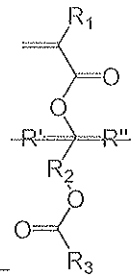
What is claimed is:

1. An acrylic monomer having a structure represented by the following formula (1):

[Chemical Formula 1]



wherein R_1 represents a hydrogen atom or a methyl group;

R_2 represents an alkanediyl group having 1 to 10 carbon atoms;

R_3 represents a cycloalkyl group having 3 to 30 carbon atoms; and

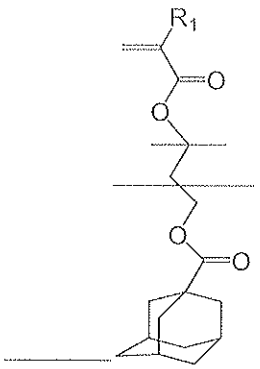
R' and R" each independently represent any one selected from the group consisting of a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, a cycloalkyl group having 3 to 30 carbon atoms, and a (C_1-C_{10} alkyl)cycloalkyl group, provided that R' and R" are not hydrogen atoms at the same time.

2. The acrylic monomer according to claim 1, wherein R_2 is selected from the group consisting of methylene, ethylidene, propylidene, trimethylene, tetramethylene, pentamethylene, hexamethylene, and heptamethylene.

3. The acrylic monomer according to claim 1, wherein R_3 is selected from the group consisting of a monocyclic cycloalkyl group having 3 to 14 carbon atoms, a bicyclic cycloalkyl group having 4 to 20 carbon atoms, a tricyclic cycloalkyl group having 10 to 30 carbon atoms, and a tetracyclic cycloalkyl group having 10 to 30 carbon atoms.

~~4. The acrylic monomer according to claim 1, having a structure represented by the following formula (1a):~~

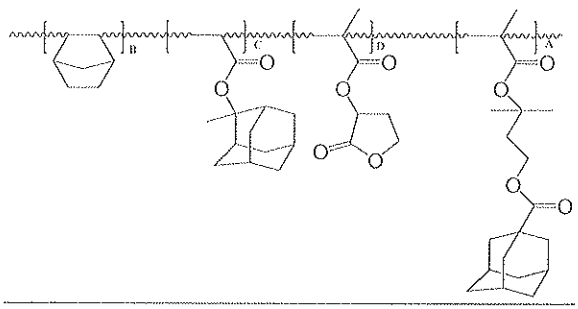
~~[Chemical Formula 1a]~~



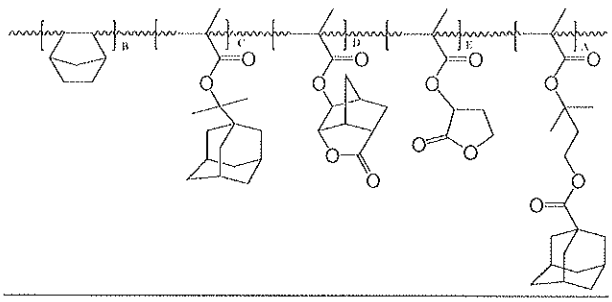
~~wherein R_1 represents a hydrogen atom or a methyl group.~~

1~~–5~~. (Currently Amended) A polymer ~~comprising a repeating unit represented by the following formula (2):~~ which is selected from the group consisting of polymers represented by the following formulae (6), (7), (10) to (13), (15) and (16):

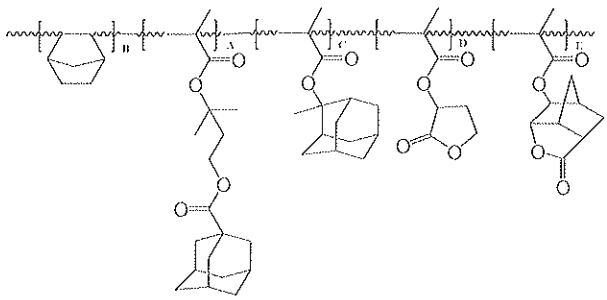
[Chemical Formula 6]



