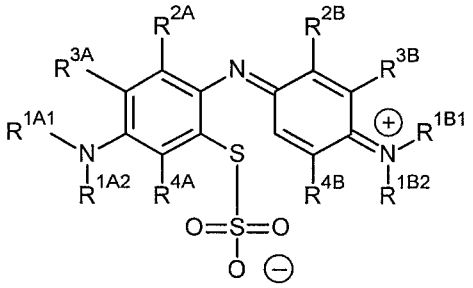
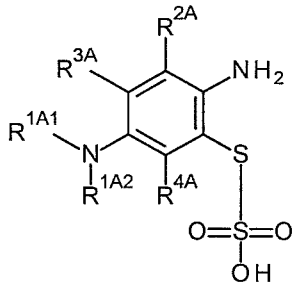
CLAIMS

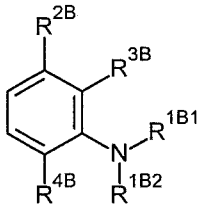
1. A method of chemical synthesis of a compound of Formula (1):



comprising a step of periodate mediated oxidative coupling,
in which a compound of Formula (2):



is reacted with a compound of Formula (3):



and a periodate oxidising agent;
to form said compound of Formula (1);
wherein:

$-R^{1A1}$ is independently C_{1-4}alkyl; C_{2-4}alkenyl; halogenated C_{1-4}alkyl; C_{5-10}aryl; halogenated C_{5-10}aryl; C_{5-10}aryl-C_{1-4}alkyl; or halogenated C_{5-10}aryl-C_{1-4}alkyl;

$-R^{1A2}$ is independently C_{1-4}alkyl; C_{2-4}alkenyl; halogenated C_{1-4}alkyl; C_{5-10}aryl; halogenated C_{5-10}aryl; C_{5-10}aryl-C_{1-4}alkyl; or halogenated C_{5-10}aryl-C_{1-4}alkyl;

$-R^{1B1}$ is independently C_{1-4}alkyl; C_{2-4}alkenyl; halogenated C_{1-4}alkyl; C_{5-10}aryl; halogenated C_{5-10}aryl; C_{5-10}aryl-C_{1-4}alkyl; or halogenated C_{5-10}aryl-C_{1-4}alkyl;

$-R^{1B2}$ is independently C_{1-4}alkyl; C_{2-4}alkenyl; halogenated C_{1-4}alkyl; C_{5-10}aryl; halogenated C_{5-10}aryl; C_{5-10}aryl-C_{1-4}alkyl; or halogenated C_{5-10}aryl-C_{1-4}alkyl;

$-R^{2A}$ is independently -H or $-R^{3AA}$;

$-R^{2AA}$ is independently C_{1-4}alkyl; C_{2-4}alkenyl; halogenated C_{1-4}alkyl; C_{5-10}aryl; halogenated C_{5-10}aryl; C_{5-10}aryl-C_{1-4}alkyl; or halogenated C_{5-10}aryl-C_{1-4}alkyl;

$-R^{2B}$ is independently -H or $-R^{3AA}$;

$-R^{2BB}$ is independently C_{1-4}alkyl; C_{2-4}alkenyl; halogenated C_{1-4}alkyl; C_{5-10}aryl; halogenated C_{5-10}aryl; C_{5-10}aryl-C_{1-4}alkyl; or halogenated C_{5-10}aryl-C_{1-4}alkyl;

$-R^{3A}$ is independently -H or $-R^{3AA}$;

$-R^{3AA}$ is independently C_{1-4}alkyl; C_{2-4}alkenyl; halogenated C_{1-4}alkyl; C_{5-10}aryl; halogenated C_{5-10}aryl; C_{5-10}aryl-C_{1-4}alkyl; or halogenated C_{5-10}aryl-C_{1-4}alkyl;

$-R^{3B}$ is independently -H or $-R^{3BB}$;

$-R^{3BB}$ is independently C_{1-4}alkyl; C_{2-4}alkenyl; halogenated C_{1-4}alkyl; C_{5-10}aryl; halogenated C_{5-10}aryl; C_{5-10}aryl-C_{1-4}alkyl; or halogenated C_{5-10}aryl-C_{1-4}alkyl;

$-R^{4A}$ is independently -H or $-R^{4AA}$;

$-R^{4AA}$ is independently C_{1-4}alkyl; C_{2-4}alkenyl; halogenated C_{1-4}alkyl; C_{5-10}aryl; halogenated C_{5-10}aryl; C_{5-10}aryl-C_{1-4}alkyl; or halogenated C_{5-10}aryl-C_{1-4}alkyl;

$-R^{4B}$ is independently -H or $-R^{4BB}$; and

$-R^{4BB}$ is independently C_{1-4}alkyl; C_{2-4}alkenyl; halogenated C_{1-4}alkyl; C_{5-10}aryl; halogenated C_{5-10}aryl; C_{5-10}aryl-C_{1-4}alkyl; or halogenated C_{5-10}aryl-C_{1-4}alkyl.

