

Title: The Characterization and Reactivity of Molybdenum (VI) Perfluoropinacolate Complexes for Oxygen Atom Transfer

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Abstract:

The hydrolytic strength of a perfluoroligand was combined with the oxidative nature of molybdenum in order to investigate the formation of metal complexes that can perform catalytic oxygen atom transfers. The metal complexes were synthesized using sodium molybdate, $\text{Na}_2[\text{MoO}_4]$, perfluoropinacol, $\text{H}_2(\text{pinF})_2^-$, and two tetraalkyl-substituted ammonium cations, tetrapropylammonium, Pr_4N^+ , and tetraethylammonium, Et_4N^+ . The complexes were then analyzed using solubility tests and nuclear magnetic resonance spectroscopy (NMR). Pr_4N^+ and Et_4N^+ were successfully coordinated to perfluoropinacol and sodium molybdate through a series of reactions. Additionally, the Et_4N^+ compound was found to be completely soluble in methanol. The results of this experiment are indicative that a metal complex had been successfully synthesized, but further experimentation is required to assess the catalytic nature and structural properties of the complexes.