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Combining N-heterocyclic Carbenes with Oxophilic and high-oxidation-state metal centers state (group 4, 12 and 13): Fundamental Reactivity and Use in Polymerization and CO_2

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平成２８年７月８日（金）13:00~

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The use of N-heterocyclic carbenes (NHCs) as ancillary ligands for coordination to transition metal complexes has undoubtedly constituted a major breakthrough in the area of organometallic chemistry and associated reactivity over the past fifteen years. When compared to their phosphine analogues, NHC-containing metal complexes usually exhibit an inert NHC-M bond yielding an enhanced stability; this has opened the way to the development of various and numerous robust NHC-incorporating metal catalysts that often feature an increased activity in catalysis. Despite their fundamental interest and potential utility in catalysis, oxophilic metal complexes bearing NHC ligands have been much less studied as such complexes are typically thought to be less stable due to an easier M-$C_{carbene}$ bond dissociation in such species. It is however well-established that NHC coordination to oxophilic metals may also impart improved stability to the resulting NHC-metal complexes. The synthesis, structural characterization and reactivity studies of various group 4 metal, Zn(II) and group 13 metal NHC-containing complexes is described. We observed that the association of such oxophilic metal centers with a NHC moiety may be of broad interest, ranging from unusual fundamental reactivity to the use of the derived NHC metal complexes as effective polymerization catalysts and in CO_2 functionalization catalysis.

本講演は、大学院総合化学院『化学研究先端講義/総合化学特別研究第二』の一部として認定されています。

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