

Chapter VI

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The theoretical treatment from dimensional analysis for mass transfer with chemical reaction in fluidized bed yielded the following correlation

$$Sh \in {}^a Sc^{-c} = K_1 Re^b + K_2 Cr^n \quad (2.19)$$

From previous works on solid-liquid system without chemical reaction and from this experiment it was possible to evaluate all the constants and exponents of the correlation for benzoic acid-NaOH system, which was found to be

$$Sh \in {}^{1.25} Sc^{-1/3} = 0.686 Re^{0.584} + 187.1 Cr^{1.369} \quad (4.1)$$

The first term on the right-hand side corresponded to the mass transfer without chemical reaction and was shown to be that of benzoic acid-water system. The second term was due to chemical reaction.

6.2 Recommendation

The study of mass transfer with chemical reaction in fluidized bed should be further carried on as follows.

1. The diffusivity of benzoic acid in NaOH solution should be determined.
2. The initial concentration of NaOH solution should be further increased to investigate the validity of the mass transfer correlation.

3. Investigation at other operating temperatures should be made. This results may give further explanation to the second term in Eq.(4.1).

4. Sintered plate distributor should be used.

5. The reactants of chemical reaction should be changed to get the new information of mass transfer in other systems.