Electrodeposition of Tin Based Film on Copper Plate for Electrocatalytic Reduction of Carbon Dioxide to Formate

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Sn based film with a thickness of 169 nm has been electrodeposited on copper plate from a choline chloride/ethylene glycol based electrolyte containing SnCl_2 . Electrochemical reduction of carbon dioxide (CO_2) has been studied on the prepared Sn based film electrode in KHCO_3 aqueous solution. The electrolysis results show that the faradaic efficiency for producing formate is affected by the time of the electrode exposed to air and the electrolysis potential. We find that the Sn based film can improve the electrocatalytic activity for CO_2 reduction. The faradaic efficiency for producing formate on the Sn based film electrode (74.1%) is higher than that on the Cu plate electrode.

Keywords: Electrodeposition; Tin based film; Carbon dioxide; Electrocatalytic reduction; Formate

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