

(54) ()

(Mn) (I) (II) , 1,000 50,000 ,
 (Mw) Mw/Mn 1.00 1.40 , (II)
 (I) 가 1/9 9/1 ()
 :
 (,
 R₁ R₂ ;
 R₃ C₇₋₁₅ ;
 R₄ , C₁₋₁₂ , C₃₋₆ , C₁₋₈
 /).
 (가) ()

(Mn) () (Mw) Mw/Mn 1.00 1.40, 1,000 50,000,
 () (가
) ()
 ArF .

LSI 가 , 가
 가 0.15 μm 1 Gb DRAM ArF 0.25 μm 256 Mb DRAM KrF
 가 ArF
 가 ()
 () () 가
 () / () 가 2 4 ,
 가

No. 4 - 39665, 5 - 265212 J. Photopolym. Sci. Technol. 5 [3], 439 (1992)

()

, 가

가

, Mw/Mn 2 5 .3

가

(가) 가 .

가 ()

()

, 가

()

()

가

(I) (II)

()

(Mw) Mw/Mn 1.00 1.40 , 1,000 50,000, (Mn)
 1/9 9/1 : (I)

(,

R₁ R₂ ;

R₃ C₇₋₁₅ ;

R₄ / , C₁₋₁₂ , C₃₋₆ , C₁₋₈ .

, , () :

(I) (II')

()

1.00 1.40 , 1,000 50,000, (Mn) (Mw) Mw/Mn
 (II') (I) 1/9 9/1
):

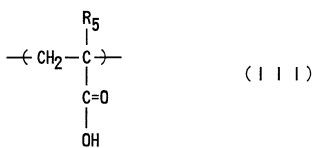
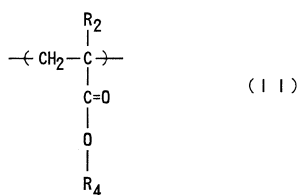
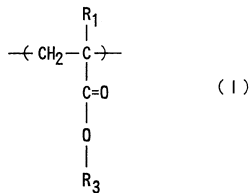
(,

R₁ R₂ ;

R₃ C₇₋₁₅ ,

R₄ C₁₋₁₂ , C₃₋₆ C₁₋₈ /
).

(I), (II) (III) () :
 (Mw/Mn 1.00 1.40 , 1,000 50,000, (Mn) (Mw)
 1/9 9/1):



(,

R₁, R₂ R₅ ;

R₃ C₇₋₁₅ ,

R₄ / , C₁₋₁₂ , C₃₋₆ C₁₋₈).

()

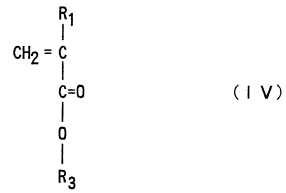
()

:

()

, , (IV) ()
 (V) ()

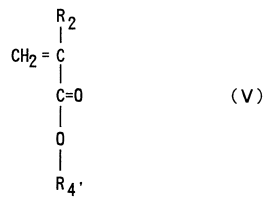
:



(,

R₁ ;

R₃ C₇₋₁₅);



(,

R₂ ;

R_{4'} C₁₋₁₂ , C₃₋₆ C₁₋₈ /)

()

:

()

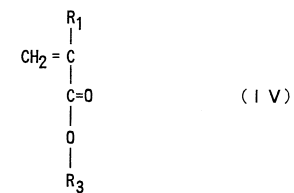
(IV) ()

(V) ()

R_{4'}

가

()



(,

R₁ ;

1 - t -

2

(, 40 mmol s - 1000 g THF 가 . 0.4 mol 1 -
 1), 0.8 mol 0.8 mol t -
 30 가 , 1 , - 60
 GC , , 5 가 .
 , , 60
 99.8 % .

GPC , Mn = 7,100 Mw/Mn = 1.20 . ¹³ C - NMR
 , m/n = 10.0/40.0 .

