Syngas Production via Carbon Dioxide Electroreduction Over CdS Nanorods

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Herein, CdS nanorods (CdS-NR) was synthesized through a simple and facile solvothermal method. XRD pattern and TEM/HRTEM images indicated that hexagonal CdS nanorods with a diameter of 10 nm were successfully prepared. When used as electrocatalyst for CO₂ reduction reaction (CO₂RR), CdS-NR afforded an excellent electrocatalytic performance in aqueous electrolyte. In comparison with commercial CdS nanoparticles (CdS-NP), CdS-NR could trigger the electroreduction of CO₂ to CO with a higher faradic efficiency and current densities. The enhanced electrochemical performance of CdS-NR than that of CdS-NP were ascribed to its enhanced adsorption of CO₂, charge transfer ability and more exposed active sites. More importantly, it was noticed that H₂ generated along with CO, and the generated gas products with controllable ratios exhibited impressive potentials to directly using as syngas.

Keywords: CdS nanorods, electrocatalysis, CO₂ reduction, syngas

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