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Neutron Diffraction Studies on Metal Cluster Hydride Complexes. Robert Bau, Chemistry Dept., Univ. of Southern California, Los Angeles, CA 90089.

The structures of hydrogen atoms on the surfaces and in the interstitial sites of metal cluster complexes serve as good models for studying the bonding modes of hydrogen on metal surfaces and in bulk metal. The results of single-crystal neutron diffraction investigations of covalent metal clusters will be summarized, and new results will be presented. In particular, the structures of the tetrahedral cluster $\text{H}_4\text{Co}_4\text{Cp}^\#_4$ ($\text{Cp}^\# = \text{C}_5\text{Me}_4\text{Et}$), solved using the new quasi-Laue VIVALDI diffractometer at the Institut Laue-Langevin in Grenoble, will be described.

It is hoped that in the future, with the development of the new Single-Crystal Diffractometer (SCD) at the Spallation Neutron Source (SNS) in Oak Ridge National Laboratory, the analysis of much smaller crystal sizes (with volumes as small as 0.1 cubic millimeters) will be possible. When this happens, it is anticipated that this area of research will expand substantially.