CLAIMS:

1. A dielectric film-forming composition, comprising:

a) at least one cyanate ester compound, the at least one cyanate ester compound comprising at least two cyanate groups;

b) at least one dielectric polymer comprising a polybenzoxazole precursor polymer, a polyimide precursor polymer, or a fully imidized polyimide polymer; and

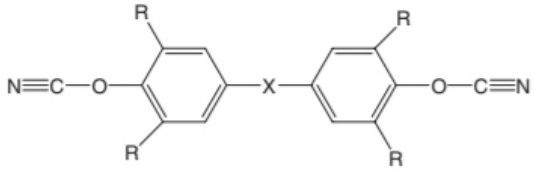
c) at least one copper passivation reagent selected from the group consisting of triazole compounds and tetrazole compounds.

2. The composition of claim 1, wherein the at least one cyanate ester compound has structure (I):

$$A\text{-}(O\text{-}C\equiv N)_m \quad (I),$$

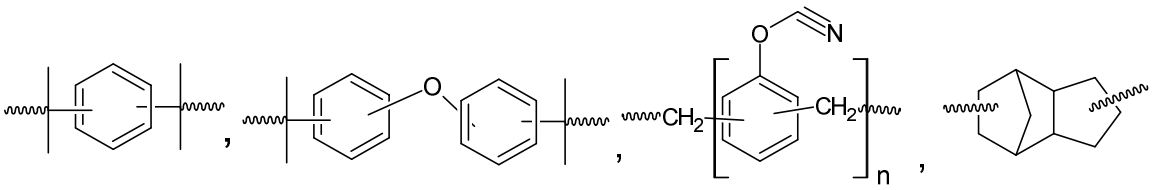
wherein m is an integer of at least 2 and A is a divalent organic group comprising a substituted or unsubstituted aromatic group.

3. The composition of claim 1 or claim 2, wherein the at least one cyanate ester compound has structure (II):



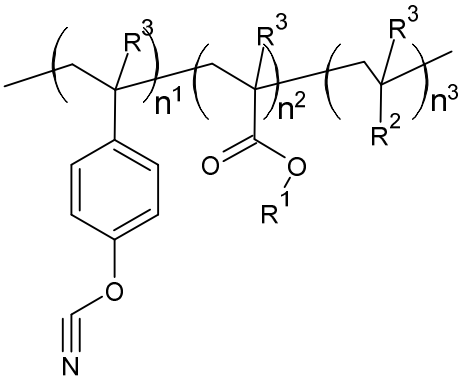
(II),

wherein R is a hydrogen atom, a C_1-C_3 alkyl group, a fully or partially halogen substituted C_1-C_3 alkyl group, or a halogen atom; and X is a single bond, -O-, -S-, -(C=O)-, -(C=O)-O-, -O-(C=O)-, -(S=O)-, -(SO_2)-, -CH_2CH_2-O-, a substituted or unsubstituted C_1-C_{10} alkylene, a fully or partially fluoro substituted C_1-C_4 alkylene, a substituted or unsubstituted C_3-C_{10} cycloalkylene, or one of the following groups:



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4. The composition of any one of claims 1 to 3, wherein the at least one cyanate ester compound has structure (III):



(III),

wherein n_1 is an integer of at least 2, n_2 and n_3 are independently 0 or an integer from 1 to 100, R^1 is an acid sensitive substituted alkyl, silyl, aryl, or arylalkyl group, R^2 is a substituted or unsubstituted C_1-C_{10} alkyl, a substituted or unsubstituted C_3-C_{10} cycloalkyl, a substituted or unsubstituted aryl group, or a –(C=O)-OR^4 group, in which R^4 is a non-acid sensitive substituted alkyl or arylalkyl group; and R^3 is a substituted or unsubstituted C_1-C_{10} alkyl, or a fluoro substituted C_1-C_4 alkyl.

