

催化、动力学与反应器

KNO₃/HMS催化酯交换法合成碳酸二月桂酯

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摘要

研究了KNO₃/HMS对碳酸二甲酯(DMC)与月桂醇酯交换反应制备碳酸二月桂酯(DDC)的催化性能。用XRD、FTIR对KNO₃/HMS催化剂进行了表征,采用Hammett指示剂-苯甲酸法测定了催化剂碱强度和碱量分布的情况,并考察了KNO₃负载量、焙烧温度以及反应条件对KNO₃/HMS催化剂性能的影响。研究表明,KNO₃负载后载体HMS仍保持良好的孔结构,KNO₃的最佳负载量为13%(质量分数),催化剂的总碱量也在此时达到最高,最佳焙烧温度为600℃;在反应物DMC/月桂醇摩尔比为1:4、DMC的滴加温度为140℃、反应时间为5 h、催化剂用量为反应物总质量的1%条件下,催化剂的效果最佳,DDC的收率和选择性分别为81.9%和99.5%。

关键词 [介孔分子筛](#) [碳酸二月桂酯](#) [碳酸二甲酯](#) [酯交换](#)

分类号

Synthesis of didodecyl carbonate by transesterification on KNO₃/HMS

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Abstract

The catalytic activity of KNO₃/HMS for the synthesis of didodecyl carbonate (DDC) by transesterification from dimethyl carbonate (DMC) and dodecanol were studied. The KNO₃/HMS catalysts were characterized with XRD and FTIR. The method of Hammett indicator-benzene carboxylic acid was used to characterize the basicity strength and the basicity amount distribution. The effects of loading quantity of KNO₃, calcination temperature and reaction conditions were investigated. The results indicated that the structures of HMS were well maintained, the optimized KNO₃ loading amount and calcination temperature were 13% (mass), and 600°C respectively. The basicity amount of KNO₃/HMS was greatly affected by the loading amount and calcination temperature. At the molar ratio of DMC to dodecanol 1:4, DMC addition temperature 140°C, reaction time 5 h and catalyst content 1% of the reactants mass, the yield and the selectivity of DDC were 81.9% and 99.5% respectively.

Key words [mesoporous sieve](#) [didodecyl carbonate](#) [dimethyl carbonate](#) [transesterification](#)

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