We claim:

1) A process comprising steps a), b) and c)

a) coating on a substrate a composition for a negative tone, aqueous base developable, broadband UV resist which is also sensitive in the areas exposed to broadband irradiation to subsequent cold laser ablation by an UV Excimer Laser emitting between 222 nm and 308 nm where the composition is comprised of components of type a1) and b1);

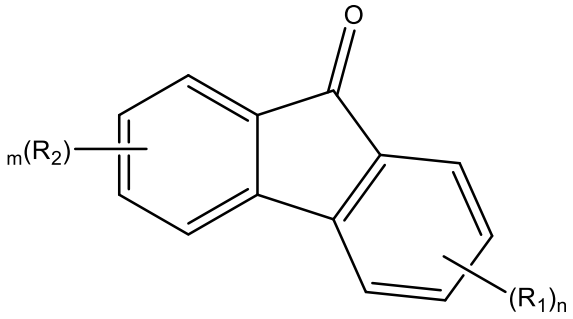
a1) components for imparting negative tone, aqueous base developable, broadband UV resist behavior comprised of

i) a resin containing phenolic moieties, carboxylic acid moieties or a combination of both types moieties such that the resin dissolves in aqueous base;

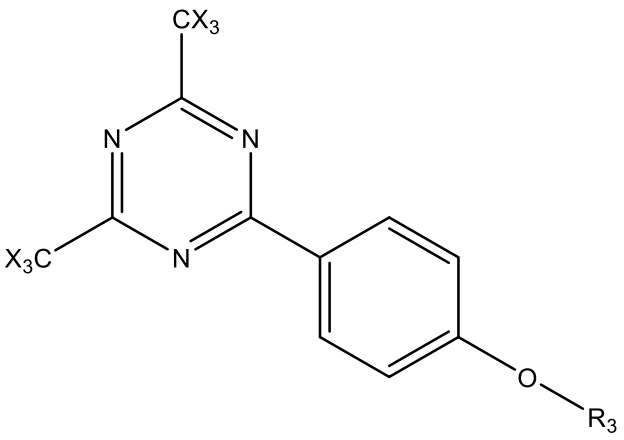
ii) at least one cross-linker; and

iii) at least one photo-initiator sensitive to broadband irradiation; and

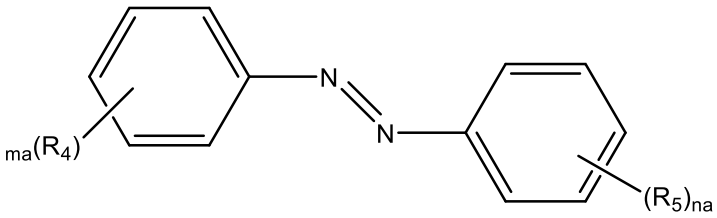
b1) a cold laser ablation excimer laser sensitizer component system comprised of at least one conjugated aryl additive absorbing ultraviolet radiation strongly in a range between from about 220 nm to about 310 nm on a substrate; wherein said conjugate aryl additive is selected from the group consisting of (I), (II), (III), (IV), (V), (VI), and (VII):



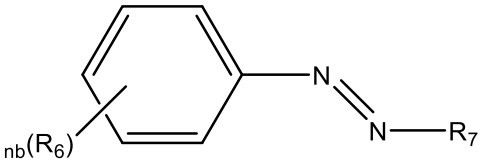
(I)



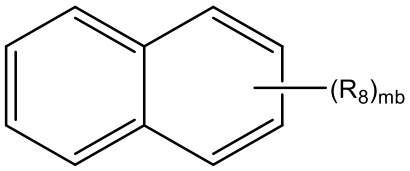
(II)



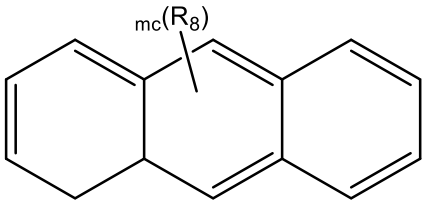
(III)



