

TABLE 20-continued

Compound	Anion	Cation	NMR analysis
5-42	an-5	ca-42	¹ H-NMR: δ (ppm) = 7.80-7.92 (m, 10H, ArH), 7.67 (s, 2H, ArH), 4.66 (s, 2H, CH ₂), 4.12(s, 2H, CH ₂), 2.31-2.43 (m, 7H, ArCH ₃ + CH), 2.13-2.16 (m, 2H, cyclohexyl), 1.97-2.02 (m, 4H, CH ₂ + CH ₂), 1.14-1.68 (m, 9H, cyclohexyl + CH), 0.84-1.15 (t, 12H, CH ₃)
5-43	an-5	ca-43	¹ H-NMR: δ (ppm) = 8.44 (d, 1H, ArH), 8.22 (m, 2H, ArH), 7.73-7.89 (m, 13H, ArH), 7.50 (d, 1H, ArH), 4.12(s, 2H, CH ₂), 2.31-2.43(m, 1H, CH), 1.87-2.02(m, 2H, CH ₂), 1.49-1.68(m, 1H, CH), 0.85-1.15(m, 9H, CH ₃ + CH ₃ + CH ₃)
5-44	an-5	ca-44	¹ H-NMR: δ (ppm) = 8.24 (d, 4H, ArH), 7.59 (t, 2H, ArH), 7.47 (t, 4H, ArH), 4.12(s, 2H, CH ₂), 2.31-2.43(m, 1H, CH), 1.87-2.02(m, 2H, CH ₂), 1.49-1.68(m, 1H, CH), 0.85-1.15(m, 9H, CH ₃ + CH ₃ + CH ₃)
5-45	an-5	ca-45	¹ H-NMR: δ (ppm) = 8.55 (d, 2H, ArH), 8.38 (d, 2H, ArH), 8.32 (d, 2H, ArH), 8.03 (d, 2H, ArH), 7.93-7.97 (m, 1H, ArH), 7.82-7.88 (m, 8H, ArH), 7.55 (d, 2H, ArH), 4.12(s, 2H, CH ₂), 2.31-2.43(m, 1H, CH), 1.87-2.02(m, 2H, CH ₂), 1.49-1.68(m, 1H, CH), 0.85-1.15(m, 9H, CH ₃ + CH ₃ + CH ₃)
5-47	an-5	ca-47	¹ H-NMR: δ (ppm) = 4.46 (s, 2H, CH ₂ (C=O)), 4.12(s, 2H, CH ₂), 3.38-3.58 (m, 4H, CH ₂ SCH ₂), 1.49-2.43 (m, 25H, Adamantyl + CH ₂ CH ₂ + CH + CH ₂), 0.85-1.15(m, 9H, CH ₃ + CH ₃ + CH ₃)
5-48	an-5	ca-48	¹ H-NMR: δ (ppm) = 7.75 (s, 2H, Ar), 4.12(s, 2H, CH ₂), 3.91-3.96 (m, 2H, CH ₂), 3.72-3.79 (m, 2H, CH ₂), 2.29-2.43(m, 5H, CH ₂ + CH), 1.49-2.19(m, 24H, Ar—CH ₃ + Adamantane + CH ₂ + CH), 0.85-1.15(m, 9H, CH ₃ + CH ₃ + CH ₃)
5-49	an-5	ca-49	¹ H-NMR: δ (ppm) = 7.82 (m, 2H, Ar), 4.12(s, 2H, CH ₂), 3.73-3.91(m, 4H CH ₂), 1.49-2.43(m, 31H, Ar—CH ₃ + CH ₂ + CH + adamantane), 0.85-1.15(m, 9H, CH ₃ + CH ₃ + CH ₃)
5-50	an-5	ca-50	¹ H-NMR: δ (ppm) = 8.23 (d, 4H, ArH), 7.98 (d, 4H, ArH), 4.12(s, 2H, CH ₂), 2.31-2.43(m, 1H, CH), 1.87-2.02(m, 2H, CH ₂), 1.49-1.68(m, 1H, CH), 1.37 (s, 18H, CH ₃ of tert-butyl), 0.85-1.15(m, 9H, CH ₃ + CH ₃ + CH ₃) ¹⁹ F-NMR: δ (ppm) = -48.5
5-51	an-5	ca-51	¹ H-NMR: δ (ppm) = 7.77-7.98 (m, 10H, ArH), 7.64 (s, 2H, ArH), 4.57(s, 2H, CH ₂ O), 4.12(s, 2H, CH ₂), 2.40 (s, 6H, CH ₃), 2.02-2.26 (m, 9H, Adamantane), 1.76 (br s, 6H, Adamantane)
5-52	an-5	ca-52	¹ H-NMR: δ (ppm) = 7.77-7.89 (m, 10H, ArH), 7.64 (s, 2H, ArH), 5.70(t, 1H, OCHC=O), 4.82 (s, 2H, ArOCH ₂), 4.12(s, 2H, CH ₂), 4.46-4.30 (m, 2H, OCOCH ₂), 2.71-2.64 (m, 1H, OCH ₂ CH ₂), 2.24-2.43 (m, 8H, CH ₃ + OCH ₂ CH ₂ + CH), 1.87-2.02(m, 2H, CH ₂), 1.49-1.68(m, 1H, CH), 0.85-1.15(m, 9H, CH ₃ + CH ₃ + CH ₃)
5-53	an-5	ca-53	¹ H-NMR: δ (ppm) = 8.28 (d, 2H, ArH), 8.11 (d, 1H, ArH), 7.86(t, 1H, ArH), 7.63-7.81(m, 7H, ArH), 4.12(s, 2H, CH ₂), 2.31-2.43(m, 1H, CH), 1.87-2.02(m, 2H, CH ₂), 1.49-1.68(m, 1H, CH), 0.85-1.15(m, 9H, CH ₃ + CH ₃ + CH ₃)

