

1.0 OBJECTIVE

The objective of the work was to investigate the characteristics of three-phase flow in a tall bubble column in support of the dissolver design for the SRC-II Demonstration Plant. Specific objectives were:

1. To study the characteristics of a two-phase (air-water) system to test the accuracy of experimental techniques used and the applicability of existing literature correlations.
2. To study the effects of liquid, slurry, and gas velocities; liquid physical properties; solids concentration and solids particle size on gas holdup in two- and three-phase flow.
3. To examine the nature and extent of solids accumulation as a function of solids concentration and particle size and slurry/gas superficial velocities.
4. To examine the basic nature of a solids withdrawal system in order to identify possible problems which must be considered in the design of such a system and its effect on variables such as phase holdups and gas and liquid dispersion.
5. To qualitatively examine backmixing and liquid circulation patterns in tall three-phase bubble columns.