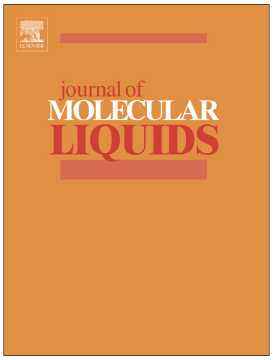

Significant effect of 5,10,15,20-meso-tetraarylporphyrinatoiron(III) chloride/triflate and acidic/neutral/basic imidazolium ionic liquids in catalytic oxidation of phenols

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PII:	S0167-7322(17)35450-8
DOI:	doi:10.1016/j.molliq.2018.03.017
Reference:	MOLLIQ 8791
To appear in:	*Journal of Molecular Liquids*
Received date:	12 November 2017
Revised date:	31 January 2018
Accepted date:	3 March 2018

Please cite this article as: Sohail Ahmad, Renu Gautam, Anchal Singhal, S.M.S. Chauhan , Significant effect of 5,10,15,20-meso-tetraarylporphyrinatoiron(III) chloride/triflate and acidic/neutral/basic imidazolium ionic liquids in catalytic oxidation of phenols. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Molliq(2017), doi:10.1016/j.molliq.2018.03.017

Significant effect of 5,10,15,20-*meso*-tetraarylporphyrinatoiron(III) chloride/triflate and acidic/neutral/basic imidazolium ionic liquids in catalytic oxidation of phenols

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Abstract: The influence of acidic, neutral and basic ionic liquids and their binary mixture with dichloromethane on the reactivity of iron(III)porphyrins was investigated during oxidation of phenols with hydrogen peroxide catalyzed by 5,10,15,20-tetraarylporphyrinatoiron(III) chloride and 5,10,15,20-tetraarylporphyrinatoiron(III) triflate. The generation of different intermediates of iron(III) porphyrin in different ILs was studied through viscosity, density, UV-Vis and ^{1}H NMR spectroscopy. The heterolytic cleavage efficiency of (TAP)Fe^{III}-OOH and formation of quinone using iron(III)porphyrin (TAP)Fe^{III}Cl with Cl atom as an axial ligand, is influenced by the structure of imidazolium moiety and the counteranion following the order [$(CH_2)_4SO_3$HMIm]CF_3COO > [Hmim]CF_3COO > [bmim]TFA »» negligible amount in [bmim]CF_3SO_3, [Hmim]CF_3SO_3, [bmim]BF_4, [bmim]PF_6 and [bmim]Cl. On the other hand, the heterolytic cleavage efficiency of (TAP)Fe^{III}-OOH with iron(III)porphyrin (TAP)Fe$^{III}CF_3SO_3$ with triflate as an axial ligand, was found in the following order [$(CH_2)_4SO_3$HMIm]CF_3SO_3 > [Hmim]CF_3SO_3 > [$(CH_2)_4SO_3$HMIm]CF_3COO > [Hmim]CF_3COO > [bmim] CF_3COO > [bmim]PF_6 ≈ [bmim]BF_4 ≈ [bmim]CF_3SO_3, while epoxidation and polymerization were mainly observed in basic and neutral ILs. The reactive intermediates formed by the reaction of monooxygen donors with (TAP)Fe^{III}Cl