

.
 가 가
 가 .
 , , ,
 가 . 24
 , 가
 8 . 가
 .
 16 가 -
 15 .
 - ,
 , , , Van der Waals 5
 . 가 .
 7,000
 , , ,
 ,
 .

.
1.
 (1)

0.1 μ ~ 1m μ Congo Red Benzopurpurine AB , , 가

27~30 , 6~10 , 2~5

.

가

,

.

가

.

$nD \leftrightarrow (D)_n$

, D :

n :

$(D)_n$:

가

.

,

.

. 가

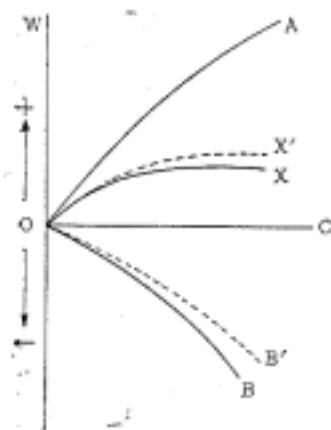
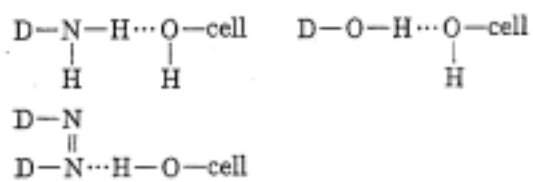
가

가 가

가

-OH

.



< 1 >

20~30

가

가

Zeta Potential

Zeta Potential

Zeta

1 A

B

X

. (, B'

(2)

D

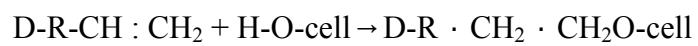
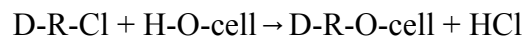
가

R-Cl R-CH :

CH₂가

가

가



(3)

(Tannin)

Katanol

가

-OH

Van der Waals

Van der

Waals

Van der Waals

Van der Waals

Katanol

Katanol

-OH

Van der Waals

Katanol

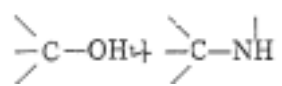
(4)

-S-S-

-S · Na S

(5)

(leuco)



가

Van der Waals

가

(lake)

strike

(6)

(Coupling)

AS , β -Naphthol Naphthol
 . β -Naphthol -OH 가

가 Van der Waals . Naphthol AS
-CONH- 가 -NH -S-

가 가

가 (soaping)

2.

(1)

(Milling) 가

가

가 가

(2)

pH7

가

2 pH pH

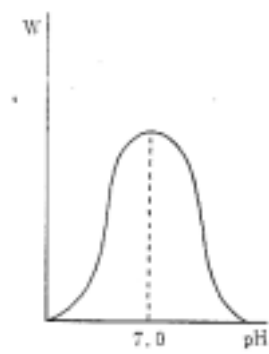
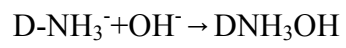
H^+ OH^- 가

H^+ 가 $-COO^-$

NH_3^+

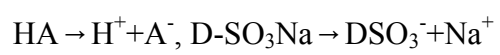
OH^- NH_3^-

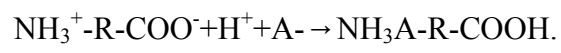
OH^- 가



< 2 >

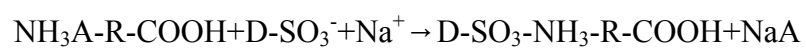
(3)





