CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusion

Since the dissolution rate of commercial plaster of Paris increased significantly at low flow rate, mass transfer becomes the limiting step. Commercial plaster of Paris gave a mass-transfer correlation of jet-impinging apparatus in reason agreement with the Rao and Trass correlation at temperature close to ambient, although presumably particle or crystallite release gave a somewhat higher power of Reynolds number and constant value than the published value.

The leveling-off of dissolution rate at higher flow rate was attributed to the involvement of control by dissolution.

In addition, the apparatus gave values for the dissolution rate constant of single-crystal gypsum and cast aspartic acid in good agreement with literature values.

The cast pellets of pure plaster of Paris, potassium bitartrate, aspartic acid and trans-cinnamic acid dissolved slowly by comparison with commercial plaster and were largely under dissolution control; flow effects were then attributed to the release of particles or crystallites which can be confirm by scanning electron microscope pictures.

The commercial plaster tends to have a higher effective solubility than pure plaster and gypsum crystal, since the dissolution rates are higher.

5.2 Recommendation

The effectives solubility of commercial plaster need to be known for determining a more precise correlation.

Further experiments should be conducted over a wider range of experimental variables, in particular temperatures, materials and material properties.