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STUDY ON EFFICIENCY OF SEDIMENTATION TANK

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SYNOPSIS

The purpose of this project is to study the efficiencies of sedimentation using a model sedimentation tank at certain flowrates.

The sedimentation tank used in this project was the H 310 Mk II Model Sedimentation Tank. The size of the tank is 100cm * 40cm * 20cm. Calcium Carbonate was used as samples in the sedimentation studies. 10% w/w of Calcium Carbonate was obtained and used for the feed tank. The retention time adopted was 30 minutes from which the flowrates were obtained.

The values of the flowrates were chosen as one eighth, one quarter and half of the calculated flowrates which were 0.33, 0.66 and 1.32 l/min. For each chosen flowrate, experiment was conducted with and without baffles. The baffle was placed at 50 mm from the inlet weir and 90 mm from the tank top.

Samples were taken at the inlet zone, outlet zone and along the tank at 25 cm distance from each other (3 stations) with the aid of pipette. It was allowed to settle out in a graduated measuring cylinder for 30 minutes which was the chosen retention time.

The sample depths were measured and the efficiency of the sedimentation tank was obtained.

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CHAPTER ONE

INTRODUCTION

1.1 GENERAL INTRODUCTION OF SEDIMENTATION

Sedimentation or settlement is a separation process, usually carried out over several hours in tanks, utilizing the effect of gravity¹. Sedimentation is utilized in water and wastewater treatment to separate suspended solids from water or wastewaters². Removal by sedimentation is based on the difference in specific gravity between solid particles and the bulk of liquid, which results in settling of suspended solids. Separation may also be carried out by a centrifuge.

There are several ways in which settlement is commonly used in sewage works:

(1) To selectively settle out the hard gritty material in grit channels, grit traps, etc.

¹ D. Barnes and F. Wilson, *Chemistry And Unit Operations In Sewage Treatment*, Applied Science Publishers, pg. 109 - 111.

² R.S. Ramalho, *Introduction To Wastewater Treatment Processes*, 2nd Edition, Academic Press, pg. 80