

Preparation and electrocatalytic activity of Fe-Nx-OMC as efficient catalyst for oxygen reduction and oxygen evolution reaction

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Rechargeable Li-air batteries are currently the subject of much attention due to the expectation that they can allow energy densities to be achieved that are several times greater than even the most state-of-the-art lithium-ion batteries. In this paper, 2D hexagonal ordered mesoporous carbon were by using nanocasting method. The Fe-Nx-OMC have 2D hexagonal structure by using iron sulfate and 1,10-phenanthroline complex which consists of micropores and mesopores. The catalytic activity of the Fe-Nx-OMC for oxygen reduction reaction has been studied and compared with the other Me-Nx-OMC (Ni, Mn, Cu, etc) by using rotating ring-disk electrode (RRDE) technique. The Fe-Nx-OMC exhibit superior catalytic activity for the ORR compared to the other Me-Nx-OMC. Besides, the Fe-Nx-OMC also afford high catalytic activity for the oxygen evolution reaction (OER). Furthermore, the Fe-Nx-OMC show the low overpotential between ORR and OER. The high ORR and OER activities and stabilities of Fe-Nx-OMC could be attributed to their special porous structure.