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10-2003-0079310
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(73)

575

(72)

1 279

307

102 705

107 606

1

101 1710

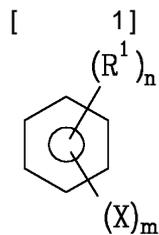
29

(74)

:

(54)

가 , 가 a) 1 ; b) , () () (-OH) 가 () (-OH) () .



(R¹ , 1 10 , 1 10 6 10)
 , , , X , m n 1 6 m+n 6 .

2

1
2
3a 3b
4a 4c

[]

[]

가 3.7V, 4V

3C

가

가

(redox shuttle) 가
2,4-

(2,4-difluoroanisole) 가

5,709,968

가
5,879,834

(biphenyl), 3-

(3-chlorothiophene),
가

가

(shut-down)

가

가

(swelling)

가

가

가

가 가

가

(current breaker)

가

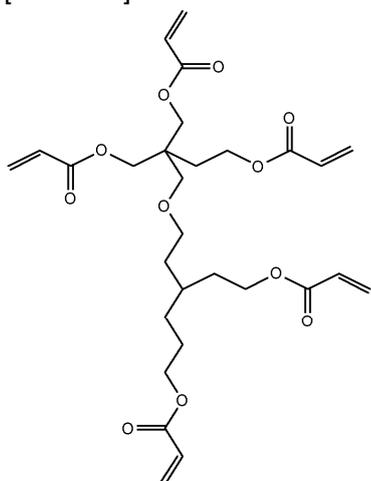
() , ()
 가 () () ,
 () () 가 ()
 가 () , (trimethylol), (triethylol),
 (tripropylol) (trialkylol) , (glycerol) , (pentaerythr-
 itol), (dipentaerythritol) (erythritol) .
 () () () () () ()
 () () () () () ()
 () () () 가 ,
 () 1 () 1 0.1 10 .
 () () ()
 1 20 () , 5 20 , 1 20 ,
 1 20 가 1 : 0 1 : 10
 () 가 1 : 0 () 가 1 : 10 가
 () () 가
 , (pyridine),
 , 1 , 0.0001 0.01 가 .
 () , () 가 (lactone) 가
 가 .
 , 가 ()
 () ()
 0.01 10 () 1000 mol% , 1
 ,
 가 1 0.001 0.5 가 .
 , 가 1
 1 50 , 2 10 , 3 가 ()
 () () 가
 () ()
 C(=O)(CH₂)_nOC(=O)C(CH₃)=CH₂ (n 1 20 , -OC(=O)(CH₂)_nOC(=O)CH=CH₂ -O
 , 1 6)
 , 1 20 , 5 20 ,
 , Ar , -OC(=O)(CH₂)_nO(CH₂)_nCH₃ (n 1 20 , -OC(=O)Ar(
), -O(C=O)(CH₂)_nOC(=O)(CH₂)_nCH₃ (n 1 20), -(C=O)CH=CH₂ .
 () 1 : 0.01 1 : 100 , 1
 : 0.5 1 : 3 .

100,000 () () (, 100) () 10,000

300

[5] () ()

5



() () 가 0.1 % 가 가 5 0.1 5 %

() () ()

40 110

가 UV

가

40

() -C(=O)-O-O-C(=O)- ,

()

6

CO₂ 가

2,2'-

가

(AIBN)
(N₂)