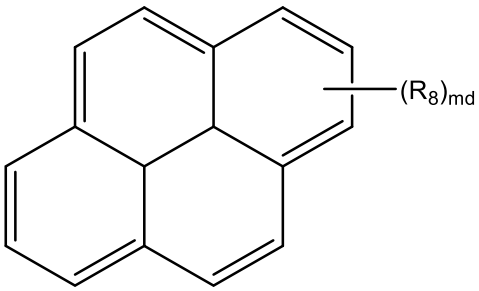
(IV)



(V)



(VI)



(VII)

where each R_1, R_2, R_3, R_4, R_5 and R_6 are independently selected from the group consisting of hydrogen, an alkyl group, an alkylenefluoroalkyl group, an alkylene aryl group, and an alkyleneoxyalkyl group; R_7 is selected from the group consisting of an alkyl group, an alkylenefluoroalkyl group, an alkylene aryl group, and an alkyleneoxyalkyl group; each R_8 is independently selected from the group consisting of hydrogen, an alkyl group, an alkylenefluoroalkyl group, an alkylene aryl group, an alkyleneoxyalkyl group, a hydroxy group, a hydroxyalkylene group, and an alkoxy group; X_3 is selected from the group consisting of Cl, Br or I; each n, na, nb, m, ma and mb is independently chosen from an integer from 1 to 4; mc is chosen from an integer from 1 to 9, and md is chosen from an integer from 1 to 10.

b) cross-linking the entire coating by blanket irradiation with broadband UV exposure; and

c) forming a pattern in the cross-linked coating by cold laser ablating with a UV excimer laser emitting between 222 nm and 308 nm.

2) The process of claim 1 wherein a1), the components for imparting negative tone, aqueous base developable, broadband UV resist behavior are selected from the group consisting of (VIII), (VIV) and (X) where,

(VIII) is comprised of

a) a phenolic film forming polymeric binder resin having a ring bonded hydroxy group;

b) a photoacid generator that forms an acid upon exposure to radiation, in an amount sufficient to initiate crosslinking of the film-forming polymeric binder resin;

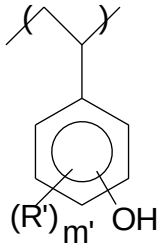
c) a first crosslinking agent that forms a carbonium ion upon exposure to the acid formed by the photoacid generator, and which comprises an etherified amino-plast polymer or oligomer;

d) a second crosslinking agent that forms a carbonium ion upon exposure to the acid formed by the photoacid generator, and which comprises dihydroxyalkyl-(tetra)-phenol, wherein the combined amount of the first and second crosslinkers is an effective crosslinking amount; and

e) a photoresist solvent;

(VIV) is comprised of:

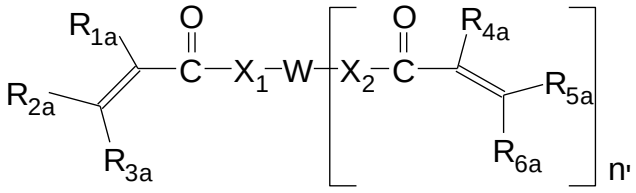
a-1) at least one alkali-soluble polymer where the alkali-soluble polymer comprises a least one unit of structure (VIVa)



(VIVa)

where each R' is independently selected from the group consisting of hydroxyl, (C1-C4) alkyl, chlorine, and bromine; and m' is chosen from an integer from 1 to 4;

b-1) at least one monomer of structure 4;



(4)

where, W is a multivalent linking group, R_{1a} to R_{6a} are independently selected from the group consisting of hydrogen, hydroxy, (C1-C20) alkyl and chlorine; X_1 and X_2 are each oxygen; and n' is an integer equal to or greater than 1; and

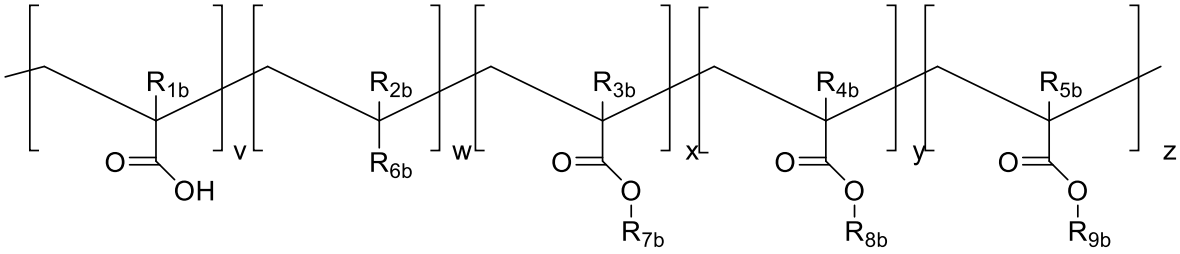
c-1) at least one photoinitiator and

d-1) a photoresist solvent,

and further where the monomer of structure 4 comprises an acid-cleavable group and the alkali soluble polymer further comprises at least one acid-cleavelable group;

