

CHAPTER I

INTRODUCTION

Fluid mixing is at the heart of most production systems in the chemical processes and allied industries. It is of vital importance in the mining, food, petroleum, chemicals, pharmaceuticals, pulp and paper, power industries and industrial waste treatment. Mass transfer for suspended particle in turbulent liquid flow is important and depends on several parameters. Physico-chemical properties are essential among them. Agitated vessels are often used because they are effective in suspending solid particles, ensuring that all the surface area available is utilised and because they lead to good transfer rates.

A survey of technical literature [1-13] shows that extensive studies related to this field have been carried out and this would seem to indicate that the subject is well explored. However a detailed analysis proves that there exists a wide divergence of theories, results and correlations.

The aim of this study is to find a general solid-liquid mass transfer correlation equation to predict mass transfer coefficient of solid spheres of benzoic acid coated on glass beads, polystyrene spheres, plastic particles type 1 and type 2 in turbulent liquid, water, 13 wt % , 20 wt % and 35.5 wt % sucrose in standard agitated vessel with standard 6-bladed turbine. Important parameters on mass transfer such as

diffusivity, impeller speed, temperature and density difference are studied and the results are correlated in terms of dimensionless number of Sherwood, Reynolds, Schmidt and Density.



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