High Performance Sn–In Cathode for the Electrochemical Reduction of Carbon Dioxide to Formic Acid

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Both Sn and In have been potentiostatically co-deposited on the surface of Cu foam at different potentials to prepare Sn–In bimetallic electrodes. Among them, the Sn₄₂In₅₈ electrode has excellent catalytic activity towards CO₂ reduction to formic acid. At –1.6 V versus Ag/AgCl, the formate Faradaic efficiency reaches its maximum, 88%; and its space time yield reaches 309 μmol h^{–1} cm^{–2} at –1.8 V versus Ag/AgCl. When it is used in the biomimetic electrochemical cell reported previously by us, a much higher space time yield, 468 μmol h^{–1} cm^{–2} is obtained.

Keywords: Electrochemical reduction, carbon dioxide, formate, tin–indium bimetallic catalyst, space time yield

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