Development of positive electrode host materials for organic batteries

E. Deunf,[a] A. Jouhara,[a] V. Cadiou,[a,b] T. Gutel,[b] L. Dubois,[c] F; Dolhem,[d] D. Guyomard,[a] N. Dupré,[a] P. Poizot[a,e]

a. Institut des Matériaux Jean Rouxel (IMN), UMR CNRS 6502, Université de Nantes, 2 rue de la Houssinière, B.P. 32229, 44322 Nantes Cedex 3, France
b. CEA, LITEN (DRT/LITEN/DEHT/LMB), Laboratoire des Matériaux pour Batteries, 17 rue des martyrs, F-38054 Grenoble, France
c. CEA, INAC (DSM/INAC/SCIB), UMR-E CEA-UGA, Laboratoire de Chimie Inorganique et Biologique, 17 rue des martyrs, F-38054 Grenoble, France
d. Laboratoire de Glycochimie, des Antimicrobiens et des Agroressources (LG2A), UMR CNRS 7378, Université de Picardie Jules Verne, 33 rue Saint-Leu, 80039 Amiens Cedex, France
e. Institut Universitaire de France (IUF), 103 bd Saint-Michel, 75005 Paris Cedex 5, France

Routine access to power sources is an essential factor towards the continuing progress of our technology-oriented society, and towards ensuring a better quality of life. In this context, due to the ever-increasing implementation of renewable energy sources, electrical energy storage systems are set to play a central and potentially critical role in the next-generation energy infrastructure. Accelerated progress and innovation in the development of new and potentially "greener" electrochemical storage devices is thus imperative. In this regard, and in parallel to research activities on regular inorganic-based electrode materials, the past decade has seen significant progress with respect to redox-active organic compounds, attracting much interest from the energy storage community. Indeed, organic chemistry provides great opportunities for discovering innovative electrode materials able to operate both in aqueous and nonaqueous electrolytes. Additionally, it must be pointed out that two types of electrochemical insertion mechanisms can be used in practice with either reversible uptake/release of cations or anions.

In this communication, we will present recent advances on new organic positive electrodes. In particular, we will report on 2,5-(dianilino)terephthalate derivatives as layered redox-active organic material belonging to low molecular weight aromatic amines, able to reversibly host anions even without a carbon additive, which is very unusual behavior for an organic electrode material.

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