

(19)
(12)

(KR)
(A)

(51) 。 Int. Cl. ⁷
C10M 135/10

(11)
(43)

2003 - 0003003
2003 01 09

(21) 10 - 2002 - 0032671
(22) 2002 06 11

(30) 09/896,041 2001 06 29 (US)

(71) , 06852 . . 588

(72) . . 06460 71

(74)

:

(54)

(a) ;

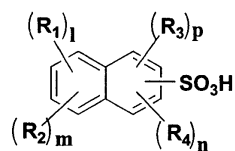
(b) (i) -, - - ;

() -, - - ;

() -, - - ;

(iv) -, - - 가
-, - -
:

[I]



, R_1, R_2, R_3 R_4 10 14
 $; l, m, n$ p 0 4 , $l + m + n + p$ 1 ; R_1, R_2, R_3
 R_4 l, m, n p 가 0 .

-, - -

, -, - / -
 . - , - , - , - ,

가 (hydraulic fluid)

. 가 , (Friedel - Cr
 afts)

C.C. Price in " Organic Reactions" , Volume 3, Chapter 1,
 pages 1 - 82, John Wiley & Sons, Inc., 1946. , 5

(hydrogen fluoride),

(the degree of alkylation)

(C.C. Price).

가

2 : (1)

$\text{RCOCl}(\text{R})$

(2)

(Clemmenson)

(Wolff - Kirshner)

R.T. Morrison and R.N. Boyd entitled " Organic Chemistry," Third Edition, Chapters 12, 19, and
 30, Allyn and Bacon, Inc., 1973

(tetramer)

3 (trimer)

4

2,764,548 (King and Thielcke)

(: C_9 ,

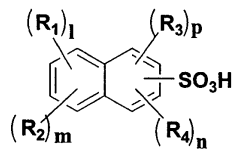
C_{12} or C_{16})

5,401,896 6,071,864

3 4 가 10 (C₁₀) , (demulsibility),
 2 Wet AFNOR the Wet Pall 2

- (a) ;
- (b) (i) -, - - ;
- () -, - - ;
- () -, - - ;
- (iv) -, - - 가
 -, - - :

[I]



, R₁, R₂, R₃ R₄ 10 14 가 (hydr
 ocarbonyl'groups) ; l, m, n p 0 4 , l + m + n + p
 1 ; R₁, R₂, R₃ R₄ l, m, n p가 0 .
 -, (a) ; (b) 가

- (a) ;
- (b) -, - - 가

(formulation)

가 , 가 , AFNOR Pall Tests
가 ,
가 ,
가 ,
가 , 5,767,045
AFNOR 가

(part)

(1) ; , (.), (.) , 가
(, 2 가).

(2) ; , -

(3) (pendent group), ,

(4) , ,

3 1 가
10

" " , " " 가

" " 가 ,

" - " 1 가

가 , " " 3 4

(1) 가

가

2 가 . [(a)] .
) , . - (가
(stock) - .
- 가 . - .

American Petroleum Institute's (API) Base Oil Classification System, viz. API Group I to Group V oils

(point) , 가 . 가
가
,
, , , , , , , , , (pour p

가

(b)(i) (b)(iv)]

가

4 1 4 가 1
10 , 10 56 .
" " .
C₁₀ C₁₄ , C₁₀ C₁₄ 1 C₁₀ C₁₄ 1 (, C₁
0 , C₁₂ C₁₄ .
(super acid) .
, 3 , 3 , 4 , 2 5
4,604,491 4,714,794 .

Zeolite Beta, Zeolite Y, ZSM - 5, ZSM - 35 USY 가 .

King , 2,764,548 - (co - cotalyst) .

, , C₁₀ C₁₄ (,
, , , C₁₀ C₁₄) 가 .
가 , (b)(i) (b)(iv)
4 . 1

가 " " (branching)
C₃ C₄ .
" " .
가 10 28 , 12 24 (, C₁₂ -
)가 C₁₀₋₁₄ -, C₁₀₋₁₄ -, C₁₀₋₁₄ -

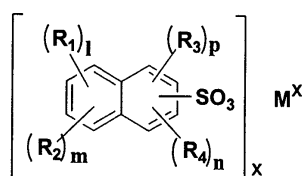
(oleum), 3 ,
Jerry March, Advanced Organic Chemistry, Reactions, Mechanisms and Structure , 4th
edition, John Wiley and Sons, p. 528, 1992

1 3 1 가 .

