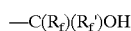
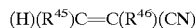


fluoroalcohol functional group having the structure:



[0113] wherein R_f and R'_f are as described above; and

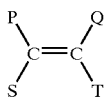
[0114] (ii) a repeat unit derived from at least one ethylenically unsaturated compound having the structure:



[0115] wherein R^{45} is a hydrogen atom or CN group; R^{46} is C_1 - C_8 alkyl group, hydrogen atom, or CO_2R^{47} group, where R^{47} is C_1 - C_8 alkyl group or hydrogen atom.

[0116] The fluoropolymer or copolymer comprises a repeat unit (discussed infra) derived from at least one ethylenically unsaturated compound containing a fluoroalcohol functional group that can have fluoroalkyl groups present as part of the fluoroalcohol group and are described earlier with regard to copolymer (b). These fluoroalkyl groups are designated R_f and R'_f as described above.

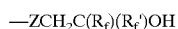
[0117] As is well known to those skilled in the polymer art, an ethylenically unsaturated compound undergoes free radical polymerization to afford a polymer having a repeat unit that is derived from the ethylenically unsaturated compound. Specifically, an ethylenically unsaturated compound having structure:



[0118] is described above with regard to copolymer (a1).

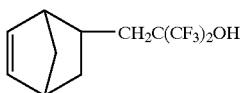
[0119] Each fluorine-containing copolymer according to this invention has an absorption coefficient of less than $4.0 \mu m^{-1}$ at a wavelength of 157 nm, preferably of less than $3.5 \mu m^{-1}$ at this wavelength, more preferably, of less than $3.0 \mu m^{-1}$ at this wavelength, and, still more preferably, of less than $2.5 \mu m^{-1}$ at this wavelength.

[0120] The fluorinated polymers, photoresists, and processes of this invention that include a fluoroalcohol functional group may have the structure:

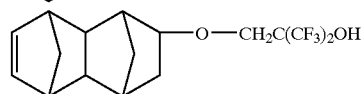
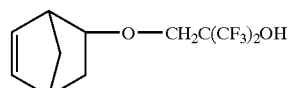
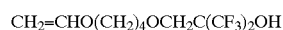
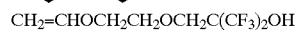
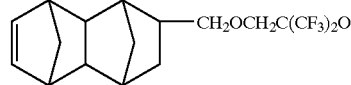
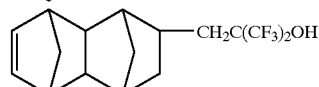
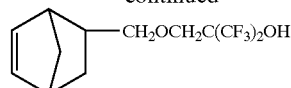


[0121] wherein R_f and R'_f are as described above; Z is as described above.

[0122] Some illustrative, but nonlimiting, examples of representative comonomers containing a fluoroalcohol functional group and within the scope of the invention are presented below:

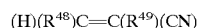


-continued



[0123] Various bifunctional compounds which can initially afford crosslinking and subsequently be cleaved (e.g., upon exposure to strong acid) are also useful as comonomers in the copolymers of this invention. As an illustrative, but non-limiting example, the bifunctional comonomer $NB-F-OMOMO-F-NB$ is desirable as a comonomer in the copolymers of this invention. This and similar bifunctional comonomers, when present in the copolymer component(s) of photoresist compositions of this invention, can afford copolymers that are of higher molecular weight and are lightly crosslinked materials. Photoresist compositions, incorporating these copolymers comprised of bifunctional monomers, can have improved development and imaging characteristics, since, upon exposure (which photochemically generates strong acid as explained infra), there results cleavage of the bifunctional group and consequently a very significant drop in molecular weight, which factors can afford greatly improved development and imaging characteristics (e.g., improved contrast). These fluoroalcohol groups and their embodiments are described in more detail as above and in PCT/US00/11539 filed Apr. 28, 2000.

[0124] At least a portion of the nitrile functionality that is present in the nitrile/fluoroalcohol polymers results from incorporation of repeat unit(s) derived from at least one ethylenically unsaturated compound having at least one nitrile group and having the structure:



[0125] wherein R^{48} is a hydrogen atom or cyano group (CN); R^{49} is an alkyl group ranging from 1 to about 8 carbon atoms, CO_2R^{50} group wherein R^{50} is an alkyl group ranging from 1 to about 8 carbon atoms, or hydrogen atom. Acrylonitrile, methacrylonitrile, fumaronitrile (trans-1,2-dicyanoethylene), and maleonitrile (cis-1,2-dicyanoethylene) are preferred. Acrylonitrile is most preferred.

[0126] The nitrile/fluoroalcohol polymers typically are characterized in having a repeat unit derived from at least one ethylenically unsaturated compound containing the fluoroalcohol functional group that is present in the nitrile/