.my/asia/our-team/>)*

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RESEARCH HIGHLIGHTS

This paper is concerned with the dye waste Procion Red and Remazol Yellow dye adsorption using, chicken feathers as the adsorbent. The adsorption characterization of activated chicken feathers by Na_2S 0.1 N and non-activated chicken feathers was determined. Effect of variation experimental parameters pH, Contact time and variation dye concentration also being investigated in a batch adsorption method. Procion and Remazol Yellow were characterized by UV-Vis spectroscopy VV

The results show that the contact time and pH condition for adsorption equilibrium are 120 min for activated chicken feathers and 100 min for chicken feathers which were not activated by Na_2S at pH 3. Procion red dye absorption by activated and not activated chicken feathers follows Freundlich isotherm and follow Langmuir isotherm. For remazol yellow dye absorption by activated and not activated chicken feathers follows Langmuir isotherm and Freundlich isotherm and the reaction kinetics follow the Ho equation.

Keywords: Adsorption, Chicken Feather, Procion Red, Remazol Yellow

RESEARCH OBJECTIVES

Keratin is a product of hardening epidermal tissue from the body and is a fibrous protein that is rich in sulfur and is widely found in hair, nails and feathers (1). Chicken feathers contain high crude protein, which is 80-91% of dry matter, crude fat of 7.79% and crude fiber of 0.88%. The physical properties of keratin are insoluble in water and difficult to dissolve in alkaline solutions (2). The use of chicken feather waste as an adsorbent for textile dyes is expected to reduce the waste of chicken feathers that continue to increase.

MATERIALS AND METHODS

A. Material

The material used is chicken feathers obtained from farms in Boyolali, Central Java. The dyes used are synthetic remazol yellow and procion red. The chemicals used in this study are Na_2S (Merck), 2M CH_3COOH (Merck), CH_3COONa (Merck).

B. Tools

The tools used are a set of glass tools and instruments that are in the FMIPA UNS Chemical Laboratory. The instruments used were UV-VIS Spectrophotometer (SHIMADZU), FTIR Spectrophotometer (SHIMADZU), pH meter (LUTRON PE-03) and Surface Analyzer Area (SAA).

C. Making Chicken Feather Adsorbents

About 1 kg chicken feather is washed with water and detergent, then dried in the sun to dry and lost in smell. After drying, the chicken feathers are cut into small pieces and ground until smooth.

D. Treatment of Activation of Chicken Feathers with Alkali Solution

Each chicken feather was taken as much as 1 gram and activated using an alkaline solution of Na_2S 0.1N as much as 100 mL, then distorted for 20 minutes. This condition is an optimum condition (3). After 20 minutes, the mixture is filtered using a Buchner funnel. The residue obtained is dried in an oven at 50 oC. Then activated chicken feathers using characterization



RESULTS

One of the factors that influence the adsorption is pH because the optimum pH can affect the functional wall of the biomass so that it can affect the absorption of textile dyes. The solution used was procion red and remazol yellow 40 ppm dyes with heavy chicken feathers both activated and not activated by 0.2 gram with a contact time of 60 minutes shown in Fig. 1:

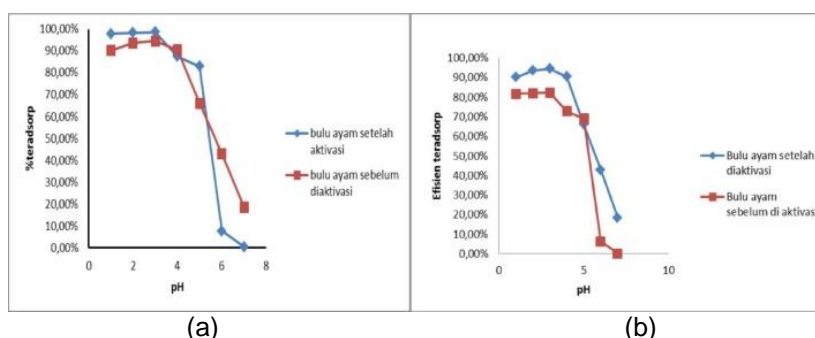


Fig. 1 influence of pH on adsorption of remazol yellow (a) and procion red (b) dyes

In Fig. 1 it can be seen that pH 3 is the optimum pH both when activated and not activated by the 2 dyes above. The color of remazol yellow has adsorbed efficiency of 85.10% when activated and when not activated is 95.51%. Procion red color when without activation is 94.49% and when activated is 98.62%. pH 3 is used for optimum pH.

FINDINGS

This paper we describe the results of research on the potential of chicken feather as a new adsorbent that can be used to overcome the decrease in environmental quality due to the presence of textile dyes in waste. The use of chicken feather waste as an adsorbent for textile dyes. Adsorption remazol yellow dye it potential use adsorbent from chicken feathers

ACKNOWLEDGEMENT

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