Influence of the electrolyte on the electrochemical performance of a polyimide material for electrodes in rechargeable batteries

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Abstract

The charge storage on organic polymers has led to increasing application of these new materials such as active electrodes in rechargeable batteries [1, 2]. Taking advantage of the redox properties of aromatic polyimide imide group [3], which allows it to be electrochemically oxidized and reduced reversibly, we will present the advances made on the electrochemical studies carried out with a polyimide derivative electrode material towards the constitution of a new battery.

Previous studies by the authors with a poliimide derivative [4] using cyclic voltammetry have shown their significant redox capacity to be applied as an alternative material for energy storage in rechargeable batteries. Furthermore, the use of polyimide is considered safe owing to this type of polymer not being flammable and having an excellent thermal stability and high mechanical strength. Since the polyimide is hydrolyzable, its use can be considered environmentally favorable.

Attempts to use composite poliimides through solvent blending methodologies lead to poor dispersion of the polymer in the composite mixture. In situ polymerization techniques were well succeed with added incorporation of carbon fibre with the poliimide precursor.

Research is in progress with studies with different electrolytes and polyimide composite in order to ensure an efficient lithium ion exchange and obtain batteries with satisfying energy performance. Advances made will be presented herein.

Keywords: *organic electroactive materials, rechargeable batteries, polyimide*

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