(X) is comprised of:

a-2) at least one polymer comprising a structure of the following formula:



wherein each of R_{1b} – R_{5b} is independently selected from the group consisting of H, F and CH_3, R_{6b} is selected from the group consisting of a substituted aryl, unsubstituted aryl, substituted heteroaryl and unsubstituted heteroaryl group; R_{7b} is a substituted or unsubstituted benzyl group; R_{8b} is selected from the group consisting of a linear or branched C_2-C_{10} hydroxy alkyl group and a C_2-C_{10} hydroxy alkyl acrylate; R_{9b} is an acid cleavable group, v = 10 – 40 mole%, w = 0 – 35 mole%, x = 0 – 60 mole%, y = 10 – 60 mole% and z = 0 – 45 mole%;

b-2) one or more free radical initiators activated by actinic radiation,

c-2) one or more crosslinkable acrylated monomers capable of undergoing free radical crosslinking wherein the acrylate functionality is greater than 1, and

d-2) a photoresist solvent.

3) The process of claim 1 wherein b1), the conjugated aryl additive is selected from the group consisting of (I) and (II).

4) The process of claim 1 wherein b1), the conjugated aryl additive is (I).

5) The process of claim 1 wherein b1), the conjugated aryl additive is (II).

6) The process of claim 2 wherein a1), the components for imparting negative tone, aqueous base developable, broadband UV resist behavior are (VIII).

7) The process of claim 2 wherein a1), the components for imparting negative tone, aqueous base developable, broadband UV resist behavior are (VIII) and the conjugated aryl additive is selected from the group consisting of (I) and (II).

8) The process of claim 2 wherein a1), the components for imparting negative tone, aqueous base developable, broadband UV resist behavior are (VIV).

9) The process of claim 2 wherein b1), the conjugated aryl additive is selected from the group consisting of (I) and (II) and where the components a1) for imparting negative tone, aqueous base developable, broadband UV resist behavior is (VIV).

10) The process of claim 2 wherein a1), the component for imparting negative tone, aqueous base developable, broadband UV resist behavior is (X).

11) The process of claim 2 wherein a1), the components for imparting negative tone, aqueous base developable, broadband UV resist behavior is (X) and where the conjugated aryl additive is selected from the group consisting of (I) and (II).

12) The process of claim 2 wherein b1), the conjugated aryl additive has between the wavelengths of 220 nm and 310 nm a molar absorptivity of between about 10 and 1000 m^2/mol.

13) The process of claim 2 wherein b1), the conjugated aryl additive has a molar absorptivity at 248 nm between 10 and 1000 m^2/mol.

14) The process of claim 2 wherein b1), the conjugated aryl additive has a molar absorptivity at 308 nm between 10 and 1000 m^2/mol.

15) The process of claim 2 wherein b1), the conjugated aryl additive is (I), and further where R_2 and R_1 are independently selected from the group consisting of hydrogen and an alkyl group.

16) The process of claim 2 wherein b1) the conjugated aryl additive is (II), R_3 is an alkyl group, and X is Cl.

17) The process of claim 2 wherein b1) the conjugated aryl additive is (V), and where at least one R_8 is independently selected from the group consisting of an alkoxy group, a hydroxyalkylene, and a hydroxy group.

18) The process of claim 2 where the conjugated aryl additive is (VI), and where at least one R_8 is independently selected from the group consisting of an alkoxy group, a hydroxyalkylene, and a hydroxy group.

19) The process of claim 1 where the broadband UV exposure is between 350 and 450 nm.

20) The process of claim 1 where the excimer laser emits at 248 nm.

21) The process of claim 1 where the excimer laser emits at 308 nm.