2. A method according to claim 1, wherein $-R^{1A1}$ is independently C_{1-4}alkyl; C_{2-4}alkenyl; or halogenated C_{1-4}alkyl, preferably $-R^{1A1}$ is independently -Me or -Et.

3. A method according to claim 1 or claim 2, wherein $-R^{1A2}$ is independently C_{1-4}alkyl; C_{2-4}alkenyl; or halogenated C_{1-4}alkyl, preferably $-R^{1A2}$ is independently -Me or -Et.

4. A method according to any one of claims 1 to 3 wherein $-R^{1B1}$ is independently C_{1-4}alkyl; C_{2-4}alkenyl; or halogenated C_{1-4}alkyl, preferably $-R^{1B1}$ is independently -Me or -Et.

5. A method according to any one of claims 1 to 4, wherein $-R^{1B2}$ is independently C_{1-4}alkyl; C_{2-4}alkenyl; or halogenated C_{1-4}alkyl, preferably $-R^{1B2}$ is independently -Me or -Et.

6. A method according to any one of claims 1 to 5, wherein $-R^{2A}$ is independently -H, or wherein $-R^{2A}$ is independently $-R^{2AA}$, optionally wherein $-R^{2AA}$, if present, is independently C_{1-4}alkyl; C_{2-4}alkenyl; or halogenated C_{1-4}alkyl, preferably $-R^{2AA}$, if present, is independently -Me or -Et.

7. A method according to any one of claims 1 to 6, wherein -R^{2B} is independently -H, or wherein -R^{2B} is independently -R^{2BB}, optionally wherein -R^{2BB}, if present, is independently C_{1-4}alkyl; C_{2-4}alkenyl; or halogenated C_{1-4}alkyl, preferably wherein -R^{2BB}, if present, is independently -Me or -Et.

8. A method according to any one of claims 1 to 7, wherein -R^{3A} is independently -H, or wherein -R^{3A} is independently -R^{3AA}, optionally wherein -R^{3AA}, if present, is independently C_{1-4}alkyl; C_{2-4}alkenyl; or halogenated C_{1-4}alkyl, preferably wherein -R^{3AA}, if present, is independently -Me or -Et.

9. A method according to any one of claims 1 to 8, wherein -R^{3B} is independently -H, or wherein -R^{3B} is independently -R^{3BB}, optionally wherein -R^{3BB}, if present, is independently C_{1-4}alkyl; C_{2-4}alkenyl; or halogenated C_{1-4}alkyl, preferably wherein -R^{3BB}, if present, is independently -Me or -Et.

10. A method according to any one of claims 1 to 9, wherein -R^{4A} is independently -H, or wherein -R^{4A} is independently -R^{4AA}, optionally wherein -R^{4AA}, if present, is independently C_{1-4}alkyl; C_{2-4}alkenyl; or halogenated C_{1-4}alkyl, preferably wherein -R^{4AA}, if present, is independently -Me or -Et.

11. A method according to any one of claims 1 to 10, wherein -R^{4B} is independently -H, or wherein -R^{4B} is independently -R^{4BB}, optionally wherein -R^{4BB}, if present, is independently C_{1-4}alkyl; C_{2-4}alkenyl; or halogenated C_{1-4}alkyl, preferably wherein -R^{4BB}, if present, is independently -Me or -Et.

12. A method according to any one of claims 1 to 11, wherein
the periodate oxidizing agent is an iodine peroxide;
the periodate oxidizing agent is periodic acid or a periodate salt;
the periodate oxidizing agent is periodic acid;
the periodate oxidizing agent is a periodate salt;
the periodate oxidizing agent is an alkali metal periodate salt;
the periodate oxidizing agent is a sodium periodate salt; or
the periodate oxidizing agent is sodium periodate ($NaIO_4$).

13. A method according to any one of claims 1 to 12, wherein the ratio, A, of the amount of compound of Formula (2), in equivalents, to the amount of compound of Formula (3), in equivalents, is from about 0.5 to about 3.0, optionally the ratio, A, is from about 0.6 to about 2.0, preferably the ratio, A, is about 1.

