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Ultrathin Two-Dimensional Cobalt Zeolite-Imidazole Framework Nanosheets for Electrocatalytic Oxygen Evolution

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A promising class of novel systems are 2D inorganic-organic hybrid materials derived from crystalline coordination networks, in particular from metal-organic frameworks (MOFs). In general, MOFs are based on the self-assembly of metal ions and organic linkers to yield 3-dimesional crystalline porous coordination networks.[1-4] MOFs may feature highly exposed active sites on their surface, including coordinatively unsaturated metal sites suited as catalytic reaction centres. Thus, 2D MOFs offer humongous possibilities and a wide parameter space, allowing for eventually achieving superior and unusual material properties that cannot be obtained otherwise. 2D MOFs exhibit a layered structure with strong in-plane coordination bonds and weak interactions between the layers (e.g., van der Waals forces and hydrogen bonding). This property may provide favorable interaction between active sites and substrate molecules with a smaller diffusion barrier as compared to their 3D bulk MOF counter parts. In my presentation, I would like to discuss on my recent paper on unprecedented facile and scalable strategy to obtain cobalt zeolite imidazole framework 2D layers by liquid exfoliation of the ZIF-9(III) phase and it exhibited highly efficient OER activity in alkaline medium.[5]

References

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