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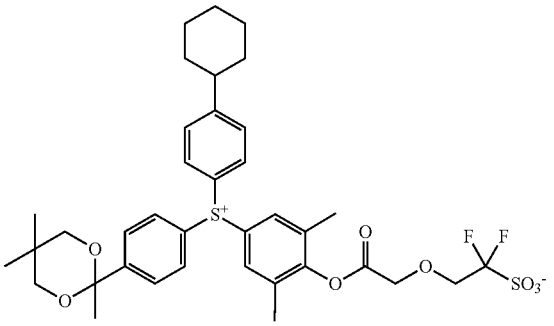
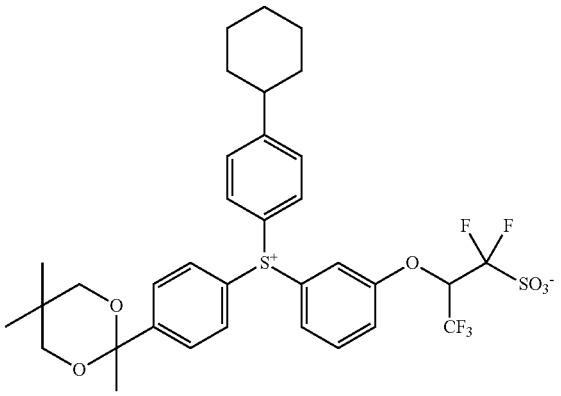
PAG-9



PAG-10



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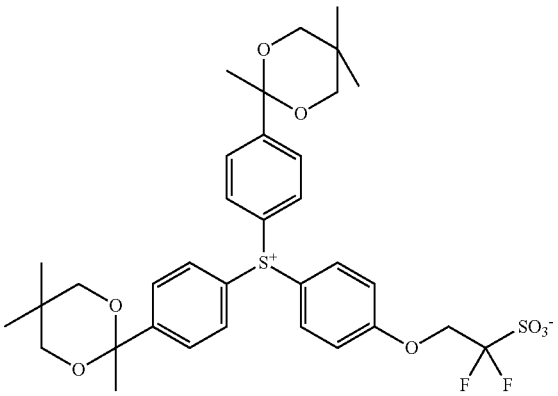
PAG-11



[0205] PAG-6 to PAG-11 were synthesized by well-known synthesis methods using corresponding reactants.

[2] Preparation of Resist Composition

Examples 1-1 to 1-19, Comparative Examples 1-1 to 1-7 and Reference Examples 1-1 to 1-2

[0206] Resist compositions in solution form were prepared by dissolving a betaine type onium compound (PAG-1 to PAG-11) or comparative betaine type onium compound or onium salt (PAG-A to PAG-F), base resin (P-1 or P-2), quencher (Q-1 or Q-2), and alkali-soluble surfactant (SF-1) in a solvent containing 0.01 wt % of surfactant A in accordance with the formulation shown in Tables 1 to 3, and filtering through a Teflon® filter with a pore size of 0.2 μm.

TABLE 1

		Resist composition	Onium compound (pbw)	Base resin (pbw)	Quencher (pbw)	Surfactant (pbw)	Solvent 1 (pbw)	Solvent 2 (pbw)
Example	1-1	R-01	PAG-1 (80)	—	—	—	PGMEA (2,240)	DAA (960)
	1-2	R-02	PAG-2 (80)	—	—	—	PGMEA (2,240)	DAA (960)
	1-3	R-03	PAG-3 (80)	—	—	—	PGMEA (2,240)	DAA (960)
	1-4	R-04	PAG-4 (80)	—	—	—	PGMEA (2,240)	DAA (960)
	1-5	R-05	PAG-5 (80)	—	—	—	PGMEA (2,240)	DAA (960)
	1-6	R-06	PAG-6 (80)	—	—	—	PGMEA (2,240)	DAA (960)
	1-7	R-07	PAG-7 (80)	—	—	—	PGMEA (2,240)	DAA (960)
	1-8	R-08	PAG-8 (80)	—	—	—	PGMEA (2,240)	DAA (960)
	1-9	R-09	PAG-9 (80)	—	—	—	PGMEA (2,240)	DAA (960)
	1-10	R-10	PAG-10 (80)	—	—	—	PGMEA (2,240)	DAA (960)
	1-11	R-11	PAG-11 (80)	—	—	—	PGMEA (2,240)	DAA (960)
	1-12	R-12	PAG-1 (40)	—	Q-1 (40)	—	PGMEA (2,240)	DAA (960)
	1-13	R-13	PAG-2 (80)	—	Q-2 (4.5)	SF-1 (0.1)	PGMEA (2,240)	DAA (960)
	1-14	R-14	PAG-3 (40)	—	Q-1 (40)	SF-1 (0.1)	PGMEA (2,240)	DAA (960)
	1-15	R-15	PAG-7 (80)	—	Q-2 (4.5)	—	PGMEA (2,240)	DAA (960)