4 - , - / -

- , - / - (II) :

[II]

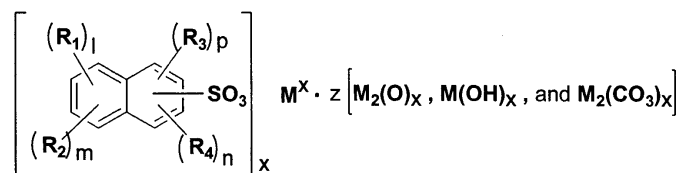


, $R_1, R_2, R_3, R_4, l, m, n$ p ; M , , IVb
 가 R Vb ; x 가 . l, m, n p가 0 ,
 가 R 가 .
 M , , , , . M , , , , .
 " " d f
 (long form) (Modern Periodic Table of Ele
 ments) , IIIa VIIa , lb , IIb 3
 12 , . F.A. Cotton, " Advanced Inorganic Chemistry" , Third Edition, John W
 iley Publishers(1972) , Learning Laboratories version(
 1996 copyright) . , , , , , .
 " IVb " 가 4
 IVb 14 .
 " Vb " 가 5
 Vb 15 .
 - , - / - , ,
 . , .
 - , - / -
 가 가 (soap)
 , , , , 가
 가 가
 , 가 , 가
 ; () , (promoter) 가
 ; ; , , ,
 ; 가
 1.0 15 .
 (reserve)
 , 1 (Chapter 3 on detergents/dis
 persants by C. C. Colyer and W. C. Gergel, published in Chemistry and Technology of Lubricants, R. Mort
 ier and S. T. Orszulik, VCH Publishers 1992). 5

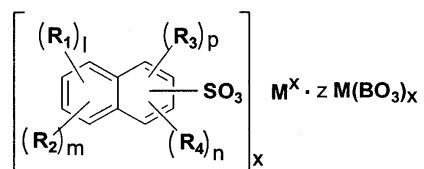
00 가(base number)

-, - / - (III), (IV) (V)
:

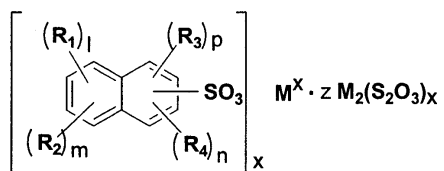
[III]



[IV]



[V]



, $R_1, R_2, R_3, R_4, l, m, n, p$ (I), M, ; x M, 가, z 0.1
, IVb, Vb
50

, IVb, Vb

$(\text{CO}_3)_x$ $\text{M}_2(\text{O})_x$, $\text{M}(\text{OH})_x$ M_2

5,484,542 ; 5,064,545 ; 4,539,126

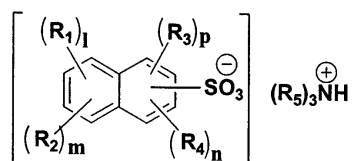
() 가 (i) n situ) 가

6,090,757

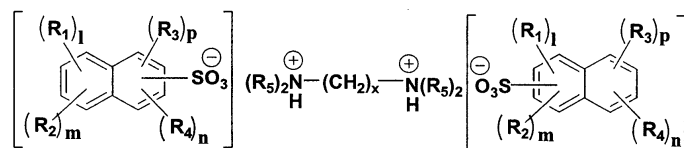
CO_2 SO_2 5,484,542 (sulfite)

(VI) (VII)

[VI]



[VII]



, R_1 , R_2 , R_3 , R_4 , l, m, n p R_5 1 25
x 2 5

- , - / - 1 , 2 3

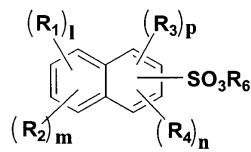
- (Primene 81R, Rohm and Hass), (tallow) (Akzo Nobel)
1 ; - (Akzo Nobel) 2 ; N - - 1,3 -

N - 1,3 - (Akzo Nobel) ; N -
- 1,3 - (Tomah Products), Jeffamine M Jeffamine D (Huntsma
n) ; N - 1,3 - (Akzo Nobel's
Ethomeen C/12 Ethoducomeen T/13)

80 가 .

$$- \frac{1}{\sqrt{\pi}} \int_0^x \frac{f(t)}{(x-t)^{3/2}} dt = - \frac{1}{\sqrt{\pi}} \int_0^x \frac{f(t)}{(x-t)^{3/2}} dt \quad (\text{VIII})$$

[VIII]


$$, R_1, R_2, R_3, R_4, l, m, n \quad p \quad , R_6 \quad 2 \quad 18$$
$$- \frac{1}{2} \frac{d}{dt} \left(\frac{1}{2} \frac{d}{dt} \right) = - \frac{1}{2} \frac{d^2}{dt^2}$$

가 가 . ,

(a) 50% ,

0.0005% 75% 25% 10%

가

[illegible]

가

가

(vehicle) 가

70cSt 80 120 40 가 10cSt 2000cSt, 70 120 100 25cSt 가 250 800 4,326,972 107, 가 D.V. Brock, Lubricating Base O
ils, Lubrication Engineering, volume 43, pages 184 - 185, March, 1987

4,582,618 (2, 37 3, 63)

가 가 (gelling agent)

(consistency)

(非) -

가 ;

(siloxanes) (2 -) (2 -) (p -)
가

가

가 . , , AFNOR
 , .