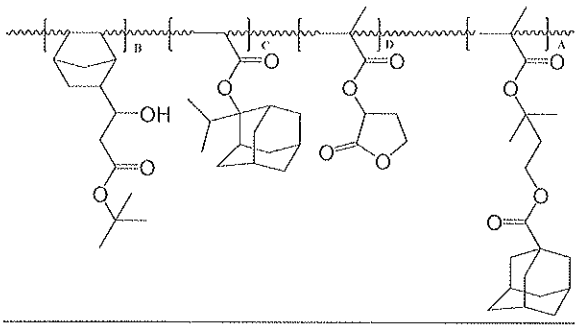
[Chemical Formula 7]



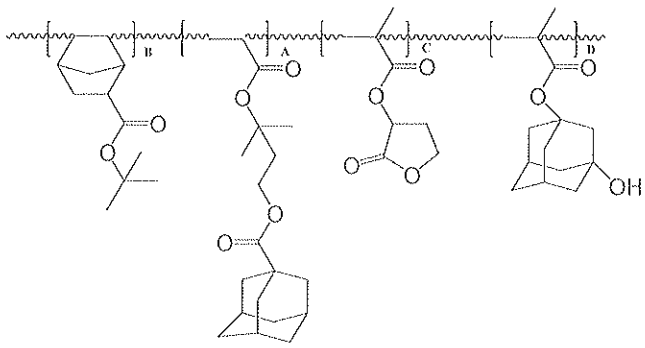
[Chemical Formula 10]



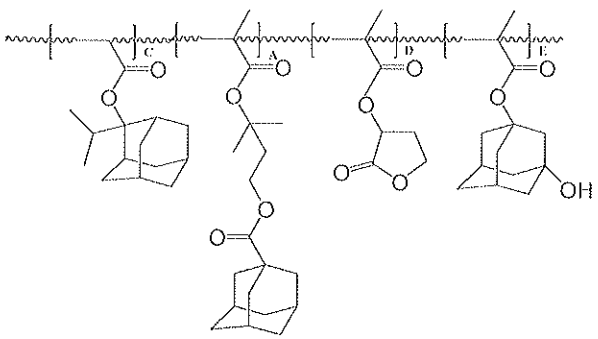
[Chemical Formula 11]



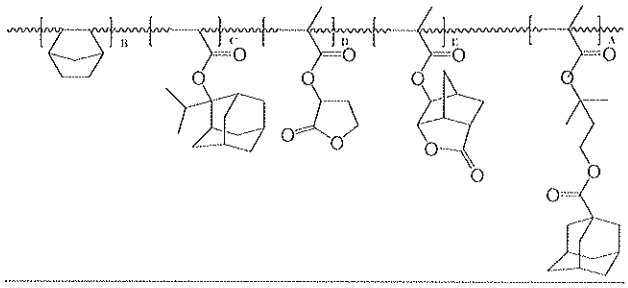
[Chemical Formula 12]



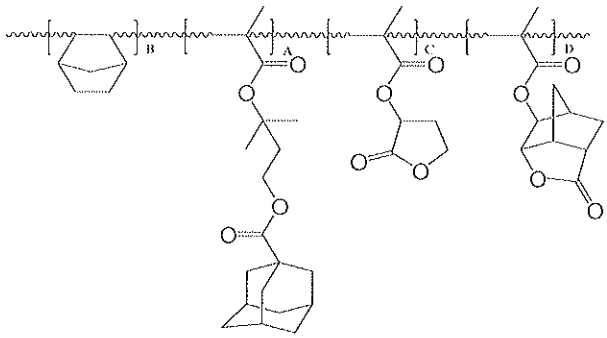
[Chemical Formula 13]



[Chemical Formula 15]



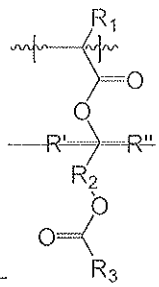
[Chemical Formula 16]



wherein in the above formulae,

A, B, C, D and E respectively represent the numbers indicating the proportions of the corresponding repeating units in the main chain, and A, B, C, D and E are related such that $A+B+C+D+E=1$, $0 < A/(A+B+C+D+E) < 0.4$, $0 \leq B/(A+B+C+D+E) < 0.4$, $0 < C/(A+B+C+D+E) < 0.6$, $0 < D/(A+B+C+D+E) < 0.6$, and $0 < E/(A+B+C+D+E) < 0.6$.

