to the irradiation with an actinic ray or radiation used in a micro resist or the like can be appropriately selected to be used.

[0182] The content of the acid generator in the actinic ray-sensitive or radiation-sensitive resin composition according to the embodiment of the present invention is preferably 0.1 to 20 mass %, more preferably 0.5 to 20 mass %, and even more preferably 5 to 20 mass % with respect to the total solid content of the actinic ray-sensitive or radiation-sensitive resin composition.

[0183] By causing the content of the acid generator to be in this range, the exposure margin in a case where the resist pattern is formed is improved.

[0184] In a case where the actinic ray-sensitive or radiation-sensitive resin composition according to the embodiment of the present invention contains two or more kinds of acid generators, a total content of the acid generator is preferably in the above range.

[0185] In the acid generator, the compound that generates the acid represented by Formula (I) due to the irradiation of an actinic ray or radiation and another acid generator may be used together, but the content of the compound that generates the acid represented by Formula (I) due to the irradiation of an actinic ray or radiation is preferably 50 mass % or more, more preferably 85 mass % or more, even more preferably 90 mass % or more, and particularly preferably 95 mass % or more with respect to a total mass of the used acid generator.

Resin

[0186] The actinic ray-sensitive or radiation-sensitive resin composition according to the embodiment of the present invention contains a resin.

[0187] As the resin, it is possible to use a well-known resin that can form a resist pattern but a resin (hereinafter, referred to as a "resin (A)") in which polarity changes due to an action of an acid is preferable.

[0188] Among these, the resin (A) is more preferably a resin (A1) that is decomposed due to an action of an acid to increase polarity. That is, the resin (A) is a resin in which solubility in an alkali developer increases due to an action of an acid, or solubility in a developer with an organic solvent as a main component due to an action of an acid decreases, and specifically, a resin having a group (hereinafter also referred to as an "acid-decomposable group") that generates an alkali-soluble group by being decomposed due to an action of an acid on at least one of a main chain or a side chain.

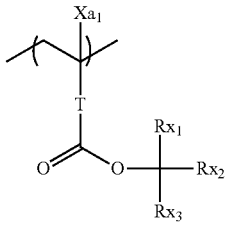
[0189] Examples of the alkali-soluble group include a carboxy group, a fluorinated alcohol group (preferably a hexafluoroisopropanol group), and a sulfonic acid group.

[0190] Hereinafter, the resin (A) is described in detail.

Repeating Unit Having Acid-Decomposable Group

[0191] The resin (A) preferably has a repeating unit having an acid-decomposable group as described above. A repeating unit that has acid-decomposable group is preferably a repeating unit represented by Formula (AI).

(AI)



[0192] In Formula (AI),

[0193] Xa_1 represents a hydrogen atom or an alkyl group that may have a substituent.

[0194] T represents a single bond or a divalent linking group.

[0195] Rx_1 to Rx_3 each independently represent a (linear or branched) alkyl group or a (monocyclic or polycyclic) cycloalkyl group.

[0196] Two of Rx_1 to Rx_3 are bonded to form a (monocyclic or polycyclic) cycloalkyl group.

[0197] Examples of the alkyl group that is represented by Xa_1 and may have a substituent include a methyl group and a group represented by $—CH_2—R_{11}$. R_{11} represents a halogen atom (such as a fluorine atom), a hydroxyl group, or a monovalent organic group.

[0198] According to an aspect, Xa_1 is preferably a hydrogen atom, a methyl group, a trifluoromethyl group, or a hydroxymethyl group

[0199] Examples of the divalent linking group of T include an alkylene group, a —COO—Rt- group, and an —O—Rt- group. In the formula, Rt represents an alkylene group or a cycloalkylene group.

[0200] preferably a single bond or a —COO—Rt- group. Rt is preferably an alkylene group having 1 to 5 carbon atoms and more preferably a $—CH_2—$ group, a $—(CH_2)_2—$ group, and a $—(CH_2)_3—$ group.

[0201] The alkyl group of Rx_1 to Rx_3 preferably has 1 to 4 carbon atoms.

[0202] The cycloalkyl group of Rx_1 to Rx_3 is preferably a monocyclic cycloalkyl group such as a cyclopentyl group or a cyclohexyl group, a polycyclic cycloalkyl group such as a norbornyl group, a tetracyclodecanyl group, a tetracyclododecanyl group, or an adamantyl group.

[0203] The cycloalkyl group formed by bonding two of Rx_1 to Rx_3 is preferably a monocyclic cycloalkyl group such as a cyclopentyl group and a cyclohexyl group or a polycyclic cycloalkyl group such as a norbornyl group, a tetracyclodecanyl group, a tetracyclododecanyl group, or an adamantyl group. The monocyclic cycloalkyl group having 5 to 6 carbon atoms is more preferable.

[0204] With respect to the cycloalkyl group formed by bonding two of Rx_1 to Rx_3, for example, one of the methylene groups constituting the ring may be substituted with a hetero atom such as an oxygen atom or a group having a hetero atom such as a carbonyl group.

[0205] It is preferable that the repeating unit represented by Formula (AI), for example, is an aspect in which Rx_1 is a methyl group or an ethyl group, and in which and Rx_2 and Rx_3 are bonded to each other to form the above cycloalkyl group.

[0206] Each of the above groups may have a substituent, examples of the substituent include an alkyl group (having