22) A process comprising steps a2), b2), c2) and d2)

a-2) coating on a substrate a composition for a negative tone, aqueous base developable, broadband UV resist which is also sensitive in the areas exposed to broadband irradiation to subsequent cold laser ablation by an UC Excimer Laser emitting between 222 nm and 308 nm where the composition is comprised of components of type a-1) and b-1);

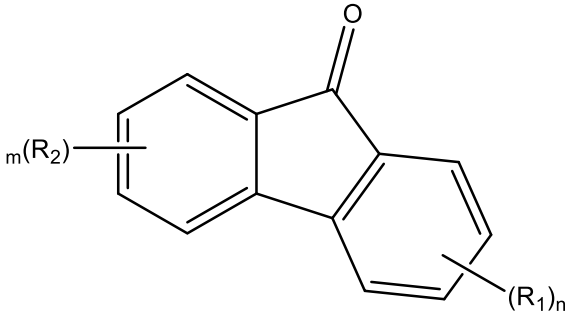
a-1) components for imparting negative tone, aqueous base developable, broadband UV resist behavior comprised of

i) a resin containing phenolic moieties, carboxylic acid moieties or a combination of both types moieties such that the resin dissolves in aqueous base;

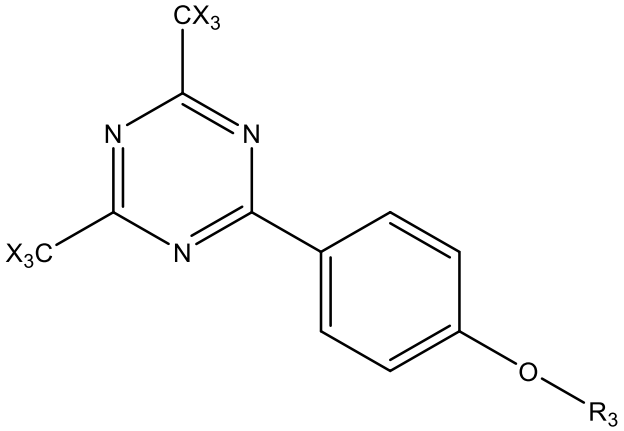
ii) at least one cross-linker; and

iii) at least one photo-initiator sensitive to broadband irradiation; and

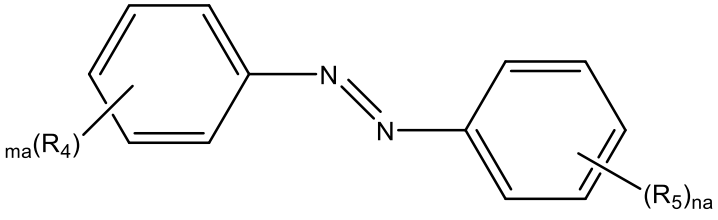
b1) a cold laser ablation excimer laser sensitizer component system comprised of at least one conjugated aryl additive absorbing ultraviolet radiation strongly in a range between from 220 nm to about 310 nm on a substrate; wherein said conjugate aryl additive is selected from the group consisting of (I), (II), (III), (IV), (V), (VI) and (VII);



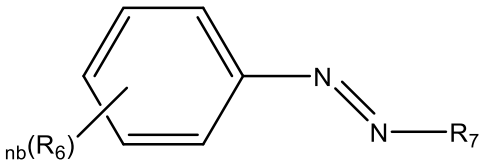
(I)



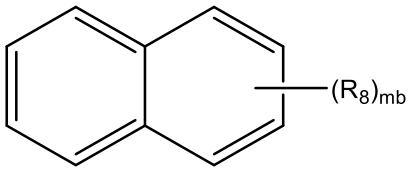
(II)



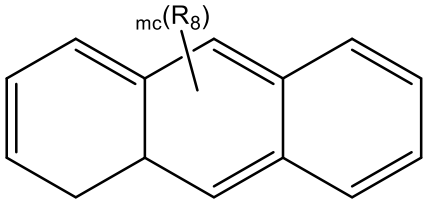
(III)



