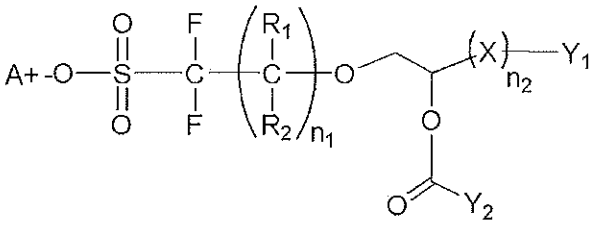
WHAT IS CLAIMED IS:

1. A photoacid generator represented by the following formula (1):

[Chemical Formula 1]



wherein in the formula (1),

Y_1 and Y_2 each independently represent any one selected from the group consisting of ~~an alkyl group, an alkenyl group, an alkoxy group,~~ a cycloalkyl group, a heterocycloalkyl group, an aryl group and a heteroaryl group;

X represents any one selected from the group consisting of an alkanediyl, an alkenediyl, NR', S, O, CO and combinations thereof, while R' represents any one selected from the group consisting of a hydrogen atom and an alkyl group;

R_1 and R_2 each independently represent any one selected from the group consisting of a hydrogen atom, an alkyl group, an alkoxy group, a perfluoroalkyl group, a perfluoroalkoxy group, a halogen group, a hydroxyl group, a carboxyl group, a cyano group, a nitro group, an amino group and a thio group;

n_1 represents an integer or 1 or 2;

n_2 represents an integer from 0 to 5; and

A^+ represents an organic counterion.

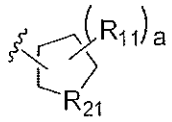
2. The photoacid generator according to claim 1, wherein

Y_1 and Y_2 each independently represent any one selected from the group consisting of ~~an alkyl group, an alkenyl group, an alkoxy group,~~ a cyclopentyl group, a cyclohexyl group, a decahydronaphthalene group, an octahydro-1H-indene group, an adamantyl group, a norbornyl group, a tetrahydrofuran group, a polycyclic cycloalkyl group containing a norbornyl group having 10 to 30 carbon atoms, a phenyl group, a naphthyl group, a biphenyl group, an anthryl group, a phenanthrene group, a fluorenyl group, a pyrene group, a phenalene group, an indene group, a biphenylene group, ~~a diphenylmethyl group,~~ a tetrahydronaphthyl group, and a dihydroanthryl group~~, a tetraphenylmethyl group and a triphenylmethyl group~~.

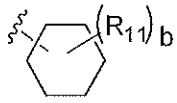
3. The photoacid generator according to claim 1, wherein

~~Y~~ Y_1 and Y_2 each independently represents any one selected from the group consisting of ~~an alkyl group, an alkenyl group, an alkoxy group, and~~ groups represented by the following formulas (1-a) to (1-i) and formulas (2-a) to ~~(2-l)~~ (2-h) and (2-j) to (2-l):

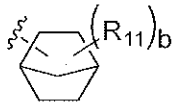
[Chemical Formula 1-a]



[Chemical Formula 1-b]

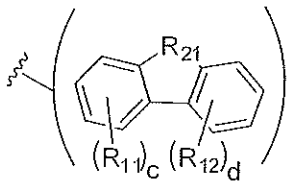


[Chemical Formula 1-c]

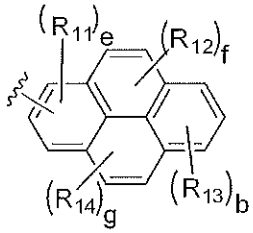


[Chemical Formula 1-d]

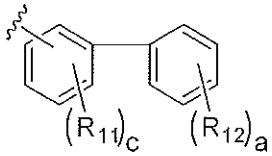
[Chemical Formula 2-e]



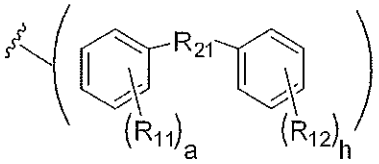
[Chemical Formula 2-f]



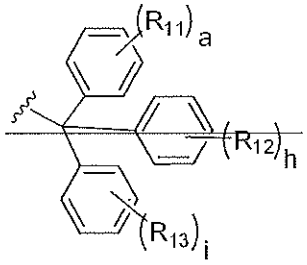
[Chemical Formula 2-g]



