



0, R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, n p q r F, H CH<sub>3</sub>, X, m  
 0 가 1 가 .  
 가 가 .  
 , 가 .  
 - .

2

1

2

1

3

2

< >

11... 12, 13...

14, 15... 16...

s - over)

가 가  
 (500 700 )  
 , 100

, 200

가

(Proton Exchange Me

membrane Fuel Cell: PEMFC) (Dir  
Direct Methanol Fuel Cell: DMFC) . , 가 가가 가  
, 가 , , , 가 가

PEMFC ,  
1 .  
1 , (11) .  
(11) 가 50 200 $\mu$ m ,  
(14), (15) / (12), (13) 가  
6) ( , 가 " ) . 1 (1

PEMFC 가 가  
(11) .  
, 가  
(13) (14), (15) 1 , PEMFC 가 (12),  
(11) (14), (15) .

(Direct Methanol Fuel Cell: DMFC) , PEMFC ,  
가 . DMFC PEMFC , 가  
가

가  
(sulfonyl group) 가 ,  
가

가  
, 가가 .

가 가  
( 5,422,411 , 5,498,639 , 5,602,185 , 5,684,192 , 5,773,480 5,  
834,523 ) . 가 가 ( ,

가

, )

가

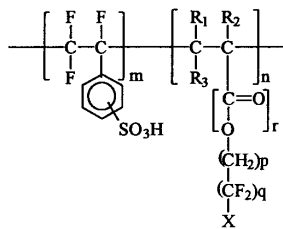
가

가

가

1

< 1 >



, R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>

F, H CH<sub>3</sub>

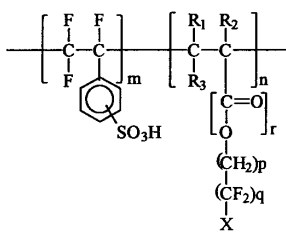
X

m 0

n p q r 0

1

< 1 >



,  $\text{R}_1, \text{R}_2, \text{R}_3$

F, H  $\text{CH}_3$  ,

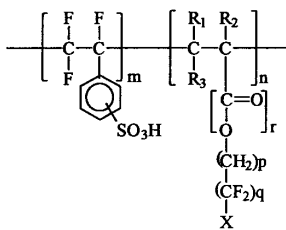
X ,

m 0 ,

n p q r 0 .

1

< 1 >



,  $\text{R}_1, \text{R}_2, \text{R}_3$

F, H  $\text{CH}_3$  ,

X ,

m 0 ,

n p q r 0 .

p 0, 1 12 3 50 , q 0, 1 12 50 , m 1 50 , n 0, 1 50 ,  
 가 50 가 3

1

(heptadecafluoro decene),

(heptadecafluoro decyl methacrylate),

(potassium persulfate)

가

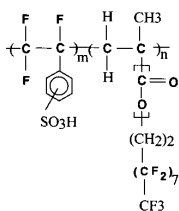
(sodium stearate) (soap)

가

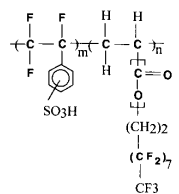
1

2 5

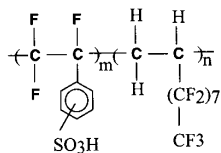
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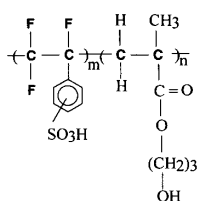
< 3 >



< 4 >



< 5 >







4						
0g	가 500Mℓ 가	4	, , -	11.8g	가	90g 3
			가 30			55 ± 1
				0.445g		5g
				55 ± 1	72	
			30g	가		
5	6					
	가		8.5g	500Mℓ		1.6cc
			68	3		
가						
	, m	15	n 14	93000		5
1						2
2	가	1				0.1S/cm
1						
1			100	23Mton		5
(MEA)			MEA			& (PEMFC)
2						
1				2		
, 1						
3						
1			100	23Mton		5
(MEA)			MEA			& (DMFC)

1 2

, 1 2

, 3 3 DMFC  
1

DMFC

1  
가

가

가

가

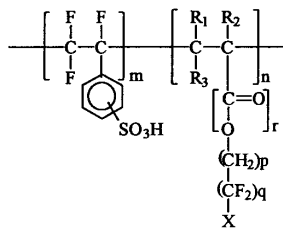
(57)

1.

