

材料工程专栏

## Recycling and Activity Recovery of Chloroaluminate Ionic Liquid as Catalyst for Alkylation of Benzene with 1-Dodecene

乔聪震, 李成岳

河南大学精细化学与工程研究所

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**摘要** Performances of 1-butyl-3-methylimidazolium aluminium chloride ([BMIM]Cl-AlCl<sub>3</sub>) ionic liquid as catalyst for the alkylation of benzene with long chain olefins were investigated in a continuous operation mode. A small pilot plant with continuous mixing-reacting-separating-recycling functions, equipped with a static mixer reactor, a tube packed with metal Al thread and a combined liquid-liquid settling phase separator, was introduced as an alternative. The results showed that the continuous fast mixing and separation of ionic liquid catalyst from reactant mixture could be synchronously accomplished within a wider flow rate ratio range of the recycling reaction mixture to the ionic liquid catalyst. The recycling of chloroaluminate ionic liquid was realized. ICP-AES detection results of Al content in the reactants proves that in-situ Al compensation to the reaction system may be an important choice to prolong the stable running time of moisture-sensitive ionic liquid [BMIM]Cl-AlCl<sub>3</sub> when feedstock inevitably contains trace water. It suggests that the activity of chloroaluminate ionic liquid is recovered under the in-situ Al compensation operation.

**关键词** [alkylation, benzene, 1-dodecene, ionic liquid, \[BMIM\]Cl-AlCl<sub>3</sub>, in-situ Al compensation](#)

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通讯作者:

作者个人主页: 乔聪震, 李成岳

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