I

(64) (3.34) 70 - 80 , 1 - (168)
 가 가 , 가 , 가가 ,
 80 1 , 가 (quenching) ,
 200 .

II

128 , 1.67 , 1 - 306 , I

III

128 , 1.67 , 1 - 269 , I

IV

82 1 - 96 , 1 - 96 , 1 - 8 , 1.67
 200 , I .

V

3 0.8 - 1.2 (oleum) I IV

20 30) 가 (

" Direct Sulfonation of Aromatic Hydrocarbons and Their Halogen Derivatives, by C. M. Sutter and A. W. Weston, Published in Organic Reactions Volume III (1946)"

(bub
 bling) (, 93 11709)
 20% 100% .

VI

50 - 70%

V

, Ca(OH)_2 , CaCO_3 가 , CaO , MgO ,
 Ba(OH)_2 가 , 90 ,
 (ozeotroped) , ,
 1.5 2.5%

VII

가 , 가 , V
 가 , 75 2 ,
 - (50/50) 가 ,
 0.5 SCF/ 100
 150 가 1 2 ,
 가 30 - 40%
 100 - 200 5 10 가 .

VIII

V (. ,) 6,090,
 757 30 - 40% ,
 2.0 - 3.0% .

IX

V 5,484,542 (. ,)
 , 5.0 10.0 . 30 - 40%

X

V (112 ; 0.0835) (50) 75
 , (Armeen O)(23.8 ; 0.0881) 가 .
 , 가가 , 100
 () (123) .
 1.0 .

XI

V (268 ; 0.2) (100) 75
 , - 2 - (56.1 ; 0.214) 가
 , 가가 X 가 2.5
 (272)

XII

V
 1.00 1.02

XIII

V 1.00 1.02
 가 , 75

I") , 가 HF - 0 가 (" 가
 B C") 가 , VI API I, II, III (" 가 A,
 - 가 1 - 7/ 가 I 70 80 %;
 가 1 - 7 7 11 % 2 5 %; 14 20 %;
 10.6ppm 가 1 - 7/ 가 I
 (ASTM D 665), (ASTM D 1401) A, B C
 , Cincinnati Milacron (ASTM D 2070) AFNOR 가
 (ASTM D 2619) 가

ASTM D 665 - 가 60
 3 % 2 , 24
 B A , A , B (spindle)

ASTM D 1401 , 40ml 40m
 I 5 100ml , / 가
 5 . 3ml 40
 90cSt 가 , 54 40 90cSt 가 ,
 82

AFNOR . 320ml 2 70
 , 5 1500rpm , 70
 (dark cabinet) . 24 , 14.5psi
 (filterability index) 가 1 가
 , 1 2 AFNOR , 0.2ml
 AFNOR AFNOR

Cincinnati Milacron (ASTM D 2070)
 200ml , 135 168
 , HF - 0 , 100mg/100ml
 10mg

가 가 ASTM (ASTM D 261
 9) . 75g, 25ml, (copper strip) 가
 48 93 5rpm
 , 가 2
 0 2 4.0 (가(acid number)) HF -
 mg/cm² 0.2

(Salt Spray Test) ASTM (ASTM B
 117) 가 35
 가 가 , 가

(Cleveland Condensing) AS
 TM (ASTM D 4585)
 (pan) 가
 가 , 가

[1]

[1]

가	1	2	3	4	5	6	7
가	I	I	I	I	I	I	I
A Exxon - I							
D 655B							
D 1401							
AFNOR							
B Chevron - II							
D 655B							
D 1401							
AFNOR							
C Petro Canada - III							
D 655B					-	-	
D 1401					-	-	
AFNOR					-	-	

1. 가 1: Pilot Chemical - C 5000 가
2. 가 2: RheinChemie - RC 4220 가
3. 가 3: C₁₂ -
4. 가 4: VI 33% (C₁₀ C₁₄) 67% (C₁₀ C₁₄)
5. 가 5: VI 100% (C₁₀ C₁₄)
6. 가 6: VI 80% 20% (C₁₀ C₁₄)
7. 가 7: VI 3% , 55% (C₁₀ C₁₄) 42%
(C₁₀ C₁₄)
8. 가 I 가 .
9. Exxon - I Exxon Americas Core 600/150 (34%/66%) .
10. Chevron - II 220R Neutral .
11. Petro Canada - III VHV18 .
- Cincinnati Milacron Test (ASTM D 2070) 가 (ASTM D 2619)
가
II 가 1 2
, 가 4 . 2 .