1

:

< 1 >



,  $\text{R}_1, \text{R}_2, \text{R}_3$

F, H  $\text{CH}_3$  ,

X

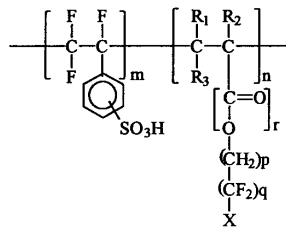
m 0

n p q r 0

2.

1

< 1 >



,  $R_1, R_2, R_3$

F, H  $CH_3$  ,

X

,

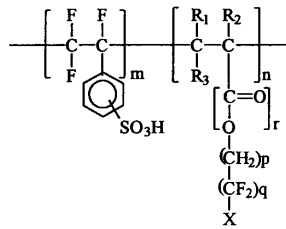
m 0 ,

n p q r 0 .

3.

1

< 1 >



,  $R_1, R_2, R_3$

F, H  $CH_3$  ,

X

,

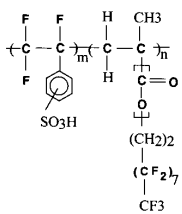
m 0 ,

n p q r 0 .

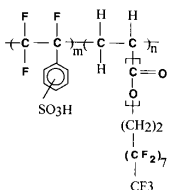
4.

1 3 , 1 가 2 5

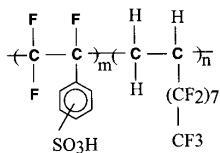
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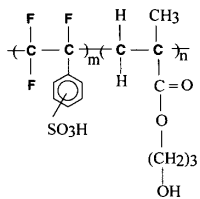
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< 4 >



< 5 >



5.

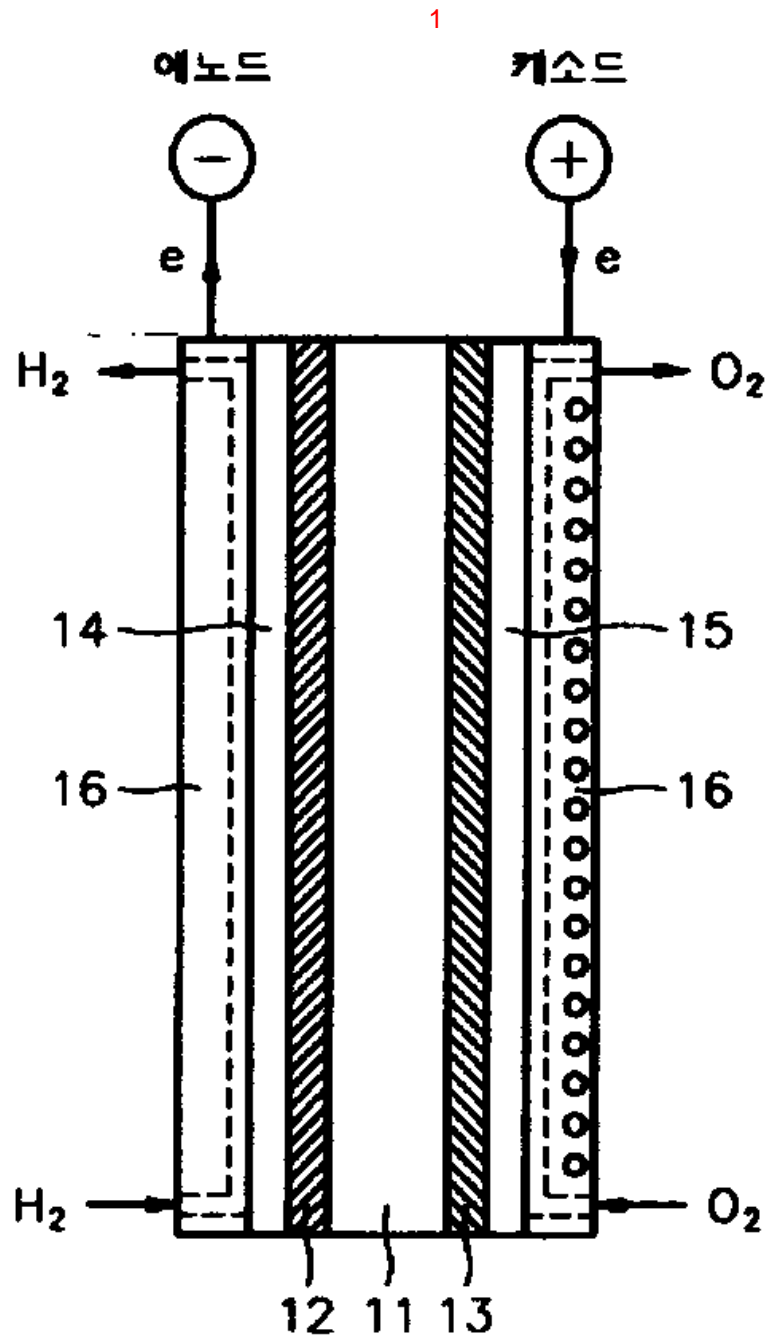
n 0, 1 3 50 , p 0, 1 12 , q 0, 1 12 , m 1 50 ,

6.

