

2004 05 03
10-0430166
2004 04 22

[illegible]

EA : , , , , , ,
 , ,

OA OAPI : , , , , , 가 ,
 , , , , , , ,

(73) 45202 1

(72)

	45040	5365
--	-------	------

47025 2393

45069 8485

45241 10444

(74)

:

(54)

3

[5,464,477 , 5,529,788 , 4,308,229 , 4,448,750 , WO 94/07989 , WO 9 7/16263 , WO 94/23852 , WO 93/06947 , 2,204,321 , 258,819 , 4,100,682 , 10036892 , 08157888]

(a)

; (b)

(i)

; (ii)

" " / (Hz) Hz

[illegible]

가 , , (i) (ii)

(Branson Ultrasonic Bath)
" "(DP Wash Machine Sonic Wash Ball),

Teldyne Water Pik SR-400R

가

가
(sonotrode)

PZT

가

가 " (chisel)

50mm 가 0.05 5mm 10

, 50kHz, 30

40

" "

가

10

100mm

가 ,

가

20

500

가

가 ,

가

가

가

/

/

가

가

/

1

가

[

1998 11 16

60/180,629 ,

7341]

100Hz

20,000kHz,

100Hz

10,000kHz,

1

50Hz

2000kHz,

150Hz

1,000kHz,

150Hz

10

0kHz,

200Hz

50kHz

70kHz

0.07 /cm²

z

100kHz,

0.02

/cm²

, 0.08

/cm²

0.05

/cm²

1

5

20

2

가

30

1

가

(,

)

가

가

가

(/) Termamyl[®]

(: Novo Nordisk), Fungamyl[®] BAN[®] (: Novo Nordisk)

01 2 %, 0.0001 0.5 %, 0.0005 0.1 %, 0.00

0.001 0.05 % [WO 95/26397 Novo Nordisk PCT/DK96/00056]

:

(a) Phadebas[®] - , 25 55 8 10 pH
Termamyl[®] 25% - Phadeb
as[®] - [WO 95/26397 , 9 10]

(b) (a) -

(c) N- : His - His - Asn - Gly - Thr - Asn - Gly - Thr - Met - Met - Gln - Tyr - Phe - Glu - Trp -
Tyr - Leu - Pro - Asn - Asp (a) -
[Lipman and Pearson, Science 227, 1985, p. 1435]

가 X% , X%

(d) , NCIB 12289, NCIB 12512, NCIB 12513 DSM 935

, (a) (c) - " "

DNA DNA

(e) (a) (d) -

(f) (i) (a) (e) - , (ii)

80% / , -

DNA DNA - ,

1. - / ;

2. - / ;

3. - ;

가 - : 가

, 가 , Ca , pH 가 - pH

(pl) , pl 가

[PCT/DK96/00056]

[Novo 1,296,839] -

; RAPIDASE[®] (: International Bio-Synthetics, Inc.), TERMAMYL[®] (: Novo) FUNG
AMYL[®] (: Novo)
[: , J. Biological Chem., Vol. 260, No. 11, June 1985, pp. 6518-6521].

, 1993 TE

RMAMYL[®]

, , pH 9 10
/ ; , 60

가 ; , pH 8 11

가 , " - " [: , WO 9402597].

- (Novo Genencor International) 가 , -

- , -

, (a) [

1994 2 3 Novo WO 9402597] , TERMAMYL ® .
 197 가 ,
 가 ; (b) [Genencor International in a paper entitled "Oxidatively Resistant alpha-Amylases" presented at the 207th American Chemical Society National Meeting, March 13-17 1994, by C. Mitchinson]
 (Genencor) NCIB806
 1 가 (Met) 가
 . Met 8, 15, 197, 256, 304, 366 438
 M197L M197T가 , M197T 가 가
 CASCADE ® SUNLIGHT ®) ; (c) [WO 9
 510603 A] 가
 Novo) DURAMYL ® 가
 cor International WO 9418314 Novo WO 9402597]
 가
 [Novo WO 9509909 A].

ADD
 가
 가
),
 (, , , ,
 (, , , ,
),
 ()
 [4,430,243]
 [5,246,621 5,244,594]
 Mn^{IV}₂ (u-O)₃ (1,4,7- -1,4,7-)₂ -(PF₆)₂ ("MnTAC
 N"), Mn^{III}₂ (u-O)₁ (u-OAc)₂ (1,4,7- -1,4,7-)₂ -(ClO₄)₂ , Mn^{IV}₄ (u-O)
 6 (1,4,7-)₄ -(ClO₄)₂ , Mn^{III} Mn^{IV}₄ (u-O)₁ (u-OAc)₂ (1,4,7- -1,4,7-
)₂ -(ClO₄)₃ [549,272].
 1,5,9- -1,5,9- , 2- -1,4,7-
 , 2- -1,4,7- .

[4,246,612 5,227,084]
 [408,131 (, 384,503 306,
 089 (-), 4,728,455 (/), 4,711,748
 224,952 (), 4,601,845 (,
), 4,626,373 (/), 4,119,557 (,
), 2,054,019 (), 866,191 (-),
 4,430,243 (-), 4,728,455 ()]
 [Co(NH₃)_n (M')_m]Y_y [, n 3 5(4 5, 가 5)
 ; M' , , , (m 1)
 ; m 1 3(1 2, 가 1) ; m+n
 6 ; Y 1 3(2 3, Y가 -1 가 2) y
 - 가
 [Co(NH₃)₅ Cl]Y_y [Co(NH₃)₅ Cl]Cl₂
 [Co(NH₃)_n (M)_m (B)_b]T_y [, +3 , n 4 5
 (5) , M , m 0, 1 2(
 1) , B , b 0 1(0) , b가 0 m+
 n 6 , b가 1 m 0 n 4 , T y(y 1 3 , T가 -1]
 가 0.23M⁻¹ s⁻¹ (25) 가 (III)
 , T , , I₃⁻ , , , , , , , , ,
 , PF₆⁻ , BF₄⁻ , B(Ph)₄⁻ , , T T
 , , HPO₄²⁻ , HCO₃⁻ , H₂PO₄⁻ . 가 , T

[illegible]

(underbuilt)" , "

1987 5 12 H. P. Rieck , SiO₂:Na₂O 1.6:1 3.2:1 , [4,664,839]

NaSKS-6 (Hoechst) ("S

KS-6") , NaSKS-6

NaSKS-6 -Na₂SiO₅ [DE-A-3,417,649

DE-A-3,742,043] SKS-6

NaMSi_xO_{2x+1}.yH₂O(, M , x 1.9 4,

2 , y 0 20, 0) , NaSKS-5, NaS

(Hoechst) , NaSKS-11 , -Na₂SiO₅(NaSKS-6)가

KS-7 NaSKS-11 , 가

가 (crispening agent) ,

[1973 11 15 2,321,001]

가 가

O(, z y 6 z y 1.0 0.5 , x $M_z (zAlO_2)_y] \cdot xH_2O$)

[1976 10 12 Krummel 3,985,669]

MAP X A, P(B),

Na₁₂ [(AlO₂)₁₂ (SiO₂)₁₂] · xH₂O(, x 20 30, 27)

A (x 0 10)

0.1 10

," "

3 가

가 ,

가

[1964 4 7 Berg 3,128,287 , 1972 1 8 Lamberti

3,635,830]

[1987 5 5 Bush 4,663,071 "TMS/TDS"].

