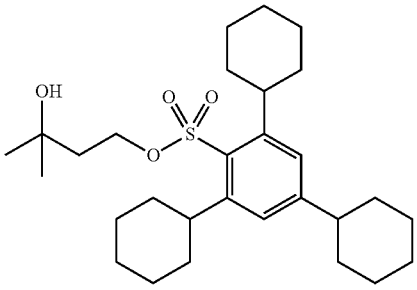
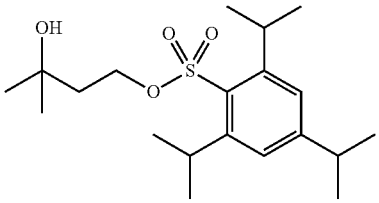
-continued

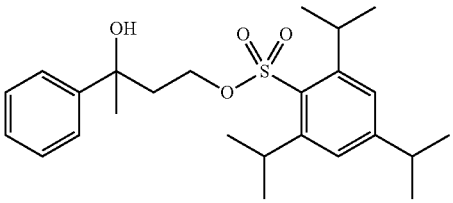
(PA-16)



(PA-17)



(PA-18)



The compound which decomposes by the action of the above-described acid to generate an acid may be used alone or in combination of two or more thereof.

Further, the content of the compound which decomposes by the action of an acid to generate an acid is preferably 0.1 to 40% by mass, more preferably 0.5 to 30% by mass, and still more preferably 1.0 to 20% by mass based on the total solid content of the electron beam- or extreme ultraviolet-sensitive resin composition.

[5] Resist Solvent (a Coating Solvent)

A solvent which may be used for preparing the composition is not particularly limited as long as it can decompose each component, but examples thereof may include alkyleneglycol monoalkyl ethercarboxylate (propyleneglycol monomethylether acetate (PGMEA) (alias: 1-methoxy-2-acetoxy propane) and the like), alkyleneglycol monoalkyl ether (propyleneglycol monomethylether (PGME; 1-methoxy-2-propanol) and the like), alkylester lactate (ethyl lactate, lactate methyl and the like), cyclic lactone (γ-butyrolactone and the like, preferably 4 to 10 carbon atoms), chained or cyclic ketone (2-heptanone, cyclohexanone and the like, preferably 4 to 10 carbon atoms), alkylenecarbonate (ethylene carbonate, propylene carbonate and the like), alkyl carboxylate (alkyl acetate such as butyl acetate is preferred), alkyl alkoxy acetate (ethyl ethoxypropionate) and the like. Examples of other usable solvents may include solvents described in [0244] and forth of U.S. Patent Application Publication No. 2008/0248425 A1.

Among the above-described solvents, alkyleneglycol monoalkylether carboxylate and alkyleneglycol monoalkyl ether are preferred.

These solvents may be used alone or in combination of two or more thereof. When two or more solvents are mixed, it is preferred that a solvent having a hydroxyl group is mixed with a solvent not having a hydroxyl group. The mass ratio of a solvent having a hydroxyl group to a solvent not having a hydroxyl group is 1/99 to 99/1, preferably 10/90 to 90/10, and more preferably 20/80 to 60/40.

As a solvent having a hydroxyl group, alkyleneglycol monoalkyl ether is preferred, and as a solvent not having a hydroxyl group, alkyleneglycol monoalkyl ethercarboxylate is preferred.

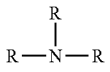
[6] Basic Compound

The electron beam- or extreme ultraviolet-sensitive resin composition according to the present invention may further contain basic compound. The basic compound is preferably a compound whose basicity is strong compound compared to phenol. In addition, this basic compound is preferably an organic basic compound, and more preferably a basic compound containing nitrogen.

Basic compound that contains usable nitrogen is not particularly limited, but for example, the compounds that are classified into the following (1) to (7) can be used.

(1) Compound represented by Formula (BS-1)

(BS-1)



In Formula (BS-1),

Each R independently represents a hydrogen atom or an organic group, provided that at least one of three kinds of R is an organic group. Such an organic group is a straight or branched alkyl group, a monocyclic or polycyclic cycloalkyl group, aryl group or aralkyl group.

The carbon number of an alkyl group as R is not particularly limited, but generally 1 to 20, and preferably 1 to 12.

The carbon number of a cycloalkyl group as R is not particularly limited, but generally 3 to 20, and preferably 5 to 15.

The carbon number of an aryl group as R is not particularly limited, but generally 6 to 20, and preferably 6 to 10. Specifically, a phenyl group, a naphthyl group and the like are exemplified.

The carbon number of an aralkyl group as R is not particularly limited, but generally 7 to 20, and preferably 7 to 11. Specifically, a benzyl group and the like are exemplified.

An alkyl group, a cycloalkyl group, an aryl group and an aralkyl group R may be groups in which a hydrogen atom is substituted with a substituent. Examples of the substituent may include an alkyl group, a cycloalkyl group, an aryl group, an aralkyl group, a hydroxyl group, a carboxyl group, an alkoxy group, an aryloxy group, an alkylcarbonyloxy group, an alkyloxycarbonyl group and the like.

Further, the compound represented by Formula (BS-1) may be a compound in which at least two of R are preferably an organic group.

Specific examples of the compound represented by Formula (BS-1) may include tri(n-butyl)amine, tri-n-pentylamine, tri-n-octylamine, tri-n-decyl amine, triisodecyl amine, dicyclohexyl methyl amine, tetradecyl amine, pentadecyl amine, hexadecyl amine, octadecyl amine, didecyl amine, methyl octadecyl amine, di-methyl undecyl amine, N,N-dimethyl-dodecyl amine, methyl di-octadecylamine, N,N-dibutyl aniline, N,N-dihexyl aniline, 2,6-diisopropyl aniline, and 2,4,6-tri (t-butyl) aniline and the like.

Further, as a basic compound represented by Formula (BS-1), examples thereof may include an alkyl group in