Reactivity of Di-*tert*-butyldiphosphatetrahedrane

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Tetrahedranes have long fascinated the chemical community due their simple structure and typically high reactivity.[1] While purely carbon-based tetrahedranes are well-known, the first mixed C/P tetrahedranes were only reported last year.[2] We recently showed that the 'hybrid' of (*t*BuC)$_4$ and P$_4$, di-*tert*-butyldiphosphatetrahedrane (*t*BuCP)$_2$ (**1**), can be synthesised in a simple nickel-catalysed dimerisation reaction of *tert*-butylphosphaalkyne, *t*BuCP.[3] Shortly after our report, the synthesis of tri-*tert*-butylphosphatetrahedrane (*t*BuC)$_3$P was published by Cummins and co-workers.[4]

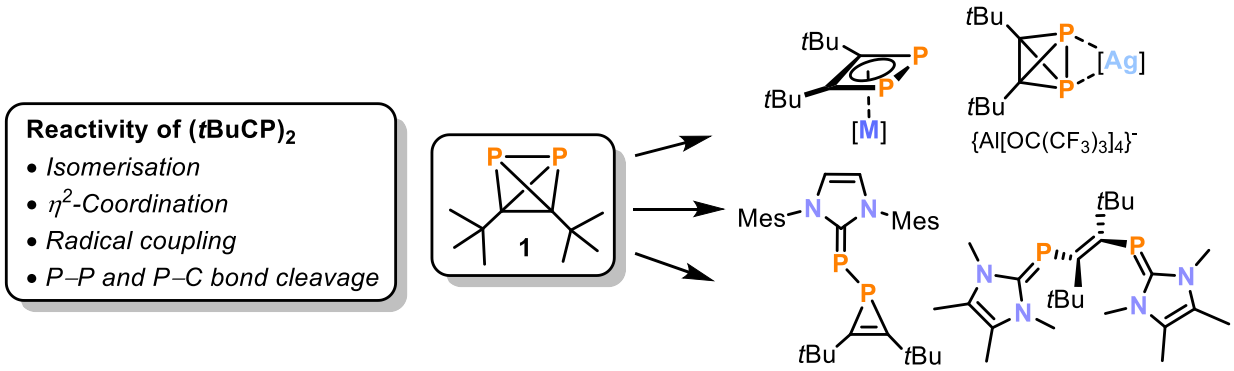

*Figure 1: Reactivity of **1**.*

We now present the remarkable reactivity of **1** towards carbenes,[5] metalloradicals,[6] and metalates. Moreover, the photochemistry of **1** is highlighted. Our investigations show the distinct reactivity of **1** compared to its monomer *t*BuCP and give access to new unsaturated organophosphorus compounds and unusual (*t*BuCP)$_n$ (n = 2, 4) ligand frameworks.

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[3] G. Hierlmeier, P. Coburger, M. Bodensteiner, R. Wolf, *Angew. Chem. Int. Ed.* **2019**, *58*, 16918–16922.
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[5] G. Hierlmeier, M. K. Uttendorfer, R. Wolf, *Chem. Commun. DOI: 10.1039/d0cc07103j*
[6] G. Hierlmeier, R. Wolf, *Angew. Chem. Int. Ed. DOI: 10.1002/anie.202015680*