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Problems/Solutions Encountered in Crystallographic Analyses of Nanosized Metal Carbonyl Clusters.

Lawrence F. Dahl, Nguyet T. Tran, Evgueni G. Mednikov, Namal de Silva, Sergei A. Ivanov, Rita Nichiporuk, Michael A. Kozee, Dept. of Chemistry, Univ. of Wisconsin-Madison, 1101 University Ave., Madison, WI 53706, USA.

The advent of CCD area-detector X-ray diffractometry for in-house small-molecule crystallography during the last decade is enabling a systematic preparative/stereochemical exploration (previously unsuccessful) of the fascinating arena of nanosized metal carbonyl clusters. This talk will illustrate its crucial role as the dominant solid-state structural tool in unequivocally establishing (in practically all cases) both the stoichiometries and atomic arrangements of a highly diversified array of giant-sized CO- and CO/PR₃-ligated homometallic/heterometallic close-packed metal-core clusters of Groups 10 (Ni, Pd, Pt) and 11 (Cu, Ag, Au). Highlights of recent research will be given along with particular problems encountered and resulting solutions.

Recent examples will illustrate available software protection against being “Marshed” and the necessity (in one case) as well as tremendous value in all cases of utilizing a multidimensional experimental/theoretical approach in characterization.