

(19) (KR)
(12) (A)

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(86) 2000 12 27 (87) 2001 07 12

(30) 99/16844 1999 12 30 (FR)

(71) 63000 - . 23
- . - 1763 - 10 12

(72)	가		
	- 63100	-	34
	- 63200	20	
	- 69008		2

(74)

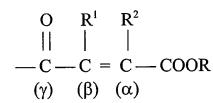
:

(54)

(/)



X



X ,

R, R¹ R² , 1가 , R¹ R²

가 ,

1

, 가 , , ,

가 (semi-finished product) , (tread)
 (white filler)

(hysteresis)

(starring agent)

가 , 가

가

가 가 , 가
가 (" 가 ")

가 0 501 227

가 .

0 810 258

(Al₂O₃)

가 , 가

가장 중요한 것은 그들이 어떤 종류의 문제를 풀고 있는지, 그리고 그들이 어떤 종류의 문제를 풀고 있는지.

2 094 859

가 , 가 가
- SH

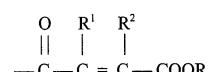
4 002 594 가 . 가 , 2 206 330

842 111 , 3 873 489 , 3 978 103 [: 2 206 330 , 3
 , - (C₁ - C₄) . 가 .
)가 . (/) - 3 - 가 . (TESPT
 , 가 [: (Degussa) Si69] . ,
 5 684 171 5 684 172]. [: 5 652 310 ,

5), , TESPT (JP 1989/2938

, (white filler) (B), " Y" " X" X 2 (A), Y
(/) (C) X - 가 가 , X
가 ,

X



(γ) (β) (α)

$$R \subset R^1 \subset R^2 \quad , \quad 1 \mapsto \quad R^1 \subset R^2$$

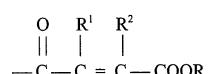
,
 B) (iii) "Y" "X"
 X
 X -
 110 190

2

(A)
 , Y
 X
 (/)
 (C)

:

X



(γ) (β) (α)

X ,

R, R¹ R² , 1가 , R¹ R²

, /) "Y" "X"
 C(, Y
 , X
)

2 X

, (B) (iii) "Y" "X"
 X
 X -
 110 190

2

(A)
 , Y
 X
 (/)
 (

:

, , ,

I.

I - 1 가

AFNOR - NFT - 43005(1980 11)
 : 가 (,) 100 가
 , 2rpm , 4
 가 (ML 1+4) " (Mooney unit)" (MU, 1 MU=0.83)

I - 2 (scorching)

AFNOR - NFT - 43004(1980 11) 130
 T5 가
 5 (MU) 가

I - 3

460002(1988 9) 10% (M10), 100% (M100) 300% (M300), AFNOR - NFT -
 (nominal secant moduli)(MPa) 2 (,) AFNOR - NFT - 40101(1979 12)
 (%) (MPa)

II.

A,), (ii) (i) : (i)
 (B), (iii) (/) ()

, " " , , , ,
 , " " , , , ,
 / , " " , , , ,

II - 1. (A)

, " " (, , 2)
) (, ,)
 , " " (, ,) 15% (%)

가 가 , :
 가 , :

(a) 4 12

(b)

8 20

) 50% , " . (A) (BR), (NR), (IR), ,

, 가 - 1,2 4% 80%, - 1,4 80%
- 1,4 가 .

