

## Radical-Type Reactivity of Novel 7-Coordinate Molybdenum Alkyl Complexes Supported by 1,3-Diketonates

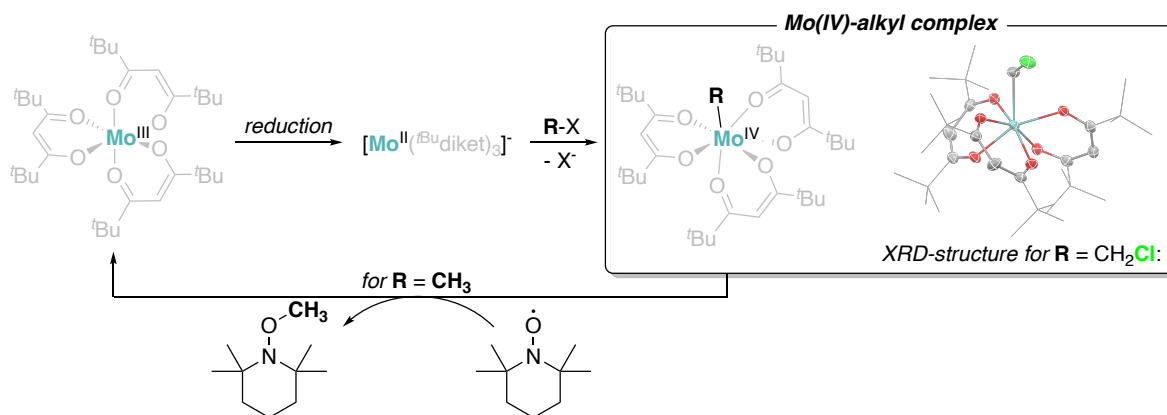
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The selective C-X bond activation of simple organohalide substrates (*e.g.* dichloromethane) by low-valent transition metals is an attractive strategy for the preparation of (halogen-)alkyl complexes. The latter have been recognized as an important class of compounds, acting as precursors for the generation of methylene and methylene-bridged complexes, which represent proposed intermediates in a variety of important catalytic processes such as alkene metathesis, Fischer-Tropsch Synthesis or cyclopropanation.<sup>1</sup>

During the study of low-valent molybdenum complexes supported by 1,3-diketonates, we have found the selective reactivity of a homoleptic and anionic Mo(II) complex with short-chain alkyl halides (R-X) such as dichloromethane. XRD solid state structure revealed the formation of a molybdenum-carbon bond as part of a novel 7-coordinate Mo(IV) complex. Next to cyclopentadienyl supported complexes of the type  $[\text{MoCp}(\text{NO})_2(\text{CH}_2\text{X})]$ ,<sup>2</sup> this is the only second report of molybdenum halomethyl complexes.

While isolated as pure compounds in the solid state, we have observed fast decomposition in solution. To better understand the reactivity of these Mo(IV) alkyl complexes, the use of deuterated alkyl halide substrate allowed for the preparation of deuterated analogues. <sup>2</sup>H NMR spectroscopy has been used as a selective probe to follow the alkyl ligand's reactivity. Its radical-type character favors hydrogen abstraction *e.g.* from THF and allows for facile and selective methyl radical transfer reactions to various acceptors such as TEMPO or diphenyl disulfide.



[1] Friedrich, H. B.; Moss, J. R. *Advances in Organometallic Chemistry* **1991**, *33*, 235-290.

[2] Elcesser, W. L.; Sörlie, M.; Hubbard, J. L. *Organometallics* **1996**, *15*, 2534-2542.