5. The composition of any one of claims 1 to 4, wherein the at least one cyanate ester compound is selected from the group consisting of 2-bis(4-cyanatophenyl)propane, hexafluorobisphenol A dicyanate, bis(4-cyanate-3,5-dimethylphenyl)methane, 1,3-bis(4-cyanatephenyl-1-(methylethylidene))benzene, bis(4-cyanatephenyl)thioether, bis(4-cyanatephenyl)ether, and a polyfunctional cyanate resin prepared from a phenol novolac, cresol novolac, or dicyclopentadiene-containing phenol resin.

6. The composition of any one of claims 1 to 5, wherein the composition comprises at least two cyanate ester compounds.

7. The composition of any one of claims 1 to 6, wherein the at least one cyanate ester compound is in an amount of from 2 wt% to 55 wt% of the composition.

8. The composition of any one of claims 1 to 7, wherein the at least one dielectric polymer is in an amount of from 2 wt% to 55 wt% of the composition.

9. The composition of any one of claims 1 to 8, further comprising at least one solvent.

10. The composition of claim 9, wherein the at least one solvent is in an amount of from 20 wt% to 98 wt% of the composition.

11. The composition of any one of claims 1 to 10, further comprising at least one reactive functional compound having at least two functional groups.

12. The composition of claim 11, wherein the at least one reactive functional compound is in an amount of from 1 wt% to 25 wt% of the composition.

13. The composition of any one of claims 1 to 12, further comprising at least one catalyst.

14. The composition of claim 13, wherein the at least one catalyst is in an amount of from 0.2 wt% to 3 wt% of the composition.

15. The composition of any one of claims 1 to 14, wherein the at least one copper passivation reagent is selected from the group consisting of benzotriazole, tolyltriazole, 5-methyl-1,2,4-triazole, 5-phenyl-benzotriazole, 5-nitro-benzotriazole, 3-amino-5-mercapto-1,2,4-triazole, 1-amino-1,2,4-triazole, hydroxybenzotriazole, 2-(5-aminopentyl)-benzotriazole, 1-amino-1,2,3-triazole, 1-amino-5-methyl-1,2,3-triazole, 3-amino-1,2,4-triazole, 3-mercapto-1,2,4-triazole, 3-isopropyl-1,2,4-triazole, 5-phenylthiolbenzotriazole, 2-[3-2H-benzotriazol-2-yl)-4-hydroxyphenyl] ethyl methacrylate, halo-benzotriazoles, naphthotriazole, 1-H-tetrazole, 5-methyl-1H-tetrazole, 5-phenyl-1H-tetrazole, 5-amino-1H-tetrazole, 1-phenyl-5-mercapto-1H-tetrazole, 5,5'-bis-1H-tetrazole, 1-methyl-5-ethyltetrazole, 1-methyl-5-mercaptotetrazole and 1-carboxymethyl-5-mercptotetrazole.

16. The composition according to any one of claims 1 to 15, wherein the at least one copper passivation reagent is in an amount of from 0.1 wt% to 3.0 wt% of the composition.

17. A dry film, comprising:

a carrier substrate, and

a dielectric film supported by the carrier substrate, wherein the film is prepared from the composition of any one of claims 1 to 16.

18. A process for depositing a metal layer, comprising:

a) depositing the composition of any one of claims 1 to 16 on a substrate to form a dielectric film;
b) exposing the dielectric film to radiation or heat or a combination of radiation or heat;
c) patterning the dielectric film to form a patterned dielectric film having openings;
d) optionally depositing a seed layer on the patterned dielectric film; and
e) depositing a metal layer in at least one opening in the patterned dielectric film.

19. A process for forming a dielectric film on a substrate, comprising:

a) providing a substrate containing copper conducting metal wire structures that form a network of lines and interconnects on the substrate;
b) depositing the composition of any one of claims 1 to 16 on the substrate to form a dielectric film; and
c) exposing the dielectric film to radiation or heat or a combination of radiation and heat.

20. A three dimensional object prepared by the process of claim 19.

21. The object of claim 20, comprising the dielectric film in at least two or three stacks.