, 2 8 20
가 가 .
" " ,
" " ,
99 20 %
1 80 %

, - ("SBR"), - (BIR),
- (SBIR) 가
- (IIR), - (SIR),
(BIR) - (SBIR) 가

, / (randomising agent)

/

가

/

/

,

()

R/IR)	(A	, SBR,	SBR/BR, SBR/NR(SBR/IR)	BR/NR(B
15	65	%,	- 1,4	15	20	30	%,
,	SBR			75	%		- 20
	(BR)					90%	
							- 55
							SBR

, " (heavy duty)" , , , (, ,),
 , A , , , (, ,)
 A SBR

(50 %) (A) 가 ,

, A , ,
 , A , ,
 (: 가)

II - 2. (B)

, , , , , , 50 % ,
 80 %

, " " () " " (,)
 , " " (clear) " (,)

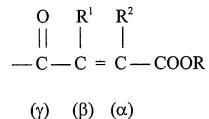
, (SiO₂) (Al₂O₃) , 2

II - 3. (C)

가 , (/) " Y" " X" 2 , X

1

X



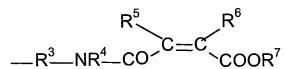
X ,

$$R, R^1 \quad R^2 \quad , \quad 1 \quad 6$$

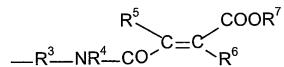
1가 , R¹ R²

"
Y
" (OR') () (, R' 17†,
. R' 1 18 , C₁₋₁₈, C₂₋₁₈, C₅₋₁₈)
C₆₋₁₈, C₁₋₆, C₂₋₆, C₅₋₈

X X | ||



11



| || ,

\mathbb{R}^3 1 10 2가 ,

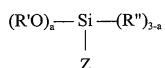
$$R^4, R^5 \quad R^6 \quad , \quad , \quad , \quad 1 \quad 6$$

1가

\mathbb{R}^7 1 6 1가

가

1



III ,

R' , 5 8 , 1 4 , 2 6
 , , , , , , , ,

R" , 1 6 , 5 8
 , , , , , , ,

Z - L - X(, L
 , S, O N) , 1 16
 , , , , , , , 2가

a 1, 2 3 .

III 가 (Y
) (R'O)_a , L
 (: I II L - R³ - NR⁴ -).

I, II III

- III R' , , n - , , , n - , CH₃OCH₂ - , CH₃OCH₂CH₂ - CH₃O
 CH(CH₃)CH₂ - , , , , , , , ,

- III R" , , n - , , , n - , , , , , ,

- I II R³ - (CH₂)₂ - , - (CH₂)₃ - , - (CH₂)₄ - , - CH₂ - CH(CH₃) - , - (CH₂)₂ - CH(CH₃) - (CH₂) - , - (CH₂)₃ - O - (CH₂)₃ - - (CH₂)₃ - O - CH₂ - CH(CH₃) - CH₂ - ,

- I II R⁴, R⁵ R⁶ , , , n - , , , n - , , ,

- I II R⁷ , , n - , , , , , , ,

- R' , , n - , , , , , , ,

- R"

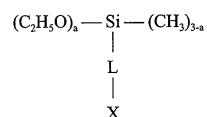
- R³ - (CH₂)₂ - - (CH₂)₃ - , , , , , , ,

- R⁴, R⁵ R⁶ , , , , , , , , , , ,

- R⁷ , , , , , , , , , , ,

III , III - 1 , , , , , , , , , , ,

III - 1



III - 1 ,

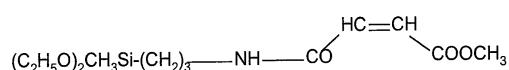
L - R³ - NR⁴ (I II) ,

X | II .

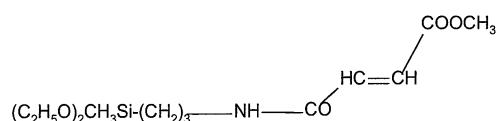
III - 1 , a가 2 , L - (CH₂)₃ - NH - , X가 - CO - CH=CH - COOCH₃
, Z가 - L - X, - (CH₂)₃ - NH - CO - CH=CH - COOH₃ N[- (-)]
[III - 2] N[- (-)] [

III - 3] .

III - 2



III - 3



III,

III - 2

III - 3

,

(1)

(5)

(6) 가

R⁷ - OH

(2)

(1),

(5)

,

(6)

(2),

가 (4)
).

