

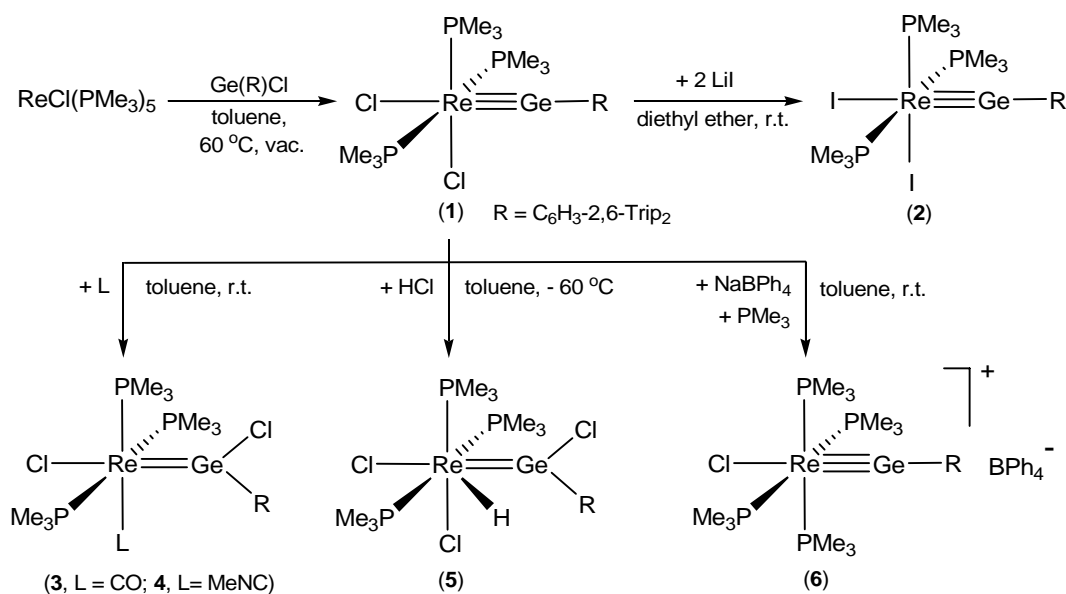
Rhenium-Germanium Triple Bonds

A.C. Filippou*, U. Chakraborty, G. Schnakenburg

Institut für Anorganische Chemie, Rheinische Friedrich-Wilhelms-Universität Bonn, Gerhard-Domagk-Str. 1, 53121 Bonn, Germany, e-mail: filippou@uni-bonn.de

Homonuclear triple bonding between Group 7 transition elements is commonly encountered in dinuclear metal complexes.^[1] In comparison, heteronuclear triple bonding is confined so far to first row main group elements, as exemplified in alkylidyne and nitrido complexes.^[2] In recent years, a series of exceptional Group 6 metal complexes featuring triple bonds to the heavier Group 14 elements Si - Pb have been reported.^[3] In the present work, the syntheses and selected reactions of the first compounds containing rhenium–germanium triple bonds are reported.

The rhenium(I) complex $\text{ReCl}(\text{PMe}_3)_5$ induces a Ge-Cl bond heterolysis of the arylgermylene $\text{Ge}(\text{R})\text{Cl}$ leading to the germylidyne complex **1**. Chloride substitution of **1** with LiI affords the iodo derivative **2**. In comparison, neutral nucleophiles as CO and MeNC promote a chloride migration reaction affording first Re^{I} chlorogermylidene complexes (**3**, **4**). Addition of HCl across the Re-Ge triple bond of **1** yields the first Re^{III} chlorogermylidene complex **5**, whereas chloride abstraction from **1** by NaBPh_4 leads in the presence of PMe_3 to the first cationic rhenium germylidyne complex (**6**). All compounds have been characterized by a variety of spectroscopic methods and single crystal X-ray diffraction studies.



[1] F.A. Cotton, C. A. Murillo, R. A. Walton, *Multiple Bonds between Metal Atoms*, 3rd Ed., Springer Science and Business Media, New York, **2005**.

[2] W.A. Nugent, J.M. Mayer, *Metal-Ligand Multiple Bonds*, Wiley, New York, **1988**.

[3] A. C. Filippou, O. Chernov, K. W. Stumpf, G. Schnakenburg, *Angew. Chem.* **2010**, 122, 3368 and refs. therein.