

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Photoelectron Spectroscopy of Transition Metal Hydride Cluster Anions and Their Roles in Hydrogenation Reactions XINXING ZHANG, KIT BOWEN, Johns Hopkins University — The interaction between transition metals and hydrogen has been an intriguing research topic for such applications as hydrogen storage and catalysis of hydrogenation and dehydrogenation. Special bonding features between TM and hydrogen are interesting not only because they are scarcely reported but also because they could help to discover and understand the nature of chemical bonding. Very recently, we discovered a PtZnH_5^- cluster which possessed an unprecedented planar pentagonal coordination between the H_5^- moiety and Pt, and exhibited special σ -aromaticity. The H_5^- kernel as a whole can be viewed as a $\eta^5\text{-H}_5$ ligand for Pt. As the second example, an H_2 molecule was found to act as a ligand in the PdH_3^- cluster, in which two H atoms form a $\eta^2\text{-H}_2$ type of ligation to Pd. These transition metal hydride clusters were considered to be good hydrogen sources for hydrogenation. The reactions between PtH_n^- and CO_2 were investigated. We observed formate in the final product $\text{H}_2\text{Pt}(\text{HCO}_2)^-$.

Xinxing Zhang
Johns Hopkins University

Date submitted: 02 Nov 2015

Electronic form version 1.4