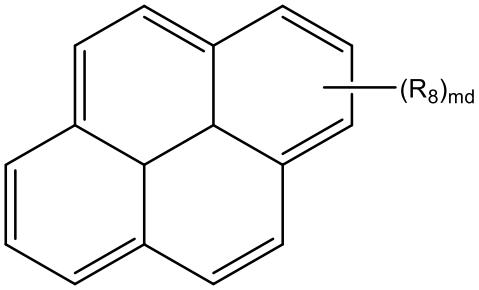
(IV)



(V)



(VI)



(VII)

where each R_1, R_2, R_3, R_4, R_5 and R_6 are independently selected from the group consisting of hydrogen, an alkyl group, an alkylenefluoroalkyl group, an alkylene aryl group, and an alkyleneoxyalkyl group; R_7 is selected from the group consisting of an alkyl group, an alkylenefluoroalkyl group, an alkylene aryl group, and an alkyleneoxyalkyl group; each R_8 is independently selected from the group consisting of hydrogen, an alkyl group, an alkylenefluoroalkyl group, an alkylene aryl group, an alkyleneoxyalkyl group, a hydroxy group, a hydroxyalkylene group, and an alkoxy group; X_3 is selected from the group consisting of Cl, Br or I; each n, na, nb, m, ma and mb is independently chosen from an integer from 1 to 4; mc is chosen from an integer from 1 to 9, and md is chosen from an integer from 1 to 10;

b2) cross-linking part of the coating by irradiation with broadband UV exposure through a mask;

c2) developing the coating with aqueous base removing the unexposed areas of the coating, thereby forming a first pattern;

d2) forming a second pattern in the first pattern by cold laser ablating of the first pattern with a UV excimer laser emitting between 222 nm and 308 nm.

23) The process of claim 22 where the excimer laser emits at 248 nm.

24) The process of claim 22 where the excimer laser emits at 308 nm.

25) The process of claim 22 wherein a1), the components for imparting negative tone, aqueous base developable, broadband UV resist behavior are selected from the group consisting of (VIII), (VIV) and (X) where,

(VIII) is comprised of

a) a phenolic film forming polymeric binder resin having a ring bonded hydroxy group;

b) a photoacid generator that forms an acid upon exposure to radiation, in an amount sufficient to initiate crosslinking of the film-forming polymeric binder resin;

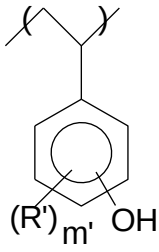
c) a first crosslinking agent that forms a carbonium ion upon exposure to the acid formed by the photoacid generator, and which comprises an etherified amino-plast polymer or oligomer;

d) a second crosslinking agent that forms a carbonium ion upon exposure to the acid formed by the photoacid generator, and which comprises dihydroxyalkyl-(tetra)-phenol, wherein the combined amount of the first and second crosslinkers is an effective crosslinking amount; and

e) a photoresist solvent;

(VIV) is comprised of:

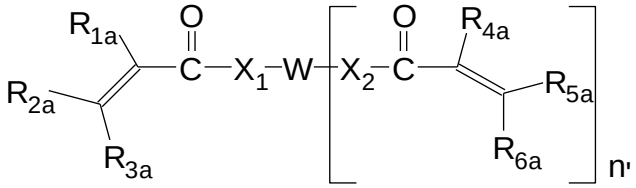
a-1) at least one alkali-soluble polymer where the alkali-soluble polymer comprises a least one unit of structure (VIVa)



(VIVa)

where each R' is independently selected from the group consisting of hydroxyl, (C1-C4) alkyl, chlorine, and bromine; and m' is chosen from an integer from 1 to 4;

b-1) at least one monomer of structure 4;



(4)

where, W is a multivalent linking group, R_{1a} to R_{6a} are independently selected from the group consisting of hydrogen, hydroxy, (C1-C20) alkyl and chlorine; X_1 and X_2 are each oxygen; and n' is an integer equal to or greater than 1; and