(m-toluoyl peroxide), t- 6 40 (lauroyl) -2- , t-

(benzoyl peroxide), m-

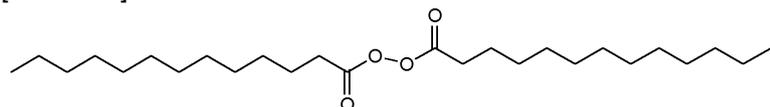
, t-

-(4-t-

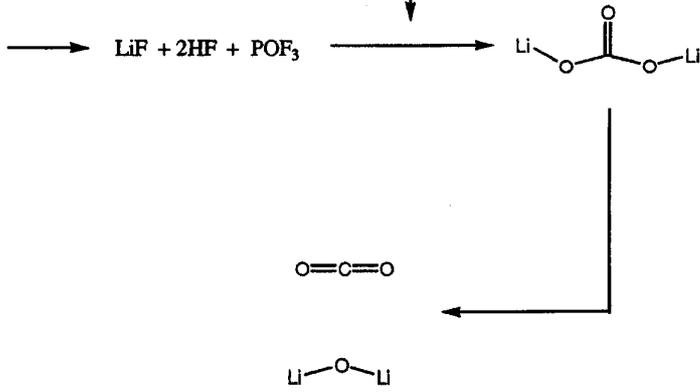
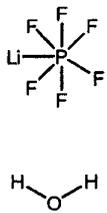
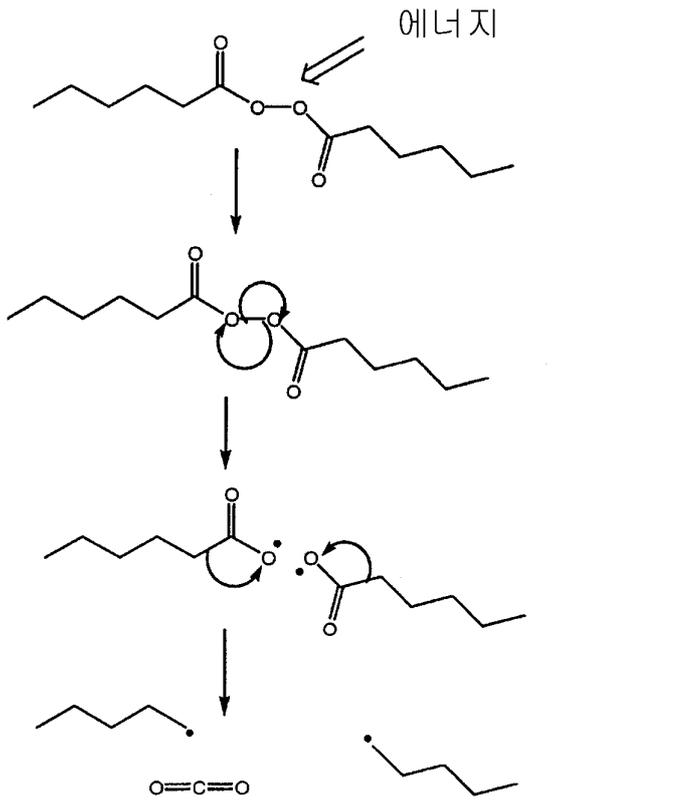
3,3,5-
가

6

[6]



[1] 1



1 가 가 가 , 가 가 , 가 가
 (Li₂CO₃) 가 가 가 , 가 가
 가 93% 가 가 가
 () () 100 0.3 5
 0.3 , 5
 가 가 , 가

LiPF₆, LiBF₄, LiSbF₆, LiAsF₆, LiClO₄, LiCF₃SO₃, Li(CF₃SO₂)₂N, LiC₄F₉SO₃, LiAlO₄, LiAlCl₄, LiN(C_xF_{2x+1}SO₂)(C_yF_{2y+1}SO₂), LiCl, LiI

가 가

(1) (dipentaerythritol) 1 , - 2
 0.01 % 가 50 가
 $\text{-OC(=O)(CH}_2)_3\text{CH}_3$ (-OH) $\text{-OC(=O)(CH}_2)_5\text{OC(=O)CH=CH}_2$, 2 (-OH)
 (EC): (EMC): (DEC): (FB) 30:55:5:10
 1.15M LiPF₆ 가 , 가 3- %
 LiCoO₂ (: 10 μm), (P) (PVDF) 94:3:3 N- ()
 NMP) 가
 4.9cm 가 147 μm (MCF; Petoca) ,
 (PVDF) 89.8:0.2:10 NMP
 5.1cm 가 178 μm
 (PE) (: 5.35cm, : 18 μm) 2.

9g
 (2)
 1 0.03 % 가 가

(3)
 (EC): (EMC): (DEC): (FB) 30:55:5:10
 1.15M LiPF₆ 가 , 가 5 % 3-
 가 1

(4)
 (EC): (EMC): (DEC): (FB) 30:55:5:10
 1.15M LiPF₆ 가 , 가 3- 5 %
 0.5 % 가 1

(5)
 2 70 2 가
 2

(1)
 (EC): (EMC): (DEC): (FB) 30:55:5:10
 1.15M LiPF₆ 가 가 1

(2)
 (EC): (EMC): (DEC): (FB) 30:55:5:10
 1.15M LiPF₆ 가 가 5 % 가
 1

(3)
 (EC): (EMC): (DEC): (FB) 30:55:5:10
 1.15M LiPF₆ 가 가 5 % 가
 1

(4)
 1
 (5)

