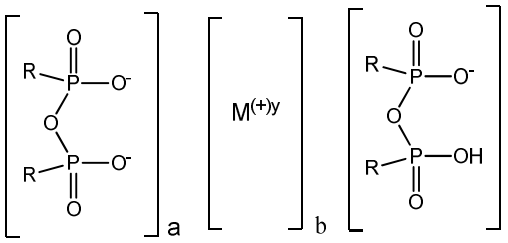
CLAIMS

1. A flame retardant and stabilizer additive composition, for thermoplastic polymers, comprising

(A) at least one phosphorus-containing flame retardant of empirical formula (I):



(I),

wherein R is H, an alkyl, aryl, alkylaryl, or arylalkyl group, M is a metal chosen from Al, Ga, Sb, Fe, Co, B, and Bi and y is 3, such that $M^{(+)y}$ is a metal cation where (+)y represents the charge formally assigned to the cation, a, b, and c represent the ratio of the components to which they correspond relative to one another in the compound, and satisfy the charge-balance equation 2(a)+c=b(y), a and c are not zero, and

(B) at least one polymeric aromatic carbodiimide.

2. The flame retardant and stabilizer additive composition of claim 1, wherein in the empirical formula (I), a is 1 or 2, b is from 1 to 4 and c is 1 or 2.

3. The flame retardant and stabilizer additive composition of claim 1, wherein a is 1, b is 1 and c is 1.

4. The flame retardant and stabilizer additive composition of claim 1, wherein M is Al or Fe.

5. The flame retardant and stabilizer additive composition of any one of claims 1-4, wherein in the empirical formula (I) R is H, C_{1-12} alkyl, C_{6-10} aryl, C_{7-18} alkylaryl, or C_{7-18} arylalkyl, wherein the alkyl, aryl, alkylaryl, or arylalkyl are unsubstituted or are substituted by halogen, hydroxyl, amino, C_{1-4} alkylamino, di-C_{1-4} alkylamino, C_{1-4} alkoxy, carboxy or C_{2-5} alkoxycarbonyl.

6. The flame retardant and stabilizer additive composition of claim 5, wherein R is unsubstituted C_{1-12} alkyl, C_6 aryl, C_{7-10} alkylaryl, or C_{7-10} arylalkyl.

7. The flame retardant and stabilizer additive composition of claim 5, wherein R is unsubstituted C_{1-6} alkyl.

8. The flame retardant and stabilizer additive composition of claim 7, wherein R is chosen from methyl, ethyl, propyl, isopropyl, butyl, and t-butyl.

9. The flame retardant and stabilizer additive composition according to any one of claims 1-8, wherein M is Al, y is 3, a is 1, b is 1 and c is 1.

10. The flame retardant and stabilizer additive composition of claim 9, wherein R is H or C_{1-6} alkyl.

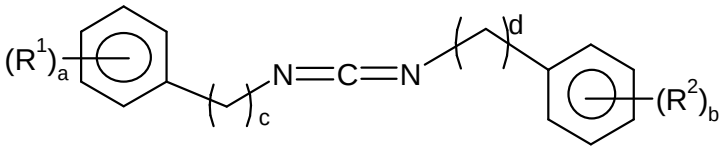
11. The flame retardant and stabilizer additive composition of claim 10, wherein R is chosen from methyl and ethyl.

12. The flame retardant and stabilizer additive composition of claim 1 further comprising (C) at least one flame retardant synergist and/or additional flame retardant.

13. The flame retardant and stabilizer additive composition of claim 12, wherein component (C) comprises a nitrogen-containing flame retardant synergist.

14. The flame retardant and stabilizer additive composition of claim 13, wherein the nitrogen-containing synergist is chosen from melamine, melam, melem, melon, melamine cyanurate, dimelamine phosphate, dimelamine pyrophosphate, melamine phosphate, melamine pyrophosphate, melamine polyphosphate, melam polyphosphate, melon polyphosphate, melem polyphosphate, and mixed polysalts thereof.

15. The flame retardant and stabilizer additive composition of claim 1, wherein the at least one carbodiimide is of the formula (III), (IV) or (V):

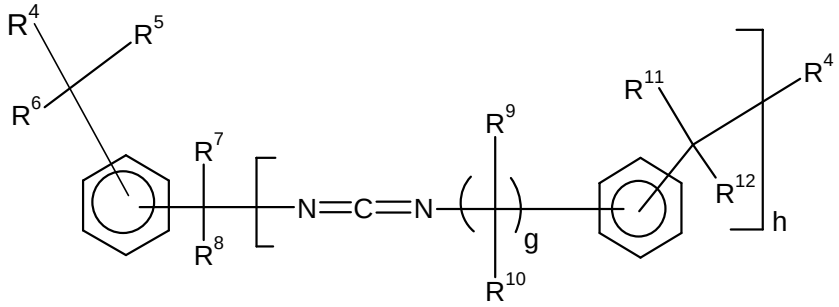


(III)

where R^1 and R^2 are independently hydrogen or C_l-C_{l0}-alkyl, C_6-C_{12}-aryl, C_7-C_{13}-aralkyl, or C_7-C_{13}-alkylaryl,

a and b are mutually independently a whole number from 1 to 5 and

c and d are mutually independently a whole number from 0 to 10;



