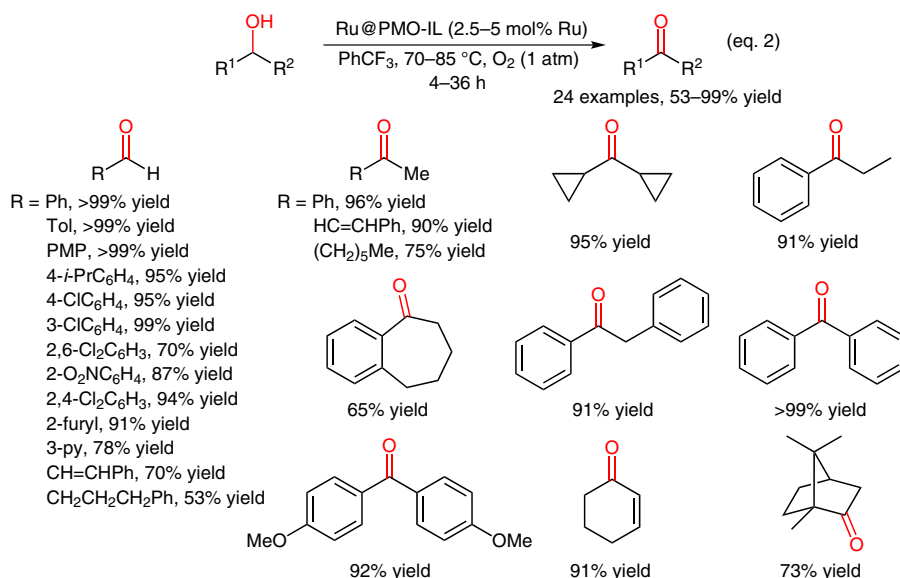
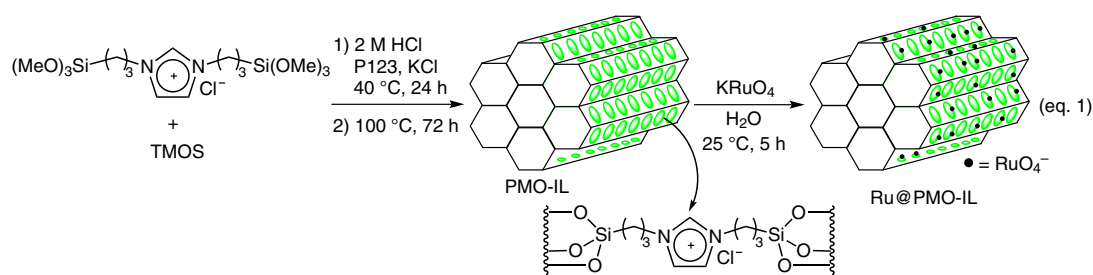


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Synthesis and Characterization of Alkyl-Imidazolium-Based Periodic Mesoporous Organosilicas: A Versatile Host
for the Immobilization of Perruthenate (RuO_4^-) in the Aerobic Oxidation of Alcohols

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Aerobic Oxidation of Alcohols with Ru@PMO-IL



Significance: Perruthenate was supported on ionic-liquid-based periodic mesoporous organosilica (Ru@PMO-IL) via the reaction of 1,3-bis-(3-trimethoxysilylpropyl)imidazolium chloride with tetramethoxysilane, followed by treatment with KRuO_4 (eq. 1). Ru@PMO-IL catalyzed the oxidation of alcohols in trifluorotoluene at 70–85 °C under 1 atm of oxygen to give the corresponding carbonyl compounds in up to >99% yield (24 examples, eq. 2).

Comment: The catalyst was recovered by centrifugation and subjected to recycling runs. ICP-AES analysis showed no significant ruthenium leaching (<1 ppm) under the reaction conditions. Nitrogen adsorption and TEM analyses of the recovered catalyst revealed no morphology change of the mesoporous structure. However, a slight loss of catalytic activity was observed during the recycling runs (for the oxidation of benzyl alcohol; 2nd reuse: 99%, 4th reuse: 89%, 5th reuse: 75%).

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