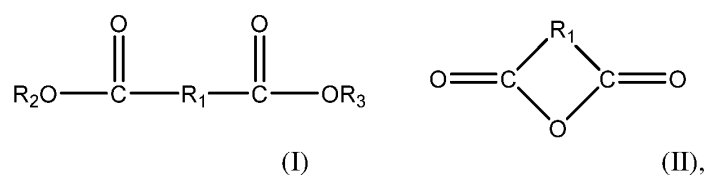


CLAIMS

1. Phosphorous containing monomer, which is an adduct of
 9,10-dihydro-9-oxa-10-phosphaphenanthrene-10-oxide (DOPO) and/or a
 nuclear substituted DOPO derivative, with
 at least one unsaturated divalent carboxylic acid, ester or anhydride
 5 thereof, as defined in formula (I) or (II),

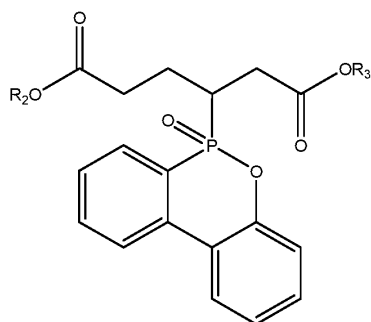


wherein

R₁ is a linear chain containing at least 4 carbon atoms and at least one
 double bond, and

R₂ and R₃ are independently hydrogen, an alkyl group or an aryl group.

2. Phosphorous containing monomer according to claim 1, wherein R₁ of the
 formula (I) or (II) is 1-butylene or 2-butylene.
3. Phosphorous containing monomer according to claim 1 or 2, wherein R₂ and
 20 R₃ of formula (I) are independently hydrogen, methyl or ethyl.
4. Phosphorous containing monomer according to any one of claims 1 to 3,
 wherein the monomer has the following formula (IV)

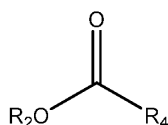


(IV),

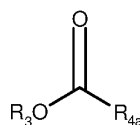
wherein R₂ and R₃ are independently hydrogen, methyl or ethyl.

5. Process for manufacturing of phosphorous containing monomer according to any one of claims 1 to 4, wherein

- in a first process step the unsaturated divalent carboxylic acid, ester or anhydride thereof, as defined in formula (I) or (II), is produced by catalytic dimerization of a carboxylic acid, ester or a mixture thereof, as defined in formula (III) or (IIIa)



(III)



(IIIa)

wherein,

R₄ and R_{4a} are independently a linear chain containing at least 2 carbon atoms and at least one double bond and R₂ and R₃ are independently hydrogen, an alkyl group or an aryl group, and

- in a further process step 9,10-dihydro-9-oxa-10-phosphaphenanthrene-10-oxide (DOPO) and/or nuclear substituted DOPO derivative is added to the unsaturated divalent carboxylic acid, ester or anhydride thereof obtained in the first process step.

6. Process for manufacturing of phosphorous containing monomer according to claim 5, wherein R₄ and/or R_{4a} are ethylene.

7. Process for manufacturing of phosphorous containing monomer according to claim 5 or 6, wherein the catalyst of the catalytic dimerization reaction is selected from the group consisting of alkyl phosphinite, aryl phosphinite, alkyl phosphinate, aryl phosphinate, metallic catalysts, which are selected from the group consisting of Ni, Pd, Ru, Rh, and mixtures thereof.

8. Phosphorous containing polymer, obtainable by polycondensation of at least one phosphorous containing monomer according to any one of claims 1 to 4, and of

at least one monomer selected from the group consisting of diamine, diol, aminoacid, lactam, hydroxycarboxylic acid, lactone or mixtures thereof, and optionally of other monomers.

9. Phosphorous containing polymer according to claim 8, wherein the polymer is a homopolymer.
- 5 10. Phosphorous containing polymer according to claim 8 or 9, wherein the polymer is a polyamide or a lactam based polyamide.
11. Process for manufacturing phosphorous containing polymer according to any one of claims 8 to 10 comprising the steps of
- 10 a) reacting 9,10-dihydro-9-oxa-10-phosphaphenanthrene-10-oxide (DOPO) and/or nuclear substituted DOPO derivative with at least one unsaturated divalent carboxylic acid, ester or anhydride thereof, as defined in formula (I) or (II), to obtain phosphorous-containing monomer according to any one of claims 1 to 4;
- 15 b) reacting the phosphorous-containing monomer obtained in step a) with at least one monomer selected from the group consisting of diamine, diol, aminoacid, lactam, hydroxycarboxylic acid, lactone or mixtures thereof; and
- c) optionally carrying out the reaction in step b) in the presence of at least one other monomer and/or
- 20 optionally carrying out the reaction in step b) in the presence of at least one monovalent carboxylic acid and/or monovalent amine and/or monovalent alcohol to obtain an end-capped polymer.
12. Phosphorous containing polymer composition comprising
- 25 at least one phosphorous containing polymer according to any one of claims 8 to 10 and optionally
- at least one thermoplastic polymer.
13. Phosphorous containing polymer composition according to claim 12,
- 30 wherein the thermoplastic polymer is selected from the group consisting of polyamides, polyphthalamides, polyesters including unsaturated polyesters resins, polysulfones, polyimides, polyolefins, polyacrylates, polyether etherketones, acrylnitril butadiene styrenes (ABS), polyurethenes, polystyrenes, polycarbonates, polyethylene oxides phenolic resins and mixtures thereof.
- 35

14. Phosphorous containing polymer composition according to any one of claims 12 or 13, wherein the phosphorous containing polymer composition has a phosphor content of 0.1 to 5 %by weight, based on the total weight of the composition.

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15. Use of a phosphorous containing polymer according to any one of claims 8 to 10 as flame retardant polymer.