

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

(51) . Int. Cl. ⁷ (11) 2002 - 0034190
C08K 5/372 (43) 2002 05 08

(21) 10 - 2002 - 7003591
(22) 2002 03 18
2002 03 18
(86) PCT/EP2000/09928 (87) WO 2001/29126
(86) 2000 10 10 (87) 2001 04 26

(30) 1901/99 1999 10 18 (CH)

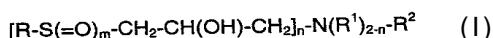
(71) 4057 141

(72) - 4055 74

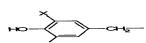
- 4312 25

(74)

(54)



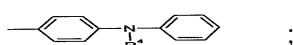
$R = C_4 - C_{20}$, $(CH_2)_q COOR^3$, $m = 0$, $R \neq$



$n = 1$, $R^4 \neq$, $R \neq$ $R^2-R^1N-CH_2-CH(OH)-CH_2-S(=O)_m-(CH_2)_x-$ 且 $R^2-R^1N-CH_2-CH(OH)-CH_2-S(=O)_m-CH_2-CH_2-(O-CH_2-CH_2)_y-$

R^1 , $C_3 - C_{12}$;

R^2



$R^3 = C_1 - C_{18}$;

$R^4 = -CH_2 - CH(OH) - CH_2 - S(=O)_m - R$;

$X = C_1 - C_8$;

$Y = C_1 - C_8$;

$m = 0, 1$;

$n = 1, 2$;

$q = 1, 2$;

x 2 6 ;

$$y \quad 1 \quad 2 \quad . \quad (1)$$

- (3 - , - 2 -) /) , S - , 4 - , / - 2 -)

가 (가) , , (가) (가)

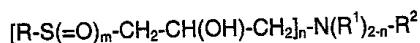
"International" 1994, pp.36 - 46;, "Tire Technology", Rubber World, 200(5), 13 - 23(1989)] 가

가 (), (), () " - (non - black) () .

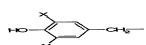
가
가
가
1 - - 2 - - 3 - 4,863,621

$$S - 4 - (3 - / - 2 -) , , ,$$

1



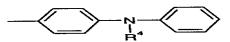
R-C₄-C₂₀, -C₄-C₂₀; , , - , , - ,
(CH₂)_qCOOR³, m 0, R 가



n 1 R⁴ 가 , R 가 R²-R'N-CH₂-CH(OH)-CH₂-S(=O)_m-(CH₂)_x- 또는 R²-R'N-CH₂-CH(OH)-CH₂-S(=O)_m-CH₂-CH₂-(O-CH₂-CH₂)-,

\mathbb{R}^1 , $C_3 - C_{12}$

R²



R^3 $C_1 - C_{18}$;

$$R^4 - CH_2 - CH(OH) - CH_2 - S(=O)_m - R$$

X C₁ - C₈ ;

Y C₁ - C₈ ;

m 0 1 ;

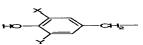
n 1 2 :

g 1 2 .

$$x = 2, 6, \dots$$

Y = 1 - 2

20 , n - , , 1 - , , 1,3 - , n - , 1 - , n - , , , , , 2 -
 , 1 - , 3 - , n - , 2 - , 1,1,3 - , 1,1,3,3 - , , ,
 , 1 - , , , 1,1,3,3,5,5 - . R . R¹ C₄ - C₂₀ , , C₆ - C₁₂ ,
 C₈ - C₁₂ . R C₃ - C₈ , C₃ - C₆ . R¹ C₁ - C₁₈ , C₄ - C₁₂ , C₆ - C₈ . X Y 1,3 - C₃ - C₁₂ . R³ C₁ - C₈
 , C₁ - C₄ , .
 - C₄ - C₂₀ 1 3 , 1 2 , 3 - , 2 - , 4 - , 3 - , 2 - ,
 5 - , 4 - , 3 - , 2 - , 7 - , 6 - , 5 - , 4 - , 3 -
 - , 3 - , 2 - , 8 - , 7 - , 6 - , 5 - , 4 - , 3 -
 , 3 - , 2 - , 9 - , 10 - , 11 - , 12 -
 , 13 - , 14 - , 15 - , 16 - , 17 -
 , 18 - , 20 - . R C₄ - C₁₂ C₅ - C₁₂ , C₅ - C₁₁ .
 n 2 , R R³ (I) b)

R C₄ - C₁₂ , - C₄ - C₁₂ ; , - , - (CH₂)_qCOOR³ , m
 0 ,
 R 가  ;

n 1 R⁴ 가 , R 가

R²-R¹N-CH₂-CH(OH)-CH₂-S(=O)_m-(CH₂)_x- $\xrightarrow{\text{H}_2\text{N}-\text{R}^4-}$ R²-R¹N-CH₂-CH(OH)-CH₂-S(=O)_m-CH₂-CH₂(O-CH₂-CH₂)_y- ;

R¹ , C₃ - C₈ ;

R³ C₄ - C₁₂ ;

X C₁ - C₄ ;

Y C₁ - C₄ ;

m 0 1 ;

q 1 2 ;

x 2 4 ;

y 1 2 (I) b)