1 1 2,2'- 0.03 % 가 가
 2C 7 (formation)
 1 4 1 3 1

[1]

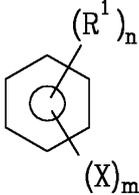
	(mm)			
			90 4	60 1
1	5.99	6.01	6.10	6.12
2	6.01	6.02	6.07	6.10
3	6.01	6.05	6.30	6.32
4	6.00	6.00	6.10	6.12
1	6.02	6.52	6.70	6.90
2	6.01	6.53	6.95	7.00
3	6.00	6.75	7.10	7.20

2C 가 (CC-CV) 1C 4.2V
 CC 1C 2.75V 400 가 1, 3, 4 2, 3
 1 4 1 3 2 2 2 1 4
 1 1 3 1 3 10 4.2V가
 가 , 4.2V 900mA(1C) 2.5 2 /
 900mA(1C)

[2]

	(mAh)	2C (mAh)	*	(%)
1	960	910	10L0	85
2	965	905	10L0	84
3	962	915	10L0	82
4	970	920	10L0	85
1	958	910	5L4, 5L5	82
2	930	890	3L3, 5L4, 2L5	81
3	920	870	5L3, 3L4, 2L2	70

) * : L
 가 :
 (L0: 2, L1: , L2: , L2: , L3: , L4: , L5:)
 가 2C ,
 1 3 1 5 , 10 mV/s
 2.75 5.0V 3 2
 3a 3b
 4a, 4b 4c 3, 1, 2 1C 12V 3
 4a 15 가

5. 1, 1, 0.1, 50, %
6. 1, 0.01, 10, %
7. 1, () () 0.1, 5
%
8. 1, () (trialkylol), (glylcerol), (erythritol)
9. 1, () -OC(=O)(CH₂)_nOC(=O)CH=CH₂ -OC(=O)(CH₂)_nO
C(=O)C(CH₃)=CH₂ (n = 1, 20)
10. 1, 1, 20, 1, 20, 5, 20
11. 10, -OC(=O)(CH₂)₃CH₃, -OC(=O)Ar(, Ar), -OC(=O)(CH₂)_nO(CH₂)_nCH₃ (n = 1, 20), -O(C=O)(CH₂)_nOC(=O)(CH₂)_nCH₃ (n = 1, 20), -(C=O)CH=CH₂
12. 1, () 1: 0.01, 1: 100
13. 1, 가
14. 13, () () 100, 0.3, 5
15. 13, (m-toluoyl peroxide), t-2-, t-, m-, t-, -(4-t-3,3,5-
16. 가 a) ; ; 가 1, b) () () (-OH) 가 () (-OH) () (-OH)
- [1]  (R¹)_n (X)_m
- (, X R¹ , m n 1 10 , 1 10 6 10)
17. 16, () () 100, 0.3, 5
- 18.

16 (m-toluoyl peroxide), t- -2- , t- , m- , t-) - (4-t- 3,3,5-

19.

LiPF₆, LiBF₄, LiSbF₆, LiAsF₆, LiClO₄, LiCF₃SO₃, Li(CF₃SO₂)₂, LiCl, LiI, LiAlO₄, LiAlCl₄, LiN(C_xF_{2x+1}SO₂)(C_yF_{2y+1}SO₂)(, x y),

20.

19 0.7 2.0M

21.

1 , , ,

22.

(MPC), (PC) (DMC), (EPC), (DEC), (MEC) (DP (EC)

23.

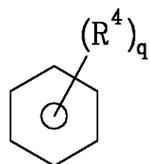
21 (cyclic) (chain)

24.

1 ,

25.

24 [7] 7



(R⁴ 1 10 q 0 6 .)

26.

24 , , , , ,

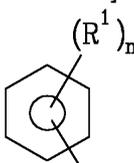
27.

24 1:1 30:1

28.

; ; 1 ,

[1]



(R¹ 1 10 , X , m n 1 6 m+n 6 .)

