

(19)
(12)

(KR)
(A)

(51) 。 Int. Cl.⁷
C08G 73/00

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(43)

10-2004-0027211
2004 04 01

(21)

10-2002-0058990

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2002 09 27

(71)

134

(72)

101 1801

17-496

5 401

(74)

:

(54)

'

40 200 , 500 5000psi 1 48

' , ,

.

,

,

.

, , , , ,

1 ,
2 (SEM) .

,
 .
 / ,
 ,
 가
 .
 ,
 ,
 4-33394 4-328126 ,
 ,
 100 μ m ,
 ,
 5,888,434 , 6,103,255 4,142,956

가
 (Thermally Induced Phase Separation, TIPS)
 ,
 가 (phase)
 가 ,
 가
 가
 가

, 5,965,202 , 6,187,427 [Appl. phys. Lett.(68, 1930, 1996), Polymer(34, 471
7, 1993)]
 ,
 가
 ,
 ,
 가

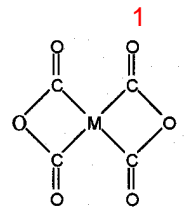
가 .

(spin coater) 가 .

가 , , 40 200 , 500 5000psi 1 48 , , .

40 200 , 500 5000psi 1 48 , , .

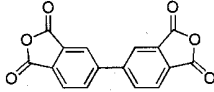
(dianhydride) 1 .



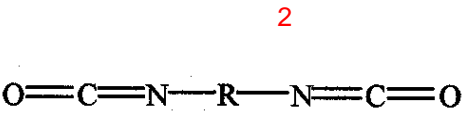
M 4가(tetravalent) , O, SO₂ ,
1 (6FDA), (PMDA), (BPD
A), (ODPA), (DSDA) 가 (BTDA)
(6FDA)가 .
1 .

[1]

6FDA		

PMDA		
BPDA		
BTDA		
DSDA		
ODPA	(ODPA)	

가 (TDI) (MDI), 2, (HDI), 가 (IPDI),



, R , , , N- (THF), (NMP), N,N'- (m-cresol), (TEA), (DMAc), (DMF) (DMAc)가 (DMSO), (BA) 가

[2]

	6FDA	
	PMDA	
	BPDA	
	BTDA	
	DSDA	

< 1>

)

0
] 0.01 (MDI)[,] 0.01 (6FDA)[,
(DMAc)[,] 25ml 3 4
100rpm
40 , 24

)

)

24 , 40 , 2500psi

가

1
4

hi ,) 5 6 μ m , 195 (SEM, S-4200, Hitac
3 7 210 μ m

< 2>

1 ,)
PMDA[,] , DMF [,]
3

< 3>

1 ,) (MDI)[,]
HDI[,] , (DMAc) NMP[,]
3

< 4>

1 ,) (6FD
A) BTDA[,] , (MDI)[,] HDI[,
] , (DMAc) NMP[,]
3

< 5>

1 ,) (6FD
A) PMDA[,] , (MDI)[,] IPDI[,
] , (DMAc) DMF[,]
3

< 6>

A) 1 BTDA[,] , (DMAc) NMP [,] (MDI)[,] IPDI[,] (6FD
3 .

< 7>

TDI[1 ,] (MDI)[,]
3 .

< 8>

A) 1 BTDA[,] , (DMAc) NMP[,] (MDI)[,] TDI[,] (6FD
3 .

[3]

				(μm)	(μm)
1	6FDA	MDI	DMAc	5 6	195 210
2	PMDA	MDI	DMF	5 6	190 200
3	6FDA	HDI	DMAc	4 5	200 207
4	BTDA	HDI	NMP	5 6	187 205
5	PMDA	IPDI	DMF	5 7	192 215
6	BTDA	IPDI	NMP	4 6	188 204
7	6FDA	TDI	DMAc	5 6	192 207
8	BTDA	TDI	NMP	5 6	195 210

3 , 200 μm , 5
6 μm .

< 9>

1) (MDI)
(DMAc) 3 1 .
4.8 5.5 μm , 190 206 μm .
4 .

< 10>

1)
(DMAc) 3 (6FDA) 2 (MDI)
4 .

< 11>

1)
(DMAc) 3 (6FDA) 4 (MDI)
4 .

< 12>

1)
(DMAc) 3 (6FDA) 5 (MDI)
4 .

