REVIEW ON EFFECTIVENESS Of 3 TYPES FRUIT SEEDS AS A NOVEL ALTERNATIVE TO THE CHEMICAL COAGULANT IN THE WASTEWATER TREATMENT PROCESS

NUR HANIS FIRZANAH BINTI RIDZUAN

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(NUR HANIS FIRZANAH BINTI RIDZUAN)

ABSTRACT

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For the treatment of wastewater which most common and cost-effective method, coagulation-flocculation was found. Chemical coagulants have been widely applied to enhance the coagulation process. On the other hand, chemical coagulants have several disadvantages, including the production of large amounts of sludge, the fact that they are non-biodegradable, and the presence of harmful substances to aquatic life. Natural coagulants are a possible answer because of global concerns about the adverse effects. Natural coagulants, on the other hand, still have a long way to go in terms of acceptance and widespread use in water commercial and industries. It is necessary to conduct a review to maximize the potential of using natural coagulants by highlighting current development and efforts to improve natural coagulant capability, such as demonstrating natural coagulant compatibility with other treatment technologies in integrated/hybrid treatment processes; natural coagulant modification for marked improvement in coagulation performance efficiency; and the synthesis of multifunctional natural coagulants. Hence, this review evaluated to investigate the efficiency of fruit seeds as a natural coagulant for replacing chemical coagulants as improving quality of water treatment. In this review, fruit seeds were chosen as natural coagulants are jackfruit (*Artocarpus heterophyllus*) seeds, mango (*Mangifera indica*) seeds, and banana trunk peduncles (*Musa)*. Meanwhile, this review also includes reviewing the effect of different coagulants on turbidity removal and coagulation activity by using a series of jar tests.

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CHAPTER 1

INTRODUCTION

1.1 Background of the study

Membrane separation, flocculation, solvent extraction, oxidation and reduction, coagulation, ion exchange, and electrolysis are only a few of the scientific technologies utilized to reduce impurities and pollutants in wastewater. The coagulation process is one of the most promising of these technologies for removing suspended solids, colloids, dissolved solids, and organic materials from wastewater. Coagulation is a physicochemical process in which the repulsive potential of the electrical double layer of colloids is lowered, resulting in micro particles that collide with one another to form larger structures known as flocs, and the entire process is known as flocculation. This application can be used to remove dissolved chemical species and turbidity by using chemical-based coagulants. For example, chemical coagulants like aluminium and ferric chloride are frequently used in conventional coagulation. However, when aluminium is employed as a coagulant in wastewater treatment, it can produce a variety of negative health effects, including intestinal constipation, memory