

Contents

Articles

John S. Wilkes

Journal of Molecular Catalysis A: Chemical 214 (2004) 11

Properties of ionic liquid solvents for catalysis

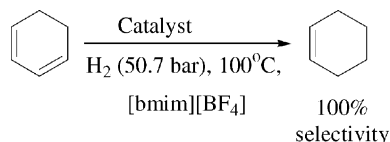
Ionic liquids are good solvents for catalytic reactions. The rational selection of the appropriate ionic liquid solvent for a particular reaction requires general knowledge of the properties of ionic liquids, and the details of some properties of the specific ionic liquid solvents being considered. The solvent properties of ionic liquids that are relevant to catalysis are discussed, and sources of the values of those properties for ionic liquids are identified.



**Dongbin Zhao, Paul J. Dyson,
Gábor Laurenczy, J. Scott McIndoe**

Journal of Molecular Catalysis A: Chemical 214 (2004) 19

On the catalytic activity of cluster anions in styrene hydrogenation: considerable enhancements in ionic liquids compared to molecular solvents

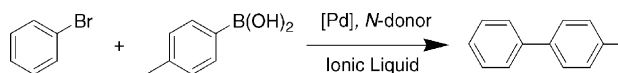


**Christopher J. Mathews, Paul J. Smith,
Tom Welton**

Journal of Molecular Catalysis A: Chemical 214 (2004) 27

N-donor complexes of palladium as catalysts for Suzuki cross-coupling reactions in ionic liquids

Palladium imidazole complexes have been used as catalyst precursors for the Suzuki cross-coupling reaction in 1-butyl-3-methylimidazolium-based ambient temperature ionic liquids.

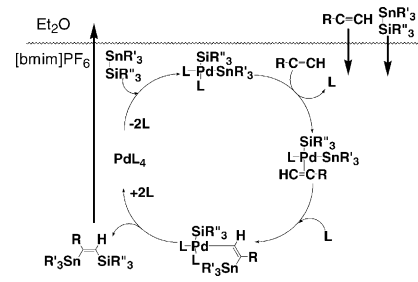


Ivan Hemeon, Robert D. Singer

Journal of Molecular Catalysis A: Chemical 214 (2004) 33

Recyclable palladium(0)-catalysed silylstannation of terminal alkynes in ionic liquids

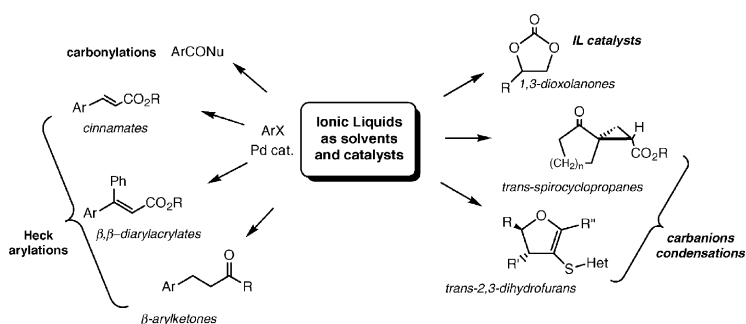
The palladium(0)-catalysed addition of silylstannanes $\text{Bu}_3\text{SnSiMe}_3$ and $\text{Bu}_3\text{SnSiMe}_2\text{Ph}$ to terminal alkynes has been shown to proceed in excellent yields in the ionic liquids 1-*n*-butyl-3-methylimidazolium hexafluorophosphate ($[\text{bmim}]\text{PF}_6$) and 1-*n*-butyl-3-methylimidazolium tetrafluoroborate ($[\text{bmim}]\text{BF}_4$). Each of the ionic liquids containing the immobilised palladium catalyst has been recycled up to 10 times without loss of activity, allowing extensive reuse of the expensive solvent/catalyst system.

**Vincenzo Calò, Angelo Nacci, Antonio Monopoli**

Journal of Molecular Catalysis A: Chemical 214 (2004) 45

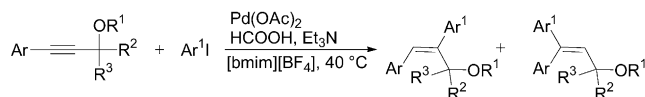
Regio- and stereo-selective carbon-carbon bond formation in ionic liquids

Ionic liquids are activating and stabilizing solvents for carbon-carbon coupling reactions. They significantly influence both the Pd-catalysed processes, such as Heck arylations as well as aryl halides carbonylations and the formation and reactivity of carbanions.

