

Effect of Pressure on the Electrochemical Conversion of CO₂ to CO

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To minimize the negative effect of carbon dioxide as a greenhouse gas and introduce renewable energy in the chemical and energy chain, an interesting approach is the Carbon Capture and Conversion. In this context, one of more appealing conversion strategies is the electrochemical reduction of CO₂, which could combine the utilization of excess electric energy from intermittent renewable sources with CO₂. (1) Furthermore, CO₂ can be selectively converted into various useful chemicals by changing the operating conditions of electrolysis. In particular, an increasing attention has been devoted to the electrochemical conversion of carbon dioxide to carbon monoxide. (2,3) The main obstacle of that conversion from water solution is the low CO₂ solubility in water. In this work, a methodical study on the effect of the CO₂ pressure and of other operating parameters on the conversion of CO₂ at flat cathodes to carbon monoxide was performed. In detail, the reduction of CO₂ was studied in different kind of electrochemical cells to evaluate the effect of various operating parameters, including the nature of the supporting electrolyte and the nature of cathode (Ag and Au), the current density, the pH and the pressure of CO₂. It was shown that an increase of the pressure leads to an improvement the stability of the electrode.

References:

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