TREATMENT OF PAINT WASTEWATER BY USING *Tacca leontopetaloides* AS A NATURAL COAGULANT AND CALCIUM OXIDE AS A COAGULANT AID

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ABSTRACT

The research works involve the study of effectiveness of *Tacca Leontopetaloides* starch as a natural coagulant and Calcium Oxide and as its coagulant aid for the treatment of paint wastewater. Three main parameters were studied; chemical oxygen demand (COD), turbidity and heavy metals removal of effluent. Coagulation treatment using jar test were performed with a flocculation system where the effects of paint wastewater pH as well as *Tacca Leontopetaloides* starch dosage on coagulation effectiveness were probed. The highest record of COD and turbidity removal percentage were 95% and 60% respectively, observed for effluent at optimum pH 7 using 90 mL dosage. The metals concentration after treatment also showed significant removal which complied with Standard B of Environmental Quality (Industrial Effluent) Regulations 2009 stipulated by the Department of Environment (DOE), Malaysia. It could be conclude that *Tacca Leontopetaloides* starch showed great potential as a natural coagulant for water treatment purposes and could be applied in the pre-treatment stage of Malaysian paint wastewater prior to secondary treatment.

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CHAPTER ONE

INTRODUCTION

1.1 RESEARCH BACKGROUND

Water is the most ample compounds found in nature, covering approximately three-fourths of the surface of the earth. However, there are several factors that have limit the amount of water available for human use as the ocean and other saline water bodies which cover 97% of total water supply are not suitable for most purposes. The remaining 3% including little over 2% is the glaciers and ice caps, along with the atmospheric and soil moisture is inaccessible. Therefore, humans only left with the remaining 0.62% found in fresh water lakes, rivers, and groundwater supplies to be used to support human needs [1]. During this era, the growth of populations and industrial activities has been uncontrollable, especially those which overuse of water in their production. In 2005, the World Water Development Report (WWDR) has published global estimates [2] that the water reserves in the world could decline by up to 40% by 2030 under the current business-as-usual (BAU) scenario [3].

The usage of water in the production especially chemical production is widely known. However, some of the productions are overused the water usage causing a concern to the scientific community as it is one of the environmental issues. The effluent from industrial may contain toxic compound which can endanger the aquatic life when it is discharge directly to the water bodies. In India and many developing countries these water treatment sludge discharged directly into downstream side of the river or disposed into nearby stream which ultimately meet the downstream river. This has causes negative impact on the quality and aquatic life [4].