Abstract Listing

Use your browser's Print button, or File-Print command sequence.

416104: Ionic liquids: Novel solvents for synthesis of advanced materials

IEC 0 [416104]: Ionic liquids: Novel solvents for synthesis of advanced materials

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ACCEPTED
Topic Selection: *Green (or Greener) Industrial Applications of Neoteric Solvents: Ionic and Supercritical Fluids: Green Synthesis*
Invited: *Y*
Preferred Presentation Format: *OralOnly*
Consider for Sci-Mix: *N*
Conforms to Bylaw 6: *Y*
Last Modified: *2000-11-19*

Abstract

Ionic liquids are a unique class of solvents that have virtually no vapor pressure and possess versatile solvent properties. Recently, they have been effectively demonstrated as a superior solvent for conducting many organic reactions. Our interest is in exploring the ionic liquids as solvents to conduct inorganic polymeric reactions for synthesizing novel inorganic materials. Here, we report a new aerogel and composite synthetic methodology based on the use of ionic liquids as solvents. The structural features of the synthesized materials will be discussed.

418895: Controlled radical polymerization in ionic liquids

IEC 0 [418895]: Controlled radical polymerization in ionic liquids

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ACCEPTED
Topic Selection: *Green (or Greener) Industrial Applications of Neoteric Solvents: Ionic and Supercritical Fluids: Green Synthesis*
Invited: *Y*
Preferred Presentation Format: *OralOnly*
Consider for Sci-Mix: *N*
Special Equipment Needs: *OHP*

Conforms to Bylaw 6: *Y*
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Abstract

Transition metal mediated living and controlled radical polymerisation is rapidly developing as an efficacious new route for the controlled polymerisation of vinyl monomers. We have been utilising a system based on Cu(I)Br with alkylpyridylmethanimine ligands for living polymerisation and Co(II) for catalytic chain transfer. One of the main constraints of some of this chemistry is the high level of catalyst required for acceptable rates of polymerisation, often equimolar with respect to initiator. This leads to contamination of products necessitating catalyst removal. Although this is relatively easily achieved in a laboratory, for most polymers, it would be advantageous for this extra process to be eliminated, especially with regards to exploitation of the technology. 1-Butyl-3-methylimidazolium hexafluorophosphate, a room temperature ionic liquid, has been used as solvent for both the copper(I) mediated living radical polymerisation and Co(II) mediated catalytic chain transfer polymerisation of methyl methacrylate.

Although room temperature ionic liquids have been found excellent solvents for a number of chemical reactions polymerization reactions have remained relatively un-investigated. This presentation will report our recent findings into the use of ionic liquids as solvents for a range of radical polymerisations.

419427: Aluminum catalyzed Diels-Alder reactions in ambient temperature ionic liquids

IEC 0 [419427]: Aluminum catalyzed Diels-Alder reactions in ambient temperature ionic liquids

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ACCEPTED
Topic Selection: *Green (or Greener) Industrial Applications of Neoteric Solvents: Ionic and Supercritical Fluids: Green Synthesis*
Invited: *Y*
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Conforms to Bylaw 6: *Y*
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Abstract

Interest in using ambient temperature ionic liquids as solvents has undergone a dramatic increase in interest during the past several years. However, the understanding of the impact of ionic liquids on chemical reactivity is only scantly developed. The development of Lewis acid catalyzed reactions in ionic liquids has great potential. The potential for combination of an environmentally benign solvent which is capable of solvating a wide range of Lewis acids render ambient temperature ionic liquids unique. Our group is presently exploring the use of aluminum catalysts for both classic as well as hetero-Diels-Alder reactions in ambient temperature ionic liquids. Our initial focus is centered on the

impact of the ionic liquid on product yields, regioselectivity and diastereoselectivity. In particular, we are exploring the development of enantioselective synthetic methodologies. Our early efforts and results in these areas will be discussed.