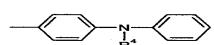
R C₆ - C₁₂ , - C₆ - C₁₂ ; - (CH₂)_qCOOR³ , n 1 R⁴ 가 , R
가R²-R¹N-CH₂-CH(OH)-CH₂-S(=O)_m-(CH₂)_x- \xrightarrow{HCl}
R²-R¹N-CH₂-CH(OH)-CH₂-S(=O)_m-CH₂-CH₂-(O-CH₂-CH₂)_y- ;R¹ C₃ - C₆ ;R³ C₆ - C₁₀ ;

m 0 1 ;

q 1 2 ;

x 2 ;

y 1 2 (I) b)

R C₈ - C₁₂ - (CH₂)_qCOOR³ , n 1 R⁴ 가 , R 가 R²-R¹N-CH₂-CH(OH)-CH₂-S(=O)_m-CH₂-CH₂-(O-CH₂-CH₂)_y- ;R¹ 1,3 - ;R² ;R³ C₆ - C₈ ;R⁴ - CH₂ - CH(OH) - CH₂ - S(=O)_m - R ;

m 0 1 ;

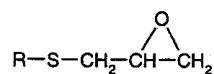
n 1 2 ;

q 1 ;

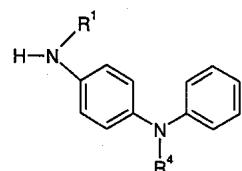
y 1 2 (I) b)

(I) (II) (III) 4,
863,621 1 : -

11



111



2 -
 (II) (III) 0.05 10 %,
 Fulcat 22B . . .
 100 220 , 110 170 , 120 150 . .
 (III) (II) . . . (II)
 (III) 1.05:1 1.5: 1 . .
 1 (I) () , m 0 (I) ()

(II) (III)

b) , , , , - /

. Hans - Georg Elias, " An Introduction to Polymer Science" , Section 12, " Elastomers" , pp. 388 - 393, 1997, VCH Verlagsgesellschaft mbH, Weinheim, Germany " Ullmann's Encyclopedia of Industrial Chemistry, fifth, , Volume A 23" , pp.221 - 440 (1993) .

1

2

3.

4.

().

5.

6.

1.1. , 2,6 - - - 4 - , 2 - - 4,6 - , 2,6 - - -
 4 - , 2,6 - - - 4 - n - , 2,6 - - - 4 - , 2,6 - - - 4 -
 , 2 - (-) - 4,6 - , 2,6 - - - 4 - , 2,4,6 - , 2,
 6 - - - 4 - , , , 2,6 - - - 4 - , 2,4 -
 - 6 - (1' - - - 1' -) - , 2,4 - - 6 - (1' - - - 1' -) - , 2,4 - - 6 -
 (1' - - - 1' -) - .

1.2. , 2,4 - - - 6 - , 2,4 - - - 6 - , 2,

1.3. , 2,6 - - - 4 - , 2,5 - - - ,
 2,5 - - , 2,6 - - 4 - , 2,6 - - - , 2,5 - - ,
 - 4 - , 3,5 - - - 4 - , 3,5 - - - 4 - ,
 (3,5 - - - 4 -) .

¹⁴ See, for example, the discussion of the 'right to be forgotten' in the European Union's General Data Protection Regulation (GDPR), Article 17(1).

1.5. , 2,2 ' - (6 - - 4 -), 2,2 ' - (4 -), 4,4 ' - (6 - - 3 -), 4,4 ' - (6 - - 2 -), 4,4 ' - (3,6 - -), 4,4 ' - (2,6 - - 4 -)

1.6. , 2,2' - (6 - - 4 -), 2,2' - (6 - - 4 -)
), 2,2' - (6 - - 4 -), 2,2' - (4,6 - -), 2,2' - (4,6 - -)
 - , 2,2' - (6 - - 4 -), 2,2' - (4,6 - -), 2,2' - [6 - (-) - 4 -]
 - , 2,2' - [6 - (, -) - 4 -], 4,4' - (2,6 - -), 4,4' -
 - (6 - - 2 -), 1,1 - (5 - - 4 -), 2,2' - (2,6 - -), 4,4' -
 - 5 - - 2 -), 1,1,3 - (5 - - 4 - - 2 -), 2,6 - (3 - - 1,1 -
 - (5 - - 4 - - 2 - -) - 3 - n - , [3,3 - (3 - - 1,1 -
 - 4' -)], (3 - - 4 - - 5 - -) - 6 -] , 1,1 - - (3,5 - - 2 -)
 - - 2' - - 5' - -) - 6 - - 4 -] , 2,2 - (5 - - 4 - - 2 -) .
 2 -) - 4 - n - , 1,1,5,5 - (5 - - 4 - - 2 -) .

1.7. O - , N - S - , 3,5,3' , 5' - - - 4,4' - - - ,
 - 4 - - 3,5 - , - 4 - - 4 - - 3,5 - - ,
 (3,5 - - - 4 -) , (4 - - 3 - - 2,6 -)
 , (3,5 - - - 4 -) , - 3,5 - - - 4 - .