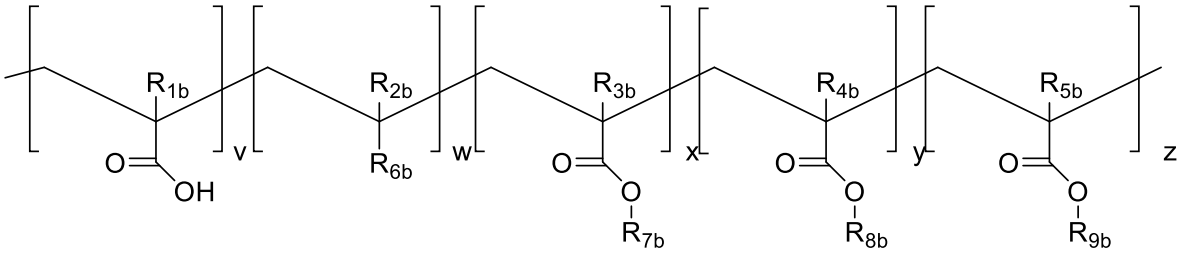
c-1) at least one photoinitiator and

d-1) a photoresist solvent,

and further where the monomer of structure 4 comprises an acid-cleavable group and the alkali soluble polymer further comprises at least one acid-cleavelable group;

(X) is comprised of:

a-2) at least one polymer comprising a structure of the following formula:



wherein each of R_{1b} – R_{5b} is independently selected from the group consisting of H, F and CH_3, R_{6b} is selected from the group consisting of a substituted aryl, unsubstituted aryl, substituted heteroaryl and unsubstituted heteroaryl group; R_{7b} is a substituted or unsubstituted benzyl group; R_{8b} is selected from the group

consisting of a linear or branched C_2-C_{10} hydroxy alkyl group and a C_2-C_{10} hydroxy alkyl acrylate; R9b is an acid cleavable group, v = 10 – 40 mole%, w = 0 – 35 mole%, x = 0 – 60 mole%, y = 10 – 60 mole% and z = 0 – 45 mole%;

b-2) one or more free radical initiators activated by actinic radiation,

c-2) one or more crosslinkable acrylated monomers capable of undergoing free radical crosslinking wherein the acrylate functionality is greater than 1, and

d-2) a photoresist solvent.

26) The process of claim 22 wherein, b1), the conjugated aryl additive is selected from the group consisting of (I) and (II).

27) The process of claim 22 wherein, b1), the conjugated aryl additive is (I).

28) The process of claim 22 wherein, b1), the conjugated aryl additive is (II).

29) The process of claim 22 wherein, a1), the components for imparting negative tone, aqueous base developable, broadband UV resist behavior are (VIII).

30) The process of claim 22 wherein, a1), the components for imparting negative tone, aqueous base developable, broadband UV resist behavior are (VIII) and the conjugated aryl additive is selected from the group consisting of (I) and (II).

31) The process of claim 22 wherein, a1) the components for imparting negative tone, aqueous base developable, broadband UV resist behavior are (VIV).

32) The process of claim 22 wherein, b1), the conjugated aryl additive is selected from the group consisting of (I) and (II) and where the components, a1) for imparting negative tone, aqueous base developable, broadband UV resist behavior are (VIV).

33) The process of claim 22 wherein, a1), the components for imparting negative tone, aqueous base developable, broadband UV resist behavior are (X).

34) The process of claim 26 wherein, a1), the components for imparting negative tone, aqueous base developable, broadband UV resist behavior are (X) and where the conjugated aryl additive is selected from the group consisting of (I) and (II).

35) The process of claim 22 wherein, b1) the conjugated aryl additive has between the wavelengths of 220 nm and 310 nm a molar absorptivity of between about 10 and 1000 m^2/mol.

36) The process of claim 22 wherein, b1), the conjugated aryl additive has a molar absorptivity at 248 nm between 10 and 1000 m^2/mol.

37) The process of claim 22 wherein, b1), the conjugated aryl additive has a molar absorptivity at 308 nm between 10 and 1000 m2/mol.

38) The process of claim 22 wherein, b1), the conjugated aryl additive is (I), and further where R_2 and R_1 are independently selected from the group consisting of hydrogen and an alkyl group.

39) The process of claim 22 wherein, b1), the conjugated aryl additive is (II), R_3 is an alkyl group, and X is Cl.

40) The composition of claim 22 wherein, b1) the conjugated aryl additive is (V), and where at least one R_8 is independently selected from the group consisting of an alkoxy group, a hydroxyalkylene, and a hydroxy group.

41) The Process of claim 22 where the conjugated aryl additive is (VI), and where at least one R_8 is independently selected from the group consisting of an alkoxy group, a hydroxyalkylene, and a hydroxy group.