

**COMPARATIVE STUDY ON TREATMENT OF
WASTEWATER USING VARIOUS TYPES OF
NATURAL COAGULANT**

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AUTHOR'S DECLARATION

I declare that the work in the thesis was carried out in accordance with the regulation of Universiti Teknologi MARA. It is original and is the results of my own, unless otherwise indicated or acknowledge as reference work.

I, hereby acknowledge that I have been supplied with the Academic Rules and Regulations, Universiti Teknologi MARA, regulating the conduct of my study and research.



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SUPERVISOR'S CERTIFICATION

I declared that I read this thesis and in my point of view this thesis is qualified in terms of scope and quality for the purpose of awarding the Bachelor of Chemical Engineering (Environment) with Honours.

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ABSTRACT

Demand of potable water keep increasing as the population growth. Water has been used in a variety of purposes such as in industries, daily activities and drinking. However, anthropogenic activities have degraded the quality of water and turbidity becomes a major concern in treating surface wastewater. Coagulation is a simple, effective and widely practiced wastewater treatment method. Chemical coagulant conventionally been used in treating turbid wastewater but it may pose adverse effect on human health and environment as well as producing voluminous toxic sludge. This review paper was conducted to determine the potential of natural coagulant to work as effective as chemical coagulant and analyse the coagulation parameter that effect the coagulation activity. A systematic literature review (SLR) which is SALSA method is used to identify, collect, synthesize and analyse data. A total of 10 plant-based coagulant and waste material are determined and demonstrated collectively in this review paper. FTIR spectrum result has verified that natural coagulant contains carboxyl and hydroxyl group which is the important properties in coagulating and flocculating. Turbidity removal efficiencies were verified to be remarkably affected by solvent extractions, pH variations and coagulant dose. Most of fruit peels showed to effectively reduce turbidity using sodium hydroxide (NaOH) as solvent extraction and some of plant-based coagulant worked successfully using distilled water due to plant's active component was water-soluble protein. In this review, most of studied natural coagulants required low dosage to achieve high removal turbidity which was in the range of 0.03-1.0 g/L. Some coagulant can effectively work either in highly acidic or alkaline, also in both or neutral pH. Overall, plant-based coagulant and waste material can potentially behave as chemical coagulant in treating turbid wastewater.