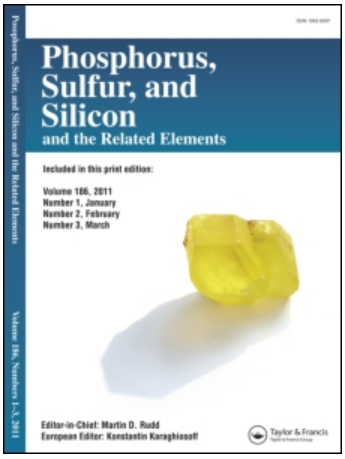

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1,2-Addition of Diphosphine Monoxide to a Double Bond of a Titanocene Carbene Complex

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1,2-ADDITION OF DIPHOSPHINE MONOXIDE TO A DOUBLE BOND OF A TITANOCENE CARBENE COMPLEX

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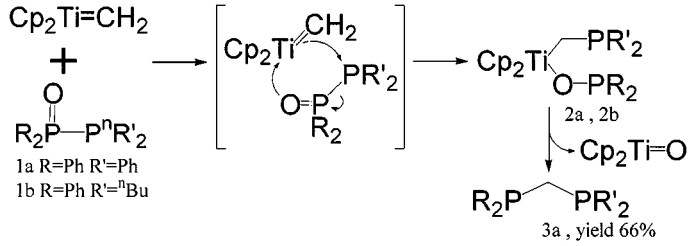
A titanocene carbene complex reacted with diphosphine monoxide to give $R_2PCH_2PR_2$.

A titanocene carbene complex exhibits various reactivities. For example, it eliminates an oxygen atom from a carbonyl compound because of strong affinity of titanium for oxygen,[1] or it undergoes 1,2-addition of E—H bond (E=Si, Ge, Sn).[2] Since disphosphine monoxides **1a** and **1b** in Scheme 1 have both P=O bond and scissile P—P bond, its reaction with titanocene carbene is of interest. The results are shown below. **2a** and **2b** are obtained when the reaction mixture is heated to 50°C in benzene or toluene. It is proposed that the P—P bond cleavage takes place through a rearrangement shown in a bracket in the scheme. And when **2a** is heated up to 80°C, titanocene oxide is eliminated from **2a** to give a bisphosphine compound **3a**.



SCHEME 1

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