It has been found that, surprisingly, the diorganylphosphinic salts of the invention have a broader processing window in the compounding of flame-retardant polymer molding compounds and in the injection molding of flame-retardant polymer moldings and simultaneously exhibit good flame retardancy.

Summary

In one aspect, there is provided a diorganylphosphinic salt containing 0.0001% to 99.9999% by weight of iron.

In another aspect, there is provided a process for producing diorganylphosphinic salts as described herein, which comprises

a) in a process stage 1 adding 0.9 to 1.1 molecules of olefin per P onto a water-soluble salt of the hypophosphorous acid or the acid itself,

b) in a process stage 2 adding 0.9 to 1.1 additional molecules of olefin per P onto the intermediate from a) to give dialkylphosphinic acid or salt thereof,

c) in a process stage 3 adding one to 9 further olefin molecules onto 0% to 20% of the dialkylphosphinate molecules from process stage 1, so as to form telomers,

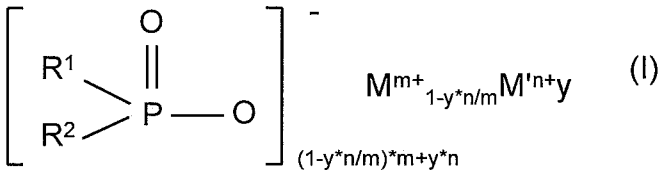
d) in a process stage 4 conducting a crystallization of the intermediate from b) or c) with a metal salt and an iron salt.

In another aspect, there is provided the use of diorganylphosphinic salts as described herein as intermediates for further syntheses, as a binder, as a crosslinker or accelerator in the curing of epoxy resins, polyurethanes and unsaturated polyester resins, as polymer stabilizers, as crop protection compositions, as sequestrants, as a mineral oil additive, as an anticorrosive, in washing and cleaning composition applications, and in electronics applications.

In another aspect, there is provided a flame-retardant thermoplastic or thermoset polymer molding composition or polymer molding, film, filament and/or fiber comprising 0.5% to 45% by weight of diorganylphosphinic salts as described herein, 0.5% to 95% by weight of thermoplastic or thermoset polymer or mixtures thereof, 0% to 55% by weight of additives and 0% to 55% by weight of filler or reinforcing materials, where the sum of the components is 100% by weight.

The invention therefore relates to diorganylphosphinic salts containing 0.0001% to 99.9999% by weight of iron.

The diorganylphosphinic salts preferably conform to the formula (II)



(I)

in which

R^1 and R^2	are the same or different and are C_1-C_{18}-alkyl in linear, branched or cyclic form, C_6-C_{18}-aryl, C_7-C_{18}-arylalkyl and/or C_7-C_{18}-alkylaryl, or together form at least one ring,
y	is 0.00001 to 0.091,
m	is 1 to 4 and
n	is 2 to 3,
M	is Mg, Ca, Al, Sb, Sn, Ge, Ti, Zr, Zn, Ce, Bi, Sr, Mn, Li, Na and/or K and
M'	is Fe.

Preferably, R^1, R^2 in formula (I) are the same or different and are independently methyl, ethyl, n-propyl, isopropyl, n-butyl, tert-butyl, n-pentyl, 2-pentyl, 3-pentyl, 2-methylbutyl, 3-methylbutyl (isopentyl), 3-methylbut-2-yl, 2-methylbut-2-yl, 2,2-dimethylpropyl (neopentyl), hexyl, heptyl, octyl, nonyl, decyl, cyclopentyl, cyclopentylethyl, cyclohexyl, cyclohexylethyl, phenyl, phenylethyl, methylphenyl and/or methylphenylethyl.