1.8. , - 2 - (3 - - 4 - - 5 -) - , - 2,2 - (3,5 - - - 2 - - 2,2 - (3,5 - -
 - 4 -) , - 4 - - 4 - - [4 - (1,1,3,3 -)] - 2,2 - (3,5 - -) .

1.9. , 1,3,5 - (3,5 - - - 4 -) - 2,4,6 - (3,5 - - - 4 -) - 2,4,6 -
 , 1,4 - (3,5 - - - 4 -) - 2,3,5 , 6 - , 2,4,6 - (3,5 - - - 4 -) .

1.10. , 2 - - 4,6 - (3,5 - - - 4 -) - 6 - (3,5 - - - 4 -) - 1,3,5 - , 2 - - 4,6 -
 - (3,5 - - - 4 -) - 1,3,5 - , 2,4,6 - (3,5 - - - 4 -) , 1,3,5 - (4 - - 4 -)
) - 1,2,3 - , 1,3,5 - (3,5 - - - 4 -) - 2,4,6 - (3,5 - - - 4 -) , 1,3,5 - (4 - - 1,3,5 - - 1, -
 - 3 - - 2,6 -) , 2,4,6 - (3,5 - - - 4 -) - 1,3,5 - , 1, -
 - 1,3,5 - , 1,3,5 - (3,5 - - - 4 -) - 1,3,5 - , 1, -
 3,5 - (3,5 - - - 4 -) .

1.11. , - 2,5 - - - 4 - , - 3,5 - - - 4 - , - 3,5 - - - 4 - , - 3,5 - - - 4 - .

1.12. , 4 - , 4 - , N - (3,5 - -) .

1.13. 1가 가 , , n - , i - , , 1,6 - , 1,9 - ,
 , 1,2 - , (,) , , N,N' - (,) , 3 - , 3 - ,
 , , , , 4 - , - 1 - , - 2,6,7 - [2.2.2]
 - (3,5 - - - 4 -) - .

- 1.14. 1가 가 , , , , n - , i - , , 1,6 - , 1,9 -
 , 1,2 - , , , , , N,N' - (, , , , , 3 - , 3 -
 , () , , , , 4 - , , - 1 - , , 3 - , 3 -
 , , , , , , , - 2,6,7 - , , - [2.2.2
] - (5 - - 4 - - 3 -) - .
- 1.15. 1가 가 , , , , n - , i - , , 1,6 - , 1,9 -
 , 1,2 - , , , , , N,N' - (, , , , , 3 - , 3 -
 , () , , , , 4 - , , - 1 - , , 3 - , 3 -
 , , , , , , , - 2,6,7 - , , - [2.2.2
] - (3,5 - - 4 -) - .
- 1.16. 1가 가 , , , , n - , i - , , 1,6 - , 1,9 -
 , 1,2 - , , , , , N,N' - (, , , , , 3 - , 3 -
 , () , , , , 4 - , , - 1 - , , 3 - , 3 -
 , , , , , , , - 2,6,7 - , , - [2.2.2
] 3,5 - - - 4 - .
- 1.17. - (3,5 - - - 4 -) , N,N' - (3,5 - - - 4 -)
 , N,N' - (3,5 - - - 4 -) - - - (3,5 - - - 4 -) , N,N' - [2 - (3 - [3,5 -
 - 4 - - -])] (Naugard^R XL - 1,).
- 1.18. (C)
- 1.19. , N,N' - - - p - , N,N' - (1 - - 3 -) - p - , N,N' - - - p - , N,N' - (1 -
 (1,4 -) - p - , N,N' - - p - , N,N' - - p - , N,N' - (2 -
) - p - , N - - N' - - p - , N - - N' - - p - , N - (1,3 -) - N' - - p -
 , N - (1 -) - N' - - p - , N - - N' - - p - , N - (4 -) - 1 - , N - - 2 - ,
) - , N,N' - - N,N' - - - p - , N - - 1 - , N - (4 -) - 1 - , N - - 2 - ,
 , , p,p' - - - , 4 - n - , 4 - , 4 - , 4 - , 4 -
 - , 4 - , 4 - , 2, 4' - - - , 4,4' - , N,N,N',N' - - 4,4' - -
 , 1,2 - [(2 -)] , 1,2 - () , (o -) / [4
 - (1',3' -)] , N - - 1 - , - , - , - , - , -
 , - , - , - / , 2,3 - - - 3,3 - - 4H - 1,4 - , , , N - , N,N,
 / N',N' - - 1,4 - - 2 - .