(1)

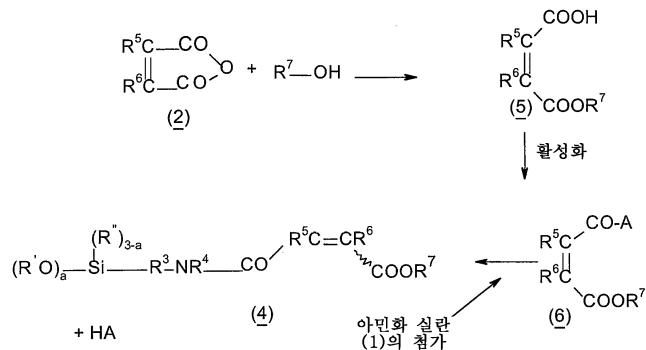
(3)(

,

(6) 가 ,

(6) A

1



(1) (3)

가

가

(1) : J. Med. Chem., 1983, 26, pages 174 - 181,

(2) (3) : John JONES, Amino Acid and Peptide Synthesis, pages 25 - 41, Oxford University Press, 1994.

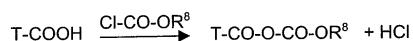
(5)

가 가

가

(i) (T - CO -
 , - O - CO - OR⁸ -),

2

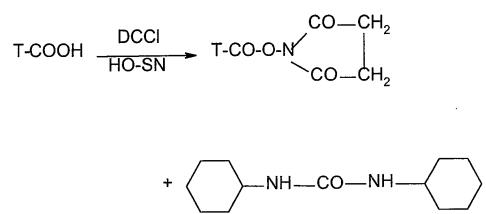


2

T - R⁵C=CR⁶-COOR⁷,R⁸, 1 3

(2i) N - (HO - SN),
 (DCCI)

3



(3i) ,
 (: - Cl),

4



(i) (2i) 가

가 (1)

 $(\text{C}_2\text{H}_5\text{O})_2\text{CH}_3\text{Si}(\text{CH}_2)_3\text{NH}_2$, $(\text{C}_2\text{H}_5\text{O})_3\text{Si}(\text{CH}_2)_3\text{NH}_2$, $(\text{CH}_3\text{O})_2\text{CH}_3\text{Si}(\text{CH}_2)_3\text{NH}_2$, $(\text{CH}_3\text{O})_3\text{Si}(\text{CH}_2)_3\text{NH}_2$, $(\text{CH}_3\text{O})_3\text{Si}(\text{CH}_2)_4\text{NH}_2$, $(\text{C}_2\text{H}_5\text{O})_3\text{Si}(\text{CH}_2)_4\text{NH}_2$, $(\text{CH}_3\text{O})_2\text{CH}_3\text{SiCH}_2\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}_2\text{NH}_2$, $(\text{CH}_3\text{O})_3\text{Si}(\text{CH}_2)_3\text{O}(\text{CH}_2)_3\text{NH}_2$.

X

C

,
 C 0.5 % 20 % .
 가 , , , , ,
 15 %, 5 12 % .
 , , , , ,
 C
 3

, " (C) " (" X " " Y ")

II - 4. 가

가 , 가 , 가 , 가 , 가 , 가 ,

, (C), ,
 , (, Y) 가
 (: , 1 , 2 , 3 , (: , -),), 가
 [: , - , - , 가 (, , - , - , - , C)] . .

II - 6.

2
 1 (, ") 110 (, ") 110 (, ") 190 ,
 0 180 (T_{max}), 110 , 60 100 , 2 (, ") 110 (, ") 190 ,
 0) , [: 0 501 227].
 B C A
 , 130 180 - , 110 190 ,

가 , - 가 1 ()
가 , 가 2
(100) ,
2 10 .

, , 가 , , 5 15 , ().

가 () 130 200 , , 가
가 , 5 90 .

