

(19)
(12)

(KR)
(A)

(51) 。 Int. Cl. ⁷
G03F 7/039

(11)
(43)

2002 - 0002877
2002 01 10

(21)
(22)

10 - 2000 - 0037228
2000 06 30

(71)

136 - 1

(72)

107 - 1304

103 - 302

205 - 1102

203 - 402

(74)

:

(54)

(P R G)

(a)
RG

(Photo Radical Generator; PRG)
, (b) , (c)

,
(d) P

1a	가	가	,
1b	가	가	,
2	1		,
3	1		,
4	2		.

(d)

(a) (Photo Radical Generator; PRG), (b) , (c) , I/D

(I/D Bias)가

EUV (13nm) 가 KrF (248nm), ArF (193nm), VUV (157nm)
(DUV: Deep Ultra Violet) (photoacid generator)

가 ,

가 ,

가 .

ArF 193nm
2.38 wt% (TMAH) 가

가 ()
(main chain) (side chain) 가

ArF 가 1a ,

가 1b ,

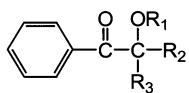
가 ,

가

, (a) , (b) , (c) , (d)

1

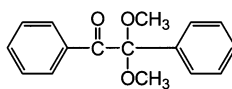
[1]



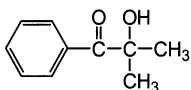
R_1 1 5 , R_2 1 5 , R_3 ,
1 5 , 1 5

1 1a α, α - - α - 1b α -
- α, α -

[1a]



[1b]



- t -

2c)

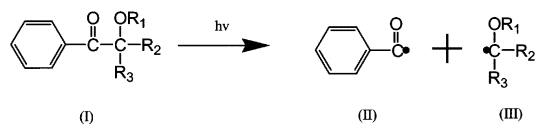
1

2 (

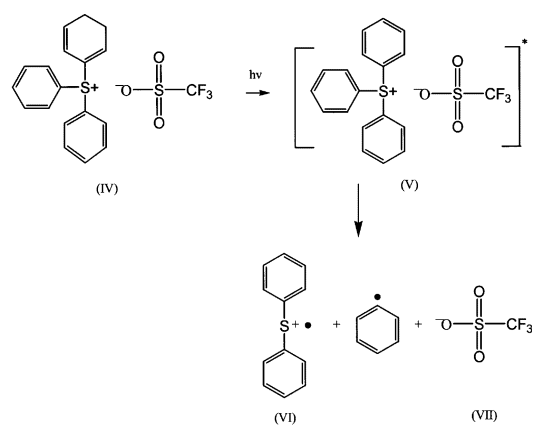
2a

(IV),

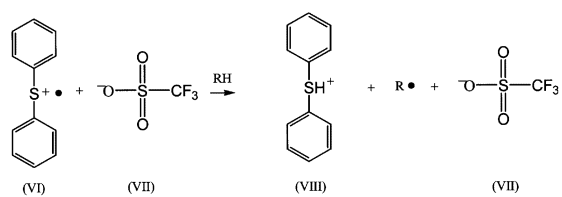
[1]



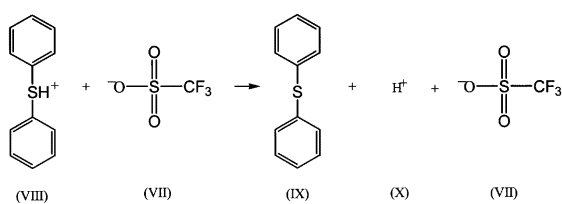
[2a]



[2b]



[2c]



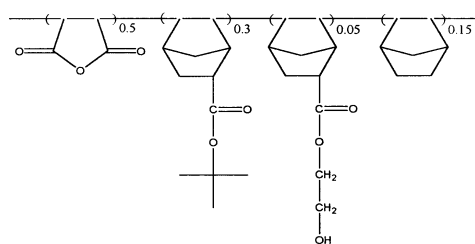
, [(IV)]가 2a 2c [(X)] , 가 1b .
 가 1
 a .
 2 , () () 가 2b가 . ,
 () () 가 .
 1 , () () () ()
 () 가 , () () ()
 () , ()
 () , () () ()
 () () ()
 () 가 가 가

0.05 10 %

10 300 %

2

[2]



3 -
2 -

200 800 %

3 -

(a)

(b) ;

(c) .

, (b) i) ; ii)
70 200 .

, ArF (193nm), KrF (248nm), VUV (157nm), EUV (13nm), E - , X -
, 1 100 mJ/cm² .

1a

[1]

2 20g, 0.24g PGMEA 160g 0.20 μm

90 140 90 ArF 140
) 2.38 wt% TMAH 0.15 μm L/S (2
) . 2 .

1.

0.12g 2 20g, 0.24g, 1a
PGMEA 160g 0.20 μm .

90 140 90 ArF 140
) 2.38 wt% TMAH 0.15 μm L/S (3
) . 가 1 .

2.

0.10g 14 20g, 0.24g, 1b
PGMEA 160g 0.20 μm .

90 140 90 ArF 140
) 2.38 wt% TMAH 0.15 μm L/S (4
) . 가 1 .

2 3 4
ArF (193nm), VUV (157nm)

(57)

1.

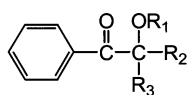
(a) , (b) , (c) , (d)

2.

