

## C717885 : MAJOR ENVIRONMENTAL ENGINEERING

KEY WORD: POWDER ACTIVATED CARBON / PACT / REACTIVE DYE

KAMONRAT DEEPRASERTWONG: ENHANCEMENT OF ACTIVATED SLUDGE  
SYSTEM FOR TEXTILE WASTE TREATMENT BY ADDITION OF POWDER  
ACTIVATED CARBON. THESIS ADVISOR:

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The purpose of this study is to investigate the effects of PAC upon the enhancement of AS for textile waste treatment. The wastewater from the cotton fabric and thread dyeing plant containing mostly reactive dyes was used, having COD concentration between 229-280 mg/l and colour between 39-122 Su.

The PAC doses of 0.25, 50, 100, 150 and 215 mg/l were studied in the AS system which were operated at a hydraulic retention time and a sludge retention time of 1 day and 7 days respectively. The average MLSS in the aeration tank were 374, 527, 699, 1090, 1506 and 1729 mg/l and the average SVI were found to be 47.58, 58.33, 30 and 33 ml/g respectively. The average effluent COD were found to be 72, 60, 60, 58, 53 and 39 mg/l respectively; and the effluent colour of 80, 69, 59, 45, 32 and 35 Su respectively, were obtained. The average COD removal were 70, 74, 74, 79, 81 and 84 % respectively; and the colour removal of 18, 26, 37, 50, 64 and 68% respectively, were obtained. This experiment clearly showed that the addition of PAC to the AS system significantly increased the colour removal efficiency and improved the settleability of sludge but could only slightly increase the COD removal efficiency.

According to the experiments, the AS process alone was found to remove COD below the effluent standard, issued by the Ministry of Science, Technology and Environment, of 120 mg/l but was able to remove the colour approx. from 100 Su to 80 Su. The PACT system was found to remove the colour down to approx. 30 Su at the PAC dose of 200 mg/l but the cost of this PAC dosage was about 8 baht/m<sup>3</sup>. Furthermore, about 4.5 times of sludge was produced from the PACT system more than the AS system.

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