, " 가 " (,) " " 가 (가) 가)

1

$$||| = 1.$$

1

1)

2 (698.1g 7.12mol), 70 가
 . , (221.4g 6.92mol) 가
 20 23, 1 10.10² Pa ,
 .  (786.9g) 가 (: 86%).

2)

$(C_2H_5O)_2CH_3Si(CH_2)_3NH_2$ (322.43g 1.685mol) 15 가
가 23

2

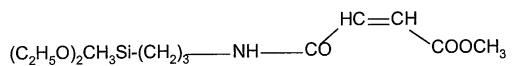
/ (50/50)

(^{29}Si) NMR NMR

$$\text{III-2} \quad - \quad \text{CH}_3\text{ZSi}(\text{OC}_2\text{H}_5)_2 \quad \text{D}(\text{OC}_2\text{H}_5)_2$$

82 % (83.2 %),

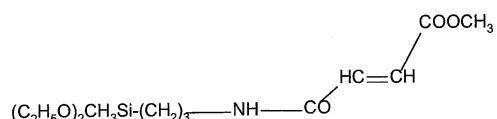
III - 2



$$\text{III - 3} \quad - \quad \text{CH}_3\text{ZSi}(\text{OC}_2\text{H}_5)_2 \quad \text{D}(\text{OC}_2\text{H}_5)$$

9 % (9.2 %),

III - 3



$$\text{CH}_3 Z(\text{OC}_2\text{H}_5)_2 \text{SiO}_{2/2} \quad \text{D}(\text{OC}_2\text{H}_5) \quad 9 \quad \% (7.6 \quad \% \quad).$$

$$\text{3} \quad , Z = (\text{CH}_2)_3 - \text{NH} - \text{CO} - \text{CH}=\text{CH} - \text{COOCH}_3 \quad , L = (\text{CH}_2)_3 - \text{NH} - \text{CO} - \text{CH}=\text{CH} - \text{COOCH}_3 \quad .$$

III - 2.

(homo finisher)] 30 가 3 4 ().

, (/) 30 80phr

III - 3.

A) 1

2
 2 : TESPT
 1 : TESPT
 2 : (82mol%) N[-(-)] (III-2)
 ,
 [2 , Y Si(OR')_a(, a 1, 2 3)] , , , ,
 , TESPT 10%
 1 2 (1 phr) (150 25)
 1 2 C1 C2 가
 :
 (T5) (20),
 가 , 가
 (50MU).
 M100 , (2) , (M100 M300) (M300)
 가
 가 (+ 7) 가 - /)
 1 (100% : (C2) (),
 2
 3) 2
 (50/50) , (0 810 258)
 2
 :
 3 : TESPT (4phr)

4 : (4.5phr)

3 , 4
 ((65phr) , 8%)
 4 (150 20) (%)
 (MPa) , 3 4 C3 C4

2 : C3 C4 100 300%
, C3 , C4가
(300%)) ()

C) 3

0 784 072 , - - 가
(C) . . .
가 () 가
가 () 가

2

5() : TESPT(4phr)

6() : (3phr) + 가 (1.2phr)

, 8% (6%)

5 6 (30 150) 5 6 C5 C6 . 3 (%)
 (MPa) ,

가),

,
 (M300/M100) . 3 (6 M100 M300
). C5

가)

(X) ,
 (/) , TESPT

, 가)

[1]

	1	2
NR(1) (2) (3) (4)ZnO (5)	100504 - 32.51.9	10050 - 4.532.51.9
CBS(6)	1.51.8	1.51.8

(1)

(2) (BET CTAB: 150 160m²/g) (Rhodia) " HD" - Zeosil 116
5MP

(3) (Degussa) TESPT - Si69

(4) (III - 2)

(5) N - 1,3 - - N - - -

(6) N - - 2 -

[2]

	1	2
(MU)T5() M10(MPa)M100(MPa)M300(M Pa)M300/M100 (%)	33215.101.741.761.0131620	40227.302.232.601.1731540

[3]

