

SEPARATION SCIENCE & ENGINEERING

鼓泡塔中水合物法分离混合气体的数值模拟

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摘要 To develop a new technique for separating gas mixtures via hydrate formation, a set of medium-sized experimental bubble column reactor equipment was constructed. On the basis of the structure parameters of the experimental bubble column reactor, assuming that the liquid phase was in the axial dispersion regime and the gas phase was in the plug flow regime, in the presence of hydrate promoter tetrahydrofuran (THF), the rate of hydrogen enrichment for CH₄+H₂ gas mixtures at different operational conditions (such as temperature, pressure, concentration of gas components, gas flow rate, liquid flow rate) were simulated. The heat product of the hydrate reaction and its axial distribution under different operational conditions were also calculated. The results would be helpful not only to setting and optimizing operation conditions and design of multi-refrigeration equipment, but also to hydrate separation technique industrialization.

关键词 [hydrate](#) [kinetics](#) [separation](#) [bubble column](#) [numerical simulation](#)

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Numerical simulation of separating gas mixtures via hydrate formation in bubble column

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Abstract To develop a new technique for separating gas mixtures via hydrate formation, a set of medium-sized experimental bubble column reactor equipment was constructed. On the basis of the structure parameters of the experimental bubble column reactor, assuming that the liquid phase was in the axial dispersion regime and the gas phase was in the plug flow regime, in the presence of hydrate promoter tetrahydrofuran (THF), the rate of hydrogen enrichment for CH₄+H₂ gas mixtures at different operational conditions (such as temperature, pressure, concentration of gas components, gas flow rate, liquid flow rate) were simulated. The heat product of the hydrate reaction and its axial distribution under different operational conditions were also calculated. The results would be helpful not only to setting and optimizing operation conditions and design of multi-refrigeration equipment, but also to hydrate separation technique industrialization.

Key words [hydrate](#); [kinetics](#); [separation](#); [bubble column](#); [numerical simulation](#)

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