化学学报 2003 61 (2): 285-290 ISSN: 0567-7351 CN: 31-1320/06

温和条件下离子液体/水两相体系中α，β-不饱和羰基化合物的环氧化反应研究

王波,杨立明,索继栓

中国科学院兰州化学物理研究所

收稿日期 修回日期 网络版发布日期 接受日期

摘要 在室温下，以双氧水为氧化剂，研究了六氟磷酸1—甲基—3—烷基咪唑离子液体与水构成的两相体系内α，β-不饱和羰基化合物的环氧化反应，详细考察了反 应时间、NaOH浓度、氧化剂用量和不同底物对反应结果的影响，并对其反应机理进行了探讨。此催化体系同传统的相转移催化体系相比，实验操作简单，反应条件更 加温和，并且有效地抑制了反应过程中环氧化合物的开环，在较为适宜的反应条件 下，甲基戊烯酮转化率达到100%，环氧化选择性可达98。

关键词 双氧水 磷酸 P 咪唑 P 反应机理 戊烯酮 P 环氧化反应 选择性 催化反应

分类号 0621

Epoxidation of a, /J-Unsaturated Carbonyl Compounds in Ionic Liquid/Water Biphasic System under Mild Conditions

Wang Bo,Yang Liming,Suo Jishuan

State Key Laboratory for oxo synthesis and selective oxidation, Lanzhou Institute of Chemical physics,Chinese Acadey of Sciences

Abstract The epoxidation of electron-deficient a, β-unsaturated carbonyl compounds with different structures has been investigated in room temperature ionic liquid/water biphasic system by using hydrogen peroxide. The effects of reaction time, concentration of sodium hydroxide, amount of oxidant and substrates on the epoxidation were studied in detail, and moreover, the reaction mechanism for the epoxidation system was proposed. In comparison with conventional phase transfer catalysis, the ring-opening reaction of the epoxides can efficiently be inhibited in the novel system induced epoxidation of a, β-unsaturated carbonyl compounds besides its relatively simple and mild reaction conditions. Under optimal conditions, the conversion and selectivity of the epoxidation of a, β-unsaturated carbonyl compounds could reach to 100% and 98% , respectively

Key words HYDROGEN PEROXIDE SOLUTION PHOSPHORIC ACID P GLYOXALINE P REACTION MECHANISM PENTENONE P EPOXIDATION REACTION SELECTIVITY CATALYTIC REACTION

DOI:

通讯作者