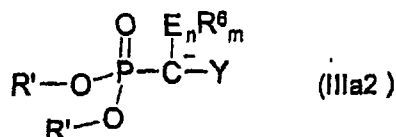


## ABSTRACT

## "PHOSPHORUS COMPOUNDS OF FORMULA IIIa2"

Phosphorus compounds of formula IIIa2



in which

R' = is equal or different independently means C<sub>1-20</sub> alkyl, branched or straight or cyclic, or C<sub>6-20</sub> aryl

E<sub>n</sub>R<sub>m</sub><sup>6</sup> = in which

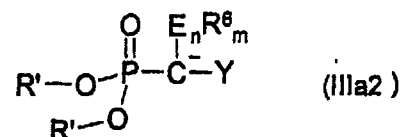
If n = m = 1 than E = S and R<sup>6</sup> = C<sub>1-20</sub>-alkyl (branched or straight chain or cyclic); C<sub>6-20</sub>-aryl - which each of those may be substituted with one or more of the following groups: F, Cl, Br, I, C<sub>1-20</sub>-alkoxy, C<sub>6-20</sub>-aryloxy, amino; F; Cl; Br; I;

Y = -CN; -C(O)NH<sub>2</sub>; -C(O)OR<sup>7</sup> with R<sup>7</sup> = C<sub>1-20</sub>-alkyl (branched or straight chain or cyclic);

C<sub>6-20</sub>-aryl - which each of those may be substituted with one or more of the following groups: F, Cl, Br, I, C<sub>1-20</sub>-alkoxy, C<sub>6-20</sub>-aryloxy, amino; F; Cl; Br; I.

**WE CLAIM:**

1. Phosphorus compounds of formula IIIa2



in which

**R'** = is equal or different independently means C<sub>1-20</sub> alkyl, branched or straight or cyclic, or C<sub>6-20</sub> aryl

**E<sub>n</sub>R<sub>m</sub><sup>6</sup>** = in which

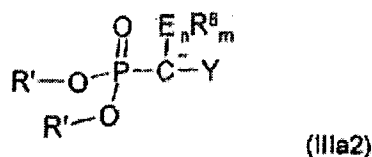
If **n = m = 1** than **E = S** and **R<sup>6</sup> = C<sub>1-20</sub>-alkyl** (branched or straight chain or cyclic); C<sub>6-20</sub>-aryl - which each of those may be substituted with one or more of the following groups: F, Cl, Br, I, C<sub>1-20</sub>-alkoxy, C<sub>6-20</sub>-aryloxy, amino; F; Cl; Br; I;

**Y = -CN; -C(O)NH<sub>2</sub>; -C(O)OR<sup>7</sup>** with **R<sup>7</sup> = C<sub>1-20</sub>-alkyl** (branched or straight chain or cyclic);

C<sub>6-20</sub>-aryl - which each of those may be substituted with one or more of the following groups: F, Cl, Br, I, C<sub>1-20</sub>-alkoxy, C<sub>6-20</sub>-aryloxy, amino; F; Cl; Br; I.

Dated this the 23<sup>rd</sup> day of March, 2012

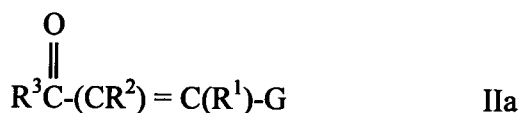
[JITESH KUMAR]  
OF REMFRY & SAGAR  
ATTORNEYS FOR THE APPLICANTS



in which E = S or S-S and n and m = 1, (P) is P(Ar)<sub>3</sub> (for IIIa) R' as defined above and  
 5 Y = -CN, -C(O)OR<sup>7</sup> (R<sup>7</sup> as defined above), R<sup>B</sup> is defined as R<sup>1</sup>, except H. Preferably R<sup>B</sup> is methyl, ethyl, propyl, isopropyl, benzyl or phenyl.

The abovementioned reactions can be conducted in the presence or in the absence of  
 the below defined  $\alpha$  -  $\beta$  - unsaturated carbonyl compound of formula (IIa).

10 2.) The Wittig Reagent (IIIa1) or Horner Reagent (IIIa2) is then reacted, as generally known in an organic solvent, such as alcohols (preferably for Horner Reagent), halogenated hydrocarbons or polar aprotic solvents (preferably for Wittig Reagents) like THF, DMF or NMP usually at a temperature in the range of from  
 15 -15 °C, to 120 °C, preferably 0 °C to 70 °C, with the  $\alpha$  -  $\beta$  - unsaturated carbonyl compound of formula (IIa)



20 wherein

R<sup>1</sup>, R<sup>2</sup> independently the same or different are H; C<sub>1-20</sub>-alkyl (branched or straight chain or cyclic); C<sub>6-20</sub>-aryl - which each of those may be substituted with one or more of the  
 25 following groups: F, Cl, Br, I, C<sub>1-20</sub>-alkoxy, C<sub>6-20</sub>-aryloxy, non substituted or preferably substituted amino -; F, Cl, Br, I, preferably R<sup>1</sup>, R<sup>2</sup>, are H, methyl, in particular H.

R<sup>3</sup> is the same as R<sup>1</sup> or R<sup>2</sup> (except H and halogens) and additionally R<sup>3</sup> shall mean -  
 CN, -NO<sub>2</sub>. Preferably R<sup>3</sup> is an electron withdrawing group (as defined above) more  
 30 preferably a fully fluorinated C<sub>1-6</sub> alkyl (branched or straight) or fully fluorinated C<sub>6-10</sub>-  
 aryl, such as trifluoromethyl, pentafluoroethyl, heptafluoropropyl heptafluoroisopropyl, pentafluorophenyl, most preferably trifluoromethyl.

G = -NH<sub>2</sub>

35 A very suitable compound IIa is F<sub>3</sub>C-C(O)-CH=CH-NH<sub>2</sub>.

The molar ratio of (IIIa1) or (IIIa2) to (IIa) is in general 1 : 1 to 1 : 3, preferably 1 : 1,2.