

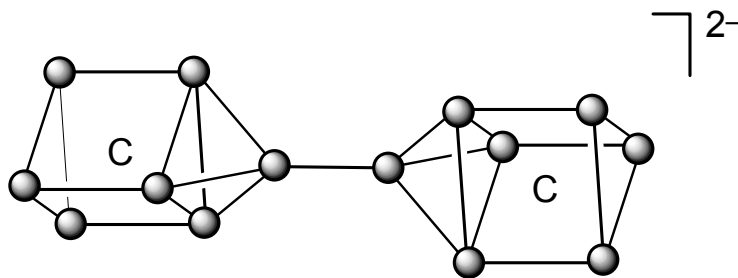
424/525 Special Topic F: Transition Metal Carbonyl Cluster Chemistry

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Some practice problems in electron counting. Come and see me if you are having difficulties or to confirm you're on the right track.

(a) Using the EAN rule, suggest metal framework structures for the series of clusters $\text{Os}_5(\text{CO})_{17}$, $\text{Os}_5(\text{CO})_{18}$, $\text{Os}_5(\text{CO})_{19}$ and $\text{Os}_5(\text{CO})_{20}$ which are formed by the sequential addition of carbonyl ligands to the trigonal bipyramidal cluster $\text{Os}_5(\text{CO})_{16}$.

(b) The cluster below has the formula $[\text{Rh}_{14}(\mu_6\text{-C})_2(\text{CO})_n]^{2-}$. Use the condensation principle to determine the number of carbonyl ligands, n .



Does the cluster conform to the effective atomic number rule?

(c) Use PSEPT to predict structures for $\text{Os}_4(\text{CO})_{15}$, $[\text{HOs}_5(\text{CO})_{15}]^-$, $\text{Os}_7(\text{CO})_{21}$, $[\text{Os}_{10}(\text{CO})_{26}]^{2-}$.