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The preparation of imidazolium based composite polymeric ionic liquid microgels containing Co metal nanoparticles and their use as catalyst in hydrolysis of NaBH_4

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Ionic liquids (IL) with vinyl functionalization as n-dialkyl-3, 3'-bis-1-vinyl imidazolium dibromides ([CnVIm] Br; n=4, 6 and 10) were prepared from vinyl imidazole (VI) and dibromo alkanes such as dibromobutane (DBB), dibromohexane (DBH) and dibromodecane (DBD). Then, polymeric ionic liquid (PIL) microgels as poly(1,4-butanediyl-3,3'-bis-1-vinylimidazolium dibromides) (p(C4VImBr)), poly(1,6-hexanediyl-3,3'-bis-1-vinylimidazolium dibromides) (p(C6VImBr)) and poly(1,10-decanediyl-3,3'-bis-1-vinylimidazolium dibromides) (p(C10VImBr)) microgels were synthesized by photo-initiated inverse suspension polymerization technique using the prepared vinyl functionalized imidazolium monomers. The prepared PIL microgels were characterized with Fourier transform infrared spectroscopy (FT-IR), scanning electron microscopy (SEM) and zeta potential. P(C4VImBr), p(C6VImBr) and p(C10VImBr) microgels were used as templates for *in situ* Co metal nanoparticle synthesis, and the prepared composite PIL microgels: p(C4VImBr)-Co, p(C6VImBr)-Co and p(C10VImBr)-Co were used as catalyst in (H_2) generation from the hydrolysis reaction of NaBH_4 . H_2 generation rate was evaluated by changing various parameters such as the types of PIL microgels as template, the amounts of Co metal nanoparticles as catalyst, the number of re-use of composite PIL catalyst and the reaction temperature.

Biography

Nurettin Sahiner has completed his PhD in 2005 from Tulane University, and did Postdoctoral studies at University of Delaware at Materials Science and Engineering and at Tulane University School of Medicine in Biochemistry. He is the Director of Nanoscience and Technology Research and Application Center. He has published more than 150 papers in reputed journals and has been serving as an Editorial Board Member for few journals.

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