

RESEARCH PAPERS

水溶性铑络合物催化1-十二碳烯氢甲酰化反应器构型的初步探索

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**摘要** Hydroformylation of 1-dodecene was studied in a biphasic system using water-soluble rhodium complex  $[\text{RhCl}(\text{CO})(\text{TPPTS})_2]$  as catalyst in the presence of cetyl trimethyl ammonium bromide as surfactant to enhance the reaction rate. Efforts were devoted to improve the performance of hydroformylation by exploring reactor configuration which enhanced the mixing, dispersion and interphase mass transfer. Experiments were carried out in a 0.5 L autoclave at the total pressure of 1.1 MPa and temperature from 363 K to 373 K. Several surface aeration configurations were tested, and higher hydroformylation rate with higher normal/branched aldehyde ratio produced were achieved. The experiences suggest that improved reactor configuration by taking reaction engineering measures is beneficial to better process economy in alkene hydroformylation.

**关键词** [1-dodecene](#) [biphasic hydroformylation](#) [gas-liquid-liquid reactor](#) [reaction engineering](#)

[surface aeration](#) [emulsification](#) [n/i ratio](#)

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**Preliminary Exploration of the Reactor Configuration for Hydroformylation of 1-Dodecene Catalyzed by Water Soluble Rhodium Complex**

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**Abstract** Hydroformylation of 1-dodecene was studied in a biphasic system using water-soluble rhodium complex  $[\text{RhCl}(\text{CO})(\text{TPPTS})_2]$  as catalyst in the presence of cetyl trimethyl ammonium bromide as surfactant to enhance the reaction rate. Efforts were devoted to improve the performance of hydroformylation by exploring reactor configuration which enhanced the mixing, dispersion and interphase mass transfer. Experiments were carried out in a 0.5 L autoclave at the total pressure of 1.1 MPa and temperature from 363 K to 373 K. Several surface aeration configurations were tested, and higher hydroformylation rate with higher normal/branched aldehyde ratio produced were achieved. The experiences suggest that improved reactor configuration by taking reaction engineering measures is beneficial to better process economy in alkene hydroformylation.

**Key words** [1-dodecene](#); [biphasic hydroformylation](#); [gas-liquid-liquid reactor](#); [reaction engineering](#); [surface aeration](#); [emulsification](#); [n/i ratio](#)

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