WHAT IS CLAIMED IS:

1. A polycyclic aromatic hydrocarbon compound of general formula (1):

$$(P—O)_x—Q—Y_w$$

(1)

wherein P represents a polymeric moiety having at least three repeating units which comprise an optionally substituted phenyl ring;

Q represents a polycyclic aromatic hydrocarbon moiety with 5 to 9 rings containing an S atom or $S(=O)_2$ moiety in its basic structure;

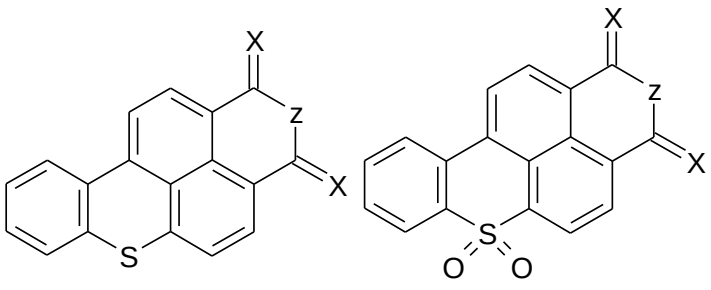
Y is selected from (i) halogen, (ii) optionally substituted N-heterocycloaliphatic groups having from 3 to about 8 ring members and which are bonded to Q through an N atom, and (iii) optionally substituted phenoxy groups;

x represents an integer of from 0 to 4; and w represents an integer of from 0 to 4

and wherein w and x are not simultaneously 0,

provided that when x = 0, at least one Y is selected from (ii) and (iii).

2. The compound of claim 1, wherein Q represents a moiety of formula (A) or (A'):



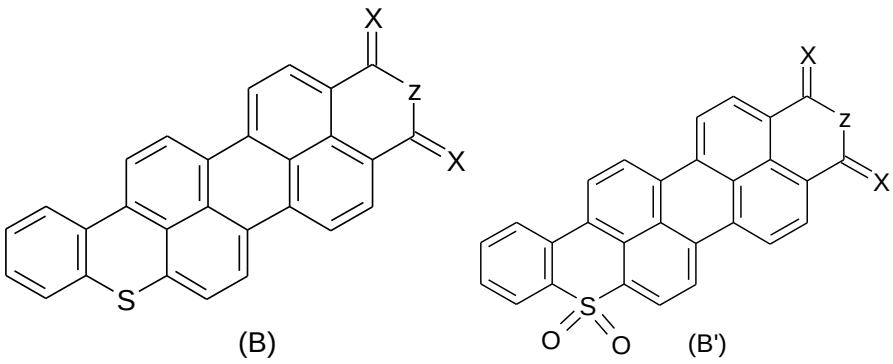
(A) (A')

wherein Z represents O, S or N-R;

wherein X, which can be the same or different, represents O, S, or NR’; and

R and R’ independently represent an optionally substituted aliphatic, cycloaliphatic, aromatic, heteroaromatic, alkylaryl, alkylheteroaryl, arylalkyl or heteroarylalkyl group having from 1 to about 20 carbon atoms; and R and R’ may also be combined to form, together with the N atoms to which they are attached, an optionally substituted and/or fused 5- to 7-membered ring.

3. The compound of claim 1, wherein Q represents a moiety of formula (B) or (B’):



wherein Z represents O, S or N-R;