2. UV

2.1. 2 - (2' -) - , 2 - (2' - - 5' -) , 2 - (3',5' - - 5' -) - 5' -
 - 2' -) , 2 - (5' - - 2' -) , 2 - (2' - - 5' -) - 2' -) - 5' -
 - (1,1,3,3 -)) , 2 - (3',5' - - 5' -) - 2' -) - 5' - - 2' -
 , 2 - (3' - - 2' - - 5' -) - 5' -) - 5' - - 2' -) - 5' - - 2' -
) , 2 - (2' - - 4' -) - 2' -) , 2 - (3',5' - - 2' -) - 2' -
) , 2 - (3',5' - - (, -) - 2' -) - 2' -) , 2 - (3' - - 5' - [2 - (2 -
 - 5' - (2 -) - 5' -) - 5' - - 2' -) - 5' - [2 - (2 -) - 5' - (2 -
) -] - 2' -) - 5' - - 2' -) , 2 - (3' - - 2' - - 5' - (2 -) - 5' - (2 -
) - 5' - [2 - (2 -) - 5' -) - 5' - - 2' -) - 5' - (2 -) - 5' - (2 -
) , 2 - (3' - - 2' - - 5' - (2 -) - 6' - - 2' -) - 2H - ; 300 2 - [3' -
 - 5' - (2 - - 4' - - 5' - 2H - - 2' -) - 2' - - 3' - (, -) - 5' - (1,1,3,
 3 -) - 5' - (2 -) - 2' -) - 2' - - 3' - (1,1,3,3 -) - 5' - (, -)
]] $[\text{R}-\text{CH}_2\text{CH}_2-\text{COO}-\text{CH}_2\text{CH}_2]_2$.

2.2. 2 - , 4 - , 4 - , 4 - , 4 - , 4 - , 4 - , 4 - , 4 - , 4 - ,
 4,2',4' - 2' - - 4,4' - .

2.3. , 4 - , 4 - , 4 - , 4 - , 2,4 - , 3,5 -
 3,5 - - - 4 - , (4 - -) , 3,5 - - - 4 - , 3,5 - - - 4 - , 3,5 -
 - - 4 - , 2 - - 4,6 - - , 3,5 - - - 4 - , 3,5 - - - 4 - .

2.4. , - - - , - - - , - - - - - - - - - - -
 , - - - , - - - - - - - - - - - - - - - -
 - p - - - , - - - - - - - - - - - - - -
) - 2 - .

2.5. , 가 (: n -) , N -
) 가 2,2' - - [4 - (1,1,3,3 -) - 3,5 - -] (1:1 1:2),
 , 4 - - 3,5 - - , (: 2 - - 4 -) , 가
 가 1 - - 4 - - 5 - .

2.6. , (2,2,6,6 - - 4 -) , (2,2,6,6 - - 4 -) - 4 -
) , (1,2,2,6,6 - - 4 -) , (1,2,2,6,6 - - 4 -) n - - 3,5 - - - 4 -
 - , 1 - (2 -) - 2,2,6,6 - - 4 - , N,N' - (2,2,
 6,6 - - 4 -) , (2,2,6,6 - - 4 -) , (2,2,6,6 - - 4 -) , (2,2,6,6 -
 - 4 -) - 1,2,3,4 - - , 1,1' - (1,2 -) (3,3,5,5 -
), 4 - - 2,2,6,6 - , 4 - - 2,2,6,6 - , (1,2,2,6,6 -
) - 2 - n - - 2 - (2 - - 3,5 - -) , 3 - n - - 7,7,9,9 -
 - 1,3,8 - [4.5] - 2,4 - , (1 - - 2,2,6,6 -) ,
 (1 - - 2,2,6,6 -) , N,N' - (2,2,6,6 - - 4 -) , 2 - - 4,6 - (4
 4 - - 2,6 - - 1,3,5 -) - 1,3,5 - 1,2 - (3 -)
 - n - - 2,2,6,6 -) - 1,3,5 - 1,2,2,6,6 -) - 1,3,5 - 1,2 - (3 -
 , 2 - - 4,6 - - (4 - n - - 1,2,2,6,6 -) - 1,3,5 - 1,2 - (3 -
) , 8 - - 3 - - 7,7,9,9 - - 1,3,8 - [4.5]
 - 2,4 - , 3 - - 1 - (2,2,6,6 - - 4 -) - 2,5 - , 3 - - 1 - (1,2,2,6,6 -
 - 4 -) - 2,5 - , 4 - - 4 - - 2,2,6,6 -
 , N,N' - - (2,2,6,6 - - 4 -) , 4 - - 2,6 - - -
 1,3,5 - , 1,2 - (3 -) 2,4,6 - - 1,3,5 -
 4 - - 2,2,6,6 - (CAS Reg. No. [136504 - 96 - 6]); 1,6 -
 2,4,6 - - 1,3,5 - N,N - 4 - - 2,2,6,6 -
 (CAS Reg. No. [192268 - 64 - 7]); N - (2,2,6,6 - - 4 -) - n -
 , N - (1,2,2,6,6 - - 4 -) - n - , 2 - - 7,7,9,9 - - 1 - - 3,8 -
 - 4 - - [4.5] , 7,7,9,9 - - 2 - - 1 - - 3,8 - - 4 - [
 4,5] , 1,1 - (1,2,2,6,6 - - 4 -) - 2 - (4 -
) , N,N' - - - N,N' - (2,2,6,6 - - 4 -) - , 4 -
 1,2,2,6,6 - - 4 - , , - - 2,2,6,6 - - 4 -
 1,2,2,6,6 - - 4 - .