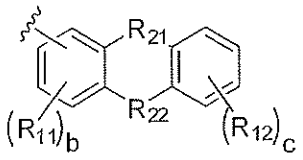
[Chemical Formula 2-h]



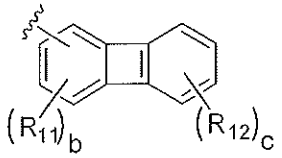
~~[Chemical Formula 2-i]~~



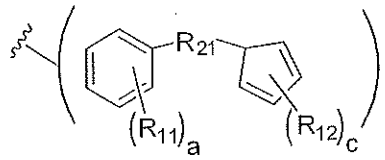
[Chemical Formula 2-j]



[Chemical Formula 2-k]



[Chemical Formula 2-l]



wherein in the formulas (2-a) to (2-h) and (2-j) to (2-l),

R_{11}, R_{12}, R_{13} and R_{14} each independently represent any one selected from the group consisting of an alkyl group, an alkoxy group, a perfluoroalkyl group, a perfluoroalkoxy group, a halogen atom, a hydroxyl group, a cyano group, a nitro group, an amino group and a thio group;

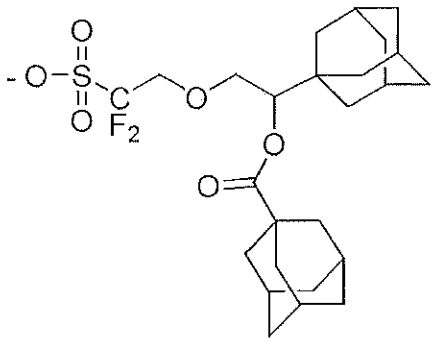
R_{21} and R_{22} each independently represent any one selected from the group consisting of $CR_{24}R_{25}$, O, CO, S and NR_{23}; R_{23} to R_{25} each independently represent any one selected from the group consisting of a hydrogen atom, an alkyl group and an aryl group;

a, and h ~~and i~~ each independently represent an integer from 0 to 5; b represents an integer from 0 to 3; c and d each independently represent an integer from 0 to 4; e, f and g each independently represent an integer from 0 to 2 ;and $0 \leq c+d+e \leq 9$.

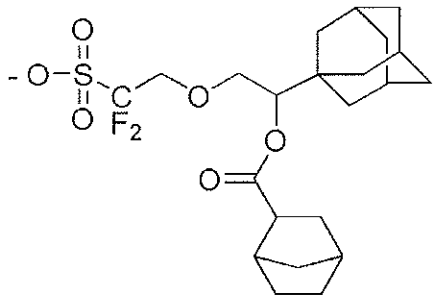
4. The photoacid generator according to claim 1, wherein the photoacid generator

is any one selected from the group consisting of compounds represented by the following formulas (3-1) to ~~(3-14)~~(3-2), (3-4) to (3-13):

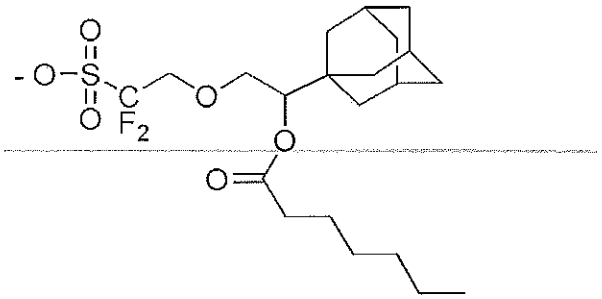
[Chemical Formula 3-1]



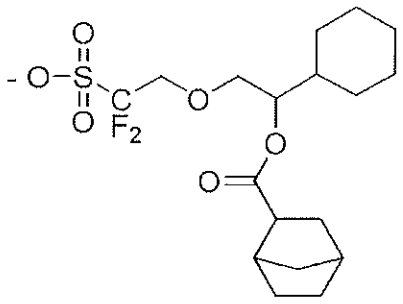
[Chemical Formula 3-2]



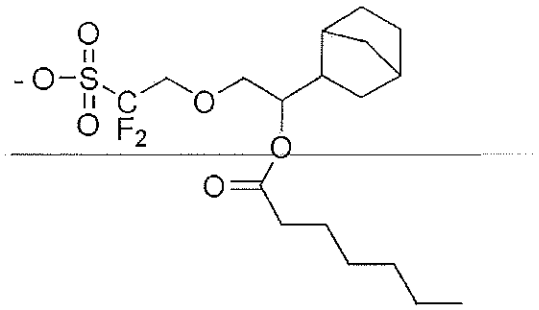
~~[Chemical Formula 3-3]~~



[Chemical Formula 3-4]