wherein X, which can be the same or different, represents O, S, or NR’; and

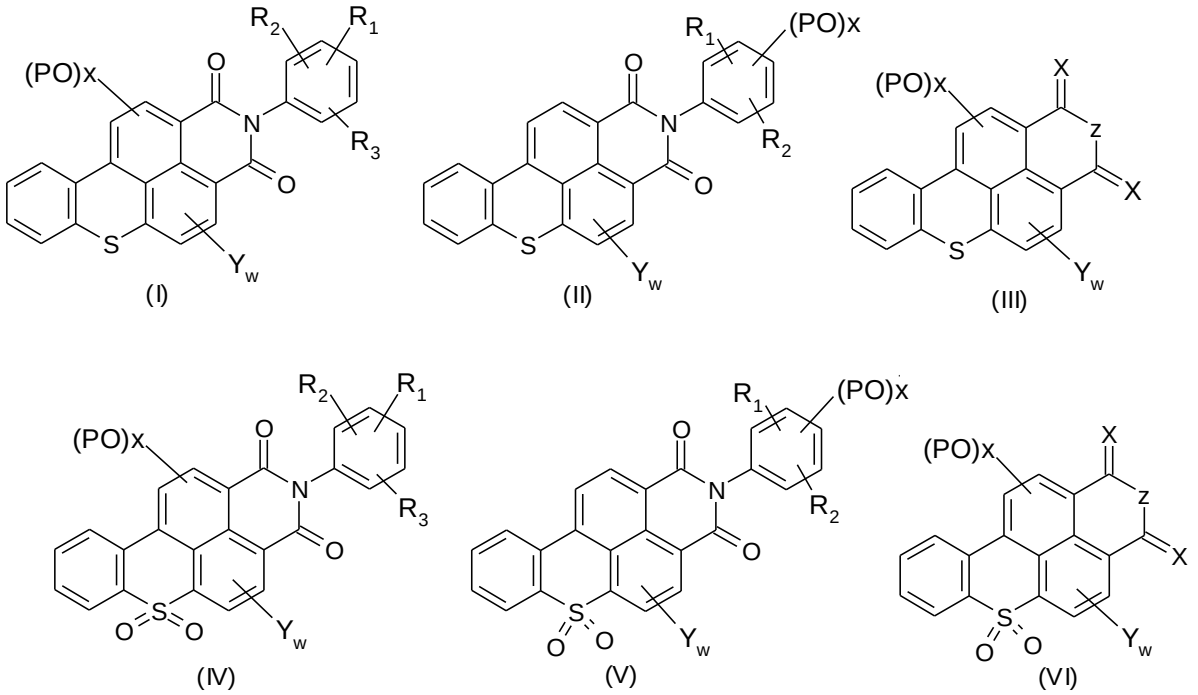
R and R’ independently represent an optionally substituted aliphatic, cycloaliphatic, aromatic, heteroaromatic, alkylaryl, alkylheteroaryl, arylalkyl or heteroarylalkyl group having from 1 to about 20 carbon atoms; and R and R’ may also be combined to form, together with the N atoms to which they are attached, an optionally substituted and/or fused 5- to 7-membered ring.

4. The compound of claim 1 , wherein x is 1 and w = 0.

5. The compound of ~~any one of claims 1 to 3~~claim 1, wherein x is 0 and w is 2 or not higher than 4.

6. The compound of ~~any one of claims 1 to 4~~claim 1, wherein (x + w) is not higher than about 4.

7. The compound of ~~any one of the preceding claims~~claim 1, wherein the compound is of formula (I) or (II) or (III) or (IV) or (V) or (VI):



wherein in the case of formula (III) and (VI), Z represents O, S or N-R; and X, which can be the same or different, represents O, S, or NR'; and

R and R' independently represent an optionally substituted aliphatic, cycloaliphatic, aromatic, heteroaromatic, alkylaryl, alkylheteroaryl, arylalkyl or heteroarylalkyl group having from 1 to about 20 carbon atoms; and R and R' may be combined to form, together with the N atoms to which they are attached, an optionally substituted and/or fused 5- to 7-membered ring;

R_1, R_2 and R_3 are independently selected from hydrogen, C_1-C_4 alkyl, C_1-C_4 alkyl-COOH, C_1-C_4 alkyl-SO_3H, C_1-C_4 alkoxy, mono(C_1-C_4)alkylamino, di(C_1-C_4)alkylamino, C_1-C_4 aminoalkyl, halogen, cyano, nitro, and SO_3H, the alkyl groups being optionally substituted;

