



Quo Vadis Chemie

The close and loose relationship between Carbon and Phosphorus



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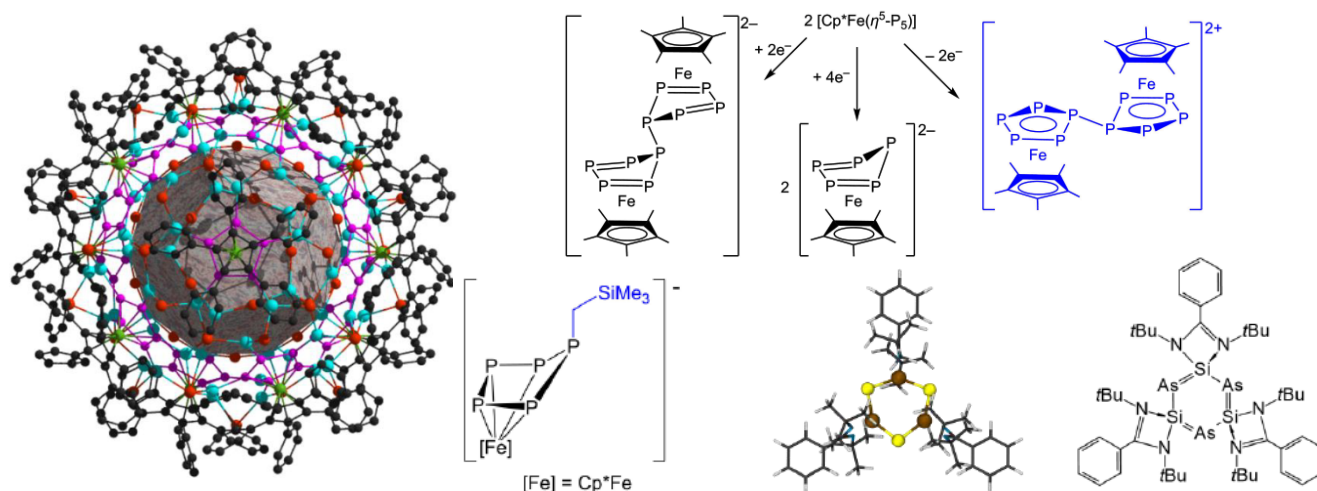
Prof. Manfred SCHEER

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on Mon 13. 5. at 15:00

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Abstract: Polyphosphorus units are an important class of compound and isolobal to carbon-based relatives. Due to the lone pairs at the phosphorus atoms, the five-fold symmetric *cyclo*-P₅ ring of the pentaphosphaferrocenes [Cp^RFe(η⁵-P₅)] enables the use of these complexes in unique supramolecular aggregations with Lewis acidic transition metal moieties to form unprecedented giant spherical molecules (Fig. 1, left).



Moreover, they represent sandwich complexes with a flexible redox and substitution behavior (Fig. 1, right-top and center), different from those of the carbon-based analogue ferrocene. The talk will compare similarities and differences between P- and C-based compounds and show some advantages of the former ones. Furthermore, the use of alternative reagents to synthesize such powerful starting materials of polypnictogen complexes and other surprising compounds will be presented (Fig. 1, right bottom).

The close and loose relationship between Carbon and Phosphorus

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Polyphosphorus units are an important class of compound and isolobal to carbon-based relatives. Because of the lone pairs at the phosphorus atoms, the five-fold symmetric cyclo-P₅ ring of the pentaphosphaferrocenes [Cp^RFe(η⁵-P₅)] enables the use of these complexes in unique supramolecular aggregations with Lewis acidic transition metal moieties to form unprecedented giant spherical molecules (Figure 1, left).¹ Moreover, they represent sandwich complexes with a flexible redox² and substitution behavior³ (Figure 1, right-top and center), different from the one of the carbon-based analogue ferrocene. The talk will compare similarities and differences between P- and C-based compounds and show some advantages of the former ones. Furthermore, the use of alternative reagents⁴ to synthesize such powerful starting materials of polypnictogen complexes and other surprising compounds will be presented (Figure 1, right bottom).⁵

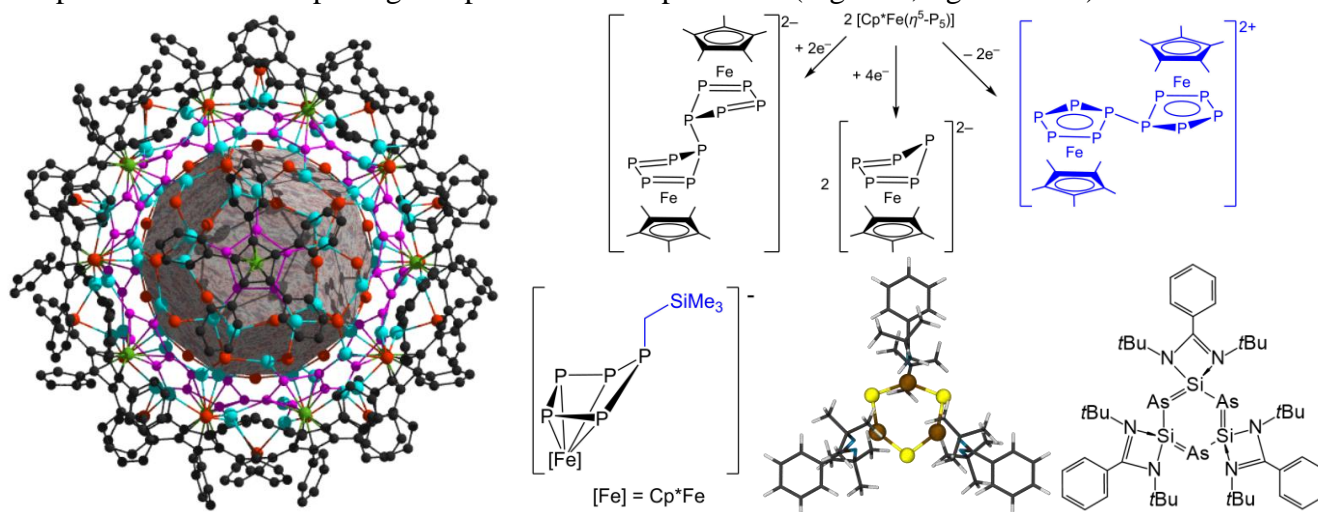


Figure 1. Versatile reactivity of [Cp^RFe(η⁵-P₅)]: left) giant supramolecular sphere; right top) redox reactions; center bottom) product of a nucleophilic attack; right bottom) arsa-sila-benzene

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- (2) M. V. Butovskiy, G. Balázs, M. Bodensteiner, E. V. Peresyphkina, A. V. Virovets, J. Sutter, M. Scheer, *Angew. Chem. Int. Ed.* **2013**, 52, 2972.
- (3) E. Mädl, M. V. Butovskii, G. Balázs, E. V. Peresyphkina, A. V. Virovets, M. Seidl, M. Scheer, *Angew. Chem. Int. Ed.* **2014**, 53, 7643.
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