**Sandro Cacchi, Giancarlo Fabrizi, Antonella Goggiamani**

Journal of Molecular Catalysis A: Chemical 214 (2004) 57

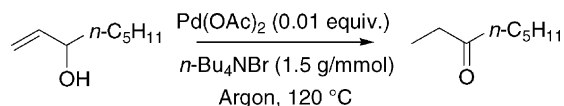
The palladium-catalyzed hydroarylation of propargylic alcohols in room temperature ionic liquids

**Benjamin Ganchegui, Sandrine Bouquillon, Françoise Hémin, Jacques Muzart**

Journal of Molecular Catalysis A: Chemical 214 (2004) 65

Palladium-catalyzed isomerization of (homo-) allylic alcohols in molten tetrabutylammonium bromide, a recyclable system

Recycling of both catalyst and molten salt. Yields, 1st run: 89%, 4th run: 86%.

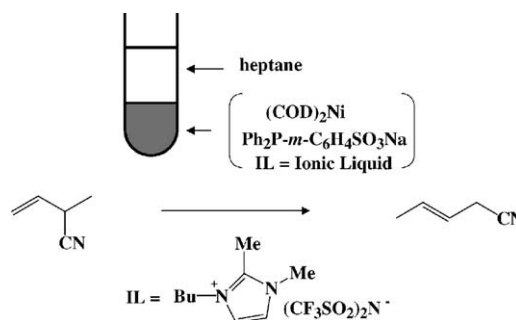


**Christophe Vallée, Christine Valério,
Yves Chauvin, Gerald P. Niccolai,
Jean-Marie Basset, Catherine C. Santini,
Jean-Christophe Galland, Blaise Didillon**

Journal of Molecular Catalysis A: Chemical 214
(2004) 71

The catalytic isomerization reactions of 2-methyl-3-butenitrile into 3-pentenitrile in ionic liquids

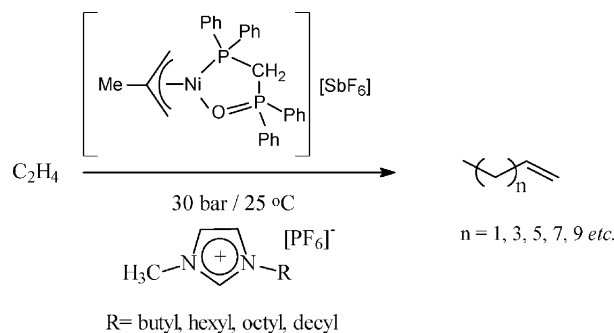
The conversion of 2-methyl-3-butenitrile (96%) to 3-pentenitrile (93% of selectivity) was performed under biphasic conditions (ionic liquid/organic solvent) with the catalytic system associating $\text{Ni}(\text{cod})_2$, $[\text{Ph}_2\text{Pm-PhSO}_3\text{Na}]$, partition experiments proved that the catalyst was immobilized in ionic phase.



Peter Wasserscheid, Claus Hilgers, Willi Keim

Journal of Molecular Catalysis A: Chemical 214
(2004) 83

Ionic liquids—weakly-coordinating solvents for the biphasic ethylene oligomerization to α -olefins using cationic Ni-complexes

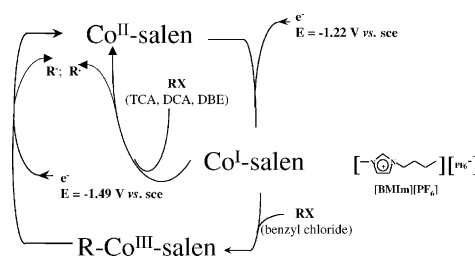


Laurent Gaillon, Fethi Bedioui

Journal of Molecular Catalysis A: Chemical 214
(2004) 91

Voltammetric analysis of the catalytic reactivity of electrogenerated Co^{I} -salen with organohalogenated derivatives in an ionic liquid at room temperature

The electrochemical behavior of Co^{II} -salen in a room temperature ionic liquid, $[\text{BMIm}][\text{PF}_6]$, was investigated and it was shown that it is similar to that previously reported in various organic solvents. Also, the nature of the involved mechanisms of the electroreductive activation of the organohalogenated derivatives is almost unchanged in the ionic liquid compared with the usual conventional organic solvents.