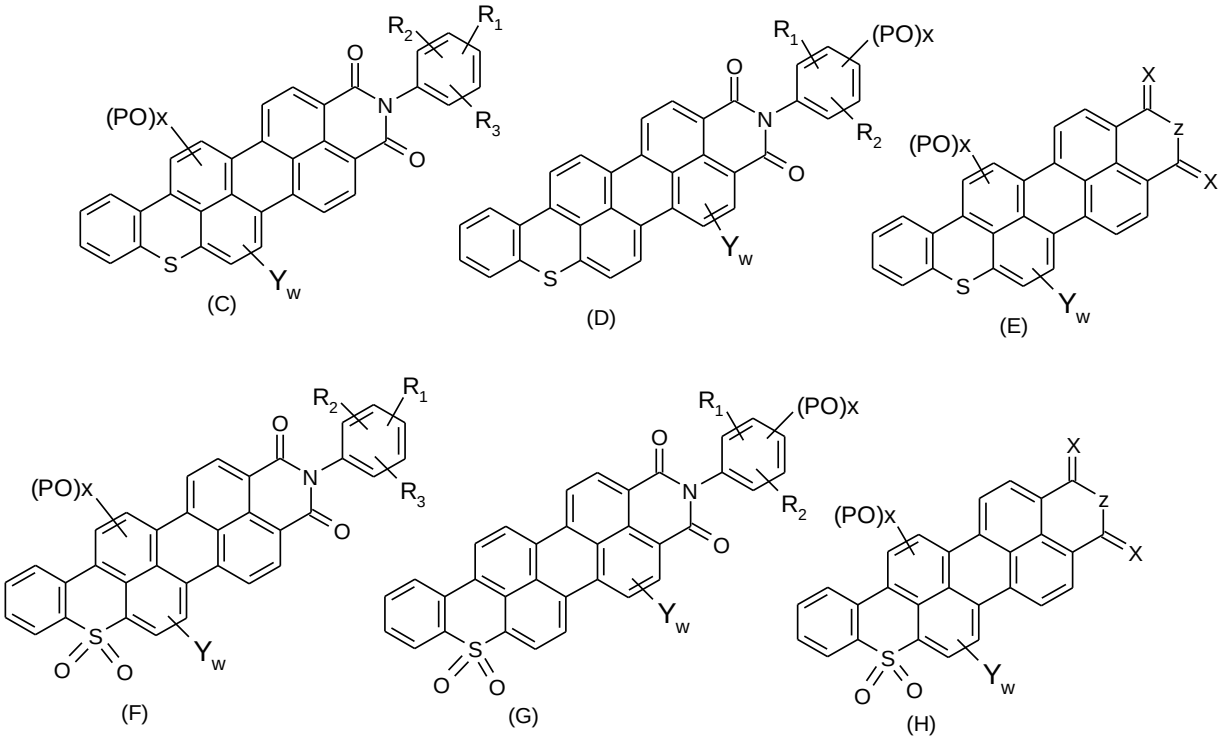
Y is selected from (i) halogen and (ii) optionally substituted N-heterocycloaliphatic groups having from 3 to about 8 ring members and which are bonded to an aromatic ring through an N atom, and (iii) optionally substituted phenoxy groups which are bonded to an aromatic ring

through an O atom, the phenoxy group may be substituted by one or more substituents selected from halogen, nitro, cyano, NRR', SO_3H and COOH and salts and derivatives of these sulfonic and carboxylic acid groups, OH, heterocycloalkyl comprising up to three heteroatoms selected from O, N and S as ring members and from 3 to about 8 ring members, and alkyl (including cycloalkyl) and alkoxy (including cycloalkoxy) groups comprising from 1 to about 10 carbon atoms;

P represents a polymeric moiety having at least three repeating units which comprise an optionally substituted phenyl ring; and

w is an integer of from 0 to 4.