~~[Chemical Formula 2]~~



~~wherein R_1 represents a hydrogen atom or a methyl group;~~

~~R_2 represents an alkanediyl group having 1 to 10 carbon atoms;~~

~~R_3 represents a cycloalkyl group having 3 to 30 carbon atoms; and~~

~~R' and R'' each independently represent any one selected from the group consisting of~~

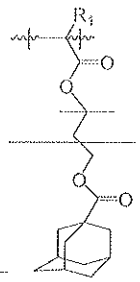
~~a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, a cycloalkyl group having 3 to 30 carbon atoms, and a (C_1-C_{10} alkyl)cycloalkyl group, provided that R' and R'' are not hydrogen atoms at the same time.~~

~~6. The polymer according to claim 5, wherein R_2 is selected from the group consisting of methylene, ethylidene, propylidene, trimethylene, tetramethylene, pentamethylene, hexamethylene, and heptamethylene.~~

~~7. The polymer according to claim 5, wherein R_3 is selected from the group consisting of a monocyclic cycloalkyl group having 3 to 14 carbon atoms, a bicyclic cycloalkyl group having 4 to 20 carbon atoms, a tricyclic cycloalkyl group having 10 to 30 carbon atoms, and a tetracyclic cycloalkyl group having 10 to 30 carbon atoms.~~

~~8. The polymer according to claim 5, comprising a repeating unit represented by the following formula (2a):~~

~~[Chemical Formula 2a]~~

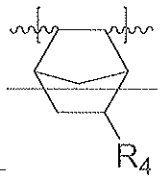


~~wherein R_1 represents a hydrogen atom or a methyl group.~~

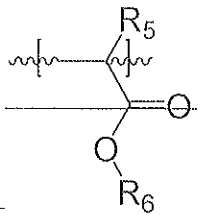
~~9. The polymer according to claim 5, further comprising one or more repeating units selected from the group consisting of repeating units represented by the following formulae~~

(3) and (4):

[Chemical Formula 3]



[Chemical Formula 4]



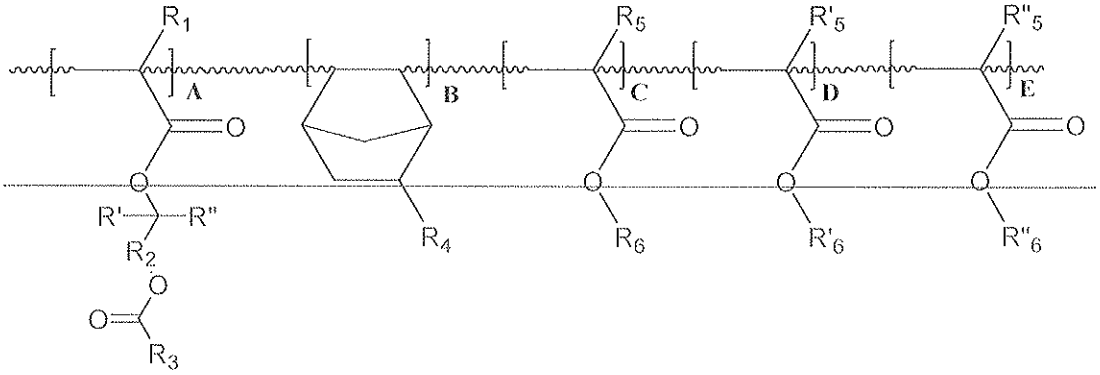
wherein in the above formulae,

R_4 and R_6 each independently represent any one selected from the group consisting of a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, a heteroalkyl group having 1 to 10 carbon atoms, a cycloalkyl group having 3 to 30 carbon atoms, an aryl group having 6 to 30 carbon atoms, a heterocyclic group having 2 to 30 carbon atoms, and combinations thereof; and

R_5 represents any one selected from the group consisting of a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, a perfluoroalkyl group having 1 to 10 carbon atoms, and an alkoxy group having 1 to 10 carbon atoms.

