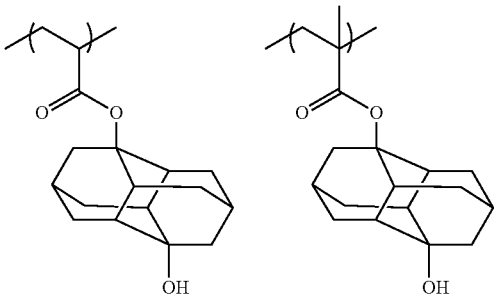
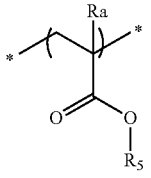
-continued



The resin (Aa) according to the present invention can further contain a repeating unit having a cyclic hydrocarbon structure in which no polar group is introduced and exhibiting no acid-decomposability. As such a repeating unit, there can be mentioned any of the repeating units of general formula (VII) below.

(VII)



In general formula (VII), R_5 represents a hydrocarbon group having at least one cyclic hydrocarbon structure in which no polar group (for example, a hydroxyl group or a cyano group) is introduced.

Ra represents a hydrogen atom, an alkyl group or a group of the formula —CH_2—O—Ra_2. In this formula, Ra_2 represents a hydrogen atom, an alkyl group or an acyl group. Ra is preferably a hydrogen atom, a methyl group, a hydroxyalkyl group or a trifluoromethyl group, most preferably a hydrogen atom or a methyl group.

The cyclic hydrocarbon structures introduced in R_5 include a monocyclic hydrocarbon group and a polycyclic hydrocarbon group. The monocyclic hydrocarbon group is preferably a monocyclic hydrocarbon group having 3 to 7 carbon atoms, more preferably a cyclopentyl group or a cyclohexyl group.

The polycyclic hydrocarbon groups include a ring-assembly hydrocarbon group and a crosslinked-ring hydrocarbon group. As preferred crosslinked-ring hydrocarbon rings, there can be mentioned a norbornyl group, an adamantyl group, a bicyclooctanyl group, a tricyclo[5.2.1.$0^{2,6}$]decanyl group and the like. As more preferred crosslinked-ring hydrocarbon rings, there can be mentioned a norbornyl group and an adamantyl group.

Substituents may be introduced in these cyclohydrocarbon groups. As preferred substituents, there can be mentioned a halogen atom (bromine, chlorine or fluorine atom) and an alkyl group (methyl, ethyl, butyl or t-butyl group). A further substituent may be introduced in this alkyl group. As the optional further substituent, there can be mentioned a halogen atom, an alkyl group, a hydroxyl group with its hydrogen atom replaced or an amino group with its hydrogen atom replaced.

As a substituent for the replacement of the hydrogen atom, there can be mentioned, for example, an alkyl group, a monovalent aliphatic hydrocarbon ring group, an aralkyl group, a substituted methyl group, a substituted ethyl group, an acyl group, an alkoxycarbonyl group or an aralkyloxycarbonyl group. Preferred alkyl groups include alkyl groups each having 1 to 4 carbon atoms. Preferred substituted methyl groups include methoxymethyl, methoxythiomethyl, benzyloxymethyl, t-butoxymethyl and 2-methoxyethoxymethyl groups. Preferred substituted ethyl groups include 1-ethoxyethyl and 1-methyl-1-methoxyethyl groups. Preferred acyl groups include aliphatic acyl groups having 1 to 6 carbon atoms, such as formyl, acetyl, propionyl, butyryl, isobutyryl, valeryl and pivaloyl groups. Preferred alkoxycarbonyl groups include alkoxycarbonyl groups each having 1 to 4 carbon atoms and the like. It is optional for the resin (Aa) to contain the repeating unit with a cyclohydrocarbon structure containing no polar group, which repeating unit does not exhibit any acid decomposability. When the repeating unit is contained, the content thereof is preferably in the range of 1 to 40 mol %, more preferably 5 to 20 mol %, based on all the repeating units of the resin (Aa).

Particular examples of the repeating units with a cyclohydrocarbon structure containing no polar group, which repeating units do not exhibit any acid decomposability are shown below. The examples in no way limit the scope of the present invention. In the formulae, Ra represents H, CH_3, CH_2OH or CF_3.