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Electroreduction of CO_2 to Fuels and Chemicals

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Message from the Guest Editors

Anthropogenic emissions of greenhouse gasses such as CO_2 have been pointed out to contribute to climate change. In order to mitigate climate change, a number of approaches have been proposed to reduce the levels of CO_2 in the atmosphere. In this sense, electroreduction of CO_2 allows the potential reutilization and transformation of CO_2 into high added value chemicals by using renewable energy such as wind power and solar energy. A wide variety of products including CO, syngas (CO/H_2), CH_4, and methanol, among others, have been obtained with high faradaic yields via electroreduction of CO_2. Nevertheless, research is still required on: (i) new (and cheaper) electrocatalyst formulations with high faradaic selectivities; (ii) new electrochemical reactor configurations able to overcome kinetic/mass transport limitations and therefore reduce the overpotential of the reduction processes; and (iii) mitigation of the competing H_2 evolution reaction. The present special issue is devoted to gather these efforts of the research community worldwide and present the most relevant technologies allowing this paradigmatic conversion.