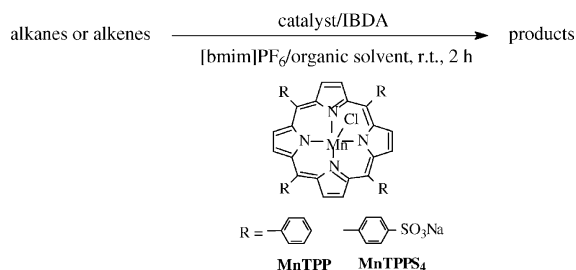


Zhen Li, Chun-Gu Xia

Journal of Molecular Catalysis A: Chemical 214
(2004) 95

Oxidation of hydrocarbons with iodobenzene diacetate catalyzed by manganese(III) porphyrins in a room temperature ionic liquid

Efficient methods for oxidation of alkanes and alkenes were obtained by using two manganese(III) porphyrin catalysts in combination with iodobenzene diacetate in a room temperature ionic liquid $[\text{bmim}]\text{PF}_6$ (1-*n*-butyl-3-methylimidazolium hexafluorophosphate). A high-valent manganese-oxo porphyrin complex ($\text{Mn}^{\text{V}} = \text{O}$) was considered as a reactive oxidation intermediate according to investigation by stopped-flow rapid spectroscopy.

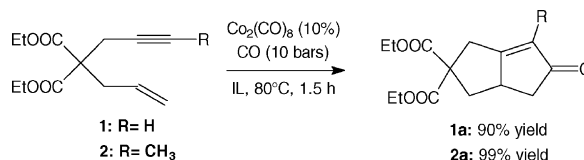


Piero Mastrorilli, Cosimo Francesco Nobile, Rossella Paolillo, Gian Paolo Suranna

Journal of Molecular Catalysis A: Chemical 214 (2004) 103

Catalytic Pauson–Khand reaction in ionic liquids

The $\text{Co}_2(\text{CO})_8$ -catalysed intramolecular and intermolecular Pauson–Khand (PK) annelation in imidazolium-based ionic liquids (ILs) is described. The reaction proceeds selectively for diethyl allyl propargyl malonates provided that the reaction is carried out under a CO pressure of 10 bar.

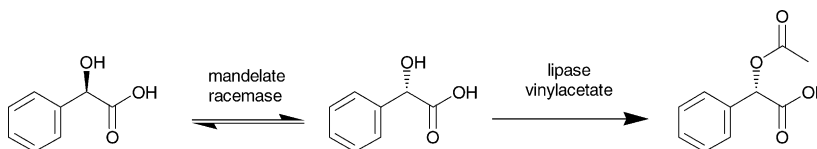


Nicole Kaftzik, Wolfgang Kroutil, Kurt Faber, Udo Kragl

Journal of Molecular Catalysis A: Chemical 214 (2004) 107

Mandelate racemase activity in ionic liquids: scopes and limitations

The deracemization of (\pm)-mandelic acid using a lipase-mandelate racemase two-enzyme system was used to investigate the scopes and limitations of ionic liquids (IL) as new reaction media for a dynamic resolution approach. Mandelate racemase was active in a biphasic system water [OMIM][PF₆].

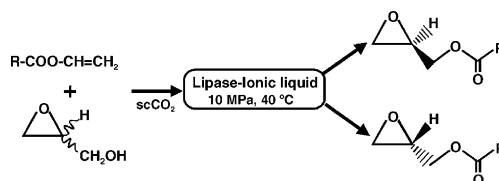


Pedro Lozano, Teresa De Diego, Daniel Carrié, Michel Vaultier, José L. Iborra

Journal of Molecular Catalysis A: Chemical 214 (2004) 113

Synthesis of glycidyl esters catalyzed by lipases in ionic liquids and supercritical carbon dioxide

Free and immobilized commercial lipases were assayed as catalysts in the synthesis of glycidyl esters from *rac*-glycidol in four different ionic liquids (ILs). The ability of lipases to catalyze glycidyl ester synthesis was clearly demonstrated, because their activity was greatly enhanced (up 95-times) by both the use of ILs media in comparison with a classical organic solvent (toluene), and the increase in the alkyl chain length of the acyl donor ester. All lipases exhibited an activity and enantioselectivity practically independent of the assayed ILs. Continuous processes for glycidyl butyrate synthesis in supercritical CO₂/IL biphasic systems was also studied, being the activity of lipases slightly reduced, while the enantioselectivity of the process remained unchanged.

