Dr. Corinne Lagrost (HDR)

CNRS researcher

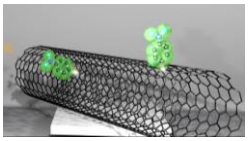
Institut des Sciences Chimiques de Rennes, UMR 6226

Université de Rennes 1, Campus de Beaulieu, 35042 Rennes, France

CV/ biography

Corinne Lagrost is Directrice de Recherche in the CNRS. She received in 2000 a pH D degree in molecular electrochemistry from université Paris Diderot (Paris, France). After a post-doctoral stay at university of Amsterdam (The Netherlands), she obtained in 2001 a CNRS permanent position at the Institut des Sciences Chimiques de Rennes, Univ. Rennes. Her main research topics concern i) the electrochemical reactivity in unconventional media (ionic liquids, DES) ii) the molecular functionalization of metallic surfaces and iii) studies of electrochemical properties of functional surfaces. Her research activities have led to the publication of 72 peer-reviewed articles.

FUNCTIONALIZATION OF CARBON MATERIALS (CARBON NANOTUBES, GLASSY CARBON, PYROLIZED PHOTORESIST FILM) BY REDUCTION OF *IN SITU* PRODUCED DIAZONIUM CATIONS IN A BRØNSTED ACIDIC IONIC LIQUID



Abstract

Imidazolium-based Brønsted acidic ionic liquid, 1-butyl-3-methylimidazolium hydrogensulfate, [BMIm][HSO_4] was used as electrolyte for the grafting of glassy carbon/PPF (pyrolyzed photoresist films) electrodes and carbon nanotubes from nitrobenzene diazonium cations.[1] The diazonium cations were simply produced *in situ* in the acidic ionic liquid containing 4-nitroaniline and $NaNO_2$. The electrochemical and atomic force microscopy (AFM) studies of the electrografted solid electrodes reveal that a particularly interesting self-limiting and self-patching process occurs in the highly viscous ionic liquid. Due to the peculiar dispersion properties of imidazolium-based ionic liquids towards carbon nanotubes, the described grafting method could have been further extended to single- and multi-walled carbon nanotubes,[2] following either an electrochemical or a chemical route. Upon gentle grinding of the carbon nanotubes with [BMIm][HSO_4] followed by centrifugation, a bucky paste is obtained and could be used to coat a basal plane graphite (BPG) electrode surface. This simple and soft method allows i) the facile electrochemical functionalization of carbon nanotubes from the nitrobenzene diazonium cations *in situ* produced in [BMIm][HSO_4] and ii) the facile electrochemical characterizations of the functionalized carbon nanotubes by means of cyclic voltammetry. Raman spectroscopy measurements were further employed to assess the covalent functionalization of single-walled carbon nanotubes. This work highlights the potential of the [BMIm][HSO_4] ionic liquid as electrolyte for the *in situ* production of diazonium cations, leading to a versatile approach toward chemically functionalized carbon nanotubes.[3]

[1] Bélanger, D.; Pinson, J. *Chem Soc. Rev.* **2011,** *40*, 3995-4048
[2] Fukushima, T.; Kosaka, A.; Ishimura, Y.; Yamamoto, T.; Takigawa, T.; Ishii, N.; Aida, T. *Science* **2003**, *300*, 2072-2075
[3]J. Carvalho Padilha, J.M. Noel, J.F. Bergamini, J. Rault-Berthelot, C. Lagrost, *ChemElectroChem*, **2016**, *3*, 572-580

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