158,635 , 4,120,874 4,102,903] [3,923,679 , 3,835,1634 , 4,

, 1,3,5- -2,4,6-

1,3,5-

가 , , 가 (,)

[1986 1 28 Bush 4,566,984

] 3,3- -4- -1,6- C5-C20

, 2- (), 2-

[1986 11 5

86200690.5/0,200,263]

[1979 3 13 Crutchfield 4,144,226

1967 3 7 Diehl 3,308,067] [Diehl

3,723,322].

, C12-C18 , /

가 가

0.01 99.9 %
 .1 80 %, 0.5 60 %
 [McCutcheon's EMULSIFIERS AND DETERGENTS, North American Edition, 1997, McCutcheon Division, MC Publishing Company, 1975 12 30 Laughlin 3,929,678 , 1981 3 3
 1 Murphy 4,259,217 ; in series :Surfactant Science", Marcel Dekker, Inc., New York and Basel; in "Handbook of Surfactants", M.R. Porter, Chapman and Hall, 2nd Ed., 1994; in "Surfactants in Consumer Products", Ed. J. Falbe, Springer - Verlag, 1987 and "Surface Active Agents and Detergents" (Vo l. I and II by Schwartz, Perry and Berch),]

/ C11-C18 1 , 2
 , C10-C18 , C10-C18
 , C12-C18 - , C12-C18 (, C₆
 C₁₈ /), C12-C18 ("), C10-C18 , C₆ C₁₈
 , C₆ 가

8 , , , , , , , , C₆ C₁₈ , C₆ C₁₈ C₆ C₁
 0.5 90 %, 5 60 %, 10 30
 %가

/ 가 ()
 ROSO₃ M[, R , C₁₀-C₂₄ , C
 10 -C₂₀ , M H (IA) , (C₁₂-C₁₈)
 (, , - , -) 4 (, -
), (,) 50
) C₁₆-C₁₈ , C₁₂-C₁₆ (50)

RO(A)_m SO₃ M[, R C₁₀-C₂₄ C₁₀-C₂₄
 , A C₁₂-C₂₀ , m 0 , C₁₂-C₁₈ 0.5 6,
 0.5 3 , M H (, , ,),
 - 4 (, -), (, -
 -C₁₈ , (1.0) , C₁₂-C₁₈ (2.25) , C₁₂-C₁₈ C₁₂
 (3.0) , C₁₂-C₁₈ (4.0) (, M

["Surface Active Agents and Detergents"(Vol. I and II by Schwartz, Pe rry and Berch)] [1975 12 30 Laughlin

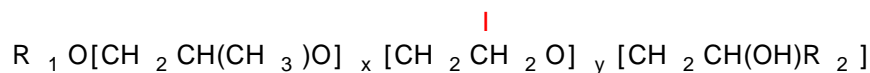
3,929,678 , 23, 58 29, 23]
 가 (Dianionics)
 가 [60/020, 60/020,772 (6161P), 60/020,928 (6162P
 503 (6158P), 60/020,832 (6159P) 60/020,773 (6162P
)(1996 6 28), 60/023,539 (6192P), 60/023493 (6194P) 60/023,540 (6193P) 60/023,527 (6

195P)(1996 8 8),] .

가 0.1 30 %, 가 0.25 20 % 0.01 40 %, 가 (cloud point)

" " 가 가 , 2 가 " "[: Kirk Othmer, pp. 360-362,]

, " " 30 , 20 , 가 10 , (가) , - 가 - (가) , - / / (PO/EO/PO) 가 1 , Olin Corporation Poly -Tergent ® SLF18) - (가) (, Olin Corporation 1994 10 Pol 13 WO 94/22800 , Olin Corporation 15 % y-Tergent ® SLF18B) . [1980 9 16 Builloty 4,223,163] 가 , (BASF-Wyandotte Corp., Wyandotte, Michigan) PLURONIC ® , REVERSED PLURONIC ® TETRONIC ® 가 ADD REVERSED PLURONI C ® 25R2 TETRONIC ® 702 , " " 40 , 50 , 60 가 8 20 1 6 15 , Tergitol 15S9(: Union Carbide), Rhodasurf TMD 8.5(: Rh one Poulenc) Neodol 91-8(: Shell) 9 15, 11 15 9(: Union Carbide), Rhodasurf TMD 8.5(: Rhone Poulenc) 가 , Tergitol 15S 9(: Union Carbide), Rhodasurf TMD 8.5(: Shell) 2 1 6 20 2 (C6-C20) , 6 12 9/11 가 6 9 , 2 , C 10:1 1:10 LFNI I - ()



R₁ 4 18 , ,
R₂ 2 26 , ,

$x = 0.5, 1.5,$
 $y = 15,$
 $[CH_2CH(OH)R_2]_{10}$
 $[1994, 10, 13]$
 $Olin Corporation$
 WO
 $94/22800$
 $(Olin Corporation)$
 $POLY-TERGENT \text{®}$
 $SLF-18B$
 $R^1O[CH_2CH(R^3)O]_x[CH_2]_kCH(OH)$
 $[CH_2]_jOR^2$
 R^1, R^2, R^3
 H
 x
 2
 R^3
 k
 j
 1
 $12,$
 1
 5
 R^1, R^2
 6
 $22,$
 $가$
 H
 1
 2
 8
 18
 R^3
 $가$
 x
 1
 $20,$
 6
 15
 R^3
 x
 3
 R^3
 (EO)
 $(PO)(PO)(PO)$
 $(EO)(PO)(EO), (EO)(EO)(PO), (EO)(EO)(EO), (PO)(PO)(EO)$
 3
 (EO)
 20
 (PO)
 x
 $가$
 $^3O]_xCH_2CH(OH)CH_2OR^2$
 R^1, R^2, R^3
 k
 1
 j
 1
 $R^1O[CH_2CH(R^3)O]_x[CH_2]_kCH(OH)$
 1
 $20,$
 6
 18
 R^2
 $가$
 9
 14
 R^3
 H
 x
 6
 15
 R^1
 O
 R^2CNZ
 R^1
 $[$
 R^1, H, C_1-C_4
 C_1-C_4
 C_5-C_{31}
 C_9-C_{17}
 C_11-C_{15}
 C_1
 C_7-C_{19}
 $2-$
 $가$
 C_1
 $($
 R^2
 C_5-C_{31}
 3
 Z
 $($
 $가$
 Z
 Z
 $-CH_2-(CHOH)_n-CH_2OH, -CH(CH_2OH)-(CHOH)_{n-1}-CH_2OH, -CH_2-(CHOH)_2(CHOR')(CHOH)-CH_2OH$
 n
 3
 5
 R'
 H
 $가$
 n
 4
 $-CH_2-(CHOH)_4-C$
 H_2OH
 R'
 $N-$
 $N-$
 $N-$
 $N-$
 $N-$
 $N-2-$
 $N-2-$
 $R^2-CO-N<$
 Z
 $1-$
 $2-$
 $1-$
 $1-$
 $1-$
 $1-$
 $가$
 $N-$
 $N-$
 $N-$
 $가$

