Title:	Self-Assembled Molecular Hybrids of CoS-DNA for Enhanced Water Oxidation with Low Cobalt Content
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Abstract:	Water oxidation in alkaline medium was efficiently catalyzed by the self-assembled molecular hybrids of CoS-DNA that had 20 times lower Co loading than the commonly used loading. The morphological outcome was directed by varying the molar ratio of metal precursor Co(Ac)2 and DNA and three different sets of CoS-DNA molecular hybrids, viz. CoS-DNA(0.036), CoS-DNA(0.06), and CoS-DNA(0.084) were prepared. These morphologically distinct hybrids had shown similar electrocatalytic behavior, because of the fact that they all contained the same cobalt content. The CoS-DNA(0.036), CoS-DNA(0.06), and CoS-DNA(0.084) required very low overpotentials of 350, 364, and 373 mV at a current density of 10 mA cm–2 (1 M KOH), respectively. The advantages of lower overpotential, lower Tafel slope (42.7 mV dec–1), high Faradaic efficiency (90.28%), high stability and reproducibility after all, with a lower cobalt loading, have certainly shown the worth of these molecular hybrids in large-scale water oxidation. Moreover, since DNA itself a good binder, CoS-DNA molecular hybrids were directly casted on substrate electrodes and used after drying. It also showed minimum intrinsic resistance as DNA is a good ionic and electronic conductor. Besides, the present method may also be extended for the preparation of other active electrocatalysts for water splitting.
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