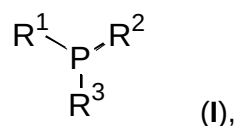


Abstract**Process for the alkoxycarbonylation of ethylenically unsaturated compounds with monophosphine ligands**

The invention relates to a process comprising the following process steps:

- 5 a) introducing an ethylenically unsaturated compound;
- b) adding a monophosphine ligand and a compound which comprises Pd, or adding a complex comprising Pd and a monophosphine ligand;
- c) adding an aliphatic alcohol;
- d) supplying CO;
- 10 e) heating the reaction mixture, the ethylenically unsaturated compound being reacted to form an ester;

where the monophosphine ligand is a compound of formula (I)



where

- 15 R^1 is selected from $-(\text{C}_1\text{-C}_{12})\text{-alkyl}$, $-\text{O}-(\text{C}_1\text{-C}_{12})\text{-alkyl}$, $-\text{O}-(\text{C}_6\text{-C}_{20})\text{-aryl}$, $-(\text{C}_6\text{-C}_{20})\text{-aryl}$, $-(\text{C}_3\text{-C}_{12})\text{-cycloalkyl}$, $-(\text{C}_3\text{-C}_{12})\text{-heterocycloalkyl}$, $-(\text{C}_3\text{-C}_{20})\text{-heteroaryl}$;
- R^2 is selected from $-(\text{C}_6\text{-C}_{20})\text{-aryl}$, $-(\text{C}_3\text{-C}_{12})\text{-cycloalkyl}$, $-(\text{C}_3\text{-C}_{12})\text{-heterocycloalkyl}$, $-(\text{C}_3\text{-C}_{20})\text{-heteroaryl}$;
- R^3 is $-(\text{C}_3\text{-C}_{20})\text{-heteroaryl}$;
- 20 and R^1 , R^2 and R^3 may each independently be substituted by one or more substituents selected from
- $-(\text{C}_1\text{-C}_{12})\text{-alkyl}$, $-(\text{C}_3\text{-C}_{12})\text{-cycloalkyl}$, $-(\text{C}_3\text{-C}_{12})\text{-heterocycloalkyl}$, $-\text{O}-(\text{C}_1\text{-C}_{12})\text{-alkyl}$, $-\text{O}-(\text{C}_1\text{-C}_{12})\text{-alkyl}-(\text{C}_6\text{-C}_{20})\text{-aryl}$, $-\text{O}-(\text{C}_3\text{-C}_{12})\text{-cycloalkyl}$, $-\text{S}-(\text{C}_1\text{-C}_{12})\text{-alkyl}$, $-\text{S}-(\text{C}_3\text{-C}_{12})\text{-cycloalkyl}$, $-\text{COO}-(\text{C}_1\text{-C}_{12})\text{-alkyl}$, $-\text{COO}-(\text{C}_3\text{-C}_{12})\text{-cycloalkyl}$, $-\text{CONH}-(\text{C}_1\text{-C}_{12})\text{-alkyl}$, $-\text{CONH}-(\text{C}_3\text{-C}_{12})\text{-cycloalkyl}$, $-\text{CO}-(\text{C}_1\text{-C}_{12})\text{-alkyl}$, $-\text{CO}-(\text{C}_3\text{-C}_{12})\text{-cycloalkyl}$, $-\text{N}-[(\text{C}_1\text{-C}_{12})\text{-alkyl}]_2$, $-(\text{C}_6\text{-C}_{20})\text{-aryl}$, $-(\text{C}_6\text{-C}_{20})\text{-aryl}-(\text{C}_1\text{-C}_{12})\text{-alkyl}$, $-(\text{C}_6\text{-C}_{20})\text{-aryl-O}-(\text{C}_1\text{-C}_{12})\text{-alkyl}$, $-(\text{C}_3\text{-C}_{20})\text{-heteroaryl}$, $-(\text{C}_3\text{-C}_{20})\text{-heteroaryl}-(\text{C}_1\text{-C}_{12})\text{-alkyl}$, $-(\text{C}_3\text{-C}_{20})\text{-heteroaryl-O}-(\text{C}_1\text{-C}_{12})\text{-alkyl}$, $-\text{COOH}$, $-\text{OH}$, $-\text{SO}_3\text{H}$, $-\text{NH}_2$, halogen.
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