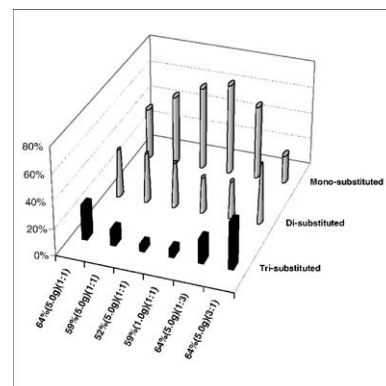


Li Xiao, Keith E. Johnson, Ronald G. Treble

Journal of Molecular Catalysis A: Chemical 214 (2004) 121

Alkane cracking, alkene polymerization, and Friedel–Crafts alkylation in liquids containing the acidic anions HX_2^- , $\text{XH}(\text{AlX}_4)^-$, $\text{XH}(\text{Al}_2\text{X}_7)^-$, and Al_2X_7^- (X = chlorine, bromine)

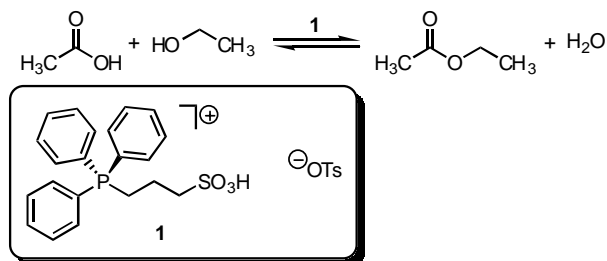
Distribution of the substitution products obtained when 2-pentene reacted with benzene in AlCl_3 – Et_3SBr ionic liquid (64, 59 and 52% are the AlCl_3 mole percentages, 5.0 and 1.0 g are the ionic liquid masses, 1:1 (1.79 ml:2.16 ml), 1:3 and 3:1 are the mole ratios of 2-pentene to benzene).



David C. Forbes, Kristin J. Weaver

Journal of Molecular Catalysis A: Chemical 214 (2004) 129

Brønsted acidic ionic liquids: the dependence on water of the Fischer esterification of acetic acid and ethanol

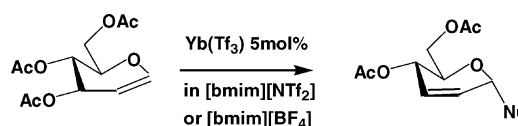


Siddam Anjaiah, Srivari Chandrasekhar, René Grée

Journal of Molecular Catalysis A: Chemical 214 (2004) 133

Carbon-Ferrier rearrangements in ionic liquids using $\text{Yb}(\text{OTf})_3$ as catalyst

The ionic liquids $[\text{bmim}][\text{BF}_4]$ and $[\text{bmim}][\text{NTf}_2]$ are used as efficient recyclable solvents in the ytterbium triflate catalysed carbon-Ferrier rearrangement of triacetyl glucal with allyl silanes, propargyl silane, and silyl enolethers.



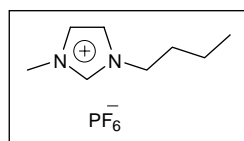
Nu: allyl silanes, propargyl silane, silyl enolethers

Pilar Formentín, Hermenegildo García, Antonio Leyva

Journal of Molecular Catalysis A: Chemical 214 (2004) 137

Assessment of the suitability of imidazolium ionic liquids as reaction medium for base-catalysed reactions. Case of Knoevenagel and Claisen-Schmidt reactions

1-Butyl-3-methylimidazolium hexafluorophosphate $[(\text{bmim})\text{PF}_6]$ containing OH^- is a suitable solvent for the Knoevenagel condensation, but the Claisen-Schmidt reaction of acetophenone and benzaldehyde requires extra amount of bases due to its depletion by reaction with ionic liquid and formation of the corresponding carbene.



as solvent

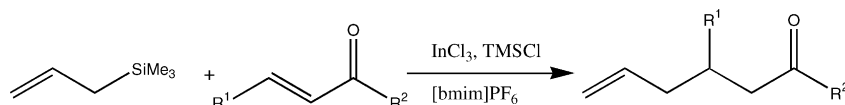
- Knoevenagel: recycling without extra base
- Claisen-Schmidt: requires addition of base
- Formation of carbene

Joshua Howarth, Paraic James, Jifeng Dai

Journal of Molecular Catalysis A: Chemical 214 (2004) 143

An exploration of the catalytic Sakurai reaction in the moisture stable ionic liquids $[\text{bmim}]\text{PF}_6$ and $[\text{bmim}]\text{BF}_4$

Several α,β -unsaturated ketones underwent the Sakurai reaction with allyltrimethylsilane to form δ,ϵ -unsaturated ketones in the presence of InCl_3 using $[\text{bmim}]\text{PF}_6$ or $[\text{bmim}]\text{BF}_4$ as the solvent. InCl_3 was a more effective catalyst in either of these two ionic liquids than in the normal solvent of choice, CH_2Cl_2 .