1 - , t -

3

(, 10 mmol s - 1000 g THF 가 . 0.5 mol
) 30 가 , , - 40
 1 GC , , 0.2 mol t - 0.
 2 mol 가 . 1 .
 GC , 30 가 . 1 .
 , 5 가 . ,
 , 60 . 99.3 %
 . GPC , Mn = 17,000 Mw/Mn = 1.18 . ¹³ C - NMR
 , m/n = 49.8/40.0 .

, t -

4

(, 50 mmol s - 1000 g THF 가 . 0.5 mol
) , 0.5 mol t - 0.3 mol
 1 GC , , - 60
 가 . ,
 , 5 가 . ,
 , 60 . 99.3 % .

GPC , Mn = 4,680 Mw/Mn = 1.10 . ¹³ C - NMR
 , m/n = 10.2/15.9 .

5

30, 40 mmol s- 1000 g THF 가 . 0.5 mol t- GC
 가 , , - 60 1 .
 , 0.3 mol 1- (1-
), 0.3 mol 0.2 mol 3- 30
 가 1 GC .

5 60 . 99.8 %

GPC , Mn = 5,280 Mw/Mn = 1.18 . ¹³ C - NMR
 , m/n = 7.6/25.5 .

3- t- , t-

6

가 , 10 mmol n- 1000 g THF 가 . 0.5 mol 2- -2- 30
 (2- -2- -60 30 . 1 가 . GC . , 0.
 5 mol t- 30 가 1 GC . GC .

5 60 . 99.8 %

GPC , Mn = 19,170 Mw/Mn = 1.13 . ¹³ C - NMR
 , m/n = 51.0/50.8 .

2- -2- t-

7

가 , 40 mmol n- 42 mmol 1,1- 1000 g THF
 (1- -40 , 1,1- . 0.5 mol 1- , 0.3 mol
 1 . 0.3 mol t- , 0.3 mol
 GC 30 가 .

가
 , 5 60
 98.2 %

GPC , Mn = 5,900 Mw/Mn = 1.25 . ¹³ C - NMR
 , m/n = 12.5/22.5

1 - , t -

8

, 20 mmol s - 가 . 0.5 mol 2 - - 2 - , 0.2 mol)
 t - (1 -
 0.3 mol t - 30 가 , - 60
 . 1 GC

가
 , 5 60
 99.0 %

GPC , Mn = 10,100 Mw/Mn = 1.20 . ¹³ C - NMR
 , m/n = 25.1/25.0

2 - - 2 - , t -
 t -

9

1 가 10 g / (2/1) 20 % 1 g
 , 1 65
 , 5 70 9.7 g . GPC
 , Mn = 9,020 Mw/Mn = 1.15 . ¹³ C - NMR , m/n/p = 25.1/21.8/3.6

, 1 - , t -

10

1 3 10 g THF 20 % 0.2 g p - 가
 40 , 가 ¹ H - NMR
 , 5 60 9.7 g

GPC , Mn = 15,880 Mw/Mn = 1.18 . ¹³ C - NMR , m/n
 /p = 50.0/32.1/7.7 . 가 27.1

, t -

11

8 10 g THF 10 % 2 N 가 3
 . t- 가 ¹H - NMR .
 . GPC , , 5 60 8.7 g
 , m/n/p = 25.1/15.0/10.0 . Mn = 8,860 Mw/Mn = 1.20 . ¹³C - NMR
 , 2- - 2- , t-

1

100 g 11 mmol (, AIBN), 0.1 mol
 1- 0.1 mol t- 가 , 5 65
 . 5 mmol AIBN 가 . 80 , 3 9
 5 1 . , , 5 60
 . 91.3 % .

GPC , Mn = 8,800, Mw/Mn = 2.8, .

2

100 g 5 mmol AIBN, 0.1 mol 1- , 0.1 mol
 0.1 mol t- 가 , 1 .
 / 2 , . , 5
 60 . 82.7 % .