[1959 2 18 Thomas Hedley Co., Ltd. 809,060 , 1960 12 2
 0 E. R. Wilson 2,965,576 , 1955 3 8 Anthony M. Schwartz
 2,703,798 , 1934 12 25 Piggott 1,985,424 ,
]

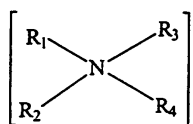
$R^2 O(C_n H_{2n} O)_t ()_x (, R^2 , - ,$
 10 18, 12, 14 , n 2 3, 2 , t 0 10,
 0 , x 1.3 10, 1.3 3, 가 1.3 2.7
)
) 가 1- 2-, 3-, 4- / 6-
 , 2-

[Kirk Othmer's Encyclopedia of Chemical Technology, 3rd Ed., Vol. 22, pp. 360-379, "Surfactants and Detergent Systems",
] 가 [1975 12 30

Laughlin 3,929,678 , 13, 14 16, 6 ,
]

$OR^3)_y][R^4(OR^3)_y]_2 R^5 N + X - [, R^2 8 18$
 $-CH_2 CH_2 -, -CH_2 CH(CH_3) -, -CH_2 CH(CH_2 OH) -, -CH_2 CH_2 CH_2 -$
 $R^4 C_1 - C_4 , C_1 - C_4$
 $, -CH_2 CHOH - CHOH COR^6 CHOHCH_2 OH(, R^6 100$
 $0) , y가 0$
 $, R^5 R^4 , R^2 R^5 18$
 $, y 0 10 y 0 15 , X]$

[M. C. Publishing Co., McCutcheon's, Detergents Emulsifiers, (North American edition 1997); Schwartz, et al., Surface Active Agents, Their Chemistry and Technology, New York; Interscience Publishers, 1949; 3,155,591 , 3,929,678 , 3,959,461 , 4,3
 87,090 4,228,044] 가



1 22 , 22 , (, R₁, R₂, R₃ R₄
 , X
 ,
)
 . R₁, R₂, R₃ R₄ 가 C1 C22 12
 22 가 , 12 22, 16
 1 3, 1 2
 0.1 20%, 1
 15% , 30% : (, -)

0.1 20 %
 5 %
 $RR'R''N O(, R 6 24, 10 18$
 1 , R' R'' 1 6)
 -
 , 10 18 1 3
 2
 ; 10 18 2 1 3 ; 10

18 2 1 3

$$\begin{array}{c} \text{O} \\ | \\ \text{R}^3(\text{OR}^4)_x\text{N}(\text{R}^5)_2 \end{array} \quad (\quad , \text{R}^3 \quad 8 \quad 22 \quad ,$$

$$\begin{array}{c} \text{R}^4 \\ | \\ \text{R}^5 \end{array}$$

$$\begin{array}{c} \text{R}^5 \end{array}$$

$$\begin{array}{c} \text{C}_{10}-\text{C}_{18} \end{array} \quad \text{C}_8-\text{C}_{12}$$

0.1 20 %, 0.1 15 %, 0.5 10

pH

$$\begin{array}{c} \text{R}^2 \\ | \\ \text{R}^1-\text{N}-\text{CH}_2-\text{R}^4-\text{Y} \\ | \quad | \\ \text{R}^3 \quad \text{X} \end{array} \quad (\quad , \text{R}^1 \quad 1 \quad 3$$

$$\begin{array}{c} \text{R}^1, \text{R}^2 \quad \text{R}^3 \end{array} \quad 14 \quad 24 \quad , \text{Y} \quad)$$

55,082] 22 , X , R² R³ 1 3 , Y , R⁴ 1 3 , R¹

R¹, R² R³ 14 24)

가 , 4

pH

(pH, ,) 가

M., (PCMX) , TRICOSAN.T TRICOSAN.TM.,

0.1 8.0 %, 0.5 2 0.01 10.0 %, 0.1 70

%, 0.5 30 %

가 (, - -),

(, OXONE, : DuPont)

10 % 500 200 1,000 10

1,250 , 500 1,000

FMC, Solvay Tokai Denka 가

("NaDCC")

[Kirk Othmer, Encyclopedia of Chemical Technology, Vol. 17, John Wiley and Sons, 1982, pp. 27-90, pp. 63-72,]

(TAED), (BzCL), 4- (NOBS), (PhBz), (C₁₀-OBS), (BZVL), (C₈-OBS), 8 9.5 pH OBS VL

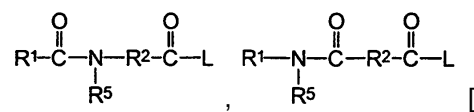
[Mitchell 5,130,045, Chung 4,412,934, 08/064,624, 08/064,623, 08/064,621, 08/064,562, 08/064,564, 08/082,270 "Bleaching Compounds Comprising Peroxyacid Activators Used With Enzymes" M. Burns, A.D. Willey, R.T. Hartshorn, C.K. Ghosh 08/133,691 (PG Case 489 OR),

(AvO) 1:1, 20:1 1:1, 10:1 3:1 4 (QSP), 4 (QSBA) QSBA 1994 8 31 08/298,903, 08/298,650, 08/298,906 08/298,904, 0.01 90% 0.1 30%, 1 8 %가 20%, 0.5 10%, 0.1

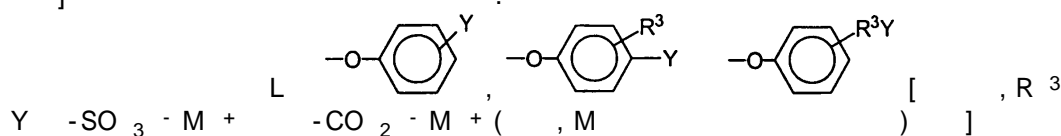
N,N,N',N'-(TAED)

