

(19)  
(12)

(KR)  
(B1)

(51) Int. Cl.<sup>7</sup>  
H01M 10/40

(45)  
(11)  
(24)

2004 12 29  
10-0462784  
2004 12 10

(21) 10-2002-0047510  
(22) 2002 08 12

(65)  
(43)

10-2004-0015420  
2004 02 19

(73)

575

(72)

215

102 705

880

6 607 901

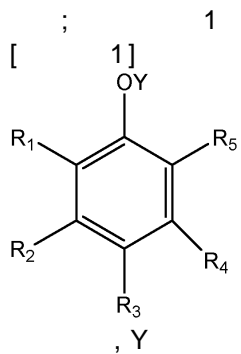
1 5

524 605

(74)

:

(54)

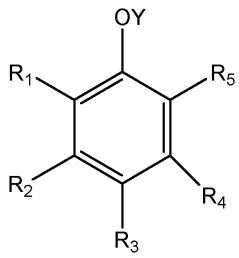


1 20

, R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>  
가

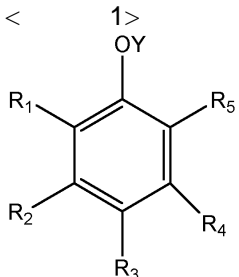
1  
 2 1 1 , 2  
 3 2 1 2  
 < >  
 1... 2 2...  
 4... 6...  
 8... 10...  
 12... 14... 가  
 16... 18...  
 20... 22, 24...

, 가  
 ,  
 / 가 ,  
 , 가  
 , 가  
 가 가  
 5,709,968 p- 5,8  
 79,834 가 , 3- , 가  
 , 가 가 가  
 , 가 가  
 가 가  
 가 가  
 가  
 ,  
 ;  
 < 1 1 >

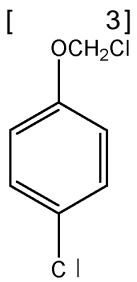
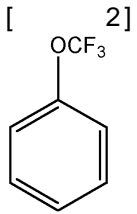


$R_1, R_2, R_3, R_4, R_5$   
 $Y$   
 $-CF_3, -CH_2Cl, -CH_2F, -C_2F_5, -CCl_3, -C_2Cl_5$   
 $Y -CH_2Cl$   
 $100, 0.1, 50$   
 $(-OH)$   
 $-OC(=O)(CH_2)_n OC(=O)CH=CH_2$   
 $-OC(=O)(CH_2)_n OC(=O)C(CH_3)_2$   
 $-OC(=O)(CH_2)_3 CH_3, -OC(=O)Ar$   
 $-O(C=O)(CH_2)_n OC(=O)(CH_2)_n CH_3$   
 $-(C=O)CH=CH_2$

가 1: 0.01 1: 100 100, 0.3  
 ( )  
 (benzoyl peroxide), m- (m-yoluoyl peroxide), t-  
 -2-, t- (4-t- 3,3,5-  
 (trimethylol), (triethylol), (tripropylol)  
 (glycerol); (pentaerythritol), (di-  
 pentaerythritol)  
 100 0.1 5 ; 가



$R_1, R_2, R_3, R_4, R_5$   
 $Y$   
 $-CF_3, -C_2F_5, -CH_2Cl, -CH_2F, -CCl_3, -C_2Cl_5$   
 $Y -CH_2Cl$   
 2 3



1 0.1 100 , 가 가 0.1 10 , 10  
 1 가 , (2.75-4.2V)  
 가 ,  
 ( ) (shuntting) 가 , 1  
 가 ,  
 ( ) , (-OH) ( ) ( )  
 가  
 2 가 ( ) ( )  
 가 , ( )  
 가 ,  
 ( ) 가 ,  
 가 ( )  
 가 ( )  
 가 3 가 ( )  
 (tripropylol) (trialkylol) , (trimethylol), (triethylol),  
 (dipentaerythritol) (erythritol) (glycerol) , (pentaerythritol)  
 ( )  
 ( ) ( ) 'MA' ( )  
 , MA ( ) MA  
 가 , MA 가 ,  
 1 MA 1 MA  
 1 0.1 10 MA