8. The compound of ~~any one of the preceding claims~~claim 1, wherein the compound is a compound of one of formulae (C), (D) or (E) or (F) or (G) or (H):



wherein in the case of formula (E) and (H), Z represents O, S or N-R; and X, which can be the same or different, represents O, S, or NR'; and

R and R' independently represent an optionally substituted aliphatic, cycloaliphatic, aromatic, heteroaromatic, alkylaryl, alkylheteroaryl, arylalkyl or heteroarylalkyl group having from 1 to about 20 carbon atoms; and R and R' may be combined to form, together with the N atoms to which they are attached, an optionally substituted and/or fused 5- to 7-membered ring;

R_1, R_2 and R_3 are independently selected from hydrogen, C_1-C_4 alkyl, C_1-C_4 alkyl-COOH, C_1-C_4 alkyl-SO_3H, C_1-C_4 alkoxy, mono(C_1-C_4)alkylamino, di(C_1-C_4)alkylamino, C_1-C_4 aminoalkyl, halogen, cyano, nitro, and SO_3H, the alkyl groups being optionally substituted;

Y is selected from (i) halogen and (ii) optionally substituted N-heterocycloaliphatic groups having from 3 to about 8 ring members and which are bonded to an aromatic ring through an N atom,; and (iii) optionally substituted phenoxy groups which are bonded to an aromatic ring through an O atom, the phenoxy group may be substituted by one or more substituents selected from halogen, nitro, cyano, NRR', SO_3H and COOH and salts and derivatives of these sulfonic and carboxylic acid groups, OH, heterocycloalkyl comprising up to three heteroatoms selected from O, N and S as ring members and from 3 to about 8 ring members, and alkyl (including cycloalkyl) and alkoxy (including cycloalkoxy) groups comprising from 1 to about 10 carbon atoms;

P represents a polymeric moiety having at least three repeating units which comprise an optionally substituted phenyl ring;

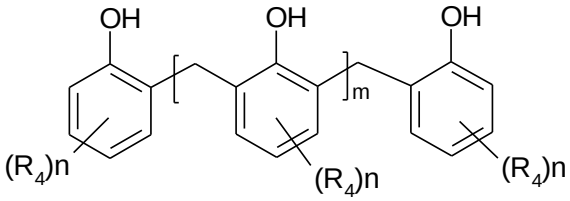
and x is an integer of from 0 to 4; and w is an integer of from 0 to 4.

9. The compound according to claim 8, wherein x is 0.

10. The compound of ~~any one of the preceding claims~~claim 1, wherein at least one group Y is selected from heterocycloaliphatic groups having from 3 to about 8 ring members, which ring members comprise from 1 to about 3 heteroatoms selected from N, S, and O, provided that at least one ring member is N, which heterocycloaliphatic compounds may be substituted by one or more substituents selected from alkyl and alkoxy groups each comprising up to about 10 carbon atoms.

11. The compound of ~~any one of the preceding claims~~claim 1, wherein at least one group Y is a residue of a heterocycloaliphatic compound selected from optionally substituted azacyclooctane, optionally substituted azepane, optionally substituted piperidine, optionally substituted piperazine, optionally substituted pyrrolidine, optionally substituted azetidine, optionally substituted aziridine, optionally substituted morpholine, optionally substituted oxazolidine, optionally substituted pyrazolidine, optionally substituted isopyrazolidine, optionally substituted isoxazolidine, and optionally substituted thiazolidine, one or more substituents each being selected from C_1-C_4 alkoxy and C_1-C_6 alkyl groups.

12. The compound of ~~any one of claims 1to 4 and 6-11~~claim 1, wherein P is a residue of a polymeric compound of general formula (2):



(2)

wherein the groups R_4, the same or different from each other, are selected from C_1-C_{10} alkyl and C_1-C_4 alkoxy;

m represents an integer of from 1 to about 30;

n represents an integer of from 1 to about 3.

13. The compound of claim 12 wherein m represents an integer of from 1 to 10 and n is 1 or 2.

14. The compound of ~~any one of claims 12 and 13~~ claim 12 wherein the groups R_4 are independently selected from C_1-C_{10} alkyl.

15. The compound of ~~any one of claims 12 to 14~~claim 12 wherein the groups R_4 are independently selected from isopropyl, tert-butyl, tert-octyl, n-nonyl, and branched nonyl.

