Polymerizable Ionic Liquid-derived Non-precious Metal Catalyst Fe-N/C for Oxygen Reduction Reaction

Guogang Xue^{1,*}, Jianjun Tian², Jun Bao³, Dan Hu³

¹ School of Physics and Electronic Engineering, Kewen College, Jiangsu Normal University, Xuzhou 221116, P.R. China

² School of Environmental and Chemical Engineering, Tianjin Polytechnic University, Tianjin 300387, P.R. China

³ Wuxi Test Institute of Supervision & Inspection on Product Quality, Wuxi 214101, P.R. China

*E-mail: ggxue@jsnu.edu.cn

doi: 10.20964/2021.01.71

Received: 10 October 2020 / *Accepted:* 15 November 2020 / *Published:* 30 November 2020

Polymerizable ionic liquid (PIL) of hydrolyzed vinyl imidazolium nitrate ([HVim]NO₃) was used to prepare the non-precious metal catalyst (NPMC) of Fe-N/C. The material was characterized for catalytic performance toward oxygen reduction reaction (ORR). The onset and half wave potential for ORR is 0.90 and 0.64 V_{RHE}, respectively. The electrochemical tests show that the Fe-N/C material is a potential NPMC for ORR. Therefore, the PIL is a promising precursor for ORR catalyst free of noble metal.

Keywords: Polymerizable ionic liquid; Non-precious metal catalyst; Oxygen reduction reaction; Fuel cell

[FULL TEXT](#)

© 2021 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).