

Co-NC hollow spheres prepared by ultrasonic spray pyrolysis and pseudomorphic replication for oxygen reduction reaction

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Metal-nitrogen-carbon (M-NC) catalysts reported as one of the possible replacement for expensive commercial electrocatalysts. This catalyst is known to show activity in oxygen reduction reaction, which is the rate-determining step in fuel cell. In this study, metal-organic frameworks (MOF) was carbonized and used as the electrocatalysts. MOF is the crystalline material which is composed of metal nodes and organic linkers. If MOF is used as precursor for electrocatalysts, they can retain some advantages such as high porosity and tunability. The synthetic procedure starts with Co-ZnO preparation. Co-ZnO hollow spheres were collected by ultrasonic spray pyrolysis technique. Then, the collected powder was converted to Co-ZIF-8 by the pseudomorphic replication. Finally, Co-NC hollow spheres were obtained by the carbonization of Co-ZIF-8 in argon atmosphere. The Co-NC hollow spheres showed outstanding half-wave potential of 0.906 V, which is higher than many of other publications.