TAED

()가, NAPAA, [1991 10 29 5,061,807] Hoechst Aktiengesellschaft, -4- (SBOBS), -1- -2- (SPCC), (STHOBS) 20% 0.1 10% 가, 40% 가



, R¹ (R¹) (R¹) 6, 1, R² 1, 14, L



(6-) (6-) (6-) 4,966,723 [1,2- -C(O)OC(R¹)=N-가

R-C(=O)-N1CCCCC1C(=O)OR6C(=O)N1CCCCC1=O

가 [4,915,854 , 4,412,934 4,634, 551]

가 [5,545,349]

$$\begin{array}{ccccccc} , 2- & -2- & , 2- & , 2- & -1- & , 2- \\ -2- & & , 2- & , 2- & -1- & , 2- & -2- \\ , 2-(2- &) & , 2-(2- & -1- &) & , 2-(2- & -2- \\) & 2-(2- &) & & & & \end{array}$$
 ; KO_2

: Akzo)	CAROAT(	: Degussa)	가	가
	가			

18 , 5,470,988 , 5,466,825 , 5,419,846 , 5,415,796 , 5,391,324 , 5,328,634 , 5,310,934 , 5,279,757 , 5,246,620 , 5,245,075 , 5,294,362 , 5,423,998 , 5,208,340 , 5,132,431
5,087,385]

08/082,270 "Bleaching Compounds Comprising Peroxyacid Activators Used With Enzymes" M.
Burns, A.D. Willey, R.T. Hartshorn, C.K. Ghosh 08/133,691 (PG Case 4890R),

4 (QSP) , QSBA QSBA 가 [, 5,460,747 , 5,584,888 5,578,136 ,] , , 1,12- (DPDA), 1,9- , , 2- -1,4- , 4,4'-

.가

[Kirk Othmer, Enc

yclopedia of Chemical Technology, Vol. 17, John Wiley and Sons, 1982]

pK1 pK2

, "pKa1" "pKa2" "pKa"

, pKa

["Critical Stability Constants: Volume 2, Amines" by Smith and Martel, Plenum Press, NY and London, 1975]

. pKa

가

(DuPont)

pKa 25

0.1

0.5M

. pKa

pKa

[Critical Stability Constants: Volume 2, Amines]

["The Chemist's Ready Reference Handbook" by Shugar and Dean, McGraw Hill, NY

, 1990]

pKa

8.0

pK1

pK2

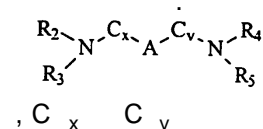
(

)

(

EDR 148)

,



[, R₂₋₅

H,

(, -CH₃ CH₂,
 , x+y 3 6

)

, A

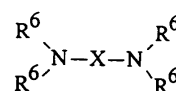
]

pKa

. A가

, x y

1



[, R⁶

400g/

, C₁-C₄, R⁸

-(R⁷O)_m R⁸ (, R⁷ C₂-C₄

)

, X i) C₃-C₁₀

, C₃-C₁₀

-C₁₀

)

, C₃-C₁₀

, ii) C₃-C₁₀

, C₃-C₁₀

-(R⁷O)_m R⁷-(

, R⁷ m

, C₃-C₁₀

, C₆-C₁₀

(

, iii) i) ii)

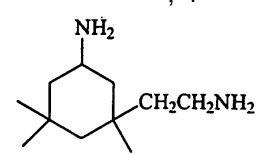
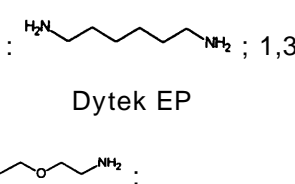
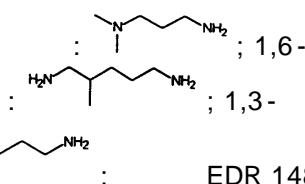
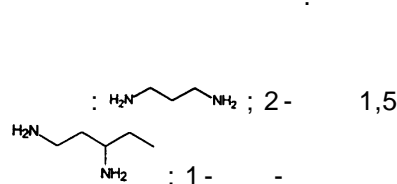
8

pKa

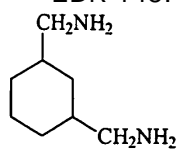
8

pKa

]



EDR 148:



가

20

25

가

35

8

, 2-

n-

8

18,

12

16

가,

가,

가

0.1

3

%,

0.1

1

%

4

14,

6

12,

8

10

C14 , , C1-C5 , C1-C5 , C8-
, C6-C16
HO-CR1R2-OH(, R1 R2 H C2-C10
/)
/ .
R-(A)_n-R1-OH(, R H, OH, 1
20, 2 15 2 10 , R1 H
A 1 20, 2 15 2 10 , n 1 5, 1 2) ,
, / , n 1 5, / 1 20,
R(A)_n-OH(, R 1 20,
2 15, 2 10 , n 1 5, 1 2 , A)
, / , n 1 5, 1 2
R-OH(, R 1 20, 1 1
5, 1 10)
R-OH(, R 1 20, 2
15, 5 12
2- / 2-
R(A)_n-OH(, R 1 20,
2 15, 5 12 , n 1 5, 1 2 , A)
, / 1- 2-
C1-C5 R(A)_n-OH(, R 1 5,
2 4 , n 1 5, 1 2 , A)
/ C1-C5 (n-BPP),
C1-C5 n-BPP[®] (: Dow chemical)
4) R-OH(, R 1 5, 2
C1-C5
(BDGE),
, , ,
, , , 20 %
1 8 % 0.5 10 %, 3 10 %, 20 %
n- CARBITOL[®] n- CELLOSOLVE[®] CARBITOL[®]
(carbitol) 2-(2-) CELLOSOLVE[®]
2- 2- -1,3- 2,2,4- -1,3-
n- , BUTYL CARBITOL[®]
-, - - 350 , 10
0 300, 115 250 , n-
n- "Dowanol"(: Dow Chemical Company) "Arcosolv"(: Arco Chem
ical Company) n-
(Union Carbide company)
" " ,
[Union Carbide "The Hoy",]

$$\gamma_H = \gamma_T \left[\frac{a-1}{a} \right]^{1/2}$$

. 가

[, H , a

$$\gamma_T = \left[\frac{(\Delta H_{25} - RT)d}{M} \right]^{1/2}$$

, (Log = 3.39066 T_b/T_c - 0.15848 - Log M) , T , T⁰ K (, H₂₅
 25 , T_c ⁰ K , R 가 (1.987cal/mole/deg) , T⁰ K , T_b ⁰ K
 , d (g/M_l) , M)

]

7.7 ,

2 7, 7.7,

3 6 .

가

/

, 0.5 30%, 2 15%, 3 8%
 1 10%, 3 6%
 10 30%, 10 20% .

