

(19)  
(12)

(KR)  
(B1)

(51) 。 Int. Cl. <sup>6</sup>  
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(45)  
(11)  
(24)

2002 11 23  
10 - 0332859  
2002 04 03

(21)  
(22)

10 - 1994 - 0017326  
1994 07 18

(65)  
(43)

1995 - 0002857  
1995 02 16

(30)

098,976

1993 07 28

(US)

(73)

19106 - 2399

,

,

100

(72)

08034,

,

,

4

(74)

:

(54)

가

,

gr/cm<sup>3</sup>

10m<sup>2</sup>/gr

.

,

가 1.01

가 , .

(fluidized bed adsorption)

(whole broth solvent extraction)

가 가

(upflow)  
(熔離)  
가 가

(terminal settling velocity) 가

(高比吸着性), lgr lgr

가, 가

59

089311

(specific surface area) gr 200m<sup>2</sup> 3~20 %

(immunomycin) (Gaillot, F.T., G1ea  
son, C., Wilson, J.J. and Zwark, J., " Fluidized Bed Adsorption for Whole Broth Extraction" , Biotechol, Pr  
og, 6, 370 375(1990)).

가 가 1.01 gr/cm<sup>2</sup>

10 m<sup>2</sup>/gr

, ( ) 2 -

가 (rardom),

1

2

, ( ) 2 -

, ( ) 2 - , , , .  
 , , , , , ( )  
 2 - .  
 , .  
 가 .  
 , , , , ,  
 , ( ) ,  
 .  
 가 , , , 3  
 .  
 cubic centimeter) 가 10 m<sup>2</sup>/gr(square meters per gram) 가 1.01gr/cm<sup>3</sup> (grams per  
 .  
 , 1.05 1.6g/cm<sup>3</sup> .  
 , 1.10 1.55g/cm<sup>3</sup> .  
 가 1.12 1.5g/cm<sup>3</sup> 가 .  
 .  
 , 10 % .  
 , 20 55 % .  
 가 .  
 .  
 - , -  
 ( , , ) . -  
 , 가 (caustic wash) 가

가 10 90 %가 , 30 % 가 .

가 20 80 %가 , 20 % 가 .

가 30 65 %가 , 5 15 % 가 .

40 900m<sup>2</sup>/gr .

" Brunaure, Emmett Teller , , " BET" .

100 700m<sup>2</sup>/gr .

200 700m<sup>2</sup>/gr 가 .

0.1 5000 μm .

35 2000 μm .

가 300 800μm 가 .

porogenic) 0 - , , (

" " 20 .

( , ) (counter - currant)

( , ) .

가

(packed adsorption column) .

alize) - , - (post - function 가 .

가 , .

2 , (1.13gr), (Culminal CMMC - 2000, Aqualon - Henkel Company 가  
) 0.86gr 50% 0.97gr (570gr) .

. 80% ((DVB), 57gr) ((DBS), 115gr)  
. 80% (DOW Chemical) 가 80 %  
20 % . 0 - (266gr) (97% , 3.42gr)  
(nitrogen sparge) 30 .

(nitrogen sweep) 572.96gr 가 . 79 가 ,  
12 , 가 35  
85 가 (dry steam) 가 가  
2 (Stripping) 35  
1 (bed volume) 3 . 2  
가 .

80% DVB 57.4gr, (TBS) 151 gr, 0 - 343gr t - (t - BPO) 1.  
14gr ; 572.97gr 가 ; 72 12  
1 .

19.821 kg. (CMMC - 2000) 0.03kg, 0,079 kg 50% 0.070kg

. 2 .

. 0 -  
가 ( 80% DVB, Dow Chemical)  
가 . ( 15 ) .

- (double - bladed) 가 30 (s  
parge) . (sweep) . (t - BPO, 80%)  
가 , 가 . 가 5  
( 25 ) 72 1 /min 가 12 72 .

