Environmental Engineering and Management Journal

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
http://www.eemj.icpm.tuiasi.ro/; http://www.eemj.eu

"Gheorghe Asachi" Technical University of Iasi, Romania

EFFECT OF PEAT WATER FLOCCULATION WITH MUNG BEAN SEED (VIGNA RADIATA) COAGULANT ON SURFACE LOADING RATE (VO) AND DETENTION TIME (TD) USING A SETTLING COLUMN

Dewi Fitria*, Rina, Lita Darmayanti, Nesa Zafira

[1]*Environmental Engineering Study Programme, Faculty of Engineering of Riau University, Kampus Binawidya KM 12,5, Simpang Baru, Pekanbaru 28291, Indonesia*

Abstract

Peat water has a brown to dark black colordue to the organic plant material turning into peat and the high content of dissolved organic matters, such as humic acid and its derivatives. One method used to reduce organic matters and the color of peat water is flocculation and coagulation process. Coagulation and flocculation can be used to reduce turbidity, microorganisms, color, organic compounds, and so on. This research aims to analyze the settling column in order to obtain an isoremoval graph of peat water that has been coagulated and flocculated using Mung bean seeds and obtain the surface loading rate (Vo) and detention time (td) to make it easier to calculate and determine sedimentation tanks for peat water treatment. The operating conditions varied were settling column depths of 25 cm, 50 cm, 75 cm, 100 cm, and 125 cm with sampling times for each port of 10 minutes, 20 minutes, 30 minutes, 45 minutes, and 60 minutes. The results showed that the best removal of organic matters was 93.10 % and for color it was 87.83 % at a settling column depth of 25 cm with a settling time of 60 minutes. The surface loading rate value obtained to produce 80 % deposition is 50 m3/day-m2 m3/day-m2 with a detention time of 40 minutes.

Key words: column settling, surface loading rate, detention time, Mung bean seeds

Received: October, 2024; Revised final: July, 2025; Accepted: September, 2025

* Author to whom all correspondence should be addressed: e-mail: dewifitria@lecturer.unri.ac.id