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Prediction of Small Bubble Holdups in Bubble Columns Operated with Various Organic Liquids at Both Ambient and Elevated Pressures and Temperatures

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This article focuses on the prediction of the small bubble holdups (assuming the existence of two major bubble classes) in two bubble columns (0.289 m in ID and 0.102 m in ID), operated with organic liquids under various conditions (including high temperature and pressure). A new correction factor has been established in the existing model for the prediction of the gas holdups in the homogeneous regime. The correction parameter is a single function of the Eötvös number (gravitational forces to surface tension forces), which characterizes the bubble shape. In addition, the behavior of small bubble holdups in 1-butanol (selected as a frequently researched alcohol) aerated with nitrogen, in a smaller BC (0.102 m in ID), at various operating pressures, is presented and discussed. The ratio of small bubble holdup to overall gas holdup, as a function of superficial gas velocity and operating pressure, has been investigated. All small bubble holdups in this work have been measured by means of the dynamic gas disengagement technique.

Metryczka

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