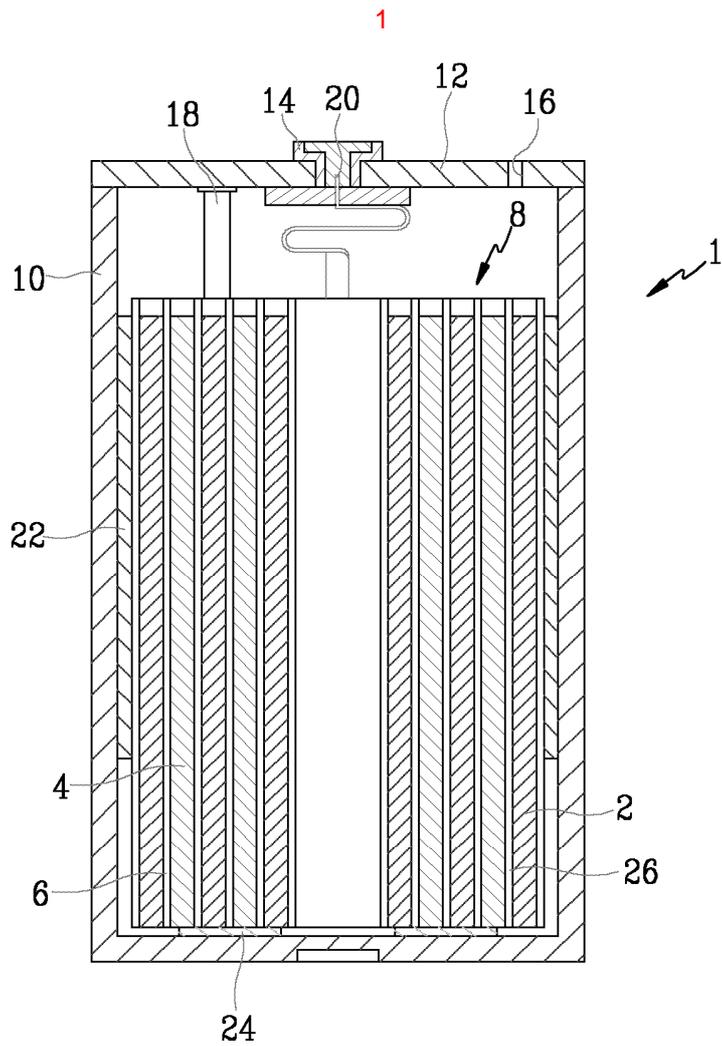
29.

28 , , , , ,

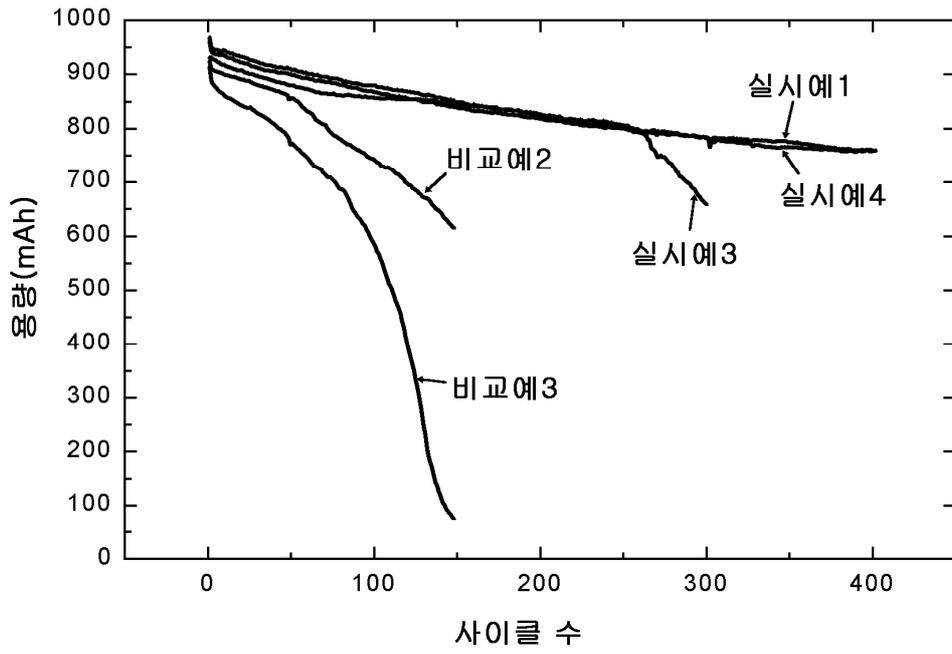
30.

a) () () ; b) () () (-OH) 가 () () (-OH) ; c) () ()