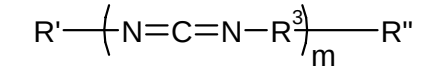
(IV)

where R^4 is NCO,

R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12} are independently hydrogen or C_1-C_{10}-alkyl, C_6-C_{12}-aryl, C_7-C_{13}-aralkyl, or C_7-C_{13}-alkylaryl,

g is a whole number from 0 to 5, and

h is a whole number from 1 to 100;



(V)

where m is a whole number from 1 to 5000,

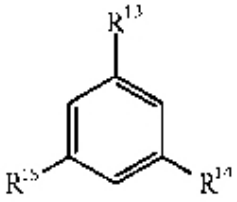
R^3 is arylene, alkyl-substituted arylene, alkylaryl-substituted arylene, or aralkyl-substituted arylene,

R' is aryl, alkylaryl, aralkyl or R^3-NCO, and

R'' is -N=C=N-aryl, -N=C=N-alkylaryl, -N=C=N-aralkyl or –NCO.

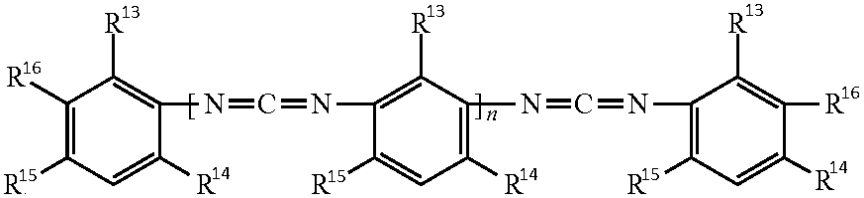
16. The flame retardant and stabilizer additive composition of claim 15, wherein the at least one carbodiimide is of the formula (V) and R^3 is chosen from arylene, C_1-C_{12}-alkyl-substituted arylene, C_7-C_{18}-alkylaryl-substituted arylene, C_7-C_{18}-aralkyl-substituted arylene, and C_1-C_{12}-alkyl-substituted C_1-C_8-alkylene-bridged arylene comprising a total of 7 to 30 carbon atoms.

17. The flame retardant and stabilizer additive composition of claim 16, wherein R^3 is



, where R^{13}, R^{14} and R^{15} are independently C_1-C_3 alkyl.

18. The flame retardant and stabilizer additive composition of claim 1, wherein the at least one carbodiimide is of the formula (VI):



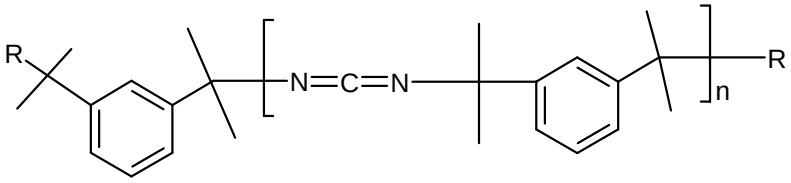
(VI)

where R^{13}, R^{14} and R^{15} are independently C_1-C_3 alkyl, R^{16} is –NCO, and

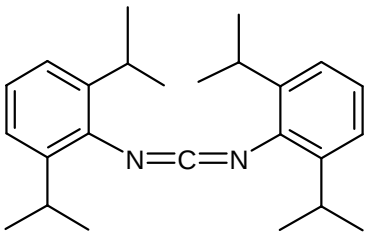
n is from 0 to 200.

19. The flame retardant and stabilizer additive composition of claim 18, wherein in formula (VI) R^{13}, R^{14} and R^{15} are each independently methyl, ethyl or isopropyl.

20. The flame retardant and stabilizer additive composition of claim 1, wherein the at least one carbodiimide is of the formula (VII) or (VIII):



(VII),



(VIII)

where R in formula (VII) is –NCO, and
n is a whole number from 1 to 200.

21. A flame retardant thermoplastic composition comprising at least one thermoplastic polymer and the flame retardant and stabilizer additive composition according to any one of claims 1-20.

22. The flame retardant thermoplastic composition of claim 21, wherein the at least one thermoplastic polymer is chosen from the group consisting of polyesters and polyamides.

23. The flame retardant thermoplastic composition of claim 22, wherein the at least one thermoplastic polymer is a polyamide chosen from the group consisting of polyamide-4,6, polyamide-6, polyamide-6,6, polyamide-6,10, polyamide-6,12, polyamide-11, polyamide-12, polyamide-4,T, polyamide-MXD,6, polyamide-12,T, polyamide-10,T, polyamide-9,T, polyamide-6,T/6,6, polyamide-6,T/D,T, polyamide-6,6/6,T/6,I, polyamide-6/6,T, polyamide-6,T/6,I, and mixtures thereof.

24. The flame retardant thermoplastic composition of claim 21, further comprising at least one inorganic filler.

25. The flame retardant thermoplastic composition of claim 24, wherein the inorganic filler comprises glass fiber.