20
 가

. 가

가

C₆-C₉

C₆-C₉
 가 , 100

1- 1-

8 ,

R¹²

R¹¹O-(R¹²O)_m¹H(, R¹¹ 3
 , m¹ 1 3) . 가

20 100g 0.1 20g

6 16

C₁₋₄

가

, n- , C₁₋₄ , Butyl Carbitol[®] 1
 (2-n- 1-) -2- (,
), (Hexyl Carbitol[®]), , 2,2,4- -1,3- , 2

가

2

20%

10%

7%

가

5

10%

1

15%,

2

12%,

C₁-C₃, C₁-C₆, C₆-C₁₂, C₁-C₄, C₁-C₆, C₂-C₄

0.5

8

%

C₁-C₃

;

,

,

;

,

,

C₁-C₈
 , (

) 1 8

,

1

4

가

,

1

2

,

,

, m-

,

[

3,915,903]

 C_1-C_4 C_1-C_4
 C_2-C_4 C_6-C_{12}

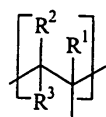
5 8 %

.05 5 %

0.1 0.01 10 %

가

가

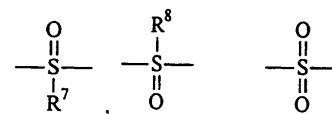
 $A-(Z)_2-L$ [, R^1, R^2, R^3 가
 C_1-C_6

, L

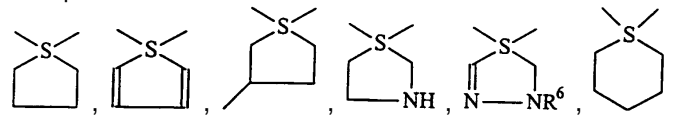
, O, NR_6 , SR_7 C_1-C_3 , O, NR_6 (, R^6 C_1-C_8 , R^7 C_1-C_3 , O, C_1-C_8 , C_1-C_3

]

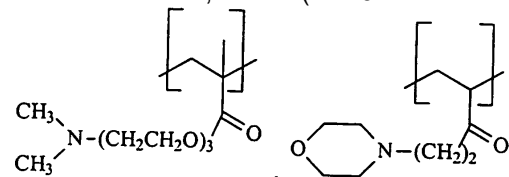
"O"

가 , $R^7 R^8$, $SR_7 R^8$

가 "O"

, $SR_7 R^8$, $SR_7 R^8$  $SR_7 R^8$

L

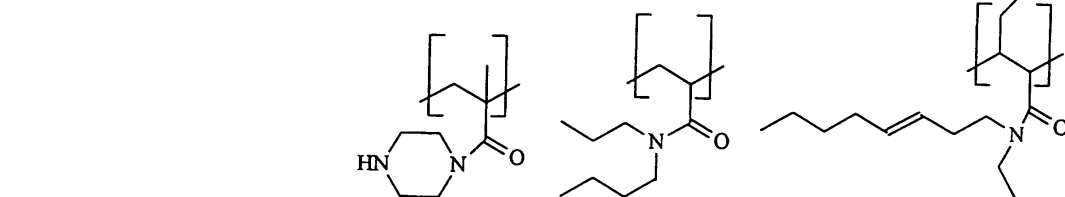
, $Z(z_0)$ 

. L

z가 0

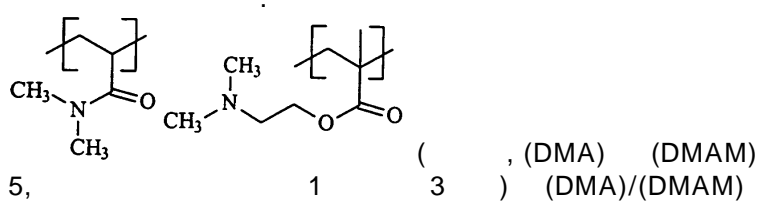
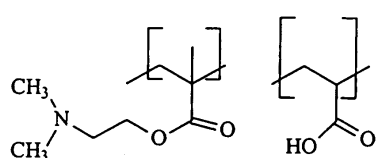
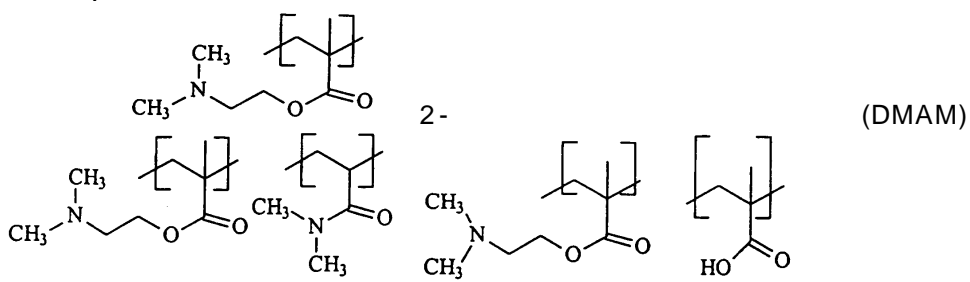
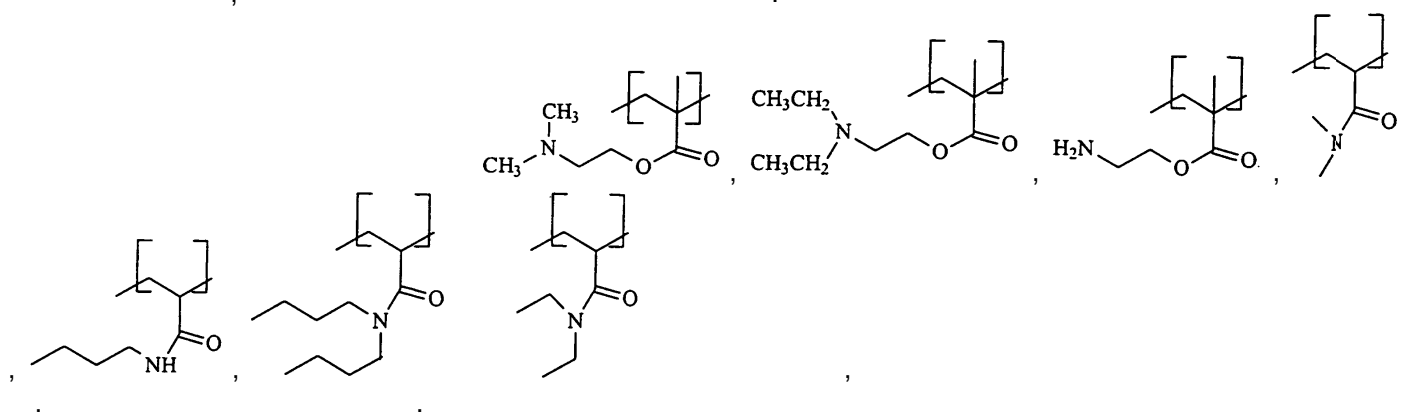
L

