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Carboranyl Derivatives of Phosphorus Acids with Boron-Phosphorus Bond

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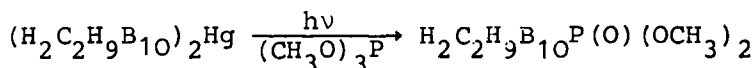
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CARBORANYL DERIVATIVES OF PHOSPHORUS ACIDS WITH BORON-PHOSPHORUS BOND

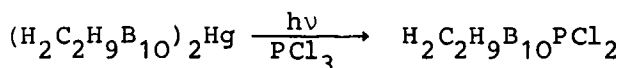
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Carboranyl derivatives of phosphorus acids with boron-phosphorus bond can be obtained in two ways:

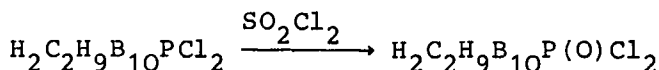
1. Photolysis of bis(m-carboran-9-yl)- and bis(p-carboran-2-yl)mercury in trimethylphosphite leads to the formation of dimethyl ester of (m-carboran-9-yl)- and (p-carboran-2-yl)phosphonic acids:



2. Photolysis of bis(o-carboran-9-yl)- and bis(m-carboran-9-yl)mercury in PCl_3 results in the formation of (o-carboran-9-yl)- and (m-carboran-9-yl)dichlorophosphines:



Oxidation of (boron-carboranyl)dichlorophosphines by sulphyryl chloride leads to dichloroanhydrides of (boron-carboranyl)phosphonic acids:



The properties of boron-carboranyl derivatives of phosphorous acids are similar to those of organic derivatives of phosphorous acids. The obtained compounds have been characterized by IR-, ^{11}B and ^{31}P NMR spectra. ^{31}P NMR chemical shift of these compounds, and those of the corresponding organo-phosphorus compounds, has the same values.