ISSN: 2576-3954
Volume-06
Journal of Chemistry and Applied Chemical Engineering

https://www.scitechnol.com/journal-chemistry-applied-chemical-engineering.php

Title: CO2 convert to carbonaceous products by liquid metal at room temperature.

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Received: October 14, 2022; Accepted: October 15, 2022; Published: November 22, 2022

The need for effective and adaptive technologies for carbon dioxide (CO2) mitigation targeting global net-zero carbon emissions is critically growing. Hence, innovative technologies for CO2 reduction have attracted worldwide interest from scientific research communities. The use of liquid metals for the conversion of CO2 into carbon or solid carbonaceous products has gained increasing attention in recent years due to their high activity and resistance to coking. Here, we present a facile approach for the reduction of CO2 to solid carbon at/and near room temperature, and atmospheric pressure, using Mg-Ga liquid metal alloys. In this process, Mg plays a major role in driving the dissociation of CO2 to its elemental constituents, carbon and oxygen. During the reaction process, Mg ions diffuse to the gas-liquid interface and reduce CO2 to carbon while undergoing an oxidation reaction. The electrochemical method ensures a sustainable cyclic process by reducing Mg ions back to their metallic counterpart. The use of liquid metal alloys for CO2 reduction reactions could enable us to achieve CO2 capture and storage at room temperature, setting a new foundation for the future exploration of efficient CO2 mitigation issues.

Biography

Ms. Linlin Ye is a final year PhD candidate in the School of Chemical Engineering at the University of Melbourne. Her research focuses on converting CO2 at low temperatures to liquid and solid value-added products and mitigating the Greenhouse gas effect using novel negative emission technologies. She also has industrial experience working for L'Oréal and DELL technologies. She is currently conducting her research from clean energy laboratories under the supervision of Prof Gang Kevin Li and Dr Ali Zavabeti..