

## Accepted Manuscript

Research paper

Towards a frustrated Lewis pair-ionic liquid system.

Florian G. Perrin, Felix D. Bobbink, Emilia Păunescu, Zhaofu Fei, Rosario Scopelliti, Gabor Laurenczy, Sergey Katsyuba, Paul J. Dyson

PII: S0020-1693(17)30528-5  
DOI: <http://dx.doi.org/10.1016/j.ica.2017.07.045>  
Reference: ICA 17768

To appear in: *Inorganica Chimica Acta*

Received Date: 6 April 2017  
Revised Date: 20 July 2017  
Accepted Date: 24 July 2017

Please cite this article as: F.G. Perrin, F.D. Bobbink, E. Păunescu, Z. Fei, R. Scopelliti, G. Laurenczy, S. Katsyuba, P.J. Dyson, Towards a frustrated Lewis pair-ionic liquid system., *Inorganica Chimica Acta* (2017), doi: <http://dx.doi.org/10.1016/j.ica.2017.07.045>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



## Towards a frustrated Lewis pair-ionic liquid system.

Florian G. Perrin<sup>1</sup>, Felix D. Bobbink<sup>1</sup>, Emilia Păunescu<sup>1</sup>, Zhaofu Fei<sup>1</sup>, Rosario Scopelliti<sup>1</sup>, Gabor Laurenczy<sup>1</sup>, Sergey Katsyuba<sup>2</sup> and Paul J. Dyson<sup>1,\*</sup>

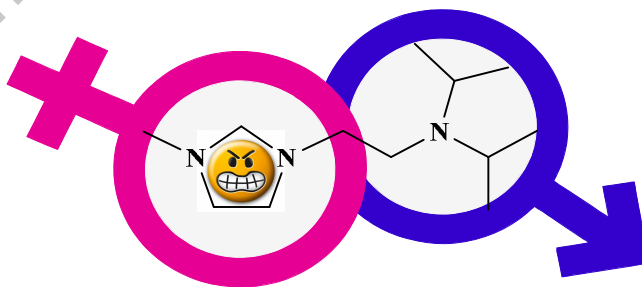
<sup>1</sup>*Institut des Sciences et Ingénierie Chimiques, École Polytechnique Fédérale de Lausanne (EPFL), CH-1015 Lausanne, Switzerland. E-mail: paul.dyson@epfl.ch*

<sup>2</sup>*A.E. Arbusov Institute of Organic and Physical Chemistry, Kazan Scientific Center, Russian Academy of Sciences, Arbuzov str. 8, 420088 Kazan, Russia*

**Abstract:** An ionic liquid encompassing a bulky tertiary amine was synthesized and used as a dual solvent-reactant for the formation of a frustrated Lewis pair with tris(pentafluorophenyl)borane, forming a pseudo-frustrated Lewis pair-ionic liquid system. The ionic liquid-LA system is prone to self-ionization, i.e. with the formation of iminium and boron hydride species, which are able to form adducts with CO<sub>2</sub>. Compared to frustrated Lewis pairs operating in organic solvents of low polarity, more forcing conditions are required for the ionic liquid system. Calculations indicate that the anion of the ionic liquid interacts with the Lewis acidic boron center, hindering reactivity, and rationalizing the low reactivity observed.

**Keywords:** Frustrated Lewis pairs, Ionic liquids, Hydrogen activation, CO<sub>2</sub> reduction, Imidazolium salts.

**Graphic abstract:**



Frustrated Lewis pairs (FLPs) are composed of sterically or electronically hindered Lewis acids (LA) and Lewis bases (LB) that do not form strong LA-LB adducts.<sup>1-4</sup> This property makes FLPs highly reactive and some are able to heterolytically split hydrogen and catalyse

Download English Version:

<https://daneshyari.com/en/article/7750844>

Download Persian Version:

<https://daneshyari.com/article/7750844>

[Daneshyari.com](https://daneshyari.com)