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**Bubble Size Control Mechanisms and Effect on Flow Regime** THOMAS SHEPARD, University of Minnesota, PAUL STRYKOWSKI — Research has been conducted in an effort to understand the impacts of different control mechanisms on bubble size during air injection into a liquid cross-flow. The motivation for this work is to gain better control during the bubble formation and coalescence processes in order to reliably generate bubbles of different sizes. In this study air is injected through a porous plate into an electrolyte solution flowing through an adjustable geometry channel. The control mechanisms considered include the pore size in the porous plate, the channel height (and thus shear rate) at the injection site, and the electrolyte concentration. The effects of the controls are studied for a range of channel pressures (10-60 psi) and gas to liquid mass flow-rate ratios (0.001-0.005). By varying the different controls, bubbles are generated with a mean diameter of 80-1600 microns while keeping the pressure and gas to liquid mass flow-rate constant. An additional outcome of the research is the demonstrated effect that bubble size has on the transition from bubbly flow to slug flow.

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