Chemistry Seminar

Monday, 6 February 2023 at 16:00 in 303 Schrenk Hall

A Sinuous Search for the Solid Structure of $Fe_3(CO)_{12}$

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The search for the solid structure of $Fe_3(CO)_{12}$ beautifully illustrates the mechanism of scientific research, specifically the modification, adjustment, and correction of knowledge through more advanced measurements. This search will use x-ray diffraction, infrared, NMR, and Mössbauer spectral measurements to determine the now well accepted solid structure of $Fe_3(CO)_{12}$ and to better understand the dynamics present in the cluster.

Painting of *Triiron Dodecacarbonyl* by Dr. Grant Delbert Venerable II presented to Larry F. Dahl in September 1967. This painting depicts the happy outcome of obtaining the ultimate solid-state structure of $Fe_3(CO)_{12}$ at room temperature; the observed six-point *Star of David* illustrates the centrosymmetric crystal disorder giving rise to a hexagon of half-iron atoms. Discernible on the left and right sides are two proposed linear triiron dodecacarbonyl models along with the three-peak Mössbauer spectrum (in black).

C. Campana et al. *J. Clust. Sc.* **25** (2014) 205.