10. The polymer according to claim 5, wherein the polymer is represented by the following formula (5):

[Chemical Formula 5]



~~wherein R_1 represents a hydrogen atom or a methyl group;~~

~~R_2 represents an alkanediyl group having 1 to 10 carbon atoms;~~

~~R_3 represents a cycloalkyl group having 3 to 30 carbon atoms;~~

~~R_4 represents any one selected from the group consisting of a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, a heteroalkyl group having 1 to 10 carbon atoms, a cycloalkyl group having 3 to 30 carbon atoms, an aryl group having 6 to 30 carbon atoms, a heterocyclic group having 2 to 30 carbon atoms, and combinations thereof;~~

~~R_5, R_5' and R_5'' each independently represent any one selected from the group consisting of a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, a perfluoroalkyl group having 1 to 10 carbon atoms, and an alkoxy group having 1 to 10 carbon atoms;~~

~~R_6, R_6' and R_6'' each independently represent a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, a heteroalkyl group having 1 to 10 carbon atoms, a cycloalkyl group having 3 to 30 carbon atoms, an aryl group having 6 to 30 carbon atoms, a heterocyclic group having 2 to 30 carbon atoms, and combinations thereof;~~

~~R' and R'' each independently represent any one selected from the group consisting of a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, a cycloalkyl group having 3 to 30 carbon atom, and a (C_1-C_{10} alkyl)cycloalkyl group, provided that R' and R'' are not hydrogen atoms at the same time; and~~

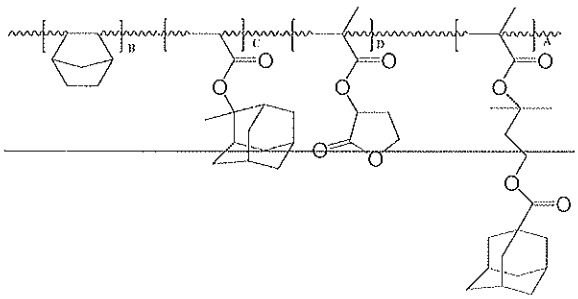
~~A, B, C, D and E respectively represent the numbers indicating the proportions of the~~

~~corresponding repeating units in the main chain, and A, B, C, D and E are related such that A+B+C+D+E=1, $0 \leq A/(A+B+C+D+E) < 0.4$, $0 < B/(A+B+C+D+E) < 0.4$, $0 < C/(A+B+C+D+E) < 0.6$, $0 \leq D/(A+B+C+D+E) < 0.6$, and $0 \leq E/(A+B+C+D+E) < 0.6$.~~

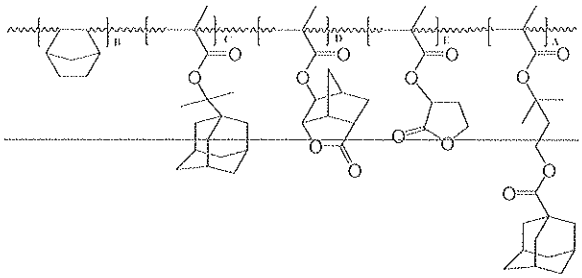
~~11. The polymer according to claim 5, comprising the repeating unit represented by the formula (2) at a content of 10 mol% to 40 mol%.~~

~~12. The polymer according to claim 5, wherein the polymer is selected from the group consisting of polymers represented by the following formulae (6) to (17):~~

