Seminar

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Thursday, 29th February 2024, 17:00 s.t.
TU Wien (Freihaus), 1040 Wien, Wiedner Hauptstraße 8-10
Sem.R. DB05B (yellow area)

The seminar will be also held as a Zoom Meeting
https://tuwien.zoom.us/j/64598910567?pwd=Q053UVVQWHFzN0d3Sjc3NFpJRGllUT09
Meeting ID: 645 9891 0567
Password: 7MYUY9ME

CO_2 and Plastic Utilization in the Context of Climate Change Mitigation

In an increasingly interconnected world, the emergence of salient issues about pollution and plastic waste has garnered pronounced attention in recent times. Undoubtedly, carbon dioxide (CO_2) emissions emerge as a pervasive variable across these monumental challenges. Global CO_2 emissions have consistently risen since the pre-industrial era, culminating in a total of 36.8 gigatons (Gt) in 2022.

In addition, plastic waste presents another significant challenge, contributing to global CO_2 emissions and the detriment of the environment and society. Recent investigations have revealed that plastic alone accounts for nearly 3.4% of the overall global greenhouse gas emissions—a staggering proportion, surpassing the carbon emissions attributed to the aviation industry. This stark reality establishes plastic as a substantial catalyst for the progression of global warming.

In light of the profound global challenges posed by plastic waste and the imperative to mitigate CO_2 emissions, the pursuit of innovative solutions that address both these environmental issues has become of paramount interest. While previous efforts have explored the potential of PET hydrolysate oxidation reaction (anode) with hydrogen fuel production (water splitting, cathode), the comprehensive utilization of both PET hydrolysate oxidation and CO_2 reduction reaction (CO_2RR) for the concurrent production of formic acid at both cathode and anode remains largely unexplored.

In this presentation, I will summarize our recent results on the production of a sustainable fuel or green chemical at both cathode and anode of a hybrid electrolyzer consisting of CO_2 reduction and PET hydrolysate oxidation into formate/formic acid (FA), a promising liquid organic hydrogen carrier (LOHC).

All interested colleagues are welcome to this seminar lecture
(45 min. presentation followed by discussion).

Günther Rupprechter
Director of Research

André Vogel
Coordinator