

Synthesis MOF-on-MOF based on ZIF-1 for application electrocatalyst

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Metal-organic frameworks are composed of particles with 3D geometry and are currently among the most widely studied heterogeneous catalysts. To further increase their activity, one of the recent trends is to develop related 2D materials with almost active size on its surface and a small thickness. Herein, we report hybrid MOFs with growth of a 3D zeolitic imidazolate framework (ZIF) on a 2D ZIF-L template (ZIF-L@ZnCo-BZIF). The material is 3D material but still retains the potential of 2D material due to leaf-shape morphology. The reasonable Co/Zn molar ratio in the shell is the key to morphology and properties of material after pyrolysis process. After pyrolysis, the structure of Leaf not only have heteroatom cobalt and nitrogen co-doped matrix carbon with a high surface area and porosity, but also retained the advantageous thin leaf-shape of 2D material which facilitate the mass transfer and electron transfer for improved performance of ORR. The synthesized ZIF-L@ZnCo-BZIF shows unique leaf-like crystal morphology using field emission scanning electron microscope, energy-dispersive X-ray spectroscopy, Brunauer-Emmett-Teller analysis.