

Reaktionen des donorfreien $(\text{CF}_3)_2\text{Cd}$ mit Phosphor(V)halogeniden: Difluorcarben-Einschiebungen und Direktsynthese von $(\text{CF}_3)_3\text{PF}_2$

Reactions of Donor-Free $(\text{CF}_3)_2\text{Cd}$ with Phosphorus(V) Halides:
Insertion of Difluorocarbene and Direct Synthesis of $(\text{CF}_3)_3\text{PF}_2$

Reint Eujen*, Ralf Haiges

Fachbereich 9 - Anorganische Chemie, Bergische Universität-GH Wuppertal,
Gaußstr. 20, D-42097 Wuppertal

Z. Naturforsch. **53 b**, 1455–1460 (1998); eingegangen am 3. Juli 1998

Phosphoranes, Trifluoromethyl Compounds, Difluorocarbene, Cadmium, NMR Data

Difluorocarbene which is quantitatively eliminated from donor-free bis(trifluoromethyl)-cadmium below 0°C inserts smoothly into the P-F bonds of PF_5 to form $(\text{CF}_3)_3\text{PF}_2$ in high yield. Due to the fast conversion of P-Cl bonds into P-F bonds by cadmium fluoride, PCl_5 forms $(\text{CF}_3)_3\text{PF}_2$ as well, and a direct synthesis of $(\text{CF}_3)_3\text{PF}_2$ with *ca.* 70 % yield starting from CdEt_2 , CF_3I and PCl_5 is reported. Whereas no insertion of CF_2 into the axial bonds of $(\text{CF}_3)_3\text{PF}_2$ has been detected, reaction of $(\text{CF}_3)_2\text{Cd}$ with $(\text{CF}_3)_3\text{PCl}_2$ gives the new tetra-kis(haloalkyl)fluorophosphoranes $(\text{CF}_3)_3(\text{CF}_2\text{Cl})\text{PF}$, $(\text{CF}_3)_3(\text{CFCl}_2)\text{PF}$, $(\text{CF}_3)_2(\text{CF}_2\text{Cl})_2\text{PF}$ and $(\text{CF}_3)_3(\text{CCl}_3)\text{PF}$. The NMR spectra of these and related compounds and of their hydrolysis products $(\text{CF}_3)_3(\text{CF}_{3-n}\text{Cl}_n)\text{PO}$ are reported. The formation of the higher chlorinated phosphoranes is discussed in terms of an isomerization mechanism presumably involving carbene elimination-reinsertion processes.

* Sonderdruckanforderungen an Prof. Dr. R. Eujen.