~~[Chemical Formula 3-14]~~



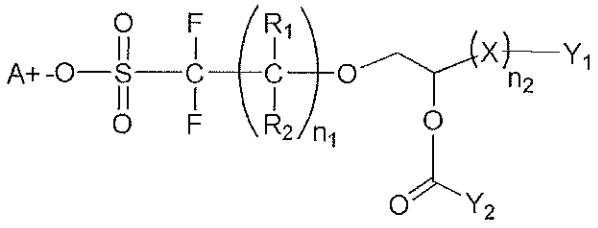
5. A method for producing a photoacid generator, the method comprising:

a first step of allowing a hydroxysulfonic acid salt to react with oxirane, and thereby producing a hydroxyethoxysulfonic acid salt;

a second step of allowing the hydroxyethoxysulfonic acid salt produced above to react with a carbonyl halide and thereby producing an intermediate; and

a third step of subjecting the intermediate thus produced to a substitution reaction of the cation, and thereby producing a compound represented by the following formula (1):

[Chemical Formula 1]



wherein in the formula (1),

Y_1 and Y_2 each independently represent any one selected from the group consisting of ~~an alkyl group, an alkenyl group, an alkoxy group,~~ a cycloalkyl group, a heterocycloalkyl group, an aryl group and a heteroaryl group;

X represents any one selected from the group consisting of an alkanediyl, an alkenediyl, NR', S, O, CO and combinations thereof; R' represents any one selected from the group consisting of a hydrogen atom and an alkyl group;

R_1 and R_2 each independently represent any one selected from the group consisting of a hydrogen atom, an alkyl group, an alkoxy group, a perfluoroalkyl group, a perfluoroalkoxy group, a halogen atom, a hydroxyl group, a carboxyl group, a cyano group, a nitro group, an amino group and a thio group;

n_1 represents an integer or 1 or 2;

n_2 represents an integer from 0 to 5; and

A^+ represents an organic counterion.

6. The method for producing a photoacid generator according to claim 5, wherein the hydroxysulfonic acid salt is represented by the following formula (6),

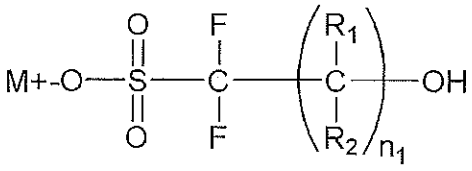
the oxirane is represented by the following formula (7),

the hydroxyethoxysulfonic acid salt is represented by the following formula (8)

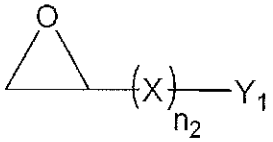
the carboxyl halide is represented by the following formula (9), and

the intermediate is represented by the following formula (10):

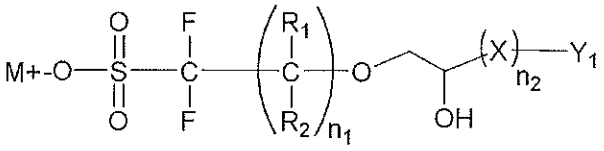
[Chemical Formula 6]



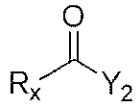
[Chemical Formula 7]



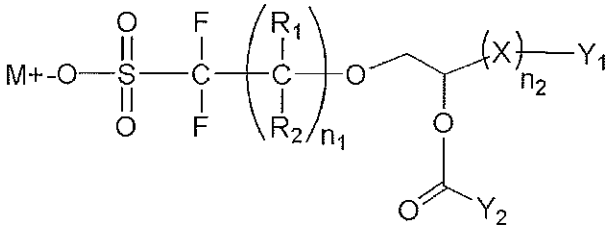
[Chemical Formula 8]



[Chemical Formula 9]



[Chemical Formula 10]



wherein in the formulas (6) to (8),

Y_1 and Y_2 each independently represent any one selected from the group consisting ~~of an alkyl group, an alkenyl group, an alkoxy group,~~ a cycloalkyl group, a