Session of Focus Materialchemie – Wednesday, **29.11.2023** 16:00 – @ Seminarraum Lehar 02 (TU-Wien, Getreidemarkt 9, BC, OG. 02, room A46) – join us on ZOOM (ID: 983 0066 2349)

E-Mobility versus E-Fuels Mobility, or both?

Niyazi Serdar SARICIFTCI

Linz Institute for Organic Solar Cells (LIOS) and Institute of Physical Chemistry

Johannes Kepler University of Linz, Altenbergerstrasse 69, A-4040 Linz, Austria

www.lios.at

In recent years a strong emphasis for electrical cars and e-mobility is observable. Politically as well as financially the e-mobility is getting great support.

On the other hand, the use of e-fuels for mobility of the future is often discussed in highly polarized fashion, often with misunderstanding. What are these e-fuels? Why do we need them?

In order to account for a sustainable future, the transport and storage of renewable energy are necessary. For this problem, we suggest the conversion of CO_2 to chemical energy carrying compounds like methane, methanol and/or other synthetic fuels using renewable energy. This is a possible and viable method to make efficient, large scale energy storage. At the same time this will make a cyclic and sustainable CO_2 economy.

We report studies on materials like conducting polymers of the third generation, functionalized with bio-organic catalysts which can be used in photo-electro-catalytic conversion devices. Going one step further, bio-catalysts such enzymes as well as living bacteria can be immobilized on electrodes. We report alternatively on immobilizing of enzymes onto functionalized graphene units creating a nano-bio-catalytic platform. Selectivity of such bio-catalysts is very high and combined with the room temperature ambient operation of such bio-electro-catalytic systems make them industrially highly attractive.