The ionic liquid effect on the Boulton-Katritzky reaction a comparison between substrates of different structure

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Abstract

The mononuclear rearrangement of heterocycles, also called Boulton-Katritzky reaction, was studied in ionic liquid solution using N-(5-phenyl-1,2,4-oxadiazol-3-yl)-N'-(4-nitrophenyl)-formamidine as substrate. The investigation was carried out using piperidine as basic catalyst and several ionic liquids differing in both cation and anion structure. Kinetic data collected were compared with the ones previously reported using (Z)-phenylhydrazone of 3-benzoyl-5-phenyl-1,2,4-oxadiazole to have information about the effect due to the different structure of the alkyl chain borne on the substrate. Furthermore, data were analysed on the grounds of polarity, Kamlet-Taft solvent parameters, but taking also in consideration the structural features of the solvent used. On the whole, the results obtained seem to indicate that the 'ionic liquid effect' can be explained considering the structural features of the constituent ions, their effect on the structure of solvent media and their ability to interact with the transition state of the target reaction..

Keywords

Ionic liquids, MRH reaction, Base catalysis.