100 가  
2 . Buchner

( 1)

	<u>실시예 3</u>	<u>실시예 4</u>	<u>실시예 5</u>	<u>실시예 6</u>	<u>실시예 7</u>
<u>80% DVB</u>	86.14	100.37	114.6	123.79	215.79
<u>TBS</u>	113.86	99.63	85.4	68.38	215.21
<u>오-크실렌</u>	316.3	335	353	358.11	720.25
<u>t-BPO</u>	1.65	1.82	1.99	2.01	3.91

3 - 7

80% DBV 57.0gr DBS 115.0gr, 0 - 266.0gr t - BPO 1.14gr

0 - (BB) ((PBBA) 98%, Broomchemie, ter  
neuzen) 3 - 7  
80% DVB 102.44 gr, BB 570gr, PBBA 97.54gr t - BPO 1.82gr

((TBBM), 99.6%, Bromine compounds, Ltd., Beer - Sheva, Israel)  
3 - 7 80% DVB 97.38  
gr, TBBM 102.65gr, 0 - 381.2gr t - BPO 1.67gr

E - 2500 가 HIAC Particle Size Analyzer

(Porosimetry) BET

(pycnometer)

Cephaloparin - C 1 9

2

10 (Bed volume)

2

r pH 2.5 3.5% NaCl I 95% cephalosporin - c(sigma - Aldrich) 11.0000 g  
10,450 ppm(parts per million)

250Mℓ Cephalosporin - C 150Mℓ (Overhead) 300rpm  
 (6,4Mℓ) 가  
 가 2 1Mℓ  
 pH 2.5 3.5% NaCl 20Mℓ  
 Cephalosporin - C 259 nm Cephalosporin - C Cephalosporin - C  
 Cephalosporin - C  
 가 5 5  
 1 - 9 ( ), (m<sup>2</sup>/gr), (ml/ml), (g/ml) 30  
 Cephalosporin - C mg Cephalosporin (Uptake Capacity) (mg/  
 cm<sup>3</sup>) 2

	<u>분포합량</u>	<u>평균입자크기</u>	<u>BET비표면적</u>	<u>밀도</u>	<u>흡수성</u>
	<u>(중량%)</u>	<u>(마이크론)</u>	<u>(m<sup>2</sup>/g)</u>	<u>(g/ml)</u>	<u>(mg/cm<sup>3</sup>)</u>
1	37.8	270	350	-	75
2	46.4	382	283	1.46	-
3	40	242	353	1.26	79
4	35	349	451	1.21	79
5	30	558	394	1.2	77
6	25	484	557	1.16	80
7	35	398	427	1.2	78
8	35	250	311	1.13	-
9	35	259	298	1.24	91
10	30	-	-	1.20	-

1 DBS 12 80% DVB ,  
 1 DVB 80 %/EVB 20 % DBV/EVB (10gr)  
 , 200ml 가 60gr  
 40 7.5gr 1  
 , 30 70 가 , 70 3 , ,

pH 12 -

2 (fritted) Buchner . 5%  
 350ml 가 40 2

10 12

( ) (%) 3

( 3)

<u>실험예 번호</u>	<u>처리시간(시간)</u>	<u>브롬화량(중량%)</u>
10	0	26.68
10	2	24.53
10	24	26.88
10	120	27.79
10	336	28.12
2	0	50.25
2	2	49.28
2	21.5	50.22
2	165	49.66
2	337.5	49.3
12	0	32.47
12	2	25.83
12	6	25.04
12	24	19.65
12	96	20.82



가 , , (dynamic uptake capacity)  
가  
가 가 .

(57)

1.

가  $1.01\text{gr}/\text{cm}^2$

$10\text{m}^2/\text{gr}$

2.

1 , ( ) 2 -  
.

3.

1 , , ,  
.

4.

1 , .

5.

1 , 10 90 % ,  
30 % , 가 .

6.

1 , 20 80 % ,  
20 % , 가 .

7.

1 , 30 65 % ,  
5 15 % , 가 .

8.

1 , 10 % .

9.

7 , 20 55 %

10.

1 , 100~700 m<sup>2</sup>/gr

11.

1 , 200 700 m<sup>2</sup>/gr

12.

1 , 1.05 1.6 gr/cm<sup>2</sup>

13.

12 , 1.10 1.55 gr/cm<sup>2</sup>

14.

13 , 1.12 1.5 gr/cm<sup>2</sup>

15.

1 , 0.1 5000

16.

1 , .

17.

1 , .

18.

17 , , , .

19.

17 , .