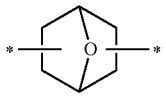
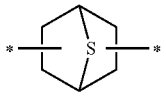
-continued

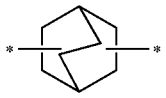
X^L-40



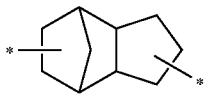
X^L-41



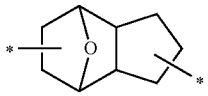
X^L-42



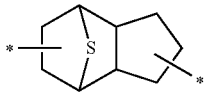
X^L-43



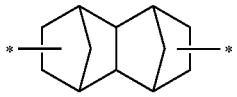
X^L-44



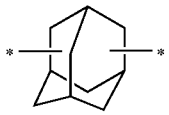
X^L-45



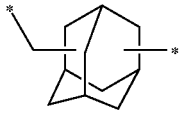
X^L-46



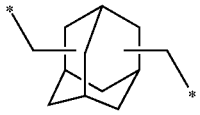
X^L-47



X^L-48



X^L-49



[0051] Of these, X^L-1 to X^L-22 and X^L-47 to X^L-49 are more preferred, with X^L-1 to X^L-17 being most preferred.

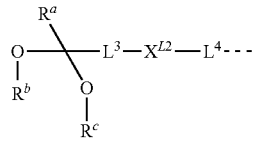
[0052] In formula (A), R^1 is a C_3-C_{40} monovalent hydrocarbon group which may contain a heteroatom other than fluorine or a C_1-C_{40} monovalent fluorinated hydrocarbon group which may contain a heteroatom other than fluorine. The monovalent hydrocarbon group may be straight, branched or cyclic. Examples include alkyl groups such as n-propyl, isopropyl, n-butyl, sec-butyl, tert-butyl, tert-pentyl, n-pentyl, n-hexyl, n-octyl, n-nonyl, n-decyl, cyclopentyl, cyclohexyl, 2-ethylhexyl, cyclopentylmethyl, cyclopentylethyl, cyclopentylbutyl, cyclohexylmethyl, cyclohexylethyl, cyclohexylbutyl, norbomyl, tricyclo[5.2.1.$0^{2,6}$]decanyl, adamantyl, and adamantylmethyl, and aryl groups such as phenyl, naphthyl and anthracenyl. Examples of the monovalent fluorinated hydrocarbon group include the foregoing monovalent hydrocarbon groups in which some or all hydrogen atoms are substituted by fluorine atoms.

[0053] In the monovalent hydrocarbon group or monovalent fluorinated hydrocarbon group, some hydrogen may be substituted by a moiety containing a heteroatom such as oxygen, sulfur, nitrogen, chlorine, bromine or iodine, or some carbon may be replaced by a moiety containing a heteroatom such as oxygen, sulfur or nitrogen, so that the group may contain a hydroxyl, cyano, carbonyl, ether bond, ester bond, sulfonate bond, carbonate bond, carbamate bond, amide bond, imide bond, lactone ring, sultone ring, thiolactone ring, lactam ring, sultam ring, carboxylic anhydride (—C(═O)—O—C(═O)—), or haloalkyl moiety. It is noted that any carbon atom in R bonded to a carbon atom on the phenyl group in formula (A) may be replaced by the heteroatom-containing moiety.

[0054] When a is 2 or more (i.e., a≥2), R^1 may be identical or different and two R^1 may bond together to form a ring with the atoms to which they are attached. Examples of the ring thus formed include cyclopropane, cyclobutane, cyclopentane, cyclohexane, norbornane and adamantane rings.

[0055] The monovalent hydrocarbon group which may contain a heteroatom other than fluorine or the monovalent fluorinated hydrocarbon group which may contain a heteroatom other than fluorine, represented by R^1, may be an acid labile group of acetal form. The preferred acid labile group of acetal form has the following formula (A').

(A')



[0056] In formula (A'), L^3 and L^4 are each independently a single bond, ether bond, ester bond, sulfonate bond, carbonate bond or carbamate bond. L^3 is preferably a single bond, ether bond, or ester bond, more preferably a single bond. L^4 is preferably a single bond, ether bond, or ester bond, more preferably a single bond.

[0057] In formula (A'), X^{L2} is a single bond or a C_1-C_{40} divalent hydrocarbon group which may contain a heteroatom. Examples of the optionally heteroatom-containing C_1-C_{40} divalent hydrocarbon group X^{L2} include the foregoing X^L-1 to X^L-49. X^{L2} is preferably a single bond.

[0058] In formula (A'), R^a is hydrogen or a C_1-C_{20} monovalent hydrocarbon group which may contain a heteroatom. The monovalent hydrocarbon group may be straight, branched or cyclic. Examples include alkyl groups such as methyl, ethyl, propyl, isopropyl, n-butyl, sec-butyl, tert-butyl, tert-pentyl, n-pentyl, n-hexyl, n-octyl, n-nonyl, n-decyl, cyclopentyl, cyclohexyl, 2-ethylhexyl, cyclopentylmethyl, cyclopentylethyl, cyclopentylbutyl, cyclohexylmethyl, cyclohexylethyl, cyclohexylbutyl, norbomyl, tricyclo[5.2.1.$0^{2,6}$]decanyl, adamantyl, and adamantylmethyl, and aryl groups such as phenyl, naphthyl and anthracenyl. In the monovalent hydrocarbon group, some hydrogen may be substituted by a moiety containing a heteroatom such as oxygen, sulfur, nitrogen or halogen, or a