( ) MA ,  
 { , 1 2  
 20 , 5 20 ( , 'RX' 1 20 )  
 MA RX 1 : 0.01 1 : 100 ( ) MA RX 가  
 ,RX 가 ( ) 가  
 e), , (Pyridin  
 , 1 , 0.0001 0.01 가  
 , ( )  
 가  
 가  
 가  
 가 1 10 , 0.01 10  
 가 1 0.001 0.5 가  
 가  
 1 50 , 2 ~ 10 3 가 ( )  
 ( )  
 ( ) 가  
 ( )  
 -OC(=O)(CH<sub>2</sub>)<sub>n</sub>OC(=O)C(CH<sub>3</sub>)=CH<sub>2</sub> (n 1 20 -OC(=O)(CH<sub>2</sub>)<sub>n</sub>OC(=O)CH=CH<sub>2</sub> )  
 , 1 6 )  
 , Ar , 1 20 , 1 20 , -OC(=O)(CH<sub>2</sub>)<sub>3</sub>CH<sub>3</sub> , -OC(=O)Ar(  
 ), -O(C=O)(CH<sub>2</sub>)<sub>n</sub>OC(=O)(CH<sub>2</sub>)<sub>n</sub>CH<sub>3</sub> (n 1 20 ), -OC(=O)(CH<sub>2</sub>)<sub>n</sub>O(CH<sub>2</sub>)<sub>n</sub>CH<sub>3</sub> (n 1 20  
 ), -(C=O)CH=CH<sub>2</sub>  
 ( ) 1: 0.01 1: 100 , 1  
 : 0.5 1 : 3  
 ( ) 300  
 100,000 ( ) 100 0.1 0.1 10 가  
 가 , 10 ( ) 가  
 가 ( )  
 ( ) 40 110 가 UV  
 ( ) -C(=O)-O-O-C(=O)- , ( ) 6  
 40  
 ,  
 2,2'- 가 (AIBN)  
 (N<sub>2</sub>)  
 CO<sub>2</sub>가

(m-toluoyl peroxide), t-  
 (lauroyl) -2-  
 (benzoyl peroxide), m-  
 -(4-t-  
 3,3,5-  
 가  
 ( )  
 100 가 0.3  
 5 , 5  
 가

0.1 100 가 가 0.1 10  
 1 ( ) /  
 가

$LiPF_6$ ,  $LiBF_4$ ,  $LiSbF_6$ ,  $LiAsF_6$ ,  $LiClO_4$ ,  $LiCF_3SO_3$ ,  $Li(CF_3SO_2)_2N$ ,  $LiC_4F_9SO_3$ ,  $LiAlO_4$ ,  $LiAlCl_4$ ,  $LiN(C_xF_{2x+1}SO_2)(C_yF_{2y+1}SO_2)$ ,  $LiCl$ ,  $LiI$   
 1 2 가 0.6 2.0M  
 , 0.7 1.6M 가 0.6M  
 , 2.0M

(DMC), (DEC), (DPC), (MPC),  
 (EPC), (EMC), (EC), (PC),  
 (BC), (FB), n- n- n- ,

(-OH)  
 ( ) ( )  
 ( )

( ) 가 ( )  
 1 ( ) ( )  
 가 ( )  
 ( )

0 85 40 110 , 60 85 6  
 가 40 40 110 가 가  
 , 110 가

UV, E-

1 (1) (2) (8) (4) (6)가 (12)가 (14) (8)가 (10) (12) (4) (24)가  
 (18) (20)가 (safety vent)(16)가 (22) (4)가

1.  
 30:55:5:10 EC/EMC/PC/FB1 - 1.15M LiPF<sub>6</sub> 2.755g 2 0.145g

2.  
 2 3 ,4- 가 1

3.  
 0.01 % (dipentaerythritol) 1 가 50 2 가

(-OH)<sub>2</sub> CH<sub>3</sub> -OC(=O)(CH<sub>2</sub>)<sub>5</sub> OC(=O)CH=CH<sub>2</sub> 4 2 4 (-OH)<sub>2</sub> -OC(=O)(CH<sub>2</sub>)<sub>5</sub> OC(=O)CH=CH<sub>2</sub> 2  
 1g, 30:55:5:10 EC/EMC/PC/FB - 1.15M LiPF<sub>6</sub> 30g

2 가 1

1.  
 LiCoO<sub>2</sub> 96g, N- (NMP) 43g 2g, (M.M.M Corp.) 2g  
 ( : 0.147mm)  
 MCF(Petoca ) 94g, N- (NMP) 65g 6g ( : 0.178mm)  
 ( : 0.025mm) , 30mm

×48mm×6mm 950mAh 2 1 2 , 1  
 2 2 .

3  
 1 3 3 , 1  
 2 .

1 1 1 가 .  
 1-3 1 , 가 .

(1) 3.0V 6.0V 가 가  
 Pt, Li , 10mV/s .

(2) 950mA(1C) 4.2V가 , 4.2V

3 95  
 0mA(1C) 2.5 ,  
 가 L0( ), L1( ), L2( ), L3( ), L4( ), L5( ) .

(3) 1.0C, 4.2V , 30 , 1.0C 2.75V  
 300 , 1 100 가 .

(4)

0.2C, 4.2V 가 , 30 , 0.2C, 2.75V

(5) 0.5C, 4.2V , 30 , 0.2C 2.75V  
 , 2.0C 2.75V  
 가 .

(5) 0.5C, 4.2V , 30 , 0.2C 2.75V  
 가 .  
 1-2 1 , , ,  
 가 1 .