2.7. , 4,4' - , 2,2' - , 2,2' - , 2,2' - - 5,5' - - , 2 - - 2' - , N,N' - (-
 , 2,2' - - 5,5' - - , 2 - - 5 - - 2' - , 2 - - 2' - - 5,4' -
 3 -) , 0 - p - - o - p - - .

2.8. 2 - (2 -) - 1,3,5 - , 2,4,6 - (2 - - 4 -) - 1,3,5 -
 , 2 - (2 - - 4 -) - 4,6 - (2,4 -) - 1,3,5 - , 2 - (2,4 -)
 - 4,6 - (2,4 -) - 1,3,5 - , 2,4 - (2 - - 4 -) - 6 - (2,4 -)
 - 1,3,5 - , 2 - (2 - - 4 -) - 4,6 - (4 -) - 1,3,5 - , 2 - (2 - - 4 -) - 4,6 -
 - 4 - (2,4 -) - 4,6 - (2,4 -) - 1,3,5 - , 2 - (2 - - 4 -) - 4,6 -
 - (2,4 -) - 1,3,5 - , 2 - [2 - - 4 - (2 - - 3 - -)] - 4,6 -
 (2,4 -) - 1,3,5 - , 2 - [4 - (/ - 2 -) - 2 -) - 2 - -] - 4,
 6 - (2,4 -) - 1,3,5 - , 2 - [2 - - 4 - (2 - - 3 - -)] - 4,
 6 - (2,4 -) - 1,3,5 - , 2 - (2 - - 4 -) - 4,6 - - 1,3,5 - , 2
 - (2 - - 4 -) - 4,6 - - 1,3,5 - , 2,4,6 - [2 - - 4 - (3 - - 2 -) - 2 - -] - 4,
 - (2 - - 4 -) - 1,3,5 - , 2 - (2 - - 4 - (4 -) - 6 - - 1,3,5 - , 2
 - {2 - - 4 - [3 - (2 - - 1 -) - 2 -]} - 4,6 - (2,4 -) - 1,3,
 5 - .

3. , N,N' - (3,5 - - - 4 -) , 3 - - 1,2,4 - , N,N' - () , N,N' - () , N,N' - ()

7. ,
(IV) :



$$R_1, C_1 - C_{12}, \dots,$$

R₂ C₁ - C₄ ,

n 0, 1 2 .

8.

13. , US - A - 4 325 863 , US - A - 4 338 244 , US - A - 5 175 312 , US - A
 - 5 216 052 , US - A - 5 252 643 , DE - A - 4 316 611 , DE - A - 4 316 622 , DE - A - 4 316 876 , EP - A
 - 0 589 839 EP - A - 0 591 102 3 - [4 - (2 -)] - 5,7 - - -
 - 2 - , 5,7 - - - 3 - [4 - (2 -)] - 2 - , 3,3 - - [5,7 - -
 - 3 - (4 - [2 -] -) - 2 - , 5,7 - - - 3 - (4 -) - 2
 - , 3 - (4 - - 3,5 -) - 5,7 - - - 2 - , 3 - (3,5 - - 4 -
) - 5,7 - - - 2 - , 3 - (3,4 -) - 5,7 - - - 2 - , 3 - (2,3 -
) - 5,7 - - - 2 - .

가 가 가 0.01 10 %

b) 가 , , , , ,
(, , , , ,
b)
b)
가 , , , , ,
5 25 % 2.

b) 가 / 가 (I), 가 (I), (I)

(I)

b)

가

b)

가

가)

가 (

가

()

b)

/

b)

b)

b)

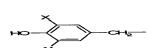
(I)

[b)]

(I)

[R-S(=O)_m-CH₂-CH(OH)-CH₂]_n-N(R¹)_{2-n}-R² (I)

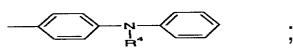
R C₄ - C₂₀ , , - C₄ - C₂₀ ; , , - , , - , , - ,
 (CH₂)_qCOOR³ , m 0 , R 가



n 1 R⁴ 가 , R 가 R²-R¹N-CH₂-CH(OH)-CH₂-S(=O)_m-(CH₂)_x- 1:1 R²-R¹N-CH₂-CH(OH)-CH₂-S(=O)_m-CH₂-CH₂-(O-CH₂-CH₂)_y- ;

R¹ , C₃ - C₁₂ ;

R²



$$R^3 \quad C_1 - C_{18} \quad ;$$

$$R^4 - CH_2 - CH(OH) - CH_2 - S(=O)_m - R \quad ;$$

X C₁ - C₈ ;

$$Y = C_1 - C_8;$$

m 0 1 ;

n 1 2 ;

q 1 2 ;

$$x \quad 2 \quad 6 \quad ;$$



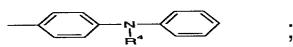
(1)

$$R - C_4 - C_{20} - , - C_4 - C_{20} - ; , , - , , - ,$$

$$(CH_2)_q COOR^3 - ,$$

$$R^1 \quad , \quad C_3 - C_{12} \quad ;$$

R²



R^3 $C_1 - C_{18}$;

$$R^4 - CH_2 - CH(OH) - CH_2 - S(=O)_m - R \quad ;$$

m 0 1 ;