[4]

	()	(μm)	(μm)
9	1	4.8 5.5	190 206
10	2	5.2 6.7	184 212
1	3	5.0 6.0	195 210
11	4	4.9 6.2	190 213
12	5	5.2 6.4	192 218

4 , 1
.
< 13>
1) 100rpm 500rpm
.
5.2 6.5μm , 125 145μm .
5 .

< 14>

1) 100rpm 1000rpm
.
5 .

< 15>

1) 100rpm 2000rpm
5 .

[5]

	(rpm)	(μm)	(μm)
1	100	5.0 6.0	195 210
13	500	5.2 6.5	125 245
14	1000	5.3 6.2	10 14
15	2000	4.8 5.2	1.0 1.5

5 , 가
가 .

< 16>
1) 40 24 40 5
6.5 7.2μm , 214 220μm .

6 .

< 17>
1) 40 24 100 5
6 .

< 18>
1) 40 24 40 15
6 .

< 19>
1) 40 24 100 15
6 .

< 20>

1 40 24) 100 24

6

[6]

	()	()	(μm)	(μm)
1	40	24	5.0 6.0	195 210
16	40	5	5.0 6.0	200 213
17	100	5	6.5 7.2	214 200
18	40	15	5.3 6.2	197 209
19	100	15	7.8 8.6	193 214
20	100	24	8.4 9.5	202 223

6. , 가 가 .

< 21>

4 1 80 , 1500psi 5 40 , 2500psi 2
5.6 6.2μm , 198 212μm .

7 .

< 22 >

4 1 80 , 2500psi 5 40 , 2500psi 2

7.

< 23 >

4 1 80 , 3500psi 5 40 , 2500psi 2

7.

< 24>

4 1 140 , 1500psi 24 40 , 2500psi 2

7.

< 25>

1
4 140 , 3500psi 24 40 , 2500psi 2
7 .

[7]

	()	(psi)	(hr)	(μ m)	(μ m)
1	140	2500	24	5.0 6.0	195 210
21	80	1500	5	5.6 6.2	198 212
22	80	2500	5	4.7 5.2	192 215
23	80	3500	5	0.4 1.2	204 217
24	140	1500	24	6.6 7.4	202 214
25	140	3500	24	1.5 2.2	200 215

7 , 가 가

,

가

가

(57)

1.

40 200 , 500 5000psi 1 48

2.

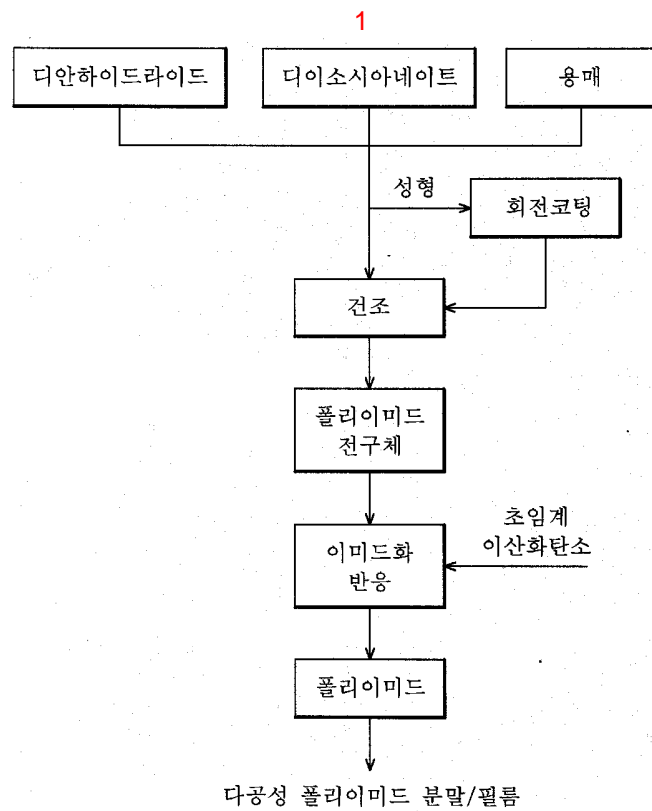
1 ,

3.

1 2 ,
가 (PMDA), (BTDA) (BPDA), (6FDA), (ODPA), (DSDA)

4.
1 2 ,
가 (IPDI), (TDI) (MDI), (HDI),

5.
1 2 ,
가 N- (THF), - (NMP), N,N'- (m-cresol), (DMAc), (DMF) (DMSO), (BA)



2