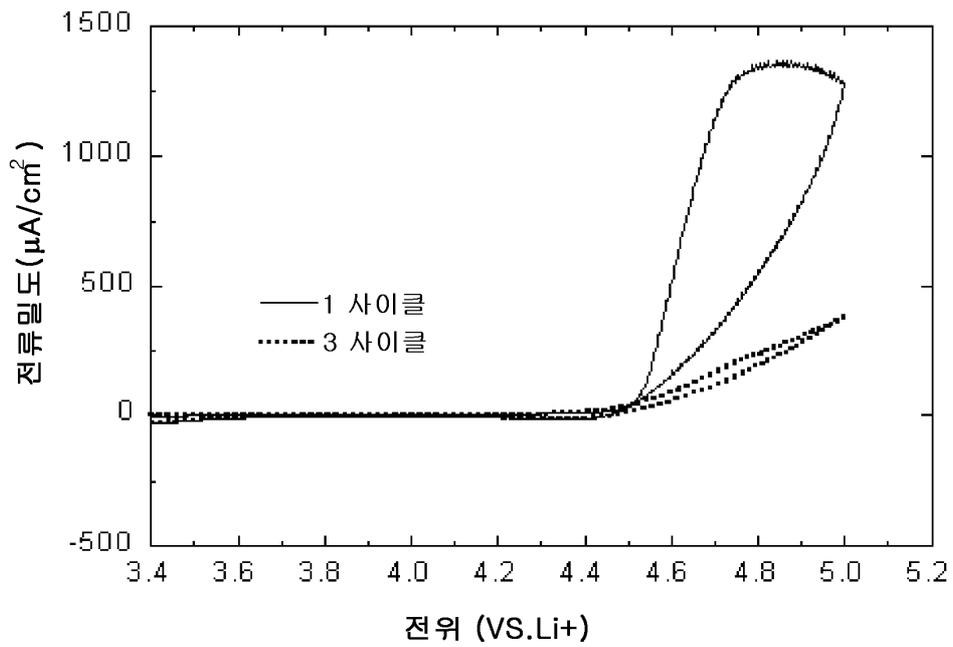
- 31. 30 , UV () () 가
- 32. 30 , 가
- 33. 30 , 40 110
- 34. 1 29
- 35. 30 33



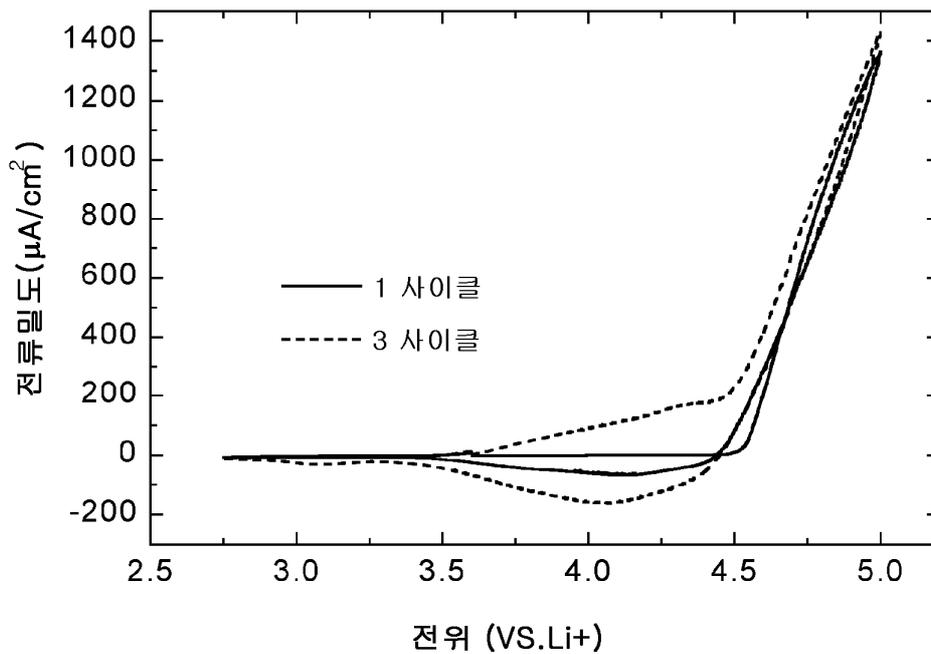
2



3a



3b



4a