GPC , Mn = 20,100, Mw/Mn = 1.6, .

3

100 g 12 mmol AIBN 0.2 mol 가 , 5
 65 . 0.1 mol t- 가 5 . 4
 mmol AIBN 가 . 80 3 95 , 1 .
 () / . ,

GPC , Mw/Mn = 4.8, . GPC
¹H - NMR . 가 .

4

100 g 15 mmol (, AIBN), 0.1 mol
 1 - , 0.1 mol t - 0.1 mol 가
 , 5 65 . 0.3 mmol AIBN 가 . 80 , 3
 95 1 .
 , 5 60
 92.3 % .

GPC , Mn = 9,200, Mw/Mn = 3.1, .

5

100 g 5 mmol AIBN, 0.1 mol 1 - , 0.1 mol , 0.
 1 mol t - 0.1 mol 가 , 1 , 0.
 , 5 60 / 2 , , , 81.5 %

GPC , Mn = 23,100, Mw/Mn = 1.7, (shoulder)

가

ArF () , , , ,
 , 가 ()

(57)

1.

(I)	(II)								
Mn)		(Mw)	Mw/Mn	1.00	1.40	1,000	50,000	,	(
I)		가 1/9	9/1		()	(II)			(
								:	

(,

R₁ R₂ ;

R₃ C₇₋₁₅ ;

R₄ , C₁₋₁₂ , C₃₋₆ , C₁₋₈).

2.

1, (I) (II')
 (Mn) (Mw) Mw/Mn 1.00 1.40 , 1,000 50,000 ,
 (I) 가 1/9 9/1 ()

(,

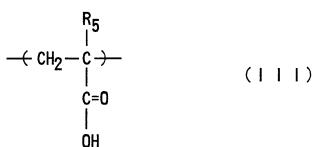
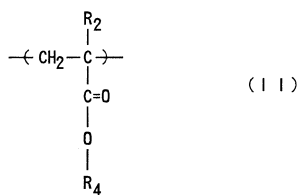
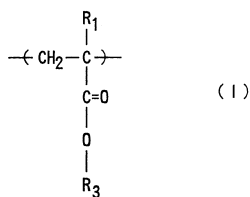
R₁ R₂ ;

R₃ C₇₋₁₅ ,

R₄ C₁₋₁₂ , C₃₋₆ C₁₋₈).

3.

1, (I), (II) (III)
 00 (III) , (Mn) (I) (Mw) Mw/Mn 1.00 1.40 , 1,000 50,0
 () 가 1/9 9/1 ()



(,

R₁, R₂ R₅ ;

R₃ C₇₋₁₅

R₄ , C₁₋₁₂

, C₃₋₆

C₁₋₈

).

4.

1 3

, 가

()

5.

1 3

, 가

()

6.

1 3

, 가

()

7.

2

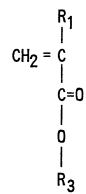
()

가

(IV) (V)

()

:



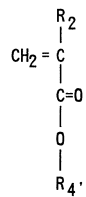
(IV)

(,

R₁ ;

R₃ C₇₋₁₅

);



(V)

(,

R₂ ;

R_{4'} C₁₋₁₂ , C₃₋₆ C₁₋₈).

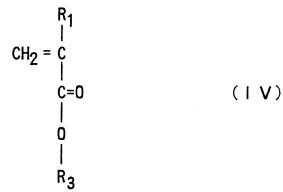
8.

3 가 ()

, (IV) ()

) 가 () ,

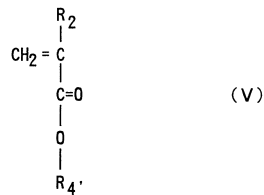
R_{4'} (V) () :



(,

R₁ ;

R₃ C₇₋₁₅);



(,

R₂ ;

R_{4'} C₁₋₁₂ , C₃₋₆ , C₁₋₈).