CUO/GRAPHENE NANO-FLOWER CATALYST FOR CO_2 ELECTRO-CHEMICAL REACTION

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Electrochemical reduction of CO_2 to low carbon organic compounds has been considered as a promising method to mitigate the greenhouse effect and produce useful energy carrying chemicals. However, the development of catalyst with high activity, selectivity, and good stability is still the bottleneck to accomplish this goal. Cu based catalysts have been reported to meet such requirement. In this work, we prepared CuO nano needle and CuO/graphene nano-flower catalysts using polyol method. The catalyst was examined using XRD (X ray diffraction), SEM/EDS (Scanning Electron Microscopy/ Energy Dispersive X-ray Spectroscopy) and electrochemical testing methods etc. Results indicate that CuO/graphene nano-flower exhibits a high catalytic activity for CO_2 conversion to formate with a Faradaic efficiency of 60% (Nano needle) and 75% (Nano flower) under -1.1V vs SHE. We also will demonstrate membrane electrolyte assembly based device for CO_2 electrochemical reduction. In where, the CuO/graphene nano-flower catalyst is coated on gas diffusion layer as the cathode.

Biography

Yucheng Wang is pursuing PhD in the department of mechanical and construction engineering, faculty of engineering and environment, Northumbria University, UK. His research is mostly focused on electrocatalysts and novel materials with particular applications in CO_2 capture and reduction using electrochemical method.

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a) CuO nano needle and b) CuOgraphene nano-flower catalysts.
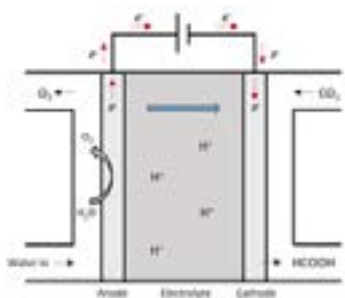
b) Sketch of the CO2 electrochemical reduction device.