I INTRODUCTION

Production of potable water from a water supply contained matter involves a series of unit processes. Coagulation is one of the most important unit processes employed in the clarification of turbid waters or colored water.

In the purification of surface waters and contaminated ground water for public supply, chemical coagulation is normally employed. The chemicals required varies with the changes in the composition of the raw water.

Although chemical coagulation for removal of colloidal impurities from water has been used in water treatment plant technology up to the present time there is little progress in the development of electrochemical processes for water purification, except the development of forced-flow electrophoresis apparatus was designed for removal of colloids and electrodialysis for desalting of the processed water.

Recently SUWAN(1971) developed a Pilot plant-scale ELETRICAL FLOCCULATOR having maximum workable outler flow of about four litres per minute which can produce coagulation of solid particles in waters from main sources as well as domestic and industrial wastes containing colloidal suspensions.

Purpose of Research

It was the purpose of this research to study the feasibility and applicabity in coagulation of raw water by electrical means. The process might be used to replace chemicals means if it is not too expensive compared with conventional method.

The device was designed to see if it could be performed satisfactory based on the basis of producing a rapid of settling of floc and leaving low residual turbidity and color in the supernatant of coagulated water although the mechanism of transfer of electrical energy was not clearly explained and required further investigation. Also, an attempt was made to compare the estimated unit production cost of both chemical and electrical treatment methods and also to find out the effect of variables involved in the coagulation treatment of raw water. An effert was put to obtain an empirical formula for predicting optimum settling time that gave less residual turbidity and color. Relatinship between electrical energy supply (in wattage) and effluent overflow from the unit will also be established.

Scope of Investigation

Scope of this research was divided into two parts :

1. Coagulation by chemical means.

The sample of natural turbid waters from the intake to Samsen Water Works were analyzedto determine initial pH, turbidity, color, alkalinity, and some inorganic contents. In conducting an experiment in this part, the jar test was selected for determination of optimum speed, optimum alum dosage ($Al_2(SO_4)_3.18H_2O$), optimum coagulant aids (using lime), and also optimum pH giving supernatant of high percent transmission and shortening the time required for effective coagulation and clarification.

2. Coagulation by electrical means.

The experiment was conducted with an electrical insulated column

designed and developed by SUWAN(1971) for coagulation of natural turbid waters. The electrical supply and effluent overflow rates were varied in order to determine the optimum turbidity and color reduction conditions. Some physical and chemical characteristics of treated water were analyzed in the same manner as initial raw waters. Cost analysis by both chemical and electrical treatment methods were determined in order to provide lower-cost product.