A

 Z $-(CH_2)-$, $(CH_2-CH=CH)-$, $-(CH_2-CHOH)-$, $(CH_2-CHNR^6)-$, $(CH_2-CHR^{14}-O)-$
, $-(CH_2)-$, R^{14} , C_1-C_6 , Z , 0 , 12 , A $NR^4 R^5$, R^4 R^5 , C_1-C_8 , R^{11} , C_1-C_4 , $-(R^{10}O)_y$
 R^{11} (, R^{10} C_2-C_4 ,

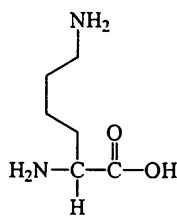
, y 1 10) , C₁-C₄ , NR⁴R⁵ , 가 , R⁴ R⁵
C₁-C₈ , 4 7

1,000 2,000,000, 5,000 1,000,000, 10,000 750
,000, 20,000 500,000, 35,000 300,000
) (



10, 1 5, 1 3) (DMAM)/(DMA) 1
5, 1 3) (DMAM)/(DMA) 1
(, (DMA) (DMAM)
(DMA)/(DMAM)

10 40% 7 11.5 pH



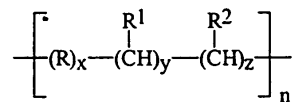
4-)

가

1500

가 4 12 pH

4 12 pH -



$$C_1 - C_4$$

$$R^2$$

$$C_3 - C_4$$

$$x_0$$

$$y_0$$

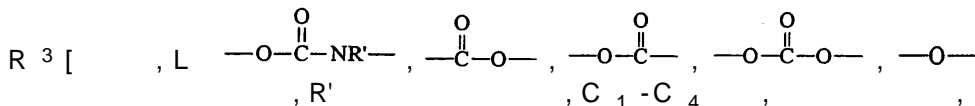
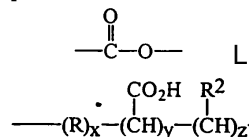
$$z_0$$

$$n$$

$$R^1$$

1,000
 2,000,000,
 5,000
 1,000,000,
 10,000
 750,000,
 20,000
 500,000,
 35,000
 300,000