419442: Green synthesis: Aromatic nitration in ionic liquids

IEC 0 [419442]: Green synthesis: Aromatic nitration in ionic liquids

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Topic Selection: *Green (or Greener) Industrial Applications of Neoteric Solvents: Ionic and Supercritical Fluids: Green Synthesis*
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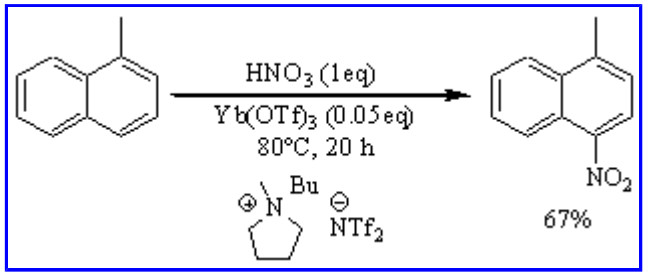
Abstract

As pressures continue to mount to make synthesis more environmentally compatible as well as more practical and cost-effective, new techniques for achieving these goals continue to be developed. Aromatic nitration is a reaction of fundamental importance at both the academic and industrial level. As with most aromatic substitution reactions, tradition reaction conditions are far from benign. An ideal nitration would involve just the use of nitric acid, since the only by-product would be water. By employing lanthanide triflates to activate the nitric acid, aromatic nitration can be carried out in room temperature ionic liquids. Further, following separation of the reaction product by either extraction or distillation, the lanthanide triflate catalyst is retained in the ionic liquid phase. This catalyst/solvent can be reused several times in further nitration reactions with no detectable loss in activity.



424304: Clean Synthesis in Ionic Liquids

IEC 0 [424304]: Clean Synthesis in Ionic Liquids

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ACCEPTED
Topic Selection: *Green (or Greener) Industrial Applications of Neoteric Solvents: Ionic and Supercritical Fluids: Green Synthesis*
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Consider for Sci-Mix: *Y*
Last Modified: *2000-11-19*

Abstract

Clean synthesis in ionic liquids

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Ionic liquids can be used for clean synthesis in a variety of reactions. Here we present two commercially important reactions carried out in chloroaluminate(III) ionic liquids; the isomerization of fatty acids and the cracking of polyethylene to low molecular weight alkanes. A number of reaction classes in neutral ionic liquids have been investigated. These include:

1. Heck reactions
2. Diels-Alder reactions
3. Nucleophilic displacement reactions (S_N2 reaction)
4. Friedel-Crafts reactions
5. Other reactions

The ways in which these industrially important reactions are cleaner than current processes and the first total synthesis of a pharmaceutical: Pravadoline (94% overall yield), carried out entirely in ionic liquids, (with potassium chloride as the only by-product) will be presented.

437401: Effectiveness of room temperature ionic liquids as solvents for free radical addition polymerization

IEC 0 [437401]: Effectiveness of room temperature ionic liquids as solvents for free radical addition polymerization

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ACCEPTED
Topic Selection: *Green (or Greener) Industrial Applications of Neoteric Solvents: Ionic and*

Supercritical Fluids: Green Synthesis
Invited: *N*
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Conforms to Bylaw 6: *Y*
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Abstract

Room Temperature Ionic Liquids (RTILs) are being investigated as replacements for volatile organic compounds (VOCs) in polymerization reactions because RTILs are nonflammable, nonvolatile, inexpensive, and easy to make. Our research goals are to study the applicability of RTILs to production of commodity polymers as a means of reducing environmental pollution, while proving that polymers formed using RTILs have the same or better mechanical properties for commercial use. Polystyrene and poly(methyl methacrylate) samples are synthesized by free radical solution polymerization using traditional VOC and RTIL solvents and tested to determine differences in polymerization kinetics and degree of polymerization. An automated materials testing system is used to determine the tensile strength and elastic modulus of these polymers.

440430: Free Radical Polymerization and Copolymerization in Room Temperature Ionic Liquids

IEC 0 [440430]: Free Radical Polymerization and Copolymerization in Room Temperature Ionic Liquids

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ACCEPTED
Topic Selection: *Green (or Greener) Industrial Applications of Neoteric Solvents: Ionic and Supercritical Fluids: Green Synthesis*
Invited: *Y*
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Conforms to Bylaw 6: *Y*
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Abstract

Free radical addition polymerization and copolymerization has been investigated in a range of room temperature ionic liquids (RTILS). We will report results on synthesis of high molecular weight acrylic polymers in RTILs, as well as results on block copolymer formation via sequential monomer addition. The latter reactions take advantage of the long-lived nature of free radicals in some of these systems. Living free radical polymerization using TEMPO-type initiators in RTILs will also be reported.

445113: Intermission

0 [445113]: Intermission

ACCEPTED
Topic Selection: *Green (or Greener) Industrial Applications of Neoteric Solvents: Ionic and Supercritical Fluids: Green Synthesis* ***Preferred Presentation Format:*** *Break*
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Abstract: Abstract text not available.

445114: Discussion

0 [445114]: Discussion

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