

Ruthenium- and Rhodium-catalyzed Carbenoid Reactions of Diazoesters in Hexaalkylguanidinium-based Ionic Liquids

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Dedicated to Professor Ernst Anders on the occasion of his 70th birthday

Hexaalkylguanidinium-based room-temperature ionic liquids were investigated as solvents for the cyclopropanation of styrene with diazoacetates catalyzed by $\text{Rh}_2(\text{OAc})_4$ or $[\text{Ru}_2(\mu\text{-OAc})_2(\text{CO})_4]_n$. While the yields of the formed cyclopropanes are much lower compared to the reactions performed in dichloromethane, the diastereomeric ratio is not significantly affected by the change of the reaction medium. Immobilization of the catalysts is only partially successful. In contrast to this intermolecular reaction, the Ru-catalyzed formation of a β -lactam by an intramolecular carbenoid C–H insertion of an α -methoxycarbonyl- α -diazoacetamide occurs in high yield, similar to the $\text{Rh}_2(\text{OAc})_4$ -catalyzed reaction. The *cis* \rightarrow *trans* isomerization of the resulting 1-*tert*-butyl-3-methoxycarbonyl-4-phenylazetid-2-one is accelerated in the ionic liquid *N,N*-dibutyl-*N'*,*N'*-diethyl-*N''*,*N''*-dihexylguanidinium triflate.

Key words: Diazoacetates, Cyclopropanation, C–H Insertion, Ionic Liquids, Rhodium, Ruthenium