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Synthesis of Phosphoryl Substituted Acetylenes and Their Reaction with Transition Metal Complexes

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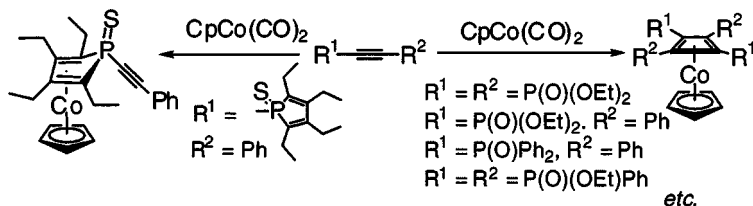
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SYNTHESIS OF PHOSPHORYL SUBSTITUTED ACETYLENES AND THEIR REACTION WITH TRANSITION METAL COMPLEXES

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Various phosphoryl- and bis(phosphoryl)acetylenes were prepared and their reaction with transition metal complexes such as $\text{CpCo}(\text{CO})_2$ was investigated. Reaction of acetylenes possessing one and two phosphoryl groups with $\text{CpCo}(\text{CO})_2$ afforded $(\eta^4\text{-cyclobutadiene})(\eta^5\text{-cyclopentadienyl})\text{cobalt(I)}$ complexes possessing two and four phosphoryl groups, respectively. The structures were mainly characterized by ^1H , ^{13}C , and ^{31}P NMR and further confirmed by X-ray crystallography. The redox properties were investigated by cyclic voltammetry indicating that the oxidation potentials were raised by introduction of phosphoryl groups. Interestingly, the cobalt complex possessing four phosphoryl groups acted as a bisbidentate ligand to afford one dimensional coordination polymer. On the other hand, acetylenes possessing a phosphole sulfide as substituent afforded Co(I) complex where phosphole group acted as η^4 -ligand.



SCHEME 1

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