

Seven-coordinate complexes of molybdenum(II) containing a trichlorogermyl ligand: X-ray crystal structure of a novel $[\text{Mo}(\text{GeCl}_3)_2(\text{CO})_2(\text{NC}(\text{Et})_3)]$.

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Rok wydania

1999

Czasopismo

Journal of Organometallic
Chemistry

Numer woluminu

585

Strony

215-224

DOI

10.1016/s0022-
328x(99)00213-2

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

The oxidative – addition of GeCl_4 to $[\text{Mo}(\text{CO})_4(\text{NCMe})_2]$ in CH_2Cl_2 provides a high-yield and fast route to the trichlorogermyl complex $[\text{MoCl}(\text{GeCl}_3)(\text{CO})_3(\text{NCMe})_2]$ (1). Besides 1, other compounds containing a Mo – Ge bond are formed, as was shown by IR and NMR investigation of the reaction mixture. These compounds react further with an excess of propionitrile giving among others, a novel, crystallographically characterized $[\text{Mo}(\text{GeCl}_3)_2(\text{CO})_2(\text{NC}(\text{Et})_3)]$ (3). Compound 3 is the first structurally characterized molybdenum(II) carbonyl complex, containing two trichlorogermyl ligands. Reaction of 1 or 3 with an alkyne (PhCCPh , PhCCMe , PhCCH) affords compounds in which CO and/or nitrile ligands were replaced by alkyne ligands. The alkyne molybdenum(II) complexes formed were characterized structurally by IR and NMR spectroscopy. However, the reaction of 1 with phenylacetylene (PA) leads to the catalytic coupling of alkyne molecules and the formation of cyclotrimers and polymers. The possible mechanisms for the formation of molybdenum(II) complexes and their role in the catalytic process are discussed.

Słowa kluczowe

Molybdenum(II), Germanium, Crystal structure, Seven-coordinate, Heterobimetallic complexes, Nitrile complexes, Alkyne complexes, Cyclotrimerization

Adres publiczny

[https://doi.org/10.1016/s0022-328x\(99\)00213-2](https://doi.org/10.1016/s0022-328x(99)00213-2)

Strona internetowa wydawcy

<http://www.elsevier.com>