Selections from Chapter 9 & others The transition metals (V)

CHEM 462 Wednesday, November 24 T. Hughbanks

Metal-Metal Bonding

- Occurs throughout the transition elements (obviously, it occurs in the elements!).
- For discrete molecules (with two or more metal atoms), M-M bonding is generally more pronounced in 2nd and 3rd row elements.
- For low oxidation states (many carbonylorganometallic-ligated clusters) M-M bonding common in 1st row T.M.s too.

Metal-Metal Bonding, Examples

- $CrCl_2$ has the "usual" $CdCl_2$ -type structure. Mo Cl_2 (& W Cl_2) = $M_6Cl_{12} = [M_6Cl_8]Cl_4$
- V_2Cl_5 is unknown. $Ta_2Cl_5 = Ta_6Cl_{15} = [Ta_6Cl_{12}]Cl_3$ (also known are Nb₆X₁₄, Nb₆X₁₅, Ta₆X₁₄ (X = Cl, Br, I))
- "NbI₃" is not known, but Nb₃I₈ forms in direct attempts to synthesize it.



