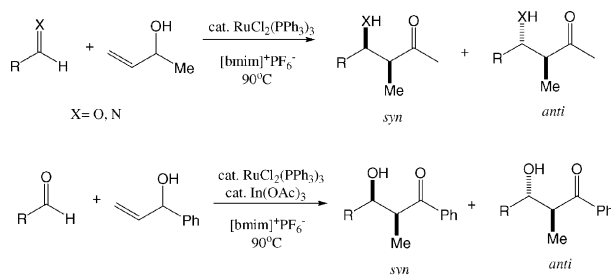


**Xiao-Fan Yang, Mingwen Wang,
Rajender S. Varma, Chao-Jun Li**

Journal of Molecular Catalysis A: Chemical 214
(2004) 147

Ruthenium-catalyzed tandem olefin migration—
aldol- and Mannich-type reactions in ionic liquid

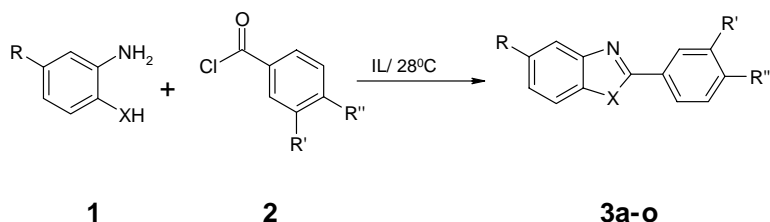
Aldol- and Mannich-type reactions via the cross-coupling of aldehydes and imines with allylic alcohols catalyzed by 5% $\text{RuCl}_2(\text{PPh}_3)_3$ were developed with ionic liquid as the solvent. With 10% $\text{In}(\text{OAc})_3$ as the co-catalyst, α -vinylbenzyl alcohol underwent similar coupling reaction with aldehydes. The solvent/catalyst system could be reused for at least five times with no loss of reactivity.



**R.N. Nadaf, S.A. Siddiqui, Thomas Daniel,
R.J. Lahoti, K.V. Srinivasan**

Journal of Molecular Catalysis A: Chemical 214
(2004) 155

Room temperature ionic liquid promoted regioselective synthesis of 2-aryl benzimidazoles, benzoxazoles and benzthiazoles under ambient conditions

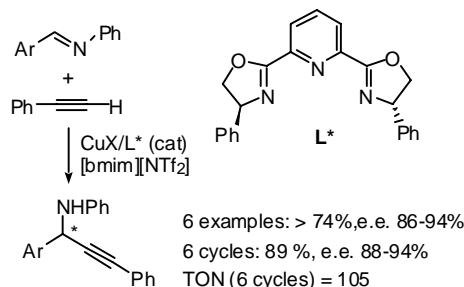


X = NH, O, S

**João N. Rosa, A. Gil Santos,
Carlos A.M. Afonso**

Journal of Molecular Catalysis A: Chemical 214
(2004) 161

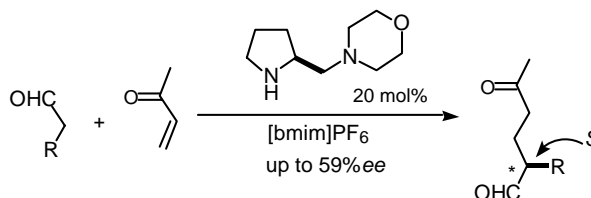
Enantioselective addition of alkynes to imines in ionic liquids



**Hisahiro Hagiwara, Tomoyuki Okabe,
Takashi Hoshi, Toshio Suzuki**

Journal of Molecular Catalysis A: Chemical 214
(2004) 167

Catalytic asymmetric 1,4-conjugate addition of unmodified aldehyde in ionic liquid



**Stefan Breitenlechner, Martin Fleck,
Thomas E. Müller, Andreas Suppan**

Journal of Molecular Catalysis A: Chemical 214
(2004) 175

Solid catalysts on the basis of supported ionic
liquids and their use in hydroamination reactions

The scope for the immobilization of homogeneous catalysts in supported ionic liquids was explored. In this study, a solution of cationic transition metal complexes in the ionic liquid 1-ethyl-3-methylimidazolium trifluoromethanesulfonate was supported on diatomic earth. The catalysts were then tested in the direct addition of 4-isopropylaniline to phenylacetylene. Compared to the corresponding homogeneous catalysts supported Rh(I), Pd(II) and Zn(II) complexes combined higher catalytic activity and selectivity.