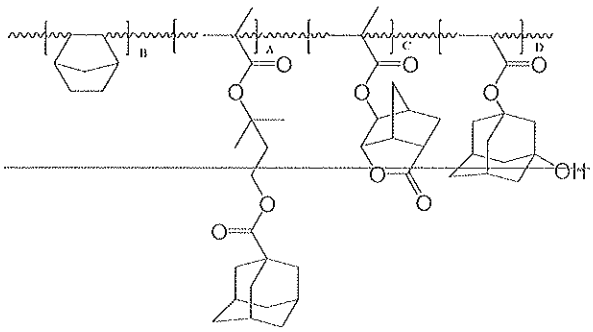
~~[Chemical Formula 6]~~



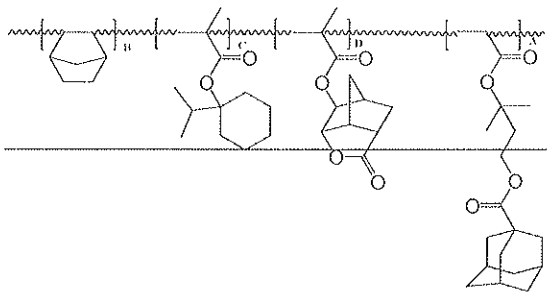
~~[Chemical Formula 7]~~



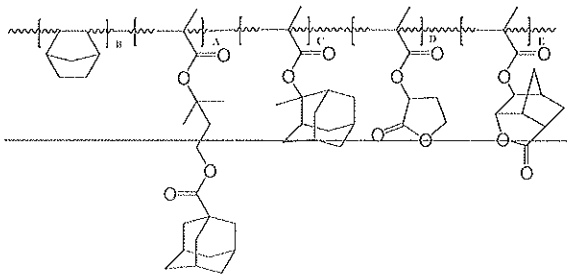
~~[Chemical Formula 8]~~



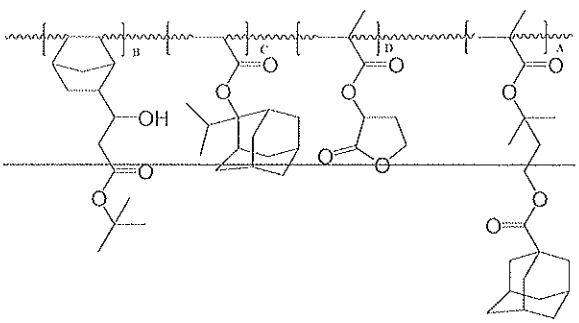
~~[Chemical Formula 9]~~



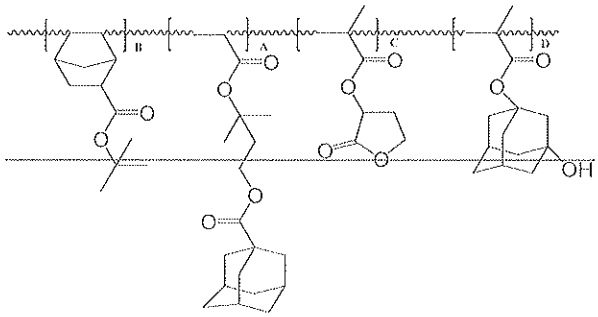
~~[Chemical Formula 10]~~



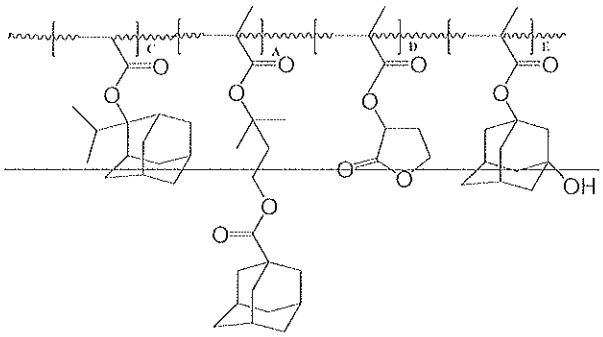
~~[Chemical Formula 11]~~



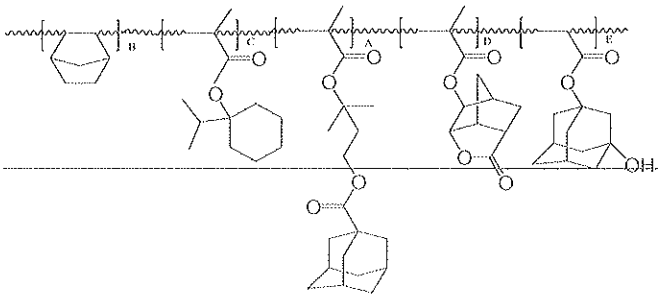
~~[Chemical Formula 12]~~



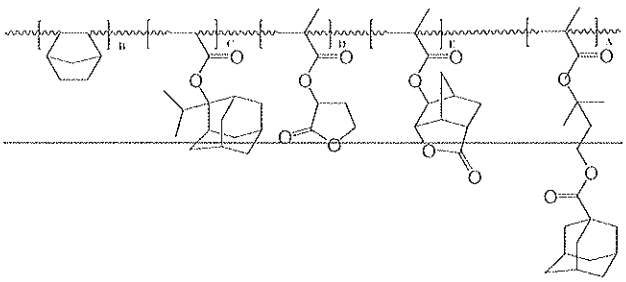
~~[Chemical Formula 13]~~



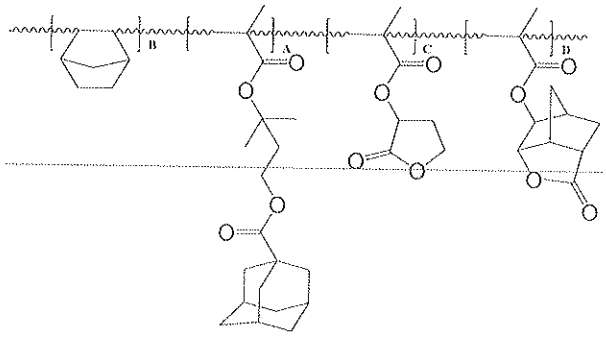
~~[Chemical Formula 14]~~



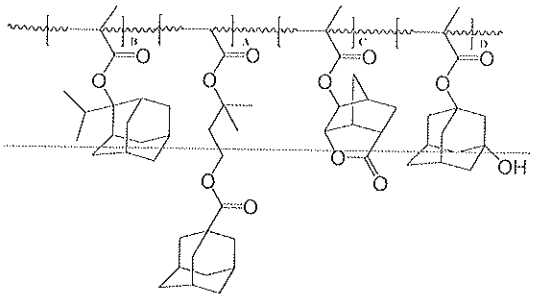
~~[Chemical Formula 15]~~



~~[Chemical Formula 16]~~



[Chemical Formula 17]



wherein in the above formulae,