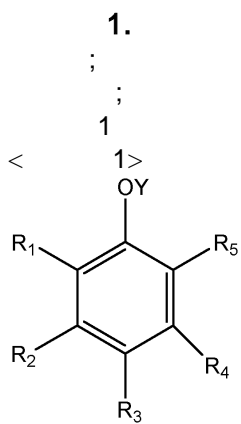
[ 1 ]

	(mm)	(mAh)	(mAh)	(%)	(1C, 12V)
1	6.12	960	940	85	L0
2	6.10	965	942	83	L0
1	6.52	920	890	60	L4

1 , 1-2 가 , , ,  
 1 3 , , , 가 ,  
 1 1-2 1 2 3  
 2 , 1 1 5.0V 4.5V , 2 1  
 , 1 4.7V  
 가 .

가

(57)



R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub> , Y 1 20

2.

1 , Y -CF<sub>3</sub>, -CH<sub>2</sub>Cl, -CH<sub>2</sub>F, -C<sub>2</sub>F<sub>5</sub>, -CCl<sub>3</sub>, -C<sub>2</sub>Cl<sub>5</sub>

3.



1, Y -CF<sub>3</sub>, R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>

4.

1, Y -CH<sub>2</sub>Cl, R<sub>1</sub>, R<sub>2</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>3</sub> Cl

5.

1, 1, 100, 0.1, 50

6.

1, 100, 0.1, 50 ( )

(-OH) ( ) 가, ( ) ( )

7.

6, 1, 20, 1, 20, 5, 20

8.

6, ( ) 가 -OC(=O)(CH<sub>2</sub>)<sub>n</sub>OC(=O)CH=CH<sub>2</sub> -OC(=O)(CH<sub>2</sub>)<sub>n</sub>O  
 C(=O)C(CH<sub>3</sub>)=CH<sub>2</sub>(n-1)<sub>20</sub>,  
 ), -OC(=O)(CH<sub>2</sub>)<sub>n</sub>O(CH<sub>2</sub>)<sub>n</sub>CH<sub>3</sub>(n-1)<sub>20</sub>, -OC(=O)Ar(, Ar  
 ), -O(C=O)(CH<sub>2</sub>)<sub>n</sub>OC(=O)(CH  
 )<sub>2</sub>nCH<sub>3</sub>(n-1)<sub>20</sub> - (C=O)CH=CH<sub>2</sub>

9.

6, 가 1: 0.01 1: 100

10.

6, ( ), 100, 0.3, 5

11.

10, (benzoyl peroxide), m- (m-yol  
 uoyl peroxide), t- -2-, t-  
 , -(4-t- 3,3,5-

12.

6, (trimethylol), (triethylol), (tripropylol)  
 ; (glylcerol) ; (erythritol) (pentaerythritol), (dipentaerythritol)

13.

6, 100, 0.1, 5

14.

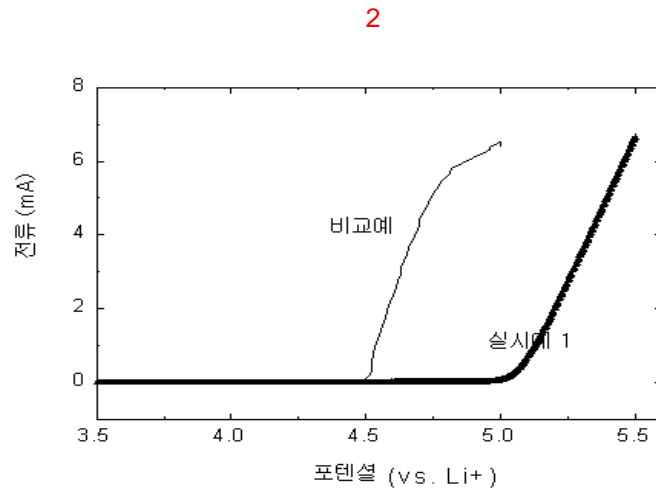
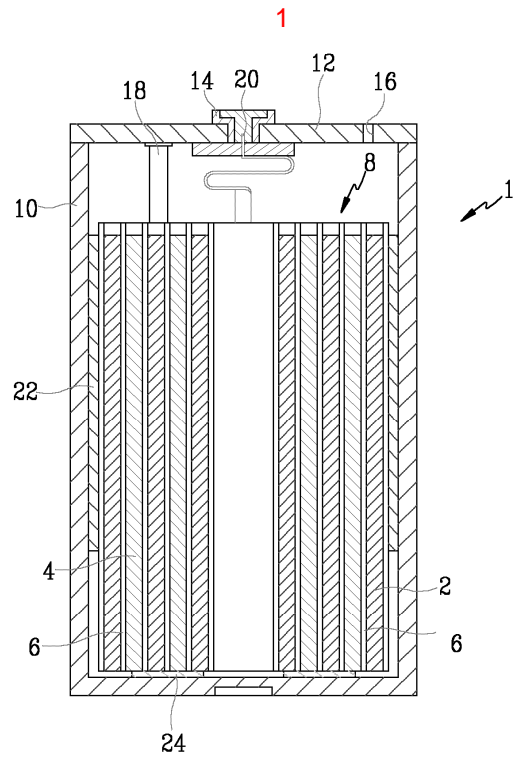
1, 13

15.

14, 가

16.

15, 가



3