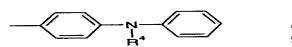
n 1 2 ;

q 1 2 ; (la) (l)

R C₈ - C₁₂ ; - (CH₂)_qCOOR³ , n 1 R⁴ ; , R R²-R¹N-CH₂-CH(OH)-CH₂-S(=O)_m-CH₂-CH₂(O-CH₂-CH₂)_l

R¹ 1,3 - ;

R²



R³ C₆ - C₈ ;

R⁴ - CH₂ - CH(OH) - CH₂ - S(=O)_m - R ;

m 0 1 ;

n 1 2 ;

q 1 ;

y 1 2 ; (Ia) (I)

%

1: 4 - {N - - N - [3 - (n -) - 2 -] } (101, 1)

n - (31.6 g) 4 - [27.2 g, Vulkanox 4010 (RTM),
] (0.8 g) 150 8 .
 220 /0.02
 51.2 g(99.5%) 4 - {N - - N - [3 -) - 2 -] } (101, 1)
 101, 1) C₂₆H₄₀N₂OS(428.68). : C 72.85; H 9.41; N 6.53; S 7.48%. : C 71.94; H 9.63; N 5.87; S 7.86%. EI - MS: 428 (M⁺), 239 (M⁺ - SCH₂CH(OH)).

1 n - , 98%
 4 - {N - - N - [3 - () - 2 -] } (102, 1)
 . C₂₇H₄₂N₂OS(442.71). : C 73.25; H 9.56; N 6.33; S 7.24%. : C 73.21; H 9.70; N 6.26; S 7.33%. EI - MS: 442 (M⁺), 239 (M⁺ - SCH₂CH(OH)).

1 n - , 103, 104 111(1)

1
107 (1)4 -
가

n -

4 - (1,3 -

n -
105, 106 108 (1)

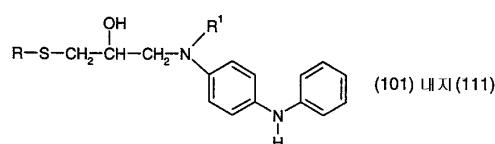
,

,

1
9 (1)n -
1
110 (1)4 - (2 -
n -

4 -

10



화합물	R	R¹	구성	M ⁺
101	n-옥틸	이소프로필	점성 오일	428
102	삼자-노닐	이소프로필	점성 오일	442
103	n-도데실	이소프로필	갈색 덩어리	484
104	삼자-도데실	이소프로필	점성 오일	484
105	n-도데실	1,3-디메틸부틸	암갈색 오일	526
106	삼자-도데실	1,3-디메틸부틸	암갈색 오일	526
107	n-옥틸	1,3-디메틸부틸	암갈색 오일	470
108	삼자-노닐	1,3-디메틸부틸	암갈색 수지	484
109	n-도데실	2-옥틸	암갈색 수지	554
110	n-도데실	시클로헥실	암갈색 수지	524
111	이소-C ₈ H ₁₇ OOCH ₂ -	이소프로필	암갈색 오일	486

2: 4 - { N -

- N - [3 - (n -

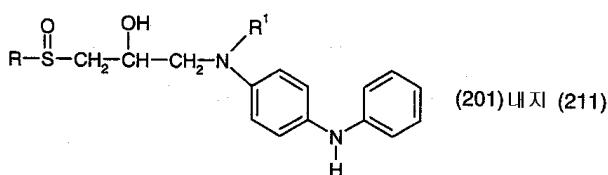
) - 2 -

]

}

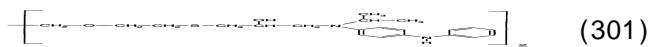
(201, 2)

4.53 g 30% 가 40 (H₂O₂) 25 ml 10g 101 (1, 1) 1, 1)
 / / (12:7:1) 7.14 g(69%) 4 - {N - - N -
 [3 - (n -) - 2 -] } (201, 2) : C 70.23; H 9.07; N 6.30; S 7.21%. : C 70.04; H 9.04; N 6.4
 26 H₄₀ N₂ O₂ S(444.68). : C 70.23; H 9.07; N 6.30; S 7.21%. : C 70.04; H 9.04; N 6.4
 2; S 7.05%. EI - MS: 444 (M⁺), 239 (M⁻ - S(=O)CH₂CH(OH),).
 , 2 102 (1, 1) , 62% 4 - {N - - N - [3 - () - 2 -] } (202, 2) : C 70.84; H 9.19; N 6.05; S 7.3
 2 O₂ S(458.71). : C 70.70; H 9.23; N 6.11; S 6.99%. : C 70.84; H 9.19; N 6.05; S 7.3
 5%. EI - MS: 458 (M⁺), 332 (M⁻ C₉H₁₈), 239 (M⁻ - S(=O)CH₂CH(OH),).
 2 103 111 (1, 1) 203 211 (2)



