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(A)

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(74)

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(54)

(a) IVB, VB, VIB ,
(b) ,

, , , , , , ,

(homopolymerization)

(polymeric supports)

(support)
(refractory oxide supports)

5,412,070

가

4,900,706

5,118,648

가

3 ()

5,952,456

(aluminoxane)

()

가 가

(chemical resistance)

(a) (b)

(a) IVB, VB, VIB

(b)

210

가

(candidates) (nonaccessible ketone site)

- ;
- (low potential toxicity);
- 가 (accessible ketone site) ' (built in) ' ;
- ;
- (,) ;
- ' ' , ;
- ;
- (compatibility);

(pore volume), 5 - 10,000 μm , 15 - 500 μm , 0.1 cm^3/g
 , 가 500 - 10,000 (pore diameter) 0.2 m^2/g 50 m^2/g
 3,000 - 300,000 g/mole

(ash)

가
(metal loading)

aterial),

(oxygenated organic m
. 가

, R¹ M(OR¹)_nX_{4-n} M IVB, VB, VIB , X , 0 n 4

, n - , R¹ , n - ,

, X R³ R⁴ R² MgX R² R³R⁴ Mg 1 - 20

, - n - , - - , , - - ,

⁶, R⁷, R⁸ R⁹ (activators) R⁶_nAIX_{3-n} R⁷R⁸ - Al - O - AIR⁹₂ , R , 0 n 3 ; ;

ors) , , - n - (activat

1 50 - 800 1 1 - 1500 ,

(activities) - 1 - 9kg .

- , C₃ - C₁₀
 /1 - , /1 - , /1 - , /1 - , /1 - , /4
 - 1 - , /1 - , /1 -
 가

- 10 200
 0.1 10 mm
 의
 , US5,955,562

0 120

, 20 80

0.05 - 8%

1 1

A

(precatalyst) 40ml LC (vial) 0.11g(0.48mmol, 98%) Pd(OAc)₂, 0.2
 2g(0.53mmol, 98%) DPPP 0.22g(1.16mmol, 98.5%) - 10 60
 가

20ml
 (nitrogen purge)

7ml HPLC

30
 (partial reducti

on) . US 4,810,774 US 5,412,070

가

A

가

HPLC () 80 1 CO/C₂H₄
 1 3 가 50:50
 20 가 10 90 30 10 100
 40 40 가
 3392 cm⁻¹ 1693 cm⁻¹ (US 5,955,562)
 (stretching frequency) DSC 243 . B
 ET 11.3 m²/g 가 40 - 200μm

2 2

(B)

가 2 1 2.0g
 70 70 30 가 50ml n-
 30 3.0ml (2.0M)
 3.0ml 1.0M TiCl₄
 (ICP %Ti 1.20, %Mg 2.58).

3 3

B

2 130 가 30 (purge) 65 , 1
 n- 2 (2581ml) 가 40
 가 15 TEAL 2.5mmol 가
 20 200RPM 2 B 20ml
 15 1 212
 244g HDPE 0.25g/ml HDPE GPC MWD 3.58
 M_n 34600 M_w 124000 (2424ml 가) 2 0.28 224g H
 DPE 186 , M_w 144000 , M_n 32200 MWD 4.40

4 4

(C)

2 1.0mmol TiCl₄ 가 (ICP %Ti 1.32, %Mg 2.20)

5 5

4

HDPE 60 40 가 3

6 6

(A)

A 4 0.427 527g
 2900g PK/g Pd*hr

7 7

(D)

가 가 3 6 4.0g
 60 30 가 50ml -
 40 30 15.0ml (2ml TiCl₄ 70
 2.0M) n- n- (free - flowing powde
 30 r) (ICP %Ti 0.83, %Mg 1.58).

8 8

(E)

가 가 3 6 4.0g
 60 30 가 50ml -
 40 30 5.0ml (10ml TiCl₄ 70
 2.0M) n- n- 1ml 가
 30 (free - flowing powder) (ICP %Ti 0.7, %Mg 2.1, %EB 3.4).

9 9

(F)

가 가 3 6 4.0g
 60 30 가 50ml -
 70 30 15.0ml (가
 2.0M) n- n- 5ml 가
 70 30 (free - flowing powde
 TiCl₄ 가 r) (ICP %Ti 3.4, %Mg 2.9, %EB 13.4).

10 10

(D)

3 130 30 가 1 n- 가
 (injection pump) 15ml 10M TEAL 가
 3 가 . 50mg D 85 15 가
 . 1 441g
 (M_n53500; M_w 337000; MWD 6.3).

11 11

(E)

9 (0.1g) 98g HDPE 1400g HDPE
 /g cat*hr

12 12

(F)

t*hr 9 513g HDPE 0.27g/cc 5200g HDPE/g ca

- ;
- (low potential toxicity);
- 가 (accessible ketone site) ' (built in) ' ;
- ;
- (,) ;
- ' ' , ;
- ;
- (compatibility);
- ' ' .

(57)

1.

(a) IVB, VB, VIB ,

(b) ,

2.

1 , 500 - 10,000 5 - 10,000 μ m, 0.2m²/g 15 - 500 μ m 50m²/g , 0.1cm³/g .

3.

1 2 ,

4.

3,000 - 300,000 g/mole

5.

가

6.

5 (oxygenated organic material),

7.

6

8.

, R¹ 1 - 20 , M(OR¹)_nX_{4-n} , X , M , 0 n 4

9.

8

10.

, X , R² MgX , R² 1 - 20

11.

1

9

1 - 20

R³R⁴Mg

R³ R⁴

12.

10

11

, - n -

13.

R⁷, R⁸ R⁹

1 - 10

R⁶_nAlX_{3-n}

R⁷R⁸ - Al - O - AlR⁹₂ , X

, R⁶, , 0 n 3

14.

13 , , , - n -

15.

13 , , , .

16.

13 15 , .

17.

, 1 - 500 .

18.

.

19.

18 , , , 1 - , 1 - , 1 - , 1 - 1 -