

# On the Reaction of $\text{C}(\text{PPh}_3)_2$ with $[\text{Co}_2(\text{CO})_8]$ : Formation and Structure of an Unusual Tetranuclear Cluster

Wolfgang Petz, Kirstin Wenck, and Bernhard Neumüller

Fachbereich Chemie der Philipps-Universität Marburg, Hans Meerwein-Straße, 35032 Marburg, Germany

Reprint requests to Prof. W. Petz. E-mail: petz@staff.uni-marburg.de or Prof. B. Neumüller. E-mail: neumuell@chemie.uni-marburg.de

*Z. Naturforsch.* **2007**, 62b, 413 – 418; received December 3, 2006

*Dedicated to Prof. Helgard G. Raubenheimer on the occasion of his 65<sup>th</sup> birthday*

The reaction of the carbodiphosphorane  $\text{C}(\text{PPh}_3)_2$  (**1**) with  $[\text{Co}_2(\text{CO})_8]$  results in the formation of the salt-like complex  $(\text{HC}\{\text{PPh}_3\}_2)[\text{Co}(\text{CO})_4]$  (**2**) in high yield if THF is used as the solvent. The proton of the cation stems from THF degradation. When the reaction is carried out in toluene, the tetranuclear cluster  $[\text{Co}_4(\text{CO})_{10}(\text{PPh}_3)(\mu_4\text{-CCPPh}_3)]$  (**3**) is formed in low yield as the only complex which could be identified by X-ray analysis. The solvate **3** ·  $\text{C}_7\text{H}_8$  crystallizes in the triclinic space group  $P\bar{1}$  with  $a = 1040.8(2)$ ,  $b = 1387.4(2)$ ,  $c = 1923.0(2)$  pm,  $\alpha = 71.96(1)^\circ$ ,  $\beta = 88.69(1)^\circ$ ,  $\gamma = 71.46(1)^\circ$ ,  $Z = 2$ . The structure of the cluster with 64 CVE is that of a “spiked triangle” in which the triphenylphosphonioacetylide  $\text{CCPPh}_3$  acts as a six-electron donor and the bonding mode is that of a  $\mu_4\text{-}\eta^2$  coordination.

**Key words:** Tetranuclear Cobalt Cluster, Carbodiphosphorane, Phosphacumulene Ligand, Proton Abstraction, Crystal Structure