Electrodeposition of silver particles and gold nanoparticles from Imidazolium Ionic Liquid Crystal

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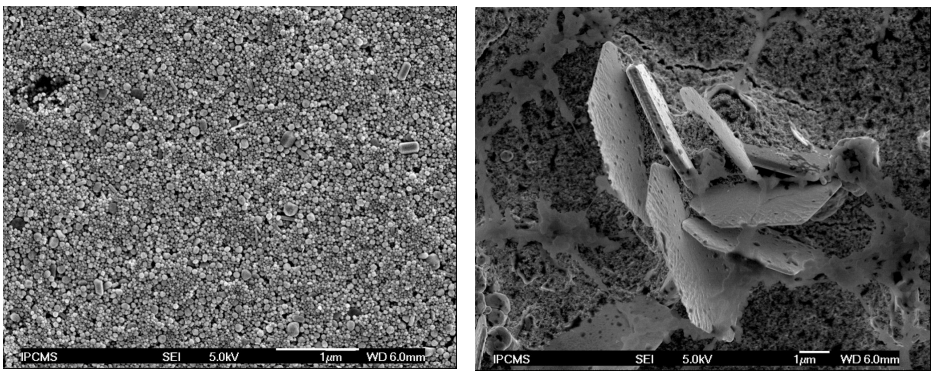
The convergence between two distinct fields of ionic liquid and liquid crystal chemistry can lead to a vast new range of materials for research and industry(1). Interest in them has been driven in large part by the perspectives presented by their potential applications, especially as solvents for electrosynthesis and the fact that liquid crystals are systems, which provide self-organized orientational ordering at macroscopic level. The association of order and mobility opens the door to investigation, for example, of electroreduction in ordered media, in the hope of obtaining shape and size selectivity due to the supramolecular architecture. Despite growing interest in the properties of ionic liquids, which are frequently based on imidazolium compounds, very little is know of systems, which forms liquid crystals(2).
We present a new strategy for a versatile exploitation of liquid-crystal template effects, which is illustrated by the electrolysis of imidazolium based liquid crystal containing dicyanoaurate(I) and dicyanoargentate(I) anions to produce gold and silver nanoparticles(3).

(1) H. Ohno, Electrochemical Aspect of Ionic Liquids, Wiley, **2005**
(2) **a**) M.Yoshio, T. Mukai, K. Kanie, M. Yoshizawa, H. Ohno and T. Kato, *Adv. Mater.*, **2002**, *14*, 351-354. ; **b**) K. Binnemans, *Chem. Rev.*, **2005,** *105*, 4148-4204
(3) W.Dobbs, J.-M. Suisse, L. Douce and R. Welter, *Angew. Chem. Int . Ed.* **2006**, *46*, 4179- 4182



a *b*

SEMs of silver particles electrodeposited from Imidazolium dicyanoargentate precursor. Electrodeposition were conducted in (a) Isotropic liquid phase and (b) Liquid crystallin phase. (Scale bars : 1μm)