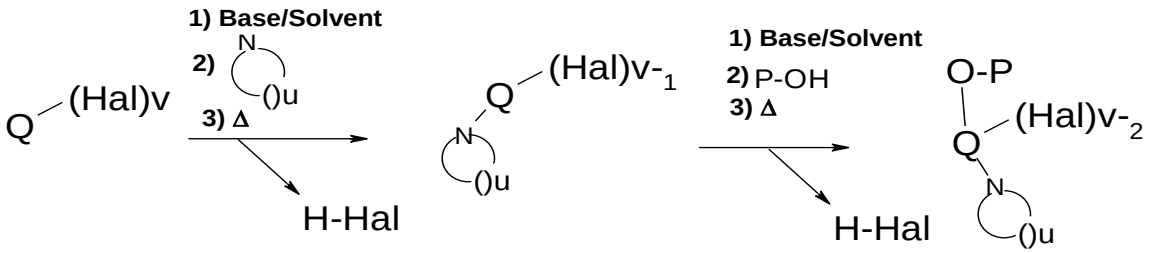
16. A process for making a compound of ~~any one of the preceding claims~~claim 1, wherein the process comprises reacting in a polar aprotic organic solvent a compound of formula $Q\text{-}(Hal)_v$ wherein Hal represents halogen and v represents an integer of from 2 to 8, successively with an N-containing cycloaliphatic compound and a polymeric compound of formula P-OH.

17. The process of claim 16 wherein at least a reaction involving the N-containing cycloaliphatic compound is carried out in the presence of at least one of an inorganic base and a strong organic non-nucleophilic base.

18. The process of ~~any one of claims 16 or 17~~claim 16, wherein from about 0.5 to about 10 g of compound of formula $Q\text{-}(Hal)_v$ are employed per 100 g of polymeric compound of formula P-OH.

19. The process of ~~any one of claims 16 to 18~~claim 16, wherein the polar solvent comprises at least one of N-methylpyrrolidone, dimethyl formamide, dimethyl acetamide, and dimethylsulfoxide.

20. The process of ~~any one of claims 16 to 19~~claim 16 wherein the process is represented as follows:



wherein

() represents CH_2 wherein at least one CH_2 group can be replaced by O, NH or S;

u is from 2 to 7;

v is an integer of from 2 to 8.

21. A printing ink composition, wherein the composition comprises a polar liquid medium and at least one compound of ~~any one of claims 1 to 15~~claim 1 dissolved or dispersed in the medium.

22. The printing ink composition of claim 21 wherein the composition comprises from about 0.01 % to about 40 % by weight of the at least one compound , based on a total weight of the composition.

23. The printing ink composition of ~~any one of claims 21 or 22~~ claim 21 wherein the printing ink composition further comprises at least one conductivity imparting substance.

24. A marking or security feature which is made with the printing ink composition of ~~any one of claims 21 to 23~~claim 21.

25 A marking or security feature which comprises at least one compound of ~~any one of the preceding claims 1 to 15~~claim 1.

26. The marking or security feature of ~~any one of claims 24 or 25~~claim 24, wherein the marking or security feature comprises at least one of a thread, a label, a barcode, a 2D code, a pattern, indicia, and a data matrix.

27. An article which comprises the marking or security feature of ~~any one of claims 24 to 26~~claim 24.

28. The article of claim 27 wherein the marking or security feature is present as a layer on the article.

29. The article of ~~any one of claims 27 to 28~~ claim 27 wherein the article is at least one of a can, a metal, an aluminum foil, a cartridge, a capsule, an article made of glass, an article made of ceramic, a packaging, a banknote, a passport, a security document, a value document, a ticket, a thread, a label, a card, a commercial good, and a cigarette packaging which may or may not carry coded or encrypted information.

30. A method of authenticating an article, wherein the method comprises providing the article with the marking or security feature of ~~any one of claims 24 to 26~~claim 24.

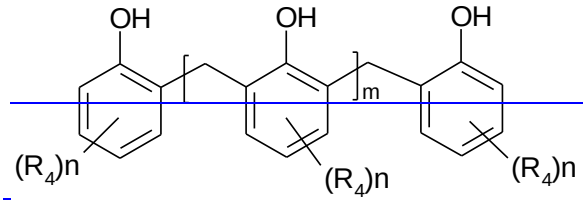
31. A method of authenticating an article, wherein the method comprises applying onto the article the printing ink composition of ~~any one of claims 21 to 23~~claim 21.