[2]

: 20% 가 80%

[2]

가		가 1	가 2	가 4
()	1	6	6	6
()	8 - 24	126	126	126

2

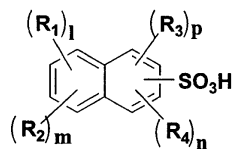
1. 가 1: Pilot Chemical - C 5000 가
2. 가 2: RheinChemie - RC 4220 가
4. 가 4: VI 33% (C₁₀ C₁₄) 67% (C₁₀ C₁₄)

가 (formulation)
 가 AFNOR Pall Tests
 가 5,767,045 AFNOR 가

(57)

1.

- (a) ;
 (b) (i) -, - ;
 () -, - ;
 () -, - ;
 (iv) -, - 가 ,
 -, - :
 [I]

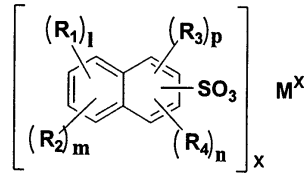


, R_1, R_2, R_3 R_4 ; l, m, n p 0 4 10 14 , $l + m + n + p$ 1 ; R_1, R_2, R_3
 R_4 l, m, n p 가 0 .

2.

1 , 가 (II)
(b)(i) :

[II]



, $R_1, R_2, R_3, R_4, l, m, n, p$; M
Vb ; x 가 , , IVb

3.

2 , (II) M , ,
.

4.

2 , (II) M , , ,
.

5.

2 , (II) M , , ,
.

6.

2 , (II) M , IVb
.

7.

2 , (II) M , Vb
.

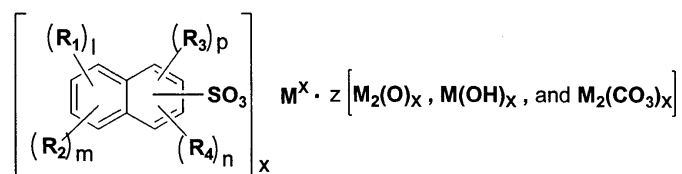
8.

2 , (II) M , , IVb Vb
2 .

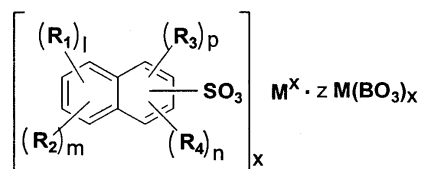
9.

1, (b)(ii),
(III), (IV) (V), :

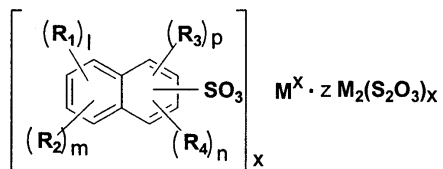
[III]



[IV]



[V]



50, $R_1, R_2, R_3, R_4, l, m, n, p$ (I) ; M
, IVb, Vb ; x M 가 ; z 0.1

10.

9, (III), (IV) (V) M, ,

11.

9, (III), (IV) (V) M, , ,

12.

9, (III), (IV) (V) M, , ,
.

13.

9, (III), (IV) (V) M, IV
b.

14.

9, (III), (IV) (V) M,
Vb.

15.

9, (III), (IV) (V)가, , , IVb Vb
2.

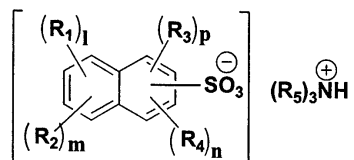
16.

1, , 가 (b)(iii).

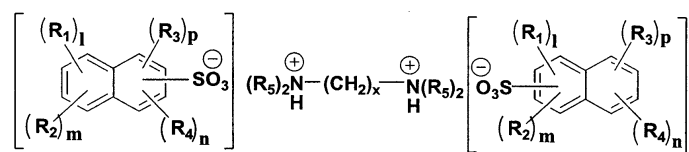
17.

16, (b)(iii) (VI) (VII)
:

[VI]



[VII]



, $R_1, R_2, R_3, R_4, l, m, n, p$; R_5 1 25
; $x = 2, 5$.

18.

17 , 80

19.

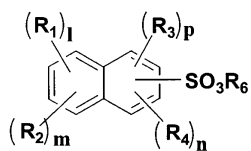
1 , 가 (b)(iv)

20.

19 , (b)(iv) (VIII)

:

[VIII]



, $R_1, R_2, R_3, R_4, l, m, n, p$ (I) , $R_6 = 2, 18$

21.

20 , 가

22.

1 , 가 10 14 .

23.

1 , 가 12 .

24.

1 , (I) - , - / - C_{10} C_{14}
 , C_{10} C_{14} 1

25.

1, R_1, R_2, R_3, R_4 10 56 .

26.

(a) ;

(b) 1 가 .

27.

(a) ;

(b) 1 가 - .

28.

1, (a)가 50% , (b)가 0.0005% .

29.

28, (b)가 25% .