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Electrochemical reduction of CO₂ by Arc plasma deposition of copper and gold composite nano particles

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The reduction of CO₂ has gained considerable attention due to the environmental concerns associated with the effect of greenhouse gases on our planet and the use of CO₂-reduced end-products for energy transport. Recently, the focus in electrochemical reduction of CO₂ has shifted from metal electrodes to new and novel materials. This study was conducted by employing a novel fabrication method of Arc Plasma Deposition (APD) to deposit a composite of copper and gold nano particles on FTO conductive glass. APD allows the nanoparticles to implant onto the substrate as opposed to the commonly used method of epitaxial growth or electro-deposition. This unique structure reduced the CO₂ to produce formic acid with up to 70% faradaic efficiency. Copper and gold nano particles have never previously been reported to produce formic acid with such high efficiency, suggesting that the co-deposition technique of implanted nanoparticles can provide an interesting future avenue in the field of electrochemical reduction of CO₂.

Biography

Fahd S Khan is currently pursuing PhD from the School of Engineering, University of Tokyo. His focus of research has been the study of novel materials for electrochemical reduction of CO₂. Earlier he has completed his Masters in Thin Film Fabrication and Characterization, from the School of Science at the University of Tokyo. He has completed his Bachelors in Electrical Engineering from the University of Engineering and Technology in Pakistan.

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