CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

From this study of axial dispersion in small diameter packed beds with very small particle diameters , the main conclusions and recommendations are presented as follows .

7.1 Conclusions

This study measured axial dispersion coefficients using a combination of flow region of Reynolds numbers between 0.18 - 3.3 , small diameter tube , and very small sized active adsorbents which have seldom been reported elsewhere . The axial dispersion coefficients obtained vary between 0.035 -2.80 cm^2/s .

The effect of particle diameter indicates that dispersion increases with decreasing particle size .

A study of the effect of tube diameter indicates that as the tube size becomes smaller so does the dispersion . This is true in the case where tube to particle diameter ratio is 10 or above where the tube wall effect is supposed to be negligeable

It is shown that the axial dispersion obtained from our condition has the same order of magnitude as molecular diffusion . For this system studied , the effect of gas dispersion appears to be so small that it can be assumed plug flow .

7.2 Recommendations

In our systems the splitting of curves was found . Whether this phenomena arises from the fact that small particle were used needs to be investigated . In the case of one set of experiments , namely system A-4-0.4 where tube diameter is the largest and particle diameter is the smallest , the behaviors of axial dispersion coefficient measured were found to be distinctively different from other sets of experiments . An explanation may be that the packing of the smallest size particle in the largest tube diameter may yield a larger tortuosity and ultimately a larger dispersion . It would be interesting to perform similar experiment in the column of the same size radius 4/8 in OD , but with the larger diameter particles .