

CHAPTER 5 : CONCLUSION

5.1 COAGULATION AND FLOCCULATION

Based on the present study, the following conclusions were derived:

- 1) Treatability of paint waste water can be affected by the pH of the waste water. In the pH range of 4.0 – 4.5 it was observed that the floc formation was minimal, however when the pH was increased to between pH 7.0 – 7.5 flocs were easily formed. The studies showed that the optimum pH for the treatment of the effluent was 7.5
- 2) Zeta potential studied carried out on the treated effluents confirmed that at pH 7.0 – 7.5 the colloidal dispersion was completely destabilised. As the pH of the treated effluent approached neutrality, the Zeta potential of the treated effluent approached zero.
- 3) Effective treatment of the effluent can only be achieved by employing alum in combination with polyelectrolytes. Treatability of the effluent improved with use of polyelectrolytes in combination with alum compared to use of alum only. Maximum COD and turbidity removal rates of 74% and 99.6% were recorded.
- 4) At the optimum pH of 7.5, the optimum dosage of alum was determined as being 700mg/L. The optimum dosage of polyelectrolyte in combination with alum at 700mg/L was determined as being 6 mg/L

5.2 MEMBRANE FILTRATION

The present studies were successful in showing that permeate of acceptable quality can be produced by using chemically treated effluent from the WWTP for reuse in various operations within the plant.

The studies showed that pretreatment of the effluent was required as untreated effluent had an effect on the limiting flux of membrane filtration process. It was deduced that flux rates were twice higher for the chemically treated effluent as compared to untreated effluent. Pump speed had no effect on quality of the permeate produced.

Microbiological test carried out on effluent before and after chemical treatment and after membrane filtration confirmed that microbiological contamination was negligible after membrane treatment. Low viable counts of microbiological organisms present in the permeate could be caused by reuse of tubes and the cellulose acetate membrane. This problem can be overcome by passing alcohol or steam through the system prior to use.