THE LONG ISLAND SUBSECTION
OF
THE NEW YORK AMERICAN CHEMICAL SOCIETY

Proudly presents

Dr. Daniel Amarante,

Department of Chemistry, Stony Brook University

Title of Talk: "Synthesis and Characterization of M(CO)(CN) and $M(RS2)_x$ Complexes to Mimic Hydrogenase"

Synopsis: Currently, the energy infrastructure is dominated by fossil fuel production and combustion. This is causing massive emission of greenhouse gases which are harming the planet. Hydrogen is often suggested as alternative fuel, sometimes called as the "fuel of the future." This statement has been mentioned for at least a generation, usually with greater seriousness during high petroleum prices. The technology to utilized hydrogen is highly advanced, however it is the scaling up that remains an issue. Hydrogen fuel cells have been designed and used, but because of the high cost and limited availability of platinum group metals this technology has not widespread to the retail market. Scientists have turned to biological systems that utilized hydrogen in order to develop new catalysts that do not require platinum group metals. In nature, hydrogen is consumed/produced with certain efficiency by hydrogenase enzymes. These enzymes are characterized as metalloenzymes which contain iron and/or nickel core.

The discovery of $[Fe(CN)_x(CO)_y]$ units in hydrogenase enzymes has prompted the study of iron–cyanide–carbonyl compounds. Recently, compounds of the general structure $[Fe^{II,III}(CN)_4L_2]^{2-,1-}$, where L = DMSO, CO, pyridine, were synthesized for the first time. This prompted studies of related compounds of the congener elements of iron, specifically using ruthenium and osmium. These studies have produced the first compounds of ruthenium with the general structure, $[Ru^{II}(CN)_4L_2]^{2-}$ where L = CO and pyridine. Iron carbonyl complexes with the H_2PS_2 ligand have been previously used to mimic the iron centers in hydrogenase enzymes. To expand on these studies, ruthenium was used to replace iron in the general structure $[M^{II}(CO)_3(PS2)]$. Various compounds were also synthesized using Li_2NS2 in place of Li_2PS2.

All are welcome!

When: Thursday, March 5th, 2020

Where: Queensborough Community College, Science Building Rm S-112

Time: 5:30 p.m. – Social w/ Light Refreshments; 6:00 pm – Seminar Start

Directions: http://www.qcc.cuny.edu/about/driving.html

After Seminar Dinner: At a nearby restaurant, $25 per person.