

DEVELOPMENT OF LOW COST
WASTEWATER TREATMENT SYSTEM
FOR SMALL SCALE BATIK INDUSTRY

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June 2003

PENGHARGAAN

Setinggi-tinggi penghargaan dan ribuan terima kasih ditujukan kepada semua mereka yang terlibat dalam menjayakan penyelidikan ini, secara langsung ataupun secara tidak langsung.

Di antaranya:

Semua Kakitangan Biro Penyelidikan dan Perundingan

Tn. Hj. Azini dan Encik Chee Teck Hock daripada Taman Pertanian Malaysia, Shah Alam, Selangor.

Semua pelajar-pelajar ijazah lanjutan di bawah penyeliaan saya.

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ABSTRACT

Batik industries generate varieties of waste liquor from cleaning, processing and dyeing processes. Disposal of the batik wastewater with pH ranges from 4 to 13 can affect an environmental problem due to high content of dissolved solid and toxic compound as well as colour body. In this study, a newly invented plant-based coagulant, known as KN1 was introduced in batik wastewater treatment. KN1 was produced from an herbaceous family plant, which is sturdy and can be easily found in tropical country. The treatment was successfully implemented by using All-In-One Concept (AOC) treatment plant. The AOC wastewater treatment plant was designed to use KN1 in order to meet the requirements of the Environmental Quality Act. The pilot plant is able chemically and physically treats the batik wastewater in the same reaction tank; hence minimize the area occupied and modification of the existing batik making apparatus. The treatment started with coagulation and flocculation process, followed by sedimentation of solid particles, finally filtration using specially designed activated carbon (GAC) column. The most suitable pH for KN1 and HCl for coagulation and flocculation process was ranging from 1 to 2.5 with 8 x 4 USS mesh non-washing GAC. The results show that the average COD and BOD reduction were 91 per cent and 72 per cent respectively. The average removal for total solid (TS), total suspended solid (TSS) and volatile suspended solid (VSS) were almost 100 percent. While, the turbidity was reduce from 447 NTU to colourless after 50 hours treatment. Heavy metals constituents show a reduction up to 80 per cent as well as oil and grease constituent. Despite the biodegradable properties, KN1 also shows the non-selectivity in treating batik wastewater compare to Polyaluminium Chloride (PAC) and Polydadmac (PDMC).