1 ,

1 .

[1]



R_1 1 5 , 1 5 , R_2 1 5 , R_3 ,
1 5 , 1 5 .

3.

2 ,

1 α, α - - α - α - - α, α -

4.

1 ,

- t -

5.

1 ,

0.05 10 %

6.

1 ,

10 300 %

7.

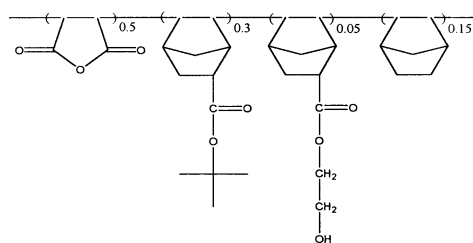
1 ,

8.

7 ,

2

[2]



9.

1 ,

3 -
, 2 -

, 3 - ,

10.

1 ,

200 800 %

11.

(a) 1 ;

(b) ;

(c) .

12.

11 ,

(b) i) ; ii) .

13.

12 ,

70 200 .

14.

11 ,

ArF (193nm), KrF (248nm), VUV (157nm), EUV (13nm), E - , X - .

15.

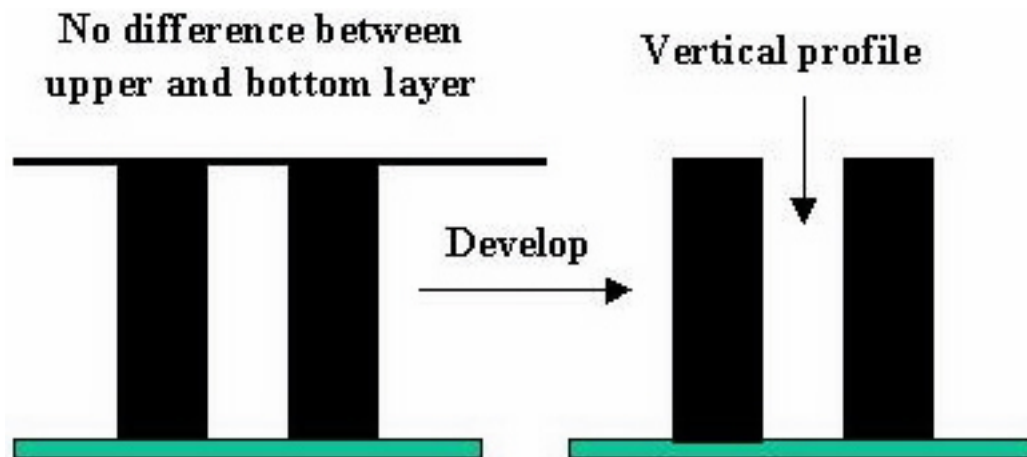
11 ,

1 100 mJ/cm² .

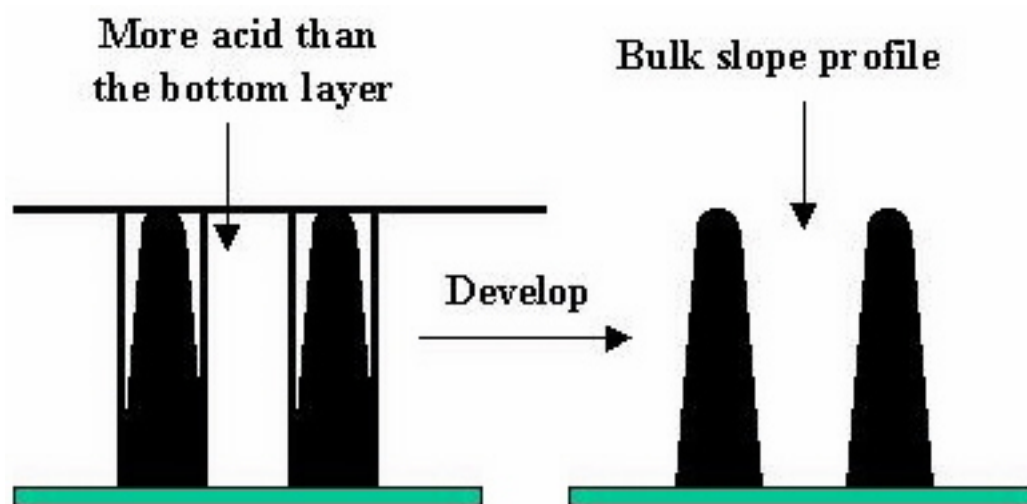
16.

11 .

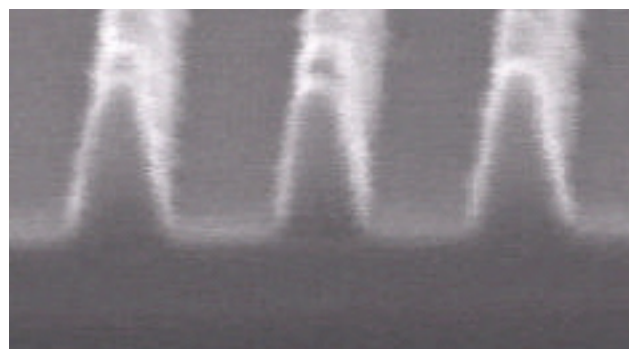
1a



1b



2



3

4:28 19-FEB-00

HPT1#1 23_0.15

83134 15.0kV X50.0K 600nm

4

