

Due: October 19, 2006

Ford and coworkers have published a manuscript describing reactive intermediates relevant to the carbonylation of $\text{CH}_3\text{Mn}(\text{CO})_5$. {S. M. Massick, V. Mertens, J. Marhenke, P. C. Ford, *Inorg. Chem.* **2002**, 41, 3553-3559}

- Describe in detail their arguments for assigning the proposed intermediate from CO loss in $\text{CH}_3\text{C}(\text{O})\text{Mn}(\text{CO})_5$ in non-interacting solvents as an η^2 -acyl species.
- What explanations are provided for the difference in reactivity of the intermediates afforded in cyclohexene *versus* THF in this process?
- Explain the KIE found in the decarbonylation of $\text{CH}_3\text{C}(\text{O})\text{Mn}(\text{CO})_5$ and $\text{CD}_3\text{C}(\text{O})\text{Mn}(\text{CO})_5$.
- What rationale was provided for the differences observed in activation parameters in cyclohexene *vs* THF for methyl migration in the intermediates resulting from CO loss in $\text{CH}_3\text{C}(\text{O})\text{Mn}(\text{CO})_5$? How different were the ΔG^\ddagger values for these processes?