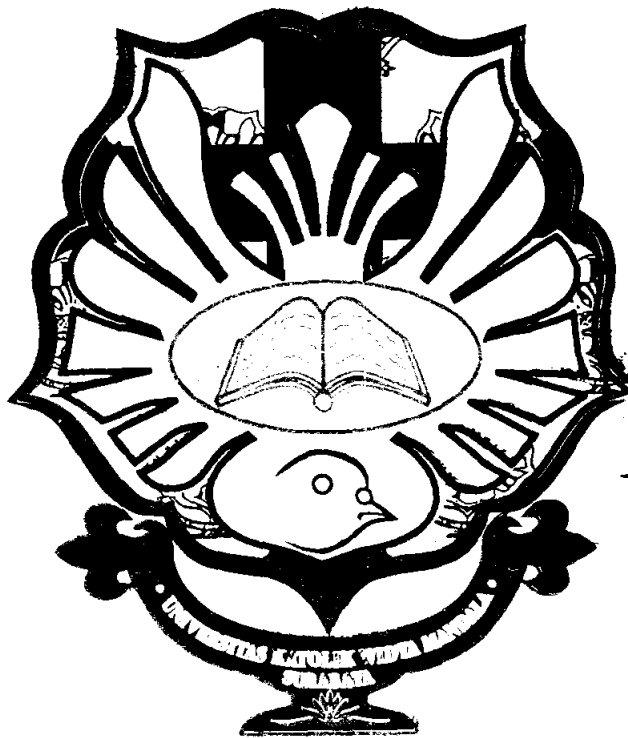


# RESEARCH PROJECT REPORT

## REMOVAL OF CHROMIUM (VI) FROM AQUEOUS SOLUTIONS BY DURIAN SHELL



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SURABAYA

2008

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**Removal of Chromium (VI) from Aqueous Solutions by Durian Shell**

which is prepared and submitted by:

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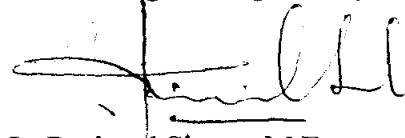
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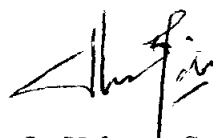
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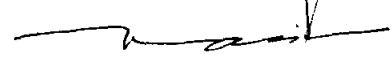
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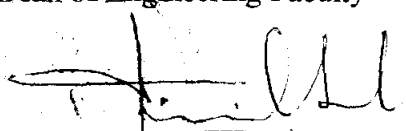
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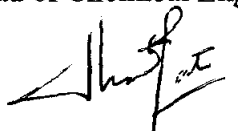
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## ABSTRACT

Direct discharge of waste and wastewater onto river and ground surface by most industry are still the main practice attributable to the economic constraints and lack of adaptable technology. To that end, leftover durian shells which are commonly available in large quantity without any further economic value are highlighted here to verify their potential employment as adsorbent so that they can be used further instead of ending as a merely waste.

The purpose of this research is to study the adsorption capacity, isotherm adsorption kinetics, thermodynamics and biosorption mechanism of Chromium (VI) using durian shell.

Isothermal experiments were carried out at four different temperatures and three different pH. Langmuir and Freundlich models fit the equilibrium data quite well ( $R^2 > 0.99$ ). On modeling its kinetics data, pseudo-second order model represents the system better than pseudo-first order model. Thermodynamically, the adsorption process was spontaneous, endothermic and irreversible. The characterization results suggest that chemisorption is the dominant mechanism in preference to physical sorption.

## DECLARATION SHEET

I declare that this research was my own work and not the others' work, some or all except be written in the text. If it is known that this research is the others' work, I am aware and accept the consequence that this research cannot be used as a prerequisite to receive "Bachelor of Engineering" degree.

Surabaya, November 24, 2008



The undergraduate student

(Kiki Trilestari / 5203005017)

## **DECLARATION SHEET**

I declare that this research was my own work and not the others' work, some or all except be written in the text. If it is known that this research is the others' work, I am aware and accept the consequence that this research cannot be used as a prerequisite to receive "Bachelor of Engineering" degree.

Surabaya, November 24, 2008



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## **LIST OF PUBLICATIONS**

Following papers related to this thesis have been published and submitted

Arief, V.O.; Trilestari, K.; Sunarso, J.; Indraswati, N.; Ismadji, S. "Recent Progress on Biosorption of Heavy Metals from Liquids Using Low Cost Biosorbents," *CLEAN (Soil, Water and Air)* 2008, In Press.

Arief, V.O.; Trilestari, K.; Sunarso, J.; Indraswati, N.; Ismadji, S. "Performance of Leftover Durian Shell for Cr (VI) Removal," *Journal of Hazardous Materials* 2008.

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The authors realize that the report is far from perfect, therefore any critics and comments which will better improve the research is gladly accepted. Lastly the authors hope that the report will be useful to all readers who need information regarding the research of the report.

Surabaya, November 24, 2008

The authors

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