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SEPARATION SCIENCE & ENGINEERING

气液并流吸收过程中液相近界面浓度分布的全息干涉测量

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摘要 Real-time laser holographic interferometry was applied to measure liquid concentrations of CO2 in the vicinity of gas-liquid free interface under the conditions of cocurrent gas-liquid flow for absorption of CO2 by ethanol. The influences of the Reynolds number on the measurable interface concentration and on the film thickness were discussed. The results show that CO2 concentration decreases exponentially along the mass transfer direction, and the concentration gradient increases as Reynolds number of either liquid or gas increases. CO2 concentrations fluctuate slightly along the direction of flow; on the whole, there is an increase in CO2 concentration. The investigation also demonstrated that film thickness decreases with the increase of Reynolds number of either of the two phases. Sherwood number representing the mass transfer coefficient was finally correlated as a function of the hy-drodynamic parameters and the physical properties.

关键词 cocurrent gas-liquid flow, absorption, concentration field, near interface, holographic interferometry.

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Measurement of liquid concentration fields near interface with cocurrent gas-liquid flow absorption using holographic interferometry

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