	3	4
NR(1) (2) (7) (3) (4)ZnO (5)	10025404 - 32.51.9	1002540 - 4.532.51.9
CBS(6)	1.51.8	1.51.8

(1) (6): 1

(7) (Baikowski) CR125(: BET 105m²/g)

[4]

	3	4
(MU)T5() M10(MPa)M100(MPa)M300(M Pa)M300/M100 (%)	38125.23.36.72.030625	46105.33.07.12.429573

[5]

	5	6
NR(1) (2) (3) (4)PDMS(8) ZnO (5)	100504 - - 32.51.9	10050 - 31.232.51.9
CBS(6)	1.51.8	1.51.8

(1) (6): 1

(8) : , - - 가 (H48V50)

[6]

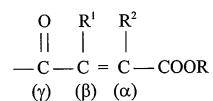
	5	6
(MU)T5() M10(MPa)M100(MPa)M300(M Pa)M300/M100 (%)	36185.23.67.62.130633	32207.24.410.52.430555

(57)

1.

X" 2 (A), Y (/) (C)
 가 , X -
 X 가 .

X



X ,

R, R¹ R² , 1가 , R¹ R² .

2.

1 , A가 , , , , ,

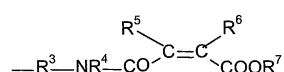
3.

2 , 가 , , , , , ,

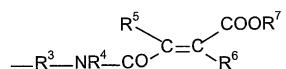
4.

1 3 , X | -

|



II



I II ,

 R^3

1 10

2가

,

 $\text{R}^4, \text{R}^5 \quad \text{R}^6$

1가

1 6

,

 R^7

1 6

1가

5.

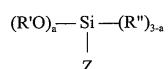
4

, C가

III

.

III



III ,

 R'

, 5 8 ,

1 4

1가

2 6

,

 R''

, 1가

1 6

,

5 8

 $\text{Z} - \text{L} - \text{X}(\text{L}, \text{S}, \text{O}, \text{N})$
 $1 \quad 16 \quad) \quad 2\text{가}$

a 1, 2 3 .

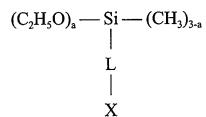
6.

4 5 III R' , , n - , , n - , CH₃OCH₂ - ,
 CH₃OCH₂CH₂ - CH₃OCH(CH₃)CH₂ - , , III , , n - , , n - , R'' 가 , , n - , ,
 , n - , n - , , , I II R³ - (CH₂)₂ - , , , R³ - (CH₂)₃ - , , , R⁴, R⁵ R⁶ - ,
 - (CH₂)₃ - , - (CH₂)₄ - , - CH₂ - CH(CH₃) - , - (CH₂)₂ - CH(CH₃) - (CH₂) - , - (CH₂)₃ - O - (CH₂)₃ - ,
 (CH₂)₃ - O - CH₂ - CH(CH₃) - CH₂ - , , , I II R⁷ , , ,
 , , n - , , , n - , , , I II R⁷ , , ,
 n - .

7.

5 6 , III III - 1

III - 1



III - 1

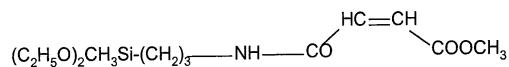
L - R³ - NR⁴ (I II) ,

X | - II -

8.

7 , III - 2 N[- (-)]

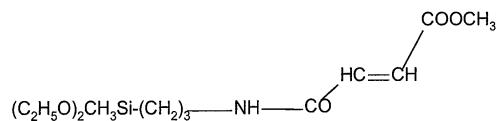
III - 2



9.

7 , III - 3 N[- (-)]

III - 3



10.

1 9 , B 10 200phr

11.

1 10 , C , B , 0.5 20 %

12.

11 , C , B , 10 %

13.