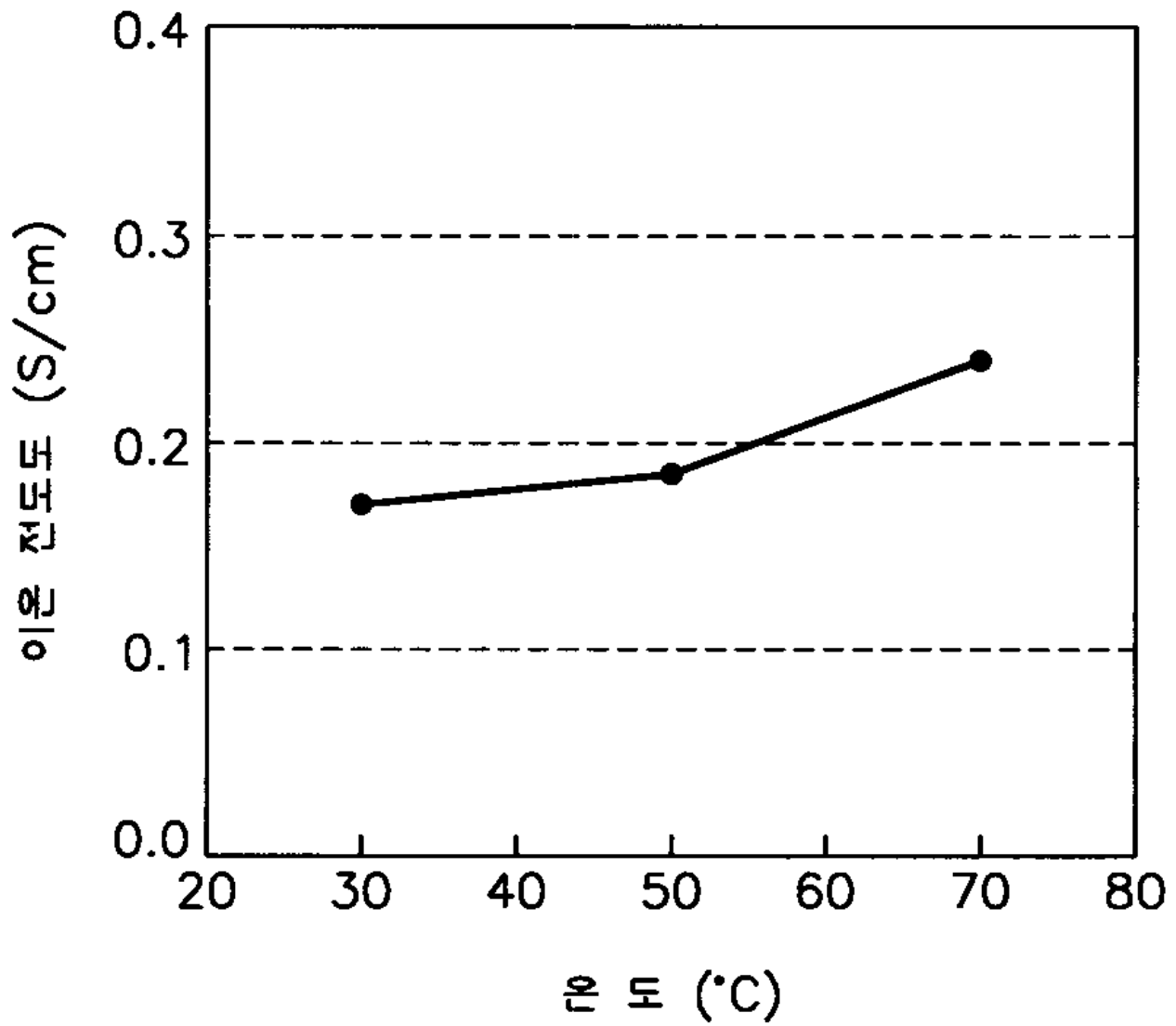
1 3 , 1 3 50 ,

7.

1 3 , 가 가  
 ,  
 8.  
 7 , 가 가,



2



3

