

RESEARCH PROJECT

BENTONITE-ALGINATE POLYMER NANOCOMPOSITE FOR THE REMOVAL OF WATER-SOLUBLE CATIONIC DYE



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SURABAYA**

2017

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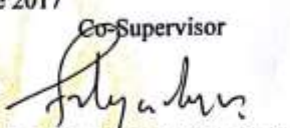
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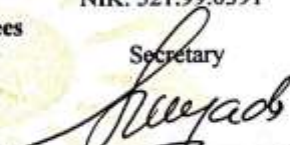

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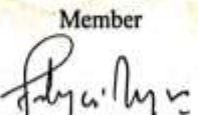
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PREFACE

The authors would like to thank God for His blessing that the Research Project entitled Bentonite-Alginate Polymer Nanocomposite for the Removal of Water-Soluble Cationic Dye has been accomplished. This report is a prerequisite in achieving Bachelor of Engineering degree in Chemical Engineering.

The authors realize that the completion of this report is achieved by the help of many people. There for, the authors would like to thank the persons below:

1. Suryadi Ismadji, Ph.D as Principal Supervisor and Felycia Edi Soetaredjo, Ph.D as Co-Supervisor;
2. Sandy Budi Hartono, Ph.D as Head of the Committees, Dra. Andriana Anteng Anggorowati, M.Si and Ery Susiany Retnoningtyas, ST., MT as members of committees;
3. Suryadi Ismadji, Ph.D as the Head of Chemical Engineering Process laboratory and Dra. Adriana Anteng Anggorowati, M.Si. as the Head of Chemical Analysis Laboratory;
4. Mr. Novi as laborant of Chemical Engineering Process Laboratory and Mr. Pudjo as laborant of Chemical Engineering Operation Laboratory;
5. Sandy Budi Hartono, Ph.D as Head of Chemical Engineering Department;
6. Suryadi Ismadji, Ph.D as Dean of Engineering Faculty;

7. Our parents and family who have given a lot of help and support, both materially and morally;
8. Our lecturers, friends and also those who are too many to be listed by name that had contributed their kind assistance.

The authors realize that this 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, May 22nd 2017

The authors

ABSTRACT

Dyes in wastewater produced from textile industry are hazardous pollutants and caused many environmental and health problems. There are various wastewater treatment for dyes removal, however one of the low cost and effective method is adsorption. In adsorption, good adsorbent is adsorbent that has high adsorption capacity, inexpensive and regeneratable. Activated carbon usually used as an adsorbent that has higher adsorption capacity compare to bentonite, but price of activated carbon is more expensive. In order to increase the adsorption capacity of bentonite as adsorbent, bentonite will be combine with natural polymer (alginate) to produce a composite, which called nanocomposite. This nanocomposite will be used to adsorpt cationic dye in wastewater of textile industry.

In this research, the process of nanocomposite preparation and performance was studied. Bentonite-alginate nanocomposite was made with ionotropic gelation method. First, bentonite was pre-treatment using hydrochloride acid 5 N, then bentonite dispersion and alginate solution was mixed in certain time then dropped into calcium chloride solution until gelispheres formed. Bentonite-alginate nanocomposite was tested in crystal violet dye as a model of dyes in wastewater textile industry. Adsorption capacity was measured using spectrophotometry method to determine the maximum adsorption capacity.

Keywords: adsorption, alginate, bentonite, crystal violet