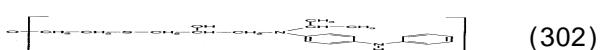
화합물	R	R¹	구성	M ⁺
201	n-옥틸	이소프로필	갈색 수지	444
202	삼자-노닐	이소프로필	갈색 수지	458
203	n-도데실	이소프로필	융점 48°C	500
204	삼자-도데실	이소프로필	점성 오일	500
205	n-도데실	1,3-디메틸부틸	암갈색 오일	542
206	삼자-도데실	1,3-디메틸부틸	암갈색 오일	542
207	n-옥틸	1,3-디메틸부틸	암갈색 오일	486
208	삼자-노닐	1,3-디메틸부틸	암갈색 수지	500
209	n-도데실	2-옥틸	암갈색 수지	570
210	n-도데실	시클로헥실	암갈색 수지	540
211	이소-C ₈ H ₁₇ OOCCH ₂ -	이소프로필	암갈색 오일	502

3: 4,13 - - 7,10 - - 1,16 - [N - - 4 - () -] - 2,15 -
(301)



3,6-
10) 4-
 . 150 6
 / (1:1)
 . 13.25 g(36%) 4,13-
 - 7,10-
 - 1,16-
 . [N-
 - 4- ()] - 2,15- (301) . C₄
₂H₅₈N₄O₄S₂(747.08). : C 67.52; H 7.83; N 7.50; S 8.58%. : C 67.58; H 7.78; N 7.2
1; S 7.93%. EI-MS: 746 (M⁺), 239 (C₆H₅NHC₆H₄N(C₃H₇)CH₂⁺).

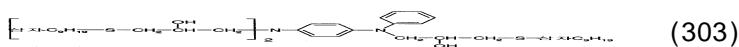
4: 302



3 - - 1,5 - 17.5 g (0.07) 150 2 22.6 g (0.10)
 4 - [Vulkanox 4010 (RTM),] 0.28 g (2)
 가 . 150 6 . . ,
 / (1:1) . 37.0 g (92%) 302 . EI - MS: 702 (M⁺),
 239(C₆H₅NHC₆H₄N(C₃H₇)CH₂⁺ ,).

5: 303

28.1 g (0.13) 150 2 9.2 g (0.05) 4 -
0.14 g (1) 가 . 150 2 .
/ (1:3) . .
. 6.1 g (16.5%) 303
. C₄₈H₈₄N₂O₃S₃ (833.40). : C 69.23; H 10.09; N 3.36; S 11.53%.
: C 68.83; H 10.09; N 3.54; S 11.68%. EI - MS: 833(M⁺), 127 (C₉H₁₉⁺); .



6:

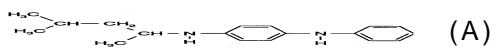
40.0 Cariflex[®] 1220 [,] 60 60.0 55.0
 (N 330), 6.0 Ingralen 450 (RTM) [], 5.0 [가]
], 2.0 [가], 0.2 IRGANOX 1520 (RTM) [가],
], 2.0 [가], 0.6 Vulkacit MOZ (RTM) [가],
], 2.0 3 가 150 , 가 [V
 Vulkacit MOZ (RTM)] 가 . 2 mm
 2 mm, 21 cm 8.0 cm .
 50 5 .
 : 0 = (AO 가) 5 = .
 . 3

실시예	안정화제 (화합물)	접촉변색 - 목측
6a ^{a)}	—	0
6b ^{a)}	Vulkanox 4020 (RTM) ^{c)}	5
6c ^{b)}	103	0-1
6d ^{b)}	106	0-1
6e ^{b)}	107	0-1
6f ^{b)}	108	0-1
6g ^{b)}	109	0-1
6h ^{b)}	110	0-1
6i ^{b)}	111	0-1
6k ^{b)}	203	0-1
6l ^{b)}	205	0-1
6m ^{b)}	206	0-1
6n ^{b)}	210	0-1

a)

b)

c) Vulkanox 4020 (RTM) [] (A) 4 - [1,3 -] :

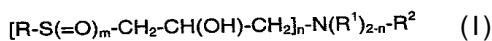


(57)

1.

a) , , , , / ,

b) (I) :

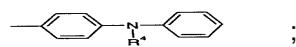


$\text{R} \quad \text{C}_4 - \text{C}_{20} \quad , \quad - \quad \text{C}_4 - \text{C}_{20} \quad ; \quad , \quad , \quad - \quad , \quad , \quad - \quad , \quad , \quad - \quad , \quad -$
 $(\text{CH}_2)_q\text{COOR}^3 \quad , \quad$

m 0 , R 가



n 1 R^4 가 , R 가 $\text{R}^2-\text{R}^1\text{N}-\text{CH}_2-\text{CH}(\text{OH})-\text{CH}_2-\text{S}(\text{=O})_m-(\text{CH}_2)_x-$ 또는
 $\text{R}^2-\text{R}^1\text{N}-\text{CH}_2-\text{CH}(\text{OH})-\text{CH}_2-\text{S}(\text{=O})_m-\text{CH}_2-\text{CH}_2-(\text{O}-\text{CH}_2-\text{CH}_2)_y-$;

 $\text{R}^1 \quad , \quad \text{C}_3 - \text{C}_{12} \quad ;$ R^2  $\text{R}^3 \quad \text{C}_1 - \text{C}_{18} \quad ;$ $\text{R}^4 \quad - \text{CH}_2 - \text{CH}(\text{OH}) - \text{CH}_2 - \text{S}(\text{=O})_m - \text{R} \quad ;$ X $\text{C}_1 - \text{C}_8 \quad ;$ Y $\text{C}_1 - \text{C}_8 \quad ;$

m 0 1 ;

n 1 2 ;

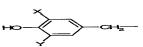
q 1 2 ;

x 2 6 ;

y 1 2 .

