

(19)
(12)

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(24)

2004 12 23
10-0463189
2004 12 14

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(65)
(43)

10-2004-0006781
2004 01 24

(73)

575

(72)

147 201

(74)

:

(54)

가 가 ; b) a) 가 가 P=O
가 ; c) ; d) , ,

1

, , , ,

1

[]

[]

가 3.7V, 4V

3C

가

가

(redox shuttle) 가

가

5,709,968

2,4-

(2,4-difluoroanisole)

가

5,879,834

(biphenyl), 3-

(3-chlorothiophene),

가

가

가

(shut-down)

가

가

가 가

(swelling)

가

가

가

가

가

(current breaker)

가

100

200

(1999-10904).

가

1

, a)

가

; c)

; b)

; d)

가

가

P=O

가

2

P=O

가

14)

(8)

(1) (2)

(4)

1

(2)

(4)

(6)

(12)

가

(

(2)

(4)

(12)

(18)

(20)

(safety vent; 16)가 (22, 24)

(26)

(26)

(6)

a)

가

가

가

; b

; d)

,

,

P=O

가

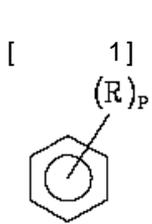
가

; c)

가 / 가 (,
), 가
 $\text{LiMn}_2\text{O}_4, \text{LiCoO}_2, \text{LiNiO}_2, \text{LiFeO}_2, \text{V}_2\text{O}_5$, TiS, MoS

가 / 가
 / / 3 / / 2
 / / 3

P=O 가
 (DMC), (DEC), (DPC), (MPC),
 (EPC), (MEC), (EC), (PC),
 (BC) , n- , n- , n-
 (cyclic) (chain)
 1:1 1:9



(R 1 10 p 0 6 .)

가 1:1 30:1

$\text{LiPF}_6, \text{LiBF}_4, \text{LiSbF}_6, \text{LiAsF}_6, \text{LiClO}_4, \text{LiCF}_3\text{SO}_3, \text{Li}(\text{CF}_3\text{SO}_2)_2\text{N}, \text{LiC}_4\text{F}_9\text{SO}_3, \text{LiAlO}_4, \text{LiAlCl}_4, \text{LiGaCl}_4, \text{LiN}(\text{C}_x\text{F}_{2x+1}\text{SO}_2)(\text{C}_y\text{F}_{2y+1}\text{SO}_2)(\text{C}_z\text{F}_{2z+1}\text{SO}_2)$,
 $\text{LiNO}_3, \text{LiCl}, \text{LiI}$
 0.6 2.0M , 0.7 1.6M
 가 0.6M 가 , 2.0M

P=O 가 P=O
 가 P=O 가 가
 가 (silyl), (siloxo) 2 20

(ethylene glycol methacrylate phosphate; $\text{CH}_2=\text{C}(\text{CH}_3)\text{CO}_2\text{CH}_2\text{CH}_2\text{OP}(\text{O})(\text{OH})_2$),
 (allyl diethylphosphonoacetate; $(\text{C}_2\text{H}_5\text{O})_2\text{P}(\text{O})\text{CH}_2\text{CO}_2\text{CH}_2\text{CH}=\text{CH}_2$),
 (triethyl 3-methyl-4-phosphonocrotonate; $(\text{C}_2\text{H}_5\text{O})_2\text{P}(\text{O})\text{CH}_2\text{C}(\text{CH}_3)=\text{CHCO}_2\text{C}_2\text{H}_5$),
 (allyl tetraisopropylphosphorodiamidite; $[(\text{CH}_3)_2\text{CH}]_2\text{N}]_2\text{POCH}_2\text{CH}=\text{CH}_2$)

P=O 가 가 0.005 % 가 5 % , 5 %

P=O 가 가

g) (stacking) (windin)

2 ; ;

(20)
P=O 가 40 90 , 40 80 P=O 가

rt- (AIBN), (BPO), (dilauroyl peroxide), (4-tert-
(t-amyl peroxy 2-ethyl hexanoate) 가 (Di(4-tert-butylcyclohexyl) peroxydicarbonate), t- 2-

100 0.1 10 , 10 0.1 가

(1)
(EC): 1.3M LiPF₆ (EMC): 가 (PC): 0.5 (FB) 30:55:5:10
100 LiCoO₂ (: 10 μ m), (P) 1 가 (PVDF) 94:3:3 N- (NMP) 가
4.9cm 가 113 μ m (PVDF) 89.8:0.2:10 NMP (MCF:petoca),
5.1cm 가 117 μ m (PE) (: 5.3cm, : 18 μ m) 5.6g 24 P=O 가

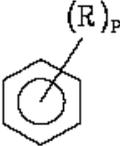
(2)
(EC): 1.3M LiPF₆ (EMC): 가 (PC): 0.5 (FB) 30:55:5:10
1 2.7 가 (PE) (: 5.3cm, : 18 μ m) 2.2 g P=O
75 4 가

(1)
(EC): 1.3M LiPF₆ (EMC): 가 (PC): (FB) 30:55:5:10 1
V 4.2 V 0.2C 가 1, 2 1 . 0.5C 3 0
90 4 48 (formation) 가

[1]

가	1	2	1
(mm)	3.84	3.83	3.83
4	4.78	4.27	5.11
48	7.81	6.90	9.87

(57)

1.
 - a) 가 가 ;
 - b) 가 가 ;
 - c) ;
 - d) , , P=O 가 (, P=O 가)
2. , , ,
3.
 - 2 , (MPC), (DMC), (DEC), (DPC
 -), (PC) (EPC), (MEC), (EC)
 - , (BC)
4.
 - 2 , (cyclic) (chain)
5.
 - 1 ,
6.
 - 5 , 1
 - [1]
 - (R)_p
 - 
 - (R 1 10 p 0 6 .)
7.
 - 6 , , , , ,
8.
 - 5 , 1:1 30:1
9.
 - 1 , LiPF₆, LiBF₄, LiSbF₆, LiAsF₆, LiClO₄, LiCF₃SO₃,
 - Li(CF₃SO₂)₂N, LiC₄F₉SO₃, LiAlO₄, LiAlCl₄, LiGaCl₄, LiN(C_xF_{2x+1}SO₂)(C_yF_{2y+1}SO₂)
 - (, x y), LiNO₃, LiCl, LiI
10.
 - 9 , 0.6 2.0M
- 11.
12.
 - 1 , (ethylene glycol methacryl
 - ate phosphate; CH₂=C(CH₃)CO₂CH₂CH₂OP(O)(OH)₂, (allyl diethyl
 - phosphonoacetate; (C₂H₅O)₂P(O)CH₂CO₂CH₂CH=CH₂), 3- -4-

(triethyl 3-methyl-4-phosphonocrotonate; $(C_2H_5O)_2P(O)CH_2C(CH_3)=CHCO_2C_2H_5$),
 (allyl tetraisopropylphosphorodiamidite; $[(CH_3)_2CH]_2N_2POCH_2$
 $CH=CH_2$)

13. 1, P=O 가 0.005 5 %

14. ; ; ;

P=O 가

15. 14 ,