32. The method of ~~any one of claims 30 to 31~~claim 30, wherein the article is at least one of a can, a metal, an aluminum foil, a cartridge, a capsule, an article made of glass, an article made of ceramic, a packaging, a banknote, a passport, a security document, a value document, a ticket, a thread, a label, a card, a commercial good, and a cigarette packaging which may or may not carry coded or encrypted information.

~~33. A polymer, wherein at least about 0.1 % of polymer molecules have bonded thereto 1 to 4 residues of formula —Q—(Y)$_w$ wherein Q represents a moiety of formula (A) or (A') according to claim 2, or (B) or (B') according to claim 3; Y is selected from (i) halogen and (ii) optionally substituted N-heterocycloaliphatic groups having from 3 to about 8 ring members, at least one of which is N, which are bonded to Q through an N atom, and/or an optionally substituted phenol group which is bonded to Q through the O atom provided that at least one Y represents (ii);~~

~~w represents an integer of from 1 to 4; and further provided that Q may at the same time be bonded to up to 4 polymer molecules .~~

~~34. The polymer of claim 33, wherein the polymer is a compound of general formula (2):~~



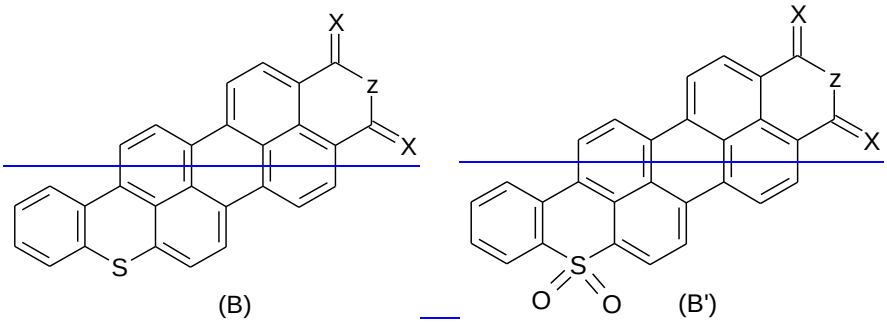
~~(2)~~

~~wherein the groups R_4, the same or different from each other, are selected from C_1-C_{10} alkyl and C_1-C_4 alkoxy;~~