14. A method according to any one of claims 1 to 13, wherein the ratio, B, of the amount of compound of Formula (2), in equivalents, to the amount of compound

of periodate oxidizing agent, in equivalents, is from about 0.5 to about 3.0, optionally the ratio, B, is from about 1.0 to about 3.0, preferably the ratio, B, is about 2.1.

15. A method according to any one of claims 1 to 14, wherein the reaction is carried out at a temperature of from about 0°C to about 30°C, optionally the temperature is from about 1°C to about 20°C, preferably the temperature is about 5°C.

16. A method according to any one of claims 1 to 15, wherein the reaction time is from about 5 minutes to about 12 hours, optionally the reaction time is from about 30 minutes to about 4 hours, preferably the reaction time is about 2 hours.

17. A method according to any one of claims 1 to 16, wherein the reaction is carried out

in the presence of an acid;
in the presence of a strong acid;
in the presence of sulfuric acid; or
in the presence of concentrated sulfuric acid.

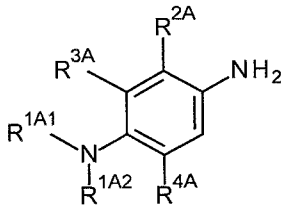
18. A method according to claim 17, wherein the ratio, C, of the amount of compound of Formula (2), in equivalents, to the amount of H^+ provided by the acid, in equivalents, is from about 0.5 to about 3.0, optionally the ratio, C, is from about 0.6 to about 2.0, preferably the ratio, C, is about 1.

19. A method according to any one of claims 1 to 18, wherein the reaction is carried out in the presence of water.

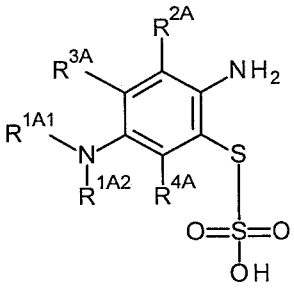
20. A method according to claim 17 or claim 18, wherein the acid is added to the compound of Formula (3) in water; then the compound of Formula (4) is added; and then the periodate oxidizing agent is added,

optionally wherein the acid is added stepwise, the compound of Formula (4) is added in one aliquot or the periodate oxidizing agent is added stepwise.

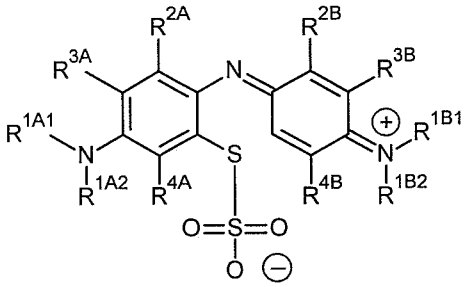
21. A method according to any one of claims 1 to 20, wherein the method further comprises a preceding step of:
converting a compound of Formula (4):



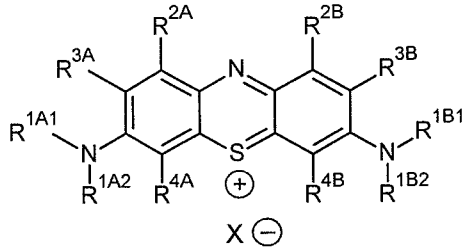
to the corresponding compound of Formula (2):



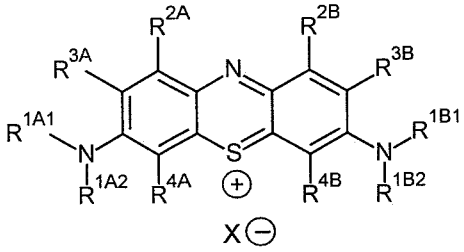
22. A method according to any one of claims 1 to 21, wherein the method further comprises a subsequent step of:
converting the compound of Formula (1):



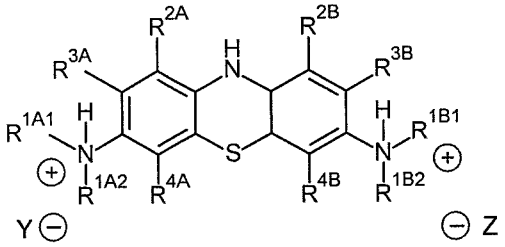
to the corresponding compound of Formula (5):



wherein X^- is one or more anionic counter ions to achieve electrical neutrality, preferably X^- is independently a halide such as Cl^-,
optionally wherein the method further comprises a subsequent step of:
converting the compound of Formula (5):



to the corresponding compound of Formula (6):



wherein Y^- and Z^-, taken together, are one or more anionic counter ions to achieve electrical neutrality, preferably wherein each of Y^- and Z^- is independently a halide such as Cl^-.