TABLE 21

Compound	Anion	Cation	NMR analysis
5-54	an-5	ca-54	¹ H-NMR: δ (ppm) = 8.05 (d, 2H, ArH), 7.74 (d, 2H, ArH), 4.12(s, 2H, CH ₂), 3.85(s, 3H, S—CH ₃), 1.87-2.02(m, 2H, CH ₂), 1.49-1.68(m, 1H, CH), 1.30(s, 18H, t-Bu), 0.85-1.15(m, 9H, CH ₃ + CH ₃ + CH ₃)
5-55	an-5	ca-55	¹ H-NMR: δ (ppm) = 8.41 (m, 2H ArH), 8.12(d, 1H, ArH), 7.73-7.93(m, 2H, ArH), 7.19(d, 1H, ArH), 5.23(s, 2H, CH ₂), 4.95(m, 1H, Adamantane), 4.03(m, 2H, CH ₂ S), 4.12(s, 2H, CH ₂), 3.75(m, 2H, CH ₂ S), 2.27-2.43(m, 5H, SCH ₂ CH ₂ + CH), 1.42-2.02(m, 17H, Adamantyl + CH + CH ₂), 0.85-1.15(m, 9H, CH ₃ + CH ₃ + CH ₃)
5-56	an-5	ca-56	¹ H-NMR: δ (ppm) = 8.42(m, 2H ArH), 8.17(d, 1H, ArH), 7.78-7.91(m, 2H, ArH), 7.23(d, 1H, ArH), 5.26(s, 2H, CH ₂), 3.75-4.19(m, 9H, SCH ₂ + CH ₃ + CH ₂), 2.29-2.60(m, 5H, SCH ₂ CH ₂ + CH), 1.87-2.02(m, 2H, CH ₂), 1.49-1.68(m, 1H, CH), 0.85-1.15(m, 9H, CH ₃ + CH ₃ + CH ₃)
5-57	an-5	ca-57	¹ H-NMR: δ (ppm) = 8.28 (d, 2H, ArH), 8.12 (d, 1H, ArH), 7.88 (t, 1H, ArH), 7.80 (d, 1H, ArH), 7.62-7.74 (m, 5H, ArH), 4.12(s, 2H, CH ₂), 2.31-2.43(m, 1H, CH), 1.87-2.02(m, 2H, CH ₂), 1.49-1.68(m, 1H, CH), 1.27 (s, 9H, CH ₃), 0.85-1.15(m, 9H, CH ₃ + CH ₃ + CH ₃)
5-58	an-5	ca-58	¹ H-NMR: δ (ppm) = 7.76-7.90 (m, 12H, ArH), 4.12(s, 2H, CH ₂), 1.87-2.69 (m, 12H, camphane + Ar—CH ₃ + CH ₂ + CH), 1.49-1.72 (m, 2H, camphane + CH), 0.65-1.19 (m, 18H, CH ₃).
5-59	an-5	ca-59	¹ H-NMR: δ (ppm) = 7.76-7.90 (m, 12H, ArH), 5.00 (s, 1H, Hyper-lactone), 4.77 (s, 2H, Hyper-lactone), 4.27 (s, 1H, Hyper-lactone), 4.12(s, 2H, CH ₂), 2.94 (s, 1H, Hyper-lactone), 2.31-2.43(m, 1H, CH), 1.49-2.13 (m, 19H, Hyper-lactone + CH ₃ + CH ₂ + CH), 0.85-1.15(m, 9H, CH ₃ + CH ₃ + CH ₃)
5-60	an-5	ca-60	¹ H-NMR: δ (ppm) = 7.72-7.83(m, 10H, ArH), 7.59(s, 2H, ArH), 5.90(d, 1H, CH), 4.87-5.05(m, 3H, CH), 4.62-4.68(m, 2H, CH ₂), 4.23(m, 1H, CH), 4.12(s, 2H, CH ₂), 1.49-2.48(m, 12H, CH ₃ + CH ₂ + CH + oxosultone), 0.85-1.15(m, 9H, CH ₃ + CH ₃ + CH ₃)

Examples 1 to 25, Comparative Examples 1 to 12

The components shown in Tables 22 to 24 were mixed together and dissolved to obtain resist compositions.

TABLE 22

	Component (A)	Component (B)	Component (C)	Component (G)	Component (F)	Component (S)
Example 1	(A)-1 [100]	(B)-1 [11.5]	(C)-1 [1.74]	—	(F)-1 [2.5]	(S)-1 [10.0] [2900]
Example 2	(A)-1 [100]	(B)-1 [11.5]	(C)-2 [1.87]	—	(F)-1 [2.5]	(S)-1 [10.0] [2900]
Example 3	(A)-1 [100]	(B)-1 [11.5]	(C)-3 [2.04]	—	(F)-1 [2.5]	(S)-1 [10.0] [2900]
Example 4	(A)-1 [100]	(B)-1 [11.5]	(C)-4 [2.47]	—	(F)-1 [2.5]	(S)-1 [10.0] [2900]