2.

1 ,

R C₄ - C₁₂ , - C₄ - C₁₂ ; , - , - (CH₂)_qCOOR³ , m
0 ,R 가  ;n 1 R⁴ 가 , R 가R²-R¹N-CH₂-CH(OH)-CH₂-S(=O)_m-(CH₂)_x- 및 R²-R¹N-CH₂-CH(OH)-CH₂-S(=O)_m-CH₂-CH₂-(O-CH₂-CH₂)_y- ;R¹ , C₃ - C₈ ;R³ C₄ - C₁₂ ;X C₁ - C₄ ;Y C₁ - C₄ ;

m 0 1 ;

q 1 2 ;

x 2 4 ;

y 1 2 .

3.

1 ,

R C₆ - C₁₂ , - C₆ - C₁₂ ; - (CH₂)_qCOOR³ , n 1 R⁴ 가 , R
가R²-R¹N-CH₂-CH(OH)-CH₂-S(=O)_m-(CH₂)_x- 및 R²-R¹N-CH₂-CH(OH)-CH₂-S(=O)_m-CH₂-CH₂-(O-CH₂-CH₂)_y- ;

R¹ C₃ - C₆ ;

R³ C₆ - C₁₀ ;

m 0 1 ;

q 1 2 ;

x 2 ;

y 1 2 .

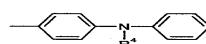
4.

1 ,

R C₈ - C₁₂ - (CH₂)_qCOOR³ , n 1 R⁴ 가 , R 가 R²-R¹N-CH₂-CH(OH)-CH₂-S(=O)_m-CH₂-CH₂(O-CH₂-CH₂)_l

R¹ 1,3 - ;

R²

 ;

R³ C₆ - C₈ ;

R⁴ - CH₂ - CH(OH) - CH₂ - S(=O)_m - R ;

m 0 1 ;

n 1 2 ;

q 1 ;

y 1 2 .

5.

1 , a)

6.

1 , a) 가 .

7.

1 , a) 가 , - 가 , 가

8.

1 , a) b) 가 가

9.

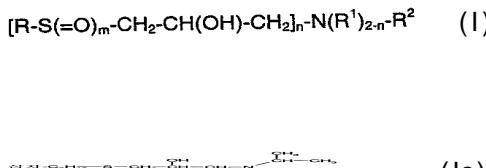
10.

11.

1 , b) a) 0.05 10 %

12.

(la) , (l) :



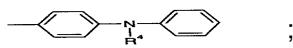
R-C₄-C₂₀, - (CH₂)_qCOOR³, m=0, R 가



n 1 R⁴ 가 , R 가 R²-R¹N-CH₂-CH(OH)-CH₂-S(=O)_m-(CH₂)_x 또는 R²-R¹N-CH₂-CH(OH)-CH₂-S(=O)_m-CH₂-CH₂-(O-CH₂-CH₂)-y-

$$\mathbb{R}^1 \quad , \quad C_3 - C_{12}$$

R²



\mathbb{R}^3 $C_1 - C_{18}$;

$$R^4 - CH_2 - CH(OH) - CH_2 - S(=O)_m - R \quad ;$$

X C₁ - C₈ ;

Y C₁ - C₈ ;

m 0 1 ;

n 1 2 ;

q 1 2 ;

x 2 6 ;

$$y \quad 1 \quad 2 \quad .$$

13.

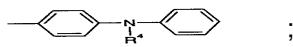
12 ,

$$R - C_4 - C_{20} - , - C_4 - C_{20} - ; , , - , , - ,$$

$$(CH_2)_q COOR^3 - ,$$

$$R^1, \quad C_3 - C_{12};$$

R²



\mathbb{R}^3 $C_1 - C_{18}$;

$$R^4 - CH_2 - CH(OH) - CH_2 - S(=O)_m - R \quad ;$$

m 0 1 ;

n 1 2 ;

q 1 2 (1) .

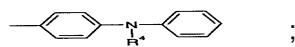
14.

12 ,

R C₈ - C₁₂ ; - (CH₂)_qCOOR³ , n 1 R⁴ ; , R R²-R¹N-CH₂-CH(OH)-CH₂-S(=O)_m-CH₂-CH₂(O-CH₂-CH₂)_y

R¹ 1,3 - ;

R²



R³ C₆ - C₈ ;

R⁴ - CH₂ - CH(OH) - CH₂ - S(=O)_m - R ;

m 0 1 ;

n 1 2 ;

q 1 ;

y 1 2 (I) .

15.

1 b) , , , , ,
/ - .

16.

1 b) , .

17.

, , , , - / - 1
b)

18.

1 b) .