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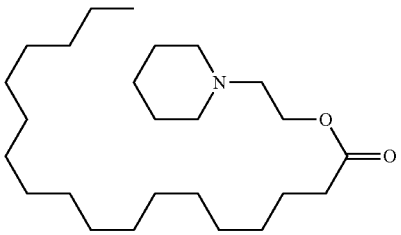
Q-2



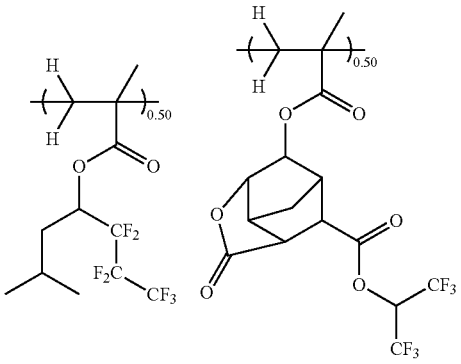
Alkali-Soluble Surfactant SF-1:

[0213] poly(2,2,3,3,4,4,4-heptafluoro-1-isobutyl-1-butyl methacrylate/9-(2,2,2-trifluoro-1-trifluoroethyloxycarbonyl)-4-oxatricyclo[4.2.1.$0^{3,7}$]nonan-5-on-2-yl methacrylate)

[0214] Mw=7,700

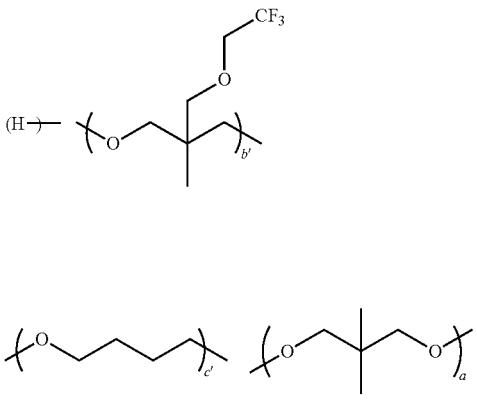
[0215] Mw/Mn=1.82

SF-1



Surfactant A:

[0216] 3-methyl-3-(2,2,2-trifluoroethoxymethyl)oxetane/tetrahydrofuran/2,2-dimethyl-1,3-propane diol copolymer (Omnova Solutions, Inc.)



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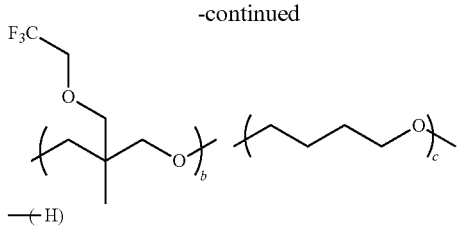

[0217] a:(b+b'):(c+c')=1:4-7:0.01-1 (molar ratio)

[0218] Mw=1,500

[3] Resist Composition Evaluation #1: Casting Solution Dissolution Test

Examples 2-1 to 2-2 and Comparative Examples 2-1 to 2-2

[0219] In a 50-mL vial, 80 parts by weight of each onium compound (PAG-1, PAG-2, PAG-A, PAG-B) was dissolved in 960 parts by weight of DAA, after which 2,240 parts by weight of PGMEA was added. Using a magnetic stirrer, the mixture was stirred at 23° C. for 24 hours, obtaining a resist composition (R-01, R-02, R-20, R-21). The liquid in the vial was visually observed to evaluate solubility. It was rated "good" when the compound was fully dissolved in the solvents and "poor" when the liquid looked white turbid. The results are shown in Table 4.

TABLE 4

		Resist composition	Onium compound	Solubility
Example	2-1	R-01	PAG-1	good
	2-2	R-02	PAG-2	good
Comparative Example	2-1	R-20	PAG-A	poor
	2-2	R-21	PAG-B	poor

[0220] As seen from Table 4, the onium compounds used in resist compositions of Examples are fully soluble in solvents, demonstrating that molecular resist compositions are constructed using the onium compounds.

[4] Resist Composition Evaluation #2: Film Forming Test

Examples 3-1 to 3-3 and Comparative Examples 3-1 to 3-2

[0221] A silicon substrate having a diameter of 8 inches was primed with hexamethyldisilazane (HMDS). Using a coater/developer system Clean Track ACT™ 8 (Tokyo Electron Ltd.), each of the resist compositions (R-03, R-04, R-05, R-22, R-25) was spin coated onto the substrate at 1,500 rpm, pre-baked on a hotplate at 100° C. for 60 seconds, and cooled at 23° C. for 30 seconds. A resist film on the substrate was visually observed. The film formation was rated "good" when a resist film was confirmed and "poor" when striae or pinholes were observed. Thereafter, using an ellipsometer Atlas XP+(Nanometrics Inc.), the thickness of the resist film on the silicon substrate was measured at 29 points which were equally spaced apart in X axis direction, to evaluate a variation of film thickness. The results are shown in Table 5.