A, B, C, D and E respectively represent the numbers indicating the proportions of the corresponding repeating units in the main chain, and A, B, C, D and E are related such that A+B+C+D+E=1, $0 \leq A/(A+B+C+D+E) < 0.4$, $0 < B/(A+B+C+D+E) < 0.4$, $0 < C/(A+B+C+D+E) < 0.6$, $0 \leq D/(A+B+C+D+E) < 0.6$, and $0 \leq E/(A+B+C+D+E) < 0.6$.

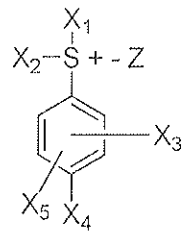
13 2. The polymer according to claim 5 1, wherein the polymer has a weight average molecular weight of 2,000 g/mol to 1,000,000 g/mol as determined by gel permeation chromatography and calculated relative to polystyrene standards, and may have a molecular weight distribution of 1 to 5.

14 3. A resist composition comprising the polymer according to any one of claims 1 or 2 5 to 13, an acid generator, and a solvent.

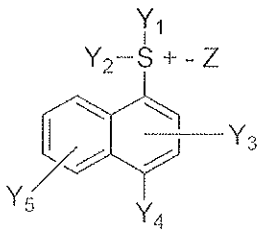
~~15~~ 4. The resist composition according to claim ~~14~~ 3, wherein the resist composition contains the polymer at a content of 3 wt% to 20 wt% relative to the total weight of the resist composition.

