

## 研究简报

离子液体介质中 $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ 催化下芳香醛与5,5-二甲基-1,3-环己二酮的缩合反应

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**摘要** 考察了在离子液体1-正丁基-3-甲基咪唑四氟硼酸盐([bmim][BF<sub>4</sub>])介质中, 芳香醛与5,5-二甲基-1,3-环己二酮的缩合反应. 实验结果表明, 在催化量的 $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ 存在下, 该反应可高产率地生成氧杂蒽二酮类化合物

**3**; 而在 $\text{TMSCl}/\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ 复合催化体系的催化下, 则得到氧杂蒽二酮类化合物的开环衍生物**4**,

反应具有非常好的选择性. 该论文提供的方法操作简单、产率高、选择性好而且对环境友好. 在反应结束后, 所用催化剂及离子液体都很容易回收, 并能有效重复使用.

**关键词** [FeCl<sub>3</sub>·6H<sub>2</sub>O](#) [离子液体](#) [氧杂蒽二酮](#) [催化](#)

分类号

## $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ Catalyzed Con-densation of Aromatic Aldehydes with 5,5-Dimethyl-1,3-cyclohexanedione in Ionic Liquids

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**Abstract** The reaction of aromatic aldehydes **1** with 5,5-dimethyl-1,3-cyclohexanedione **2** was investigated by using [bmim][BF<sub>4</sub>] as a reaction medium. It was found that without additional catalyst this reaction could only be realized at elevated temperature and gave a mixture of xanthenediones **3** and their ring-opening derivatives 2,2'-arylmethylenebis-(3-hydroxy-5,5-dimethyl-2-cyclohexen-1-one) (**4**) in poor yields. On the other hand, when it was carried out in the presence of  $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ , its selectivity and efficiency could be improved significantly and compound **3** could be obtained exclusively with high yield under optimized reaction conditions. Further study showed that when the same re-action was carried out under the catalysis of a combination of trimethylchlorosilane and  $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ , compound **4**, without any contamination of **3**, was obtained in good yield.

**Key words** [FeCl<sub>3</sub>·6H<sub>2</sub>O](#) [ionic liquid](#) [xanthenedione](#) [catalysis](#)

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