1 12 , B가

14.

1 12 , B가

15.

1 14 , B가

16.

1 14 , B가

17.

2 16 , A가 ,

18.

17 , A가

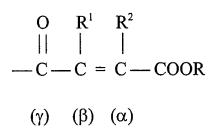
19.

1 18 , 가

20.

(i) " X" 2 (A) (ii) Y
Y" - X
- (/) (C) (B) (iii) " X
X 110 190 , ,

X



X ,

R, R¹ R² , 1가 , R¹ R²

21.

20 , 가 130 180

22.

, , (crown plies), , (carcass plies), ,
 roduct) , 1 18 가 (semi - finished p

23.

1 18

24.

19

25.

, , , , , ,
 가 .

26.

25 , 가 .

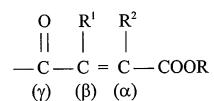
27.

26 , 17 18

28.

Y , "Y" "X" 2
 X (, X
 (C) (/)

X



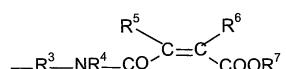
X ,

R, R¹ R² , 1가 , R¹ R²

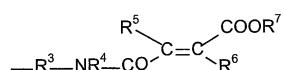
29.

28 , X I - II -

I



II



I II ,

R³ 1 10 2가 ,R⁴, R⁵ R⁶ , , , 1 6
1가 , ,R⁷ 1 6 1가

30.

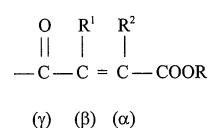
28 29 , 가 , , , ,

31.

(i) "X" 2 (A) (ii) Y (B) (iii) "Y" X

- 가 110 190 (/) (C) , , X

X



X ,

R, R¹ R² , 1가 , R¹ R²

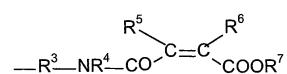
32.

31 , 가 130 180 .

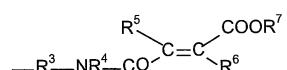
33.

31 32 , X | - II

|



II



| II ,

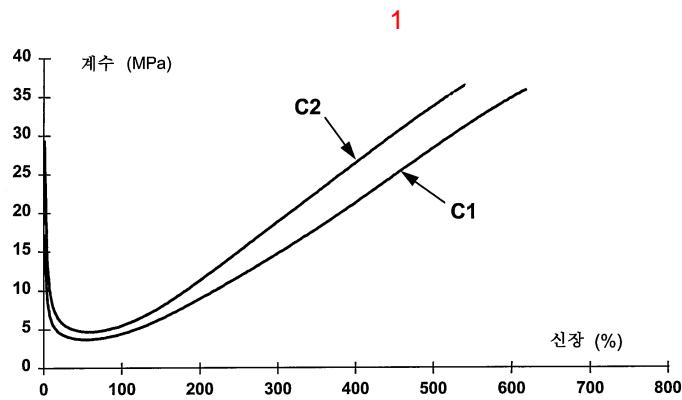
R³ 1 10 2가 ,

R⁴, R⁵ R⁶ , , , 1 6

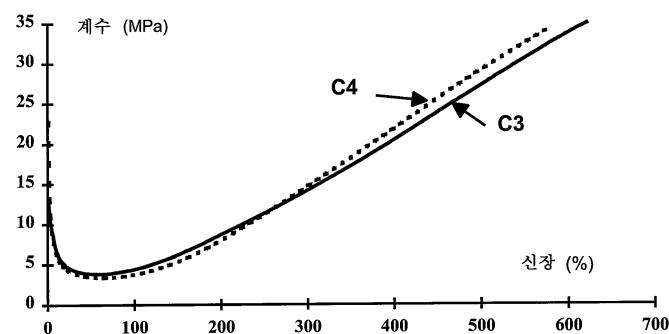
R⁷ 1 6 1가 .

34.

31 33 , 가 , ,
,



2



3

