Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad - 500107

Internal Seminar

Metal oxide decorated doped carbons for the electrochemical reduction of CO_2

Sreekanth Narayanaru

TCIS, Hyderabad

Design of electrocatalytic interfacial architecture is essential for the efficient reduction of CO_2 to a selective product. Selectivity depends on several factors like applied potential, surface structure of the electrocatalysts, ability to stabilize CO_2 and intermediates like the anion radical, CO_2^- and CO, electrolyte, electrolyte pH and local (interfacial) pH, and finally the impurity effects. Although the mechanism of CO_2 reduction to high value products and fuels is uncertain, it is apparent that it requires a balance between CO adsorption, H availability, and intermediates that facilitate C-C bond coupling. Generating fuels like methanol and formic acid from CO_2 is a new focus in recent research. Cu based catalysts are emerging as efficient ones due to their remarkable catalytic activity for electrochemical conversion to useful products. Cu can convert CO_2 to various hydrocarbons depending upon the potential we applied. Recent studies on different forms of Cu and nanoparticles derived from copper oxide show good selectivity and high faradaic efficiency. The main objective of this work is to gain understanding of the electrocatalytic activity of the metal/non-metal composite for the selective reduction of CO_2RR. In this work, we used doped carbons decorated with Cu_2O/Cu nanoparticles for the electrochemical reduction of CO_2. Instead of using activated carbon as a support for the metal nanoparticle, catalyst doped carbon shows better catalytic activities since it has its own catalytic centres or they can adsorb CO_2 on its surface.

Wednesday, Apr 4th 2018

2:00 PM (Tea/Coffee at 1:30 PM)

Seminar Hall, TIFR-H