



Status of High PAG-Outgassing Resist Studies

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I. High PAG-outgas Resists

1. ESCAP with TBPI-PFBS and with TPS-PFBS

- **Expect limited outgas from polymer**

2. Acetal EVE-PHS with TBPI-PFBS and with TPS-PFBS

- **Expect added outgas boost from polymer**

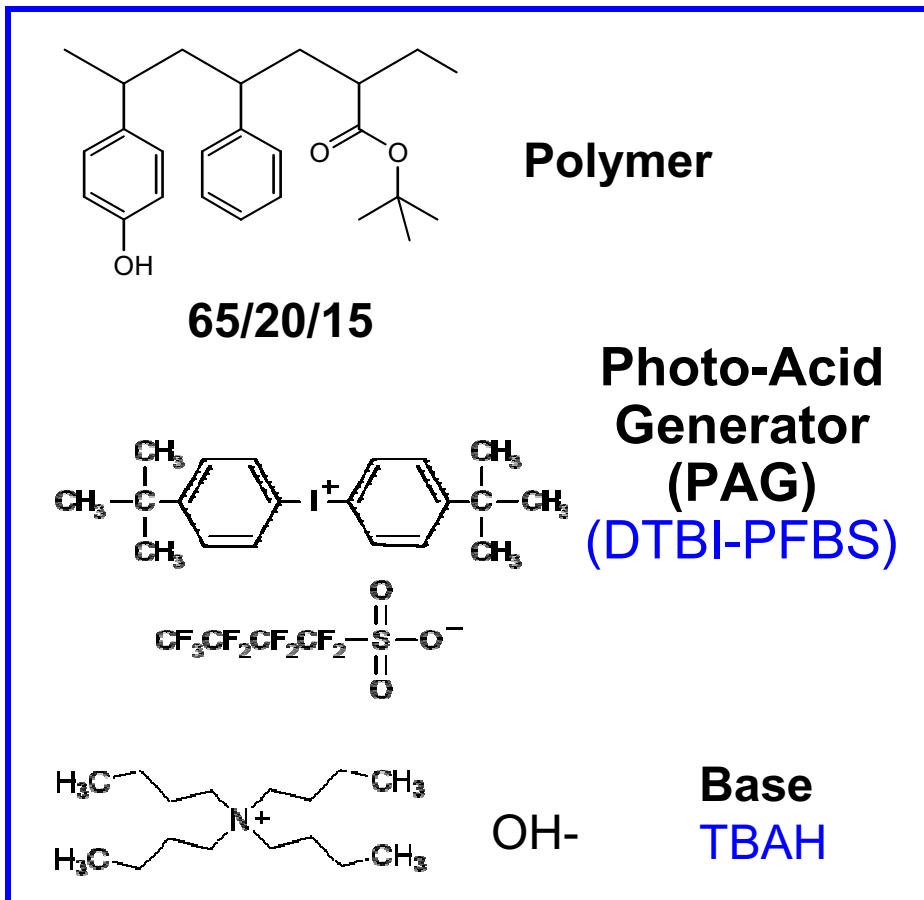
II. Preliminary ROX outgassing results:

- **ESCAP with 25% PAG loading**



III. Published resist for RLS study

Published resist formulation¹⁻⁴



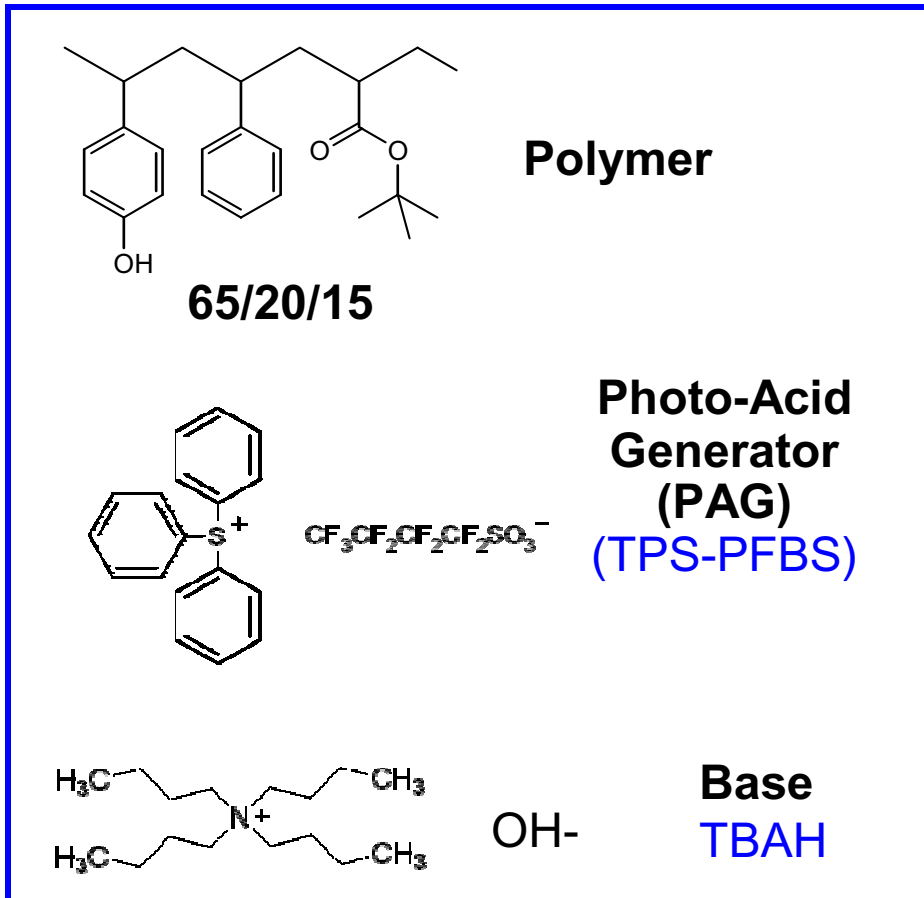
Seven platforms:

5%, 7.5%, 10%, 15%, 20%, 30%, and 40% PAG at 0.64 base loading

All resists except 50% exhibit good coatings.

1. J. Roberts et al., SPIE 61533U (2006)
2. T. Fedynyshyn et al., SPIE 65190X (2007)
3. J. Woodward et al., SPIE 651915 (2007)
4. T. Fedynyshyn et al., SPIE 651917 (2007)

ESCAP/Sulfonium resist chemical structures



- 3 resist platforms with 7.5%, 15%, & 30% PAG at 0.64 base loading
- All resists give good coating

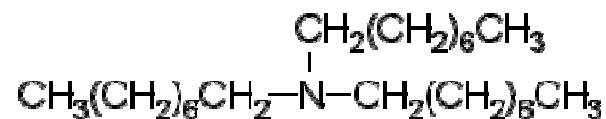
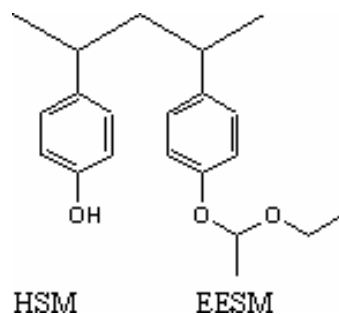
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The EVE-PHS Resist – still to be tested.

Resist Name	Polymer	PAG	wt %	Base	wt %	Solvent	Actual Thickness (Å)
EH2-43A-43	Poly-GT2 in PMA (60:40)	DTBPI-PFBS	25	Trioctyl-amine	0.68	PMA/Ethyl lactate	1256
EH2-43B-43		TPS-PFBS	25				1253

processing conditions:

Coat	PAB		PEB		Develop	
Å	Temp	Time (s)	Temp	Time (s)	Developer	Time (s)
1250	90	60	110	90	MF26A	45



Trioctylamine

Poly-GT2: HSM & EESM (58.3:41.7)



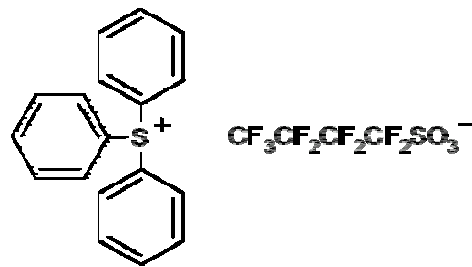
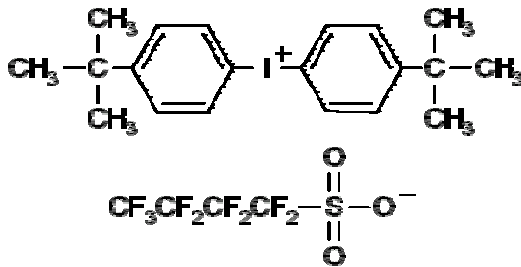
Ultrahigh PAG Resists

Circled Resists
Tested for
Outgassing

% PAG	I+	S+
5	OS2	
7.5	OS1	OS-S1
10	OS3	
15	OS4	OS-S2
20	OS5	
25	OS6	OS-S3
30	OS7	OS-S4
40	OS8	OS-S5
50	OS9	OS-S6
60	OS10	OS-S7
70	OS11	OS-S8

I⁺

S⁺



Outgassing Results ESCAP with Ultrahigh PAG

Resist	PAG %	E0 (mJ/cm ²)	2.5x E0	7x E0
ESCAP TBPI-FBS OS6	25	2.7	1.7 x 10 ¹⁴ molecules/cm ²	4.4 x 10 ¹⁴ molecules/cm ²
ESCAP TBPI-FBS OS8	40		3.16 x 10 ¹⁴ molecules/cm ²	NA
ESCAP TPS- PFBS OS-S3	25	2.7	2.2 x 10 ¹⁴ molecules/cm ²	4.9 x 10 ¹⁴ molecules/cm ²
ESCAP TPS- PFBS OS-S5	40		4.04 x 10 ¹⁴ molecules/cm ²	NA

All results in molecules/cm² from 35-200 AMU excluding 44AMU