



Review—Innovative Polymeric Materials for Better Rechargeable Batteries: Strategies from CIC Energigune

Heng Zhang,^{1,z} Michel Armand,^{1,z} and Teófilo Rojo^{1,2,z}

¹*CIC Energigune, Parque Tecnológico de Alava, Miñano, Alava 01510, Spain*

²*Department of Chemical Engineering, Faculty of Science and Technology, University of the Basque Country UPV-EHU, 48080 Bilbao, Spain*

Published March 5, 2019.

DOI: [10.1149/2.0811904jes](https://doi.org/10.1149/2.0811904jes)

Abstract

The need for sustainable energy sources and their efficient utilization has motivated extensive explorations of new electrolytes, electrodes, and alternative battery chemistries departing from current lithium-ion battery (LIB) technologies. The evolution and development of rechargeable batteries are tightly linked to the research of polymeric materials, such as polymer electrolytes and redox-active polymeric electrodes, separators, and binders, etc... In this contribution, we review the recent progresses on polymer electrolytes and redox-active polymeric electrodes developed in CIC Energigune with particular attention paid to the molecular designing and engineering. On the basis of our knowledge and experience accumulated in rechargeable batteries, further developments and improvements on the properties of these polymeric materials for building better rechargeable batteries are discussed.

Acknowledgments

This work was supported by GV-ELKARTEK-2016 from the Basque Government, and MINECO RETOS (Ref: ENE2015-64907-C2-1-R) from Spanish Government. H.Z. thanks the Basque Government for the Berrikertu program (1-AFW-2017-2). This manuscript is dedicated to the 73th birthday of Prof. Dr. Michel Armand, who ushered theoretical concepts leading to practical applications in energy-related electrochemistry.