~~16~~ 5. The resist composition according to claim ~~14~~ 3, wherein the acid generator is one or more compounds selected from the group consisting of compounds represented by the following formulae (18) and (19):

[Chemical Formula 18]



[Chemical Formula 19]



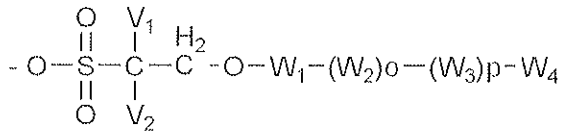
wherein X_1, X_2, Y_1 and Y_2 each independently represent any one selected from the group consisting of a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an alkenyl group, a haloalkyl group having 1 to 10 carbon atoms, an aralkyl group having 6 to 30 carbon atoms, an aryl group having 6 to 30 carbon atoms, and combinations thereof, while X_1 and X_2, or Y_1 and Y_2 may be joined together to form a saturated or unsaturated hydrocarbon ring having 3 to 30 carbon atoms;

X_3, X_4, X_5, Y_3, Y_4 and Y_5 each independently represent any one selected from the group consisting of a hydrogen atom, an alkyl group having 1 to 30 carbon atoms, a halogen

group, an alkoxy group having 1 to 30 carbon atoms, an aryl group having 6 to 30 carbon atoms, a thiophenoxy group, a thioalkoxy group having 1 to 30 carbon atoms, an alkoxycarbonylalkoxy group having 1 to 20 carbon atoms, and combinations thereof;

Z of the anion moiety represents OSO_2CF_3, $OSO_2C_4F_9$, $OSO_2C_8F_{17}$, $N(CF_3)_2$, $N(C_2F_5)_2$, $N(C_4F_9)_2$, $C(CF_3)_3$, $C(C_2F_5)_3$, $C(C_4F_9)_3$, or the following formula (20):

[Chemical Formula 20]



wherein V_1 and V_2 each independently represent a halogen atom;

W_1 represents -(C=O)- or -(SO2)-;

W_2 represents an alkanediyl group having 1 to 10 carbon atoms;

W_3 represents any one selected from the group consisting of a cycloalkyl group having 3 to 30 carbon atoms, an aryl group having 6 to 30 carbon atoms, an aralkyl group having 7 to 30 carbon atoms, an aryloxy group having 6 to 30 carbon atoms, an arylthio group having 6 to 30 carbon atoms, a heterocyclic group having 5 to 30 carbon atoms, and combinations thereof;

W_4 represents any one selected from the group consisting of a hydrogen atom, a halogen group, an alkyl group having 1 to 10 carbon atoms, an alkoxy group having 1 to 10 carbon atoms, a haloalkyl group having 1 to 10 carbon atoms, an alkylthio group having 1 to 10 carbon atoms, an aryl group having 6 to 30 carbon atoms, and combinations thereof;

o represents an integer of 0 or 1; and

p represents an integer from 0 to 2.

~~17~~ 6. The resist composition according to claim ~~14~~ 3, wherein the resist composition

contains the acid generator at a content of 0.3 to 10 parts by weight relative to 100 parts by weight of the solids content of the resist composition.

~~18~~ 7. The resist composition according to claim ~~14~~ 3, further comprising an additive selected from the group consisting of an alkali dissolution inhibitor, an acid diffusion inhibitor, a surfactant, a sensitizer, and mixtures thereof.

~~19~~ 8. A method for forming a resist pattern, the method comprising:

applying the resist composition according to claim ~~14~~ 3 on a substrate to form a resist film;

heat treating the resist film, and then exposing the resist film into a predetermined pattern; and

developing the exposed resist pattern.

~~20~~ 9. The method for forming a resist according to claim ~~19~~ 8, wherein the exposure process is carried out by using a light source selected from the group consisting of KrF excimer laser light, ArF excimer laser light, extreme ultraviolet laser light, X-radiation, and an electron beam.