Electrochemical Synthesis and Electrocatalytic Performance of Coordination Nanosheets

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Keywords: Coordination Nanosheet; Bis(diimino)metal complex; Electrochemical Synthesis; Electric Conductivity; Electrocatalyst

A coordination nanosheet (CONASH) is a two-dimensional metal complex framework composed of metal ions and organic ligand molecules. Various kinds of functional CONASHs have been synthesized in this decade utilizing the diversity of chemical structures and functionalities derived from the huge variety of combinations of metal ions and ligands and the simple and inexpensive synthetic procedures due to the complexation reaction progressing under mild conditions.[1)]

Bis(diimino)metal complex CONASHs are highly affable for utilization as electrode materials for secondary batteries, capacitors, electrocatalysts, and sensors because of the electric conductive properties not generally observed in coordination polymers, the porous structure contributing to mass transport and enhancing the surface area, and the redox properties of the metal complex units.[1a)] The synthesis requires the oxidation process to form the bis(diimino)metal complex. Although oxygen in the air is used as an oxidizing reagent in conventional methods, we have developed the electrochemical synthesis method for the direct formation of MHABs (M = Co, Ni, Cu) composed of metal and hexaaminobenzene on an electrode by electrochemical oxidation and reported the catalytic performance of the MHAB-modified electrodes for hydrogen evolution reaction.[2)]

In this poster presentation, we will present a modified electrochemical synthesis method for MHAB formation, the characterization by spectroscopic and microscopic techniques, and the electrocatalytic performance of the prepared electrodes.

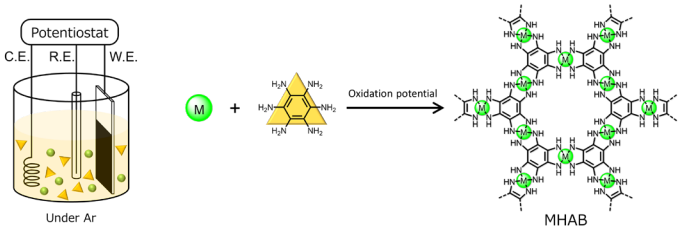

Figure. Illustration of electrochemical synthesis method and chemical structure of MHAB.

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