~~m represents an integer of from 1 to about 30;~~

~~n represents an integer of from 1 to about 3.~~

~~35. Optionally substituted compound of formula (B) or (B'):~~

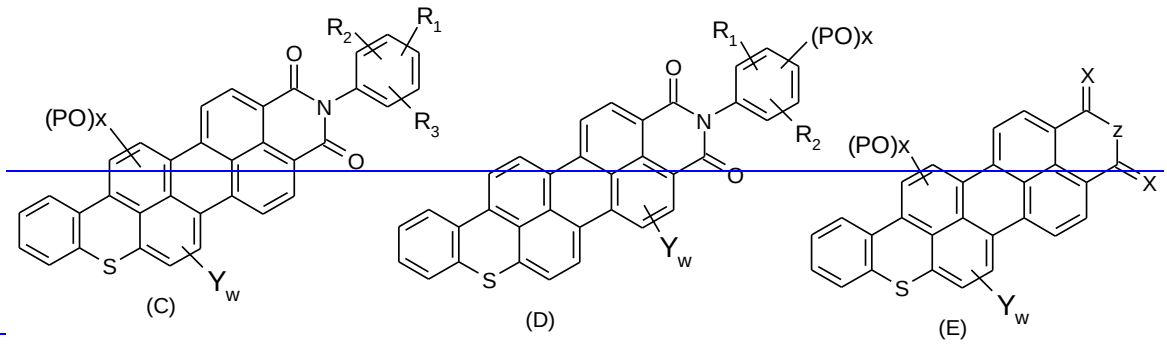


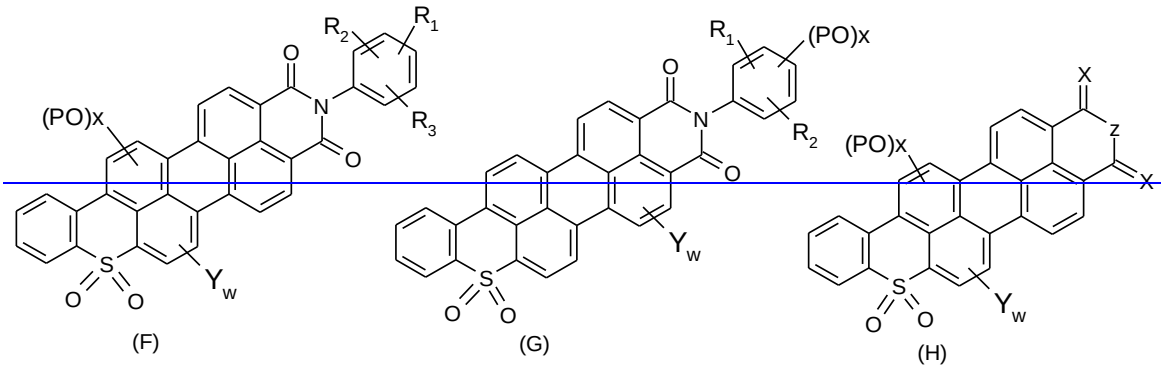
~~wherein Z represents O, S or N-R, and X, which can be the same or different, represents O, S, or NR';~~

~~R and R' independently represent an optionally substituted aliphatic, cycloaliphatic, aromatic, heteroaromatic, alkylaryl, alkylheteroaryl, arylalkyl or heteroarylalkyl group having from 1 to about 20 carbon atoms; and R and R' may also be combined to form, together with the N atoms to which they are attached, an optionally substituted and/or fused 5- to 7-membered ring.~~

~~36. The compound of claim 35 which is unsubstituted.~~

~~37. The compound of claim 35, wherein the compound is a compound of one of formulae (C), (D) or (E) or (F) or (G) or (H):~~





~~wherein in the case of formula (E) and (H), Z represents O, S or N-R; and X, which can be the same or different, represents O, S, or NR'; and~~

~~R and R' independently represent an optionally substituted aliphatic, cycloaliphatic, aromatic, heteroaromatic, alkylaryl, alkylheteroaryl, arylalkyl or heteroarylalkyl group having from 1 to about 20 carbon atoms; and R and R' may be combined to form, together with the N atoms to which they are attached, an optionally substituted and/or fused 5- to 7-membered ring;~~

~~R_1, R_2 and R_3 are independently selected from hydrogen, C_1-C_4 alkyl, C_1-C_4 alkyl-COOH, C_1-C_4 alkyl-SO_3H, C_1-C_4 alkoxy, mono(C_1-C_4)alkylamino, di(C_1-C_4)alkylamino, C_1-C_4 aminoalkyl, halogen, cyano, nitro, and SO_3H, the alkyl groups being optionally substituted;~~

~~Y is selected from (i) halogen and (ii) optionally substituted N-heterocycloaliphatic groups having from 3 to about 8 ring members and which are bonded to an aromatic ring through an N atom,; and (iii) optionally substituted phenoxy groups which are bonded to an aromatic ring through an O atom, the phenoxy group may be substituted by one or more substituents selected from halogen, nitro, cyano, NRR', SO_3H and COOH and salts and derivatives of these sulfonic and carboxylic acid groups, OH, heterocycloalkyl comprising up to three heteroatoms selected from O, N and S as ring members and from 3 to about 8 ring members, and alkyl (including cycloalkyl) and alkoxy (including cycloalkoxy) groups comprising from 1 to about 10 carbon atoms;~~

~~P represents a polymeric moiety having at least three repeating units which comprise an optionally substituted phenyl ring;~~

~~and x is an integer of from 0 to 4; and w is an integer of from 0 to 4.~~