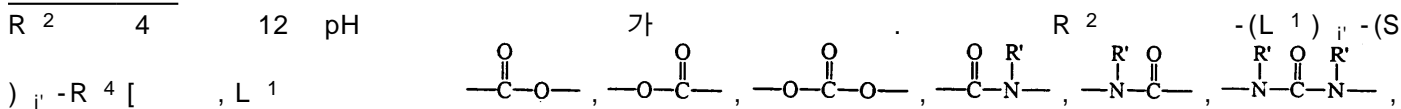
R¹ 4 12 pH 가 가 . R¹ -(L)_i -(S)_i -

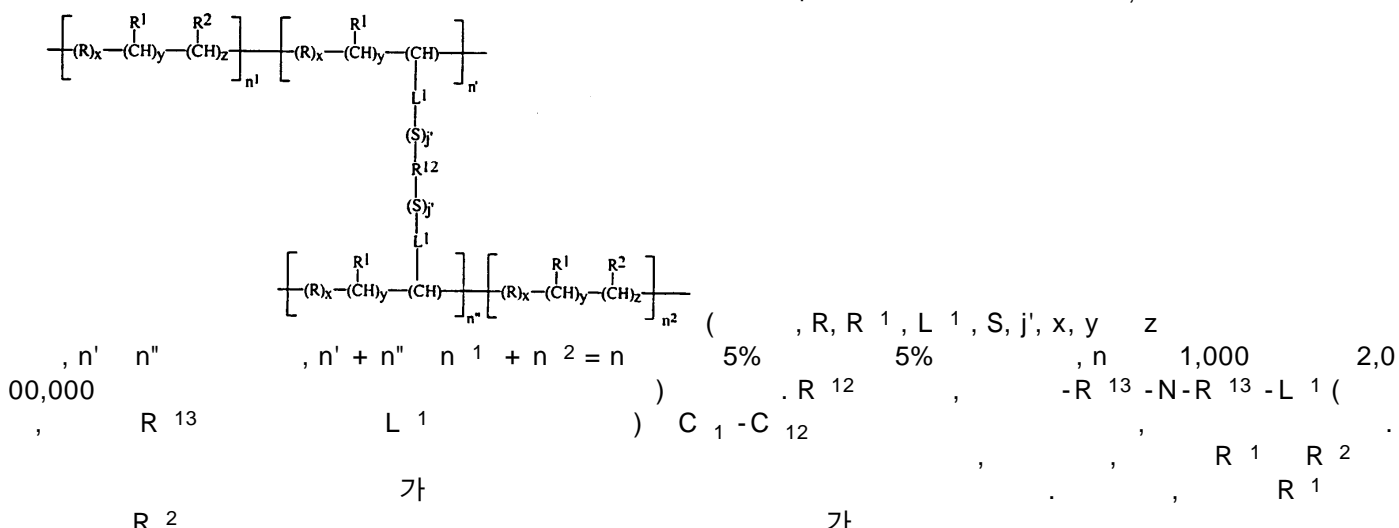
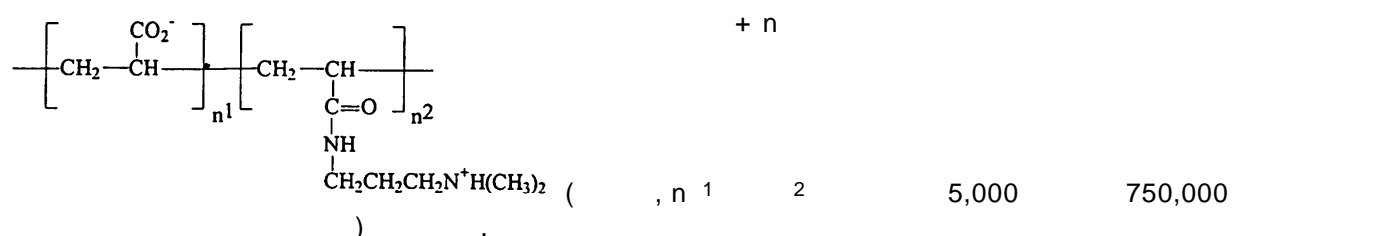
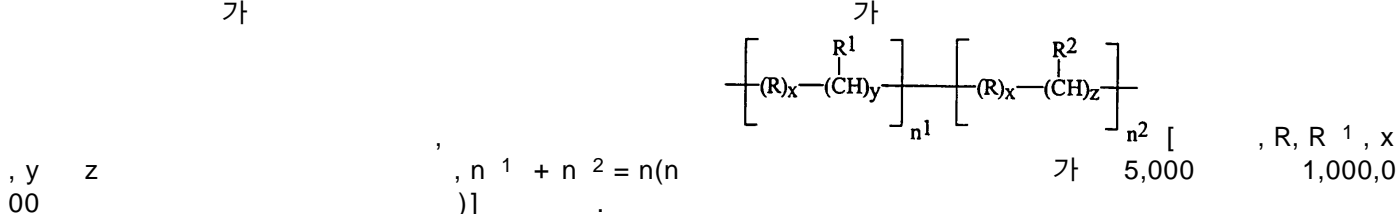
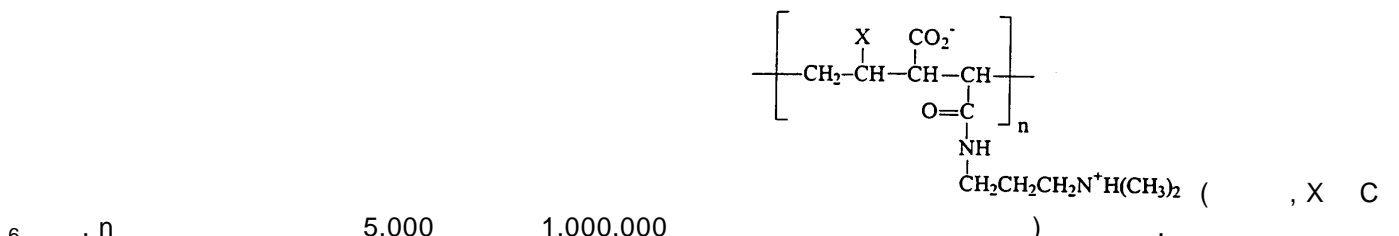
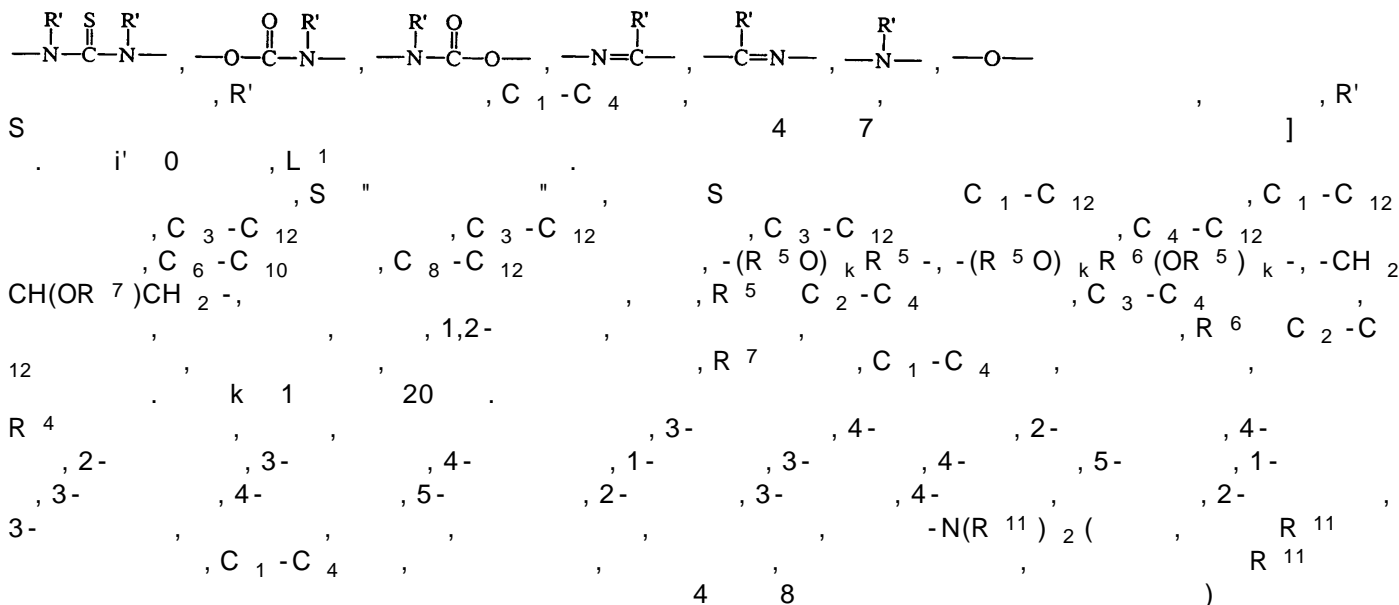

$$], R', S$$


$$\text{---(R)}_x\text{---(CH)}_y\text{---(CH)}_z\text{---} \quad \left(\begin{array}{c} \text{, S} \quad \text{, C}_3\text{---C}_{12} \quad \text{, C}_6\text{---C}_{10} \quad \text{, C}_8\text{---C}_{12} \quad \text{, CH(OR}^7\text{)CH}_2\text{---} \quad \text{, C}_{12} \end{array} \right)$$

$$\begin{aligned} & \text{R}^3, \text{R}^{10}, -\text{CO}_2\text{M}, -\text{SO}_3\text{M}, -\text{OSO}_3\text{M}, -\text{CH}_2\text{P(O)(OM)}_2, -\text{OP(O)(OM)}_2, -\text{CR}^8\text{R}^9 \\ & \text{R}^{10} [\text{R}^8, \text{R}^9, \text{R}^{10}, -(\text{CH}_2)_m\text{R}^{11} (\text{R}^{11}, -\text{CO}_2\text{H}, -\text{SO}_3\text{M}, -\text{OSO}_3\text{M}, -\text{CH(CO}_2\text{H)CH}_2\text{CO}_2\text{H}, -\text{CH}_2\text{P(O)(OH)}_2, -\text{OP(O)(OH)}_2, \\ & -\text{CO}_2\text{H}, -\text{CH(CO}_2\text{H)CH}_2\text{CO}_2\text{H}, -\text{CO}_2\text{H}), \text{R}^8, \text{R}^9, \text{R}^{10}] . \end{aligned}$$

R² 4 12 pH





[illegible]

25	Grosselink	5,691,298	, 1997	2	4	Pan	[1997	11
5,599,782	, 1995	5	16	Grosselink	5,415,807	, 1993	1	26
Morrall	5,182,043	, 1990	9	11	Grosselink			
4,956,447	, 1990	12	11	Maldonado	4,976,879	, 1990	11	6
cheibel	4,968,451	, 1990	5	15	Borcher, Sr			4,
925,577	, 1989	8	29	Grosselink	4,861,512	, 1989	10	31
nado	4,877,896	, 1987	10	27	Grosselink			4,77
1,730	, 1987	12	8	Grosselink	4,711,730	, 1988	1	26
link	4,721,580	, 1976	12	28	Nicol			4,000,093
1976	5	25	Hayes	3,959,230	, 1975	7	8	Basadur
	3,893,929	, 1987	4	22	Kud	0	219	048
가	[Voillard				4,201,824	, Lagasse		4,240,918
, Tung	4,525,524	, Ruppert			4,579,681	, 4,220,918		
	4,787,989	, Rhone-Poulenc Chemie	1988		279,134	A , BASF(1991)		4
57,205	A , Unilever N.V.	2,335,044						

