CHAPTER 8

DISCUSSION

In this study, we found that the raw characteristics of textile dyeing wastewater vary in composition and streangth. The variation is owing to the color change from time to time during the process. So the coagulant used must be chosen from the average value of raw characteristics of wastewater. And, for the industry; we must choose the coagulant that the cost is rather cheap, efficiency in the flocculation and easy to handle. Though the disadvantage of the alum are the less dense of the floc. slower and longer period in setting than the iron floc. But it is cheaper, easier to use and handle, easier to decrease the color and pH in the effluent. Consequently, we decided to use the alum as the coagulant.

When using activated carbon column, the color and organic matter are removed completely; but when the wastewater that has high pH passing through the column, the black color is occurred due to the desorption of activated carbon. And we found that in removing both the color and organic matter by this method, the rate of flow must be slow, the cost of of activated carbon is rather expensive; so this method is not as good as the coagulation.

The results of this study shows that:

Figure 13, the higher the pH the more alum dosage is used.

Figure 14, the removal of alkalinity is irregular, they depend on the pH value and the composition of wastewater.

Figure 15, the COD removed rapidly in initial and turn to slow when alum dosage is more than 300 ppm. This shows that the optimum dosage in removing COD is 300 ppm.

Figure 16, in using more dosage of the alum the more color is removed and turn to slow at alum dosage more than 300 ppm.
Figure 17, the removal of turbidity depends on the alum dosage.
Figure 18, the removal of suspended solids are very good at the alum dosage of 300 ppm. The aame as the COD removal.

So the alum dosage of 300 ppm. is suitable for treating this wastewater. The removal of color is not regular, it depends on the type of the dye used. It is difficult to remove red color because it is the true color.

Table 12 shows that for the alum dosage 200 ppm. the COD, suspended solids and the color are removed 42.0 %, 89.9 % and 15.6 % respectively. And when the dosage is increased to 400 ppm. The removal of COD, suspended solids and color are 42.0 %, 91.5 % and 23.0 % respectively. This shows that the removal of the color is increased when we increase the dosage of alum.

The object of this study is to remove COD and suspended solids rather than the color, because the COD and suspended solids are the main problem of stream pollution. So the dosage of the alum 300 ppm. is suitalbe in treating this wastewater and give the result good enough for discharge into the stream.

We will compare with the study of Nemerow*, Nemerow has reported complete removal of color from a mixed sewage and textile dyeing wastewater by the treatment with alum 200 ppm. at pH 8.3 or with alum 140 ppm. at pH 7.0, a 63 percent reduction in BOD_5 was also achieved. From this study,it is difficult to determine BOD_5 of wastewater due to high in pH and temperature then the determination of the chemical oxygen demand is instead. We used the alum dosage 300 ppm. for the treatment, the reduction in COD was about 60-75 percent. In the raw characteristics of wastewater, the high in the pH is due to the process of the scouring so if we separate scouring wastewater from the composite wastewater, the pH of wastewater is not more than 9, the alum dosage will be less than the former. If we used activated carbon as the aid, the color will be removed more than when using alum alone. Due to the change in color from time to time during the process, the dosage of activated carbon using as an aid will change accordance with the color. This is difficult to handle, because the activated carbon is small in grain size, low in density and difficult to settle, so using alum alone is more convenient and gives good result than alum plus activated carbon.

From Table 16, we adjusted the pH of wastewater from 10.2 to 6.8 by conc. sulfuric acid and use alum 300 ppm. the same dose as using with the wastewater which does not adjust the pH. The result is not better, because in this pH value alum is good solubility so that the turbidity will increase due to the alum floc.

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* Nemerow, N. L. "Textile Dye Waste Treatment" North Carolina Dept. Eng. Research Bull No. 55, 165-70. 1952.