Inorganic Seminar

Monday, November 16, 3:15 pm

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"Thermodynamic and mechanistic studies of CO₂ reduction catalysts"

Abstract: The increase in global energy demands, coupled with growing environmental concerns, necessitates the development of viable technologies to store solar energy. Towards this end, my group is focused on developing efficient catalysts that convert CO_2 to CO, methanol or formic acid. My talk will first describe our mechanistic studies on known CO_2 hydrogenation catalysts, whereby mechanistic insight is gleaned through thermochemical studies, and allows for tuning the product selectivity. We also have uncovered a unique mechanism for CO_2 hydrogenation, whereby CO_2 must first bind to the ligand before subsequent reduction occurs. I will then discuss how we have used the same thermochemical approach to study the mechanism of electrocatalytic CO_2 reduction in a combined carbon capture & reduction system. Finally, I will present a novel ligand scaffold that, when put on CO_2 to formate; this is unique in that no H2 is produced electrocatalytically. The collective work underscores the importance of the effective hydricity as a parameter of interest and in using thermochemical parameters to rationalize and uncover alternative mechanisms. The studies presented are contextualized in developing an understanding of how to rationally design energy-efficient CO_2 reduction catalysts.



Zoom Meeting: https://rochester.zoom.us/j/93563356202 Meeting ID: 935 6335 6202 | Password: 890765 Website: https://events.rochester.edu/event/chemistry_inorganic_seminar_saouma

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