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# Department of Chemistry

## *Dow Lecture Series*

9:45 a.m. Thursday, January 30, 2014 • 331 Smith Hall



### William D. Jones

Professor  
Department of Chemistry  
University of Rochester

#### *Why Do Weaker Metal-Carbon Bonds Lead to More Stable Complexes? What's Going On?*

Research interests include organometallic research in strong C-X bond cleavage, catalysis, model studies, mechanisms, kinetics, thermodynamics, and synthetic applications.

Website: <http://www.chem.rochester.edu/faculty/faculty.php?name=jones>

#### **Abstract**

A series of kinetic measurements of  $\text{Tp}^i\text{Rh}(\text{CNneopentyl})(\text{R})\text{H}$  complexes ( $\text{Tp}^i = \text{tris}(3,5\text{-dimethylpyrazolyl})\text{borate}$ ) where  $\text{R} = \text{alkyl, aryl, vinyl, benzyl, allyl, and } \text{CH}_2\text{X}$  ( $\text{X} = \text{CN, C} \equiv \text{CMe, CH}_2\text{C}=\text{OCH}_3$ , and others) have been used to determine relative metal-carbon bond energies in these compounds. A thermodynamic analysis allows for the extraction of an increase in bond energy of  $\sim 7$  kcal/mol for R groups in which the corresponding anion is resonance stabilized. This increase in bond strength is associated with an increase in the ionic contribution to metal-carbon bonding. Trends will be analyzed in terms of inductive vs. resonance contributions to the bonding. These studies have been extended to complexes with other spectator ligands in place of isocyanide, including  $\text{PMe}_3$  and  $\text{P}(\text{OMe})_3$ .

Host: Professor William Tolman  
Refreshments will be served prior to the seminar.