New strategy for designing new materials based on conducting polymers and metal oxide: from sensing to energy application

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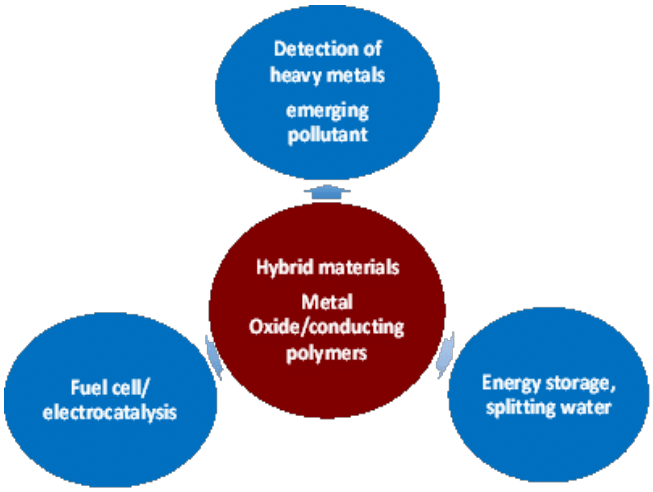
Abstract

The presence of aromatic compounds rich in carbon and azote in the backbone of conducting polymers such as polypyrrole, polyaniline, and poly-phenylenediamine improve their capacity to quench metallic particles via amine group to include them into their frameworks. Herein, a new and simple strategy based on electrochemical cascade reactions was used to prepare metal oxide / conducting polymers. [1-5]. Metal oxides such as Nickel, Ruthenium or Copper oxide are widely used for Direct alcohol fuel cell (DAFC) applications due to their interesting optical, catalytic and electrical properties. In the first part of this work, we will explore the most commonly used methods for preparing metal-conducting polymer based nanocomposites including the key factors influencing their morphology. The catalytical performances of mono and bimetal catalysts deposited on poly-phenylenediamine for electrooxidation of ethanol reaction and oxygen reduction will be examined. The developed nanocomposites offer a great potential for application as sensors or electrocatalysts. We look for future collaborations to apply our catalyst for electrochemical reduction of CO_2.



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Mama El Rhazi obtained her PhD thesis in electrochemistry in 1992 investigating the modified electrodes by impedance techniques. She started her career by teaching chemistry in the university of Versailles saint –Quentin (France). She then moved to the University of Hassan II - Casablanca (Morocco). She was also invited as associate professor at university of Cergy-Pontoise – France, during 1994 and 1996. She is currently professor in department of chemistry at Faculty of Sciences and Technologies of Mohammedia. She is President of Moroccan Society of Analytical Chemistry for sustainable development. She was president of Federation of African Societies of Chemistry (2017-2022), member of Pan African Chemistry Network. . Chair and Co-chair of several international conferences (ASCD 2010, ACSD2013, ACD2016, abchem 2022.). Her research interests include electroanalysis, modified electrode by conducting polymers / and nanoparticles or by metallic film as bismuth for detection of heavy metals or organic compounds.

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