

MS13-1-23 A new germylene- β -sulfoxide hemilabile ligand and its applications in coordination chemistry demonstrated by

X-ray diffraction

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Abstract

The hemilabile ligands with a combination of strong and weak donor groups have become essential tools in transition-metal catalysis. On the other hand, the investigation of transition-metal germylene complexes has attracted considerable interest over the past few decades. However, the use of transition-metal germylene complexes in catalysis remains sporadic, with only a few recent reports.

In this context, we report the synthesis of a germylene- β -sulfoxide ligand ² **1** and its abilities in coordination chemistry. Its bridging capability as bidentate ligand towards transition metal complexes was clearly established by X-ray diffraction analysis with the metal complexes (**1**)-W(CO)₄, (**1**)-Mo(CO)₄ and (**1**)-Ni(cod) (cod = 1,5-cyclooctadiene).

Furthermore, the reaction of ligand (**1**) with [Ru(PPh₃)₃Cl₂] afforded a complex which readily evolves during crystallization to an unprecedented bis-ruthenium complex. To the best of our knowledge, this complex is the first crystallographically characterized complex featuring two bridge chlorine atoms, and a trans-phosphine-sulfoxide arrangement.

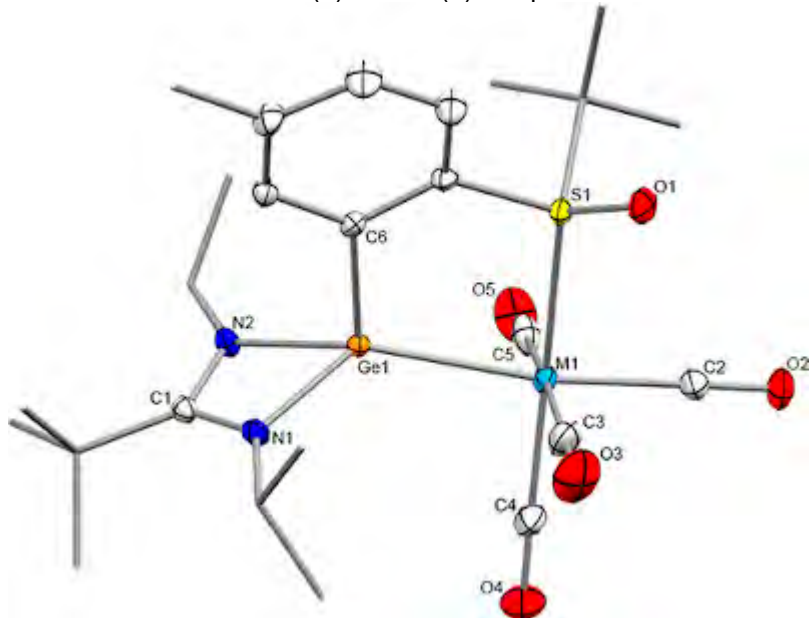
Finally, the hemilabile character of **1** was clearly demonstrated by the nickel complex and a reaction with carbon monoxide giving a stable tricarbonyl Ni(0)-complex, its structure was confirmed by X-ray diffraction analysis.

Applications of this new germylene- β -sulfoxide ligand in enantioselective catalysis is under investigation.

References

1. Nicolas Lentz, Cynthia Cuevas-Chavez, Sonia Mallet-Ladeira, Jean-Marc Sotiropoulos, Antoine Baceiredo, Tsuyoshi Kato, and David Madeo *Inorganic Chemistry* 2021 60 (1), 423-430.
2. Nicolas Lentz, Sonia Mallet-Ladeira, Antoine Baceiredo, Tsuyoshi Kato, and David Madec, *Dalton Trans.*, 2018,47, 15751-15756.

Molecular structures of W(0) and Mo(0) complexes



An unprecedented bridged bis-ruthenium complex