0
가
0.05 1.2 %
-5,5- 5- 6
["The Production and Application of Fluorescent Brightening Agents", M. Zahradnik, Published by John Wiley Sons, New York (1982)]

		[1988	12	13	Wixon	4,790,8
56]			PHORWHITE	(: Verona)		
		Tinopal UNPA,	Tinopal CBS	Tinopal 5BM(: Ciba-Gaigy); Artic		
White CC	Artic White CWD(	: Hilton-Davis, Italy); 2-(4-	-)-2H-	[1,2-d]	, 4,	
4'-	-(1,2,3-	-2-)-	- , 4,4'-()	.		
	4-	-7-	-	, 1,2- (-	-2-) , 1,3-	- , 2,5-
(	-2-)	, 2-	- -[1,2-d]	2-(	-4-)-2H-	- [1,2-d]
	,	[1972	2	29	Hamilton	3,646,015].

가

가

가 [Baskerville

(3,936,537] 0 20%, 0.5 10%) 가

가

N- N-

N- 가 , MgCl₂, MgSO₄ N- 가

0.1 2% 가

가

C₁₃-C₁₅ (EO 7) 3 5% SIPERNAT D10, : DeGussa) 가 (500 12,500

가 (conditioner) 가

가 (MEA), 2,6- -3 - -4- (BHT), 0.001 5 %

(tricritical)

가 1 2 2 6(

1,3- 5 90%, 1,2- 10 50% (free water) 가 가

가

가 AExS 가 7

12.5, 2 13 pH 12, pH 9 11.5

가

	(%)(46 , 7gpg)	
	5	5
3% pc		+ ADW
1()	42	2
1 + * (1.5ppm TTW)	98	44

- (i) ADW : , 44 (5) , 7gpg
(ii) (): Branson 2210
2
(iii) 1.5ppm TTW 0.005%
(iv) 50 70

가 LDL3

	(1 10 ;)			
	2		5	
LDL3, 3% pc	2	4.8	3	5
ADW (3000ppm TTW)	5	9	7.5	n/a
(i) : 46 , 400rpm, 7gpg, 250Mℓ (ii) : 46 , 7gpg, Branson 2210, 250Mℓ (iii) 0.004% (0.24ppm TTW)				

	(%)(0.4% 2S)
+ ADW	22
	45
	66
Branson 2210 , 46 , 7gpg	

7

. 0

Scotch-Brite

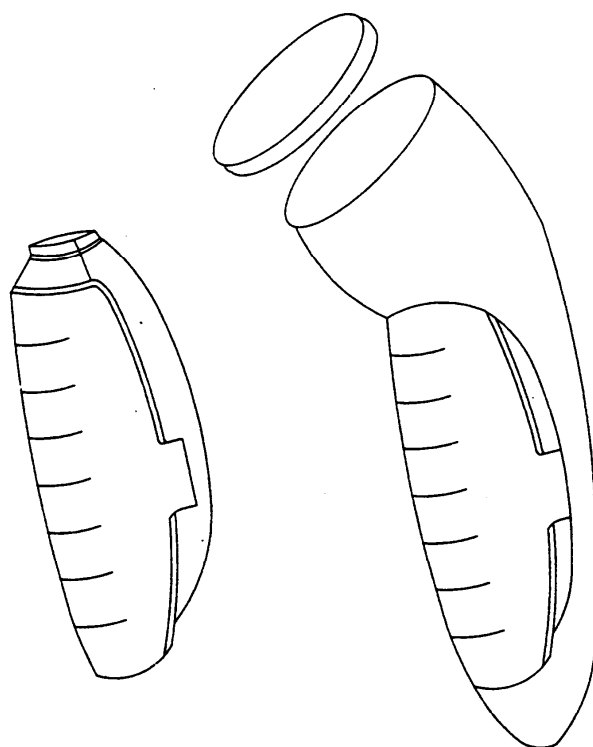
(1 + 0.005% , 40)	(%)
Scotch-Brite 7 (0)	30
7 (+)	86
7 (-)	48
2	

	1	2
10% pH	7.8	10.0
AE0.6S	26.28	29.0
	1.73	7.5
ADM	1.73	---
C11E9	---	4.88

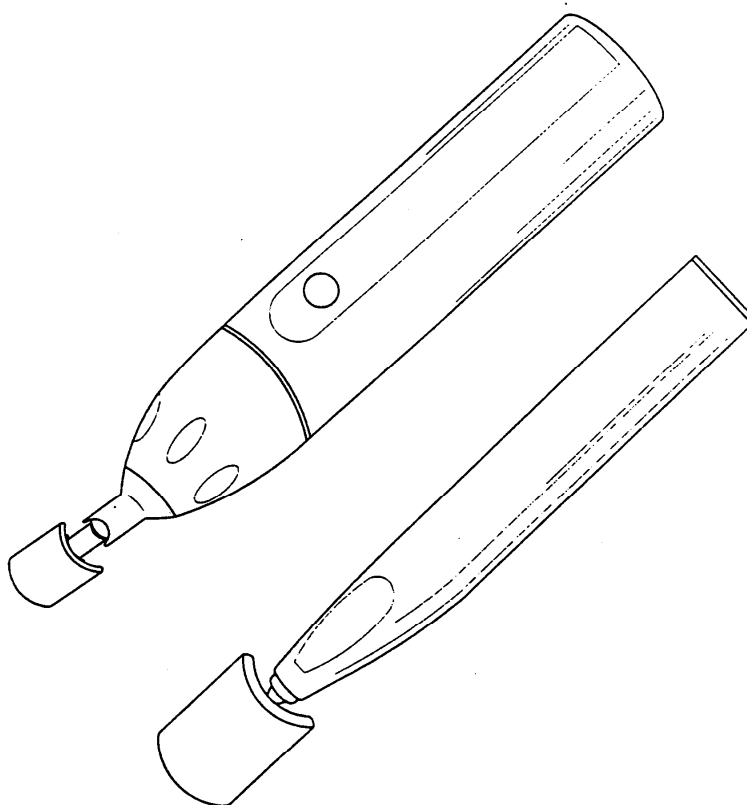
[illegible]

8	12.	, (c)	가
1	13.	,	가
1	14.	, 가	,
8	15.	, 가	가
8	16.	, 가	,

1



2



3