Na⁺가

A⁻



3

4 pH

3 D-SO₃⁻ H⁺

A⁻가 가 가

4

-COO⁻ H⁺

가

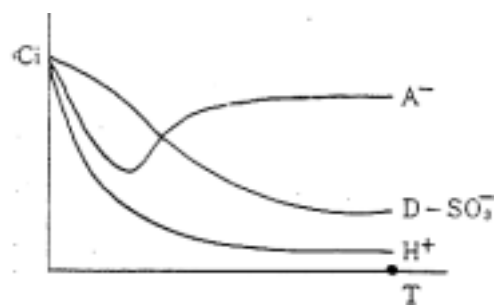
가

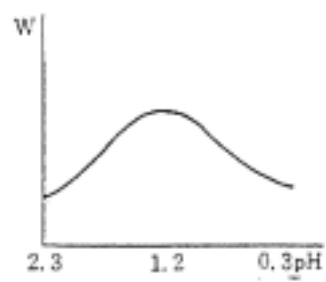
가

A⁻

A⁻

가





< 4 >

가

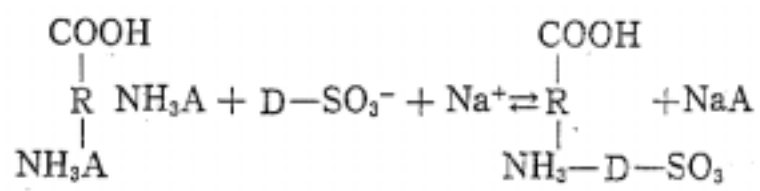
가

Van der Waals

가

-NH₂

가



가

(4)

가

(5)

가

-SO₃H

-NH₂

(6) 1:1

Neolan

1:1

Cr

-SO₃H

가

가

가

가

가

Cr

(7) 1:2

Irgalan

Cr

Cr

-SO₃H

1:1

Cr

가

가

3.

(1)

, Stubbs

White

Van der Waals

가

가

4.

가

(Amorphous regions)

가
가

가 가 . 가 .

(1)

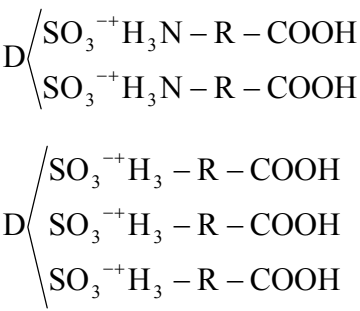
-SO₃H

-NH₂

-NH₂ 가 -

SO₃H 2~3 가

2~3 가 .



pH4~7 pH2

-CONH-CONH₂⁺-

-NH₃⁺ 가 가 가

, 1:2 ,

,

(2)

가

가

가

-NH₂ 가

-SO₃H 가

$$-\text{SO}_3\text{H}$$

,

가

Van der Waals

가

$$-\text{OH}$$

-COOH 가

$$-\text{COOH}$$

가

가

β -Naphthol

Oxyna-phthoic acid

Zeta potential [/]

pH3.4~3.6 가

1 2

, salicylic acid

80~90

가 Van der Waals

, O,P-

가

(4)

-CN

가

~

(:

95%)

Wurz, Gleng, Backmann

. Wurz

가

가 . Gleng Backmann ()

(3.7×10^{-5} /-g) (4×10^{-5} /-g) Malachite green

Carbinol (3.8×10^{-5} /-g)

Malachite green Carbinol 가

가

가

(, , ,)가

(,) (

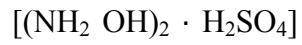
85~95%)

(, ,

) (40~60%)

(, , , ,

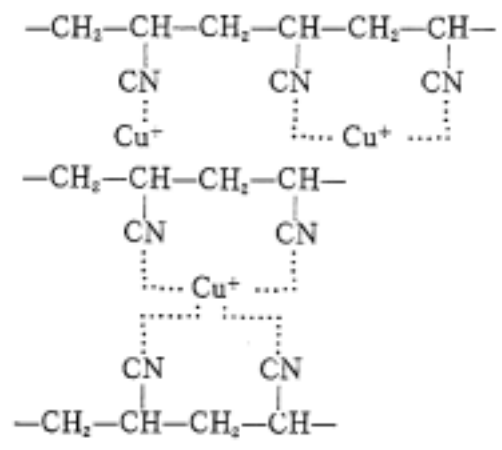
)



가 100 2

1 .(4

,)



Cu^+ 가 pH2~3.5

가 -CH

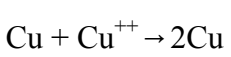
70 15

2 1 1

가 1955

Sandoz

1 Sandocry



-Cl

가

가

가

.

.

-

C-

.

,

.

, , , ,

.

,

가 ,

가

가 ,

가

.

60~70

,

가

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