

1.

1.1

" 가 가 ,  
." 1937 2



( ), , ( ),  
" "  
Wallace Hume Carothers

, ,  
 ,  
 ,  
 ,  
 ,  
 DuPont

Carothers . 5

1935 2 가 Polyamide , DuPont

"Nylon" . "Nylon"

.

(A) "Nyl" "-on" "Cotton"

"Rayon" .

(B) Carothers

"Nyl" , "-on" (A)

.

(C)

. Now You

Lousy Old Nipponese! ,

"NYLON" .

## 1.2

가

가

85%

.

mn

m

(dicarboxylic acid)

(diamine)

m,

n . ,

m

m .

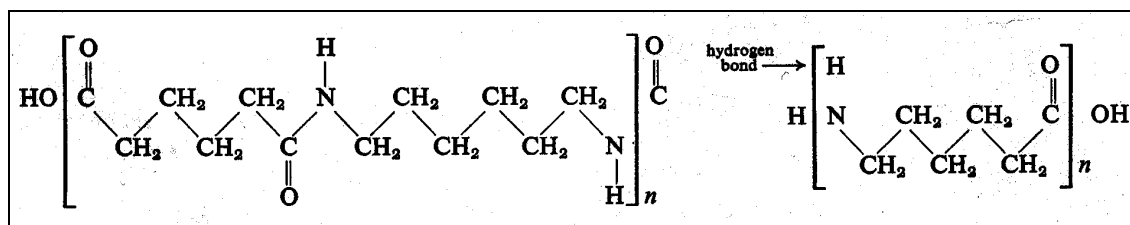
66 6

66 40%

66 50%

20% 66 6

( ) ( ) 66



<Nylon 66>

<Nylon 6>

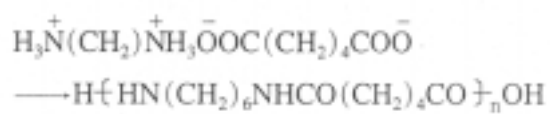
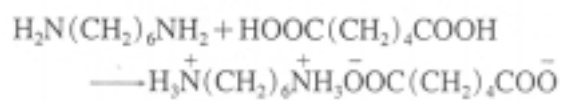
2.

2.1 66

66

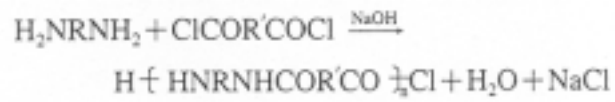
66

66



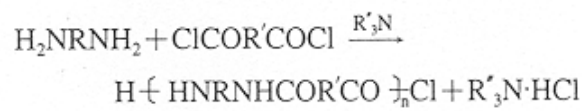
(acid chloride)

(adipolychloride)



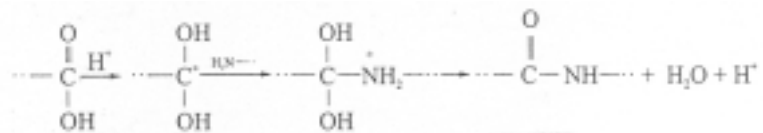
가

(acid acceptor)



가 (carbonyl addition

elimination reaction)



66

10,000

25,000

가 가

,

,

, 가

2.2

6

6

ε -

( ε -caprolactam)

H-[-HN(CH<sub>2</sub>)<sub>5</sub>]-OH . 1930

가 1932

66

6

6

1937

I.G.

(Schlack)

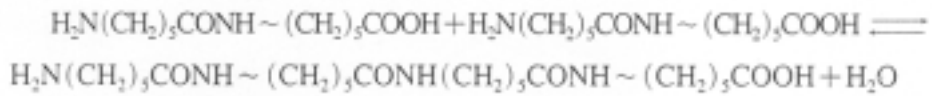
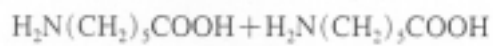
가

66

가

L(Perlon L)

#### ■ 축합반응



6

ε -

1~20% 가

가 .

, ε -

% 가

.

, 가 ,

가

.

가

.

(dull yarn)

0.1~2%

가

.

### 3.

#### 3.1

66

66

가

66

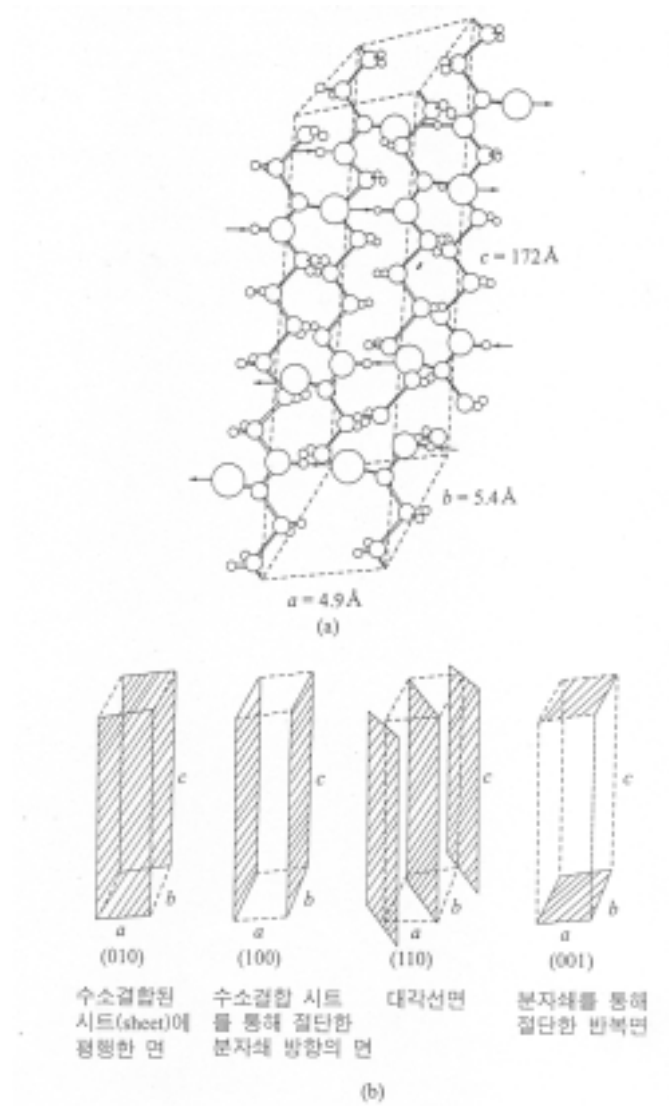
$a=4.9$  ,  $b=5.4$  ,  $c=17.2$  ( ),  $\alpha=48.5^\circ$  ,  $\beta=77^\circ$  ,  $\gamma=63.5^\circ$

. < >

66

30~100

4~6



3.2

6

6

가

CO , 6 NH  
 a=9.56 , b=17.24 , c=8.01  $\beta = 67.5^\circ$   $\alpha$   
 a=9.33 , b=16.88 , c=4.78  $\beta = 121^\circ$  (pseudohexagonal)  
 y 가 가 ,  $\alpha$   
 6 가 .

4.

4.1

, , ,  
 . ,  
 가  
 ,  
 . (spin-draw)  
 가 .  
 66 가 66  
 ,  
 . 66  
 가 .

6 66 . 66

66 .

5.

5.1 66

66 , 265

40~50 가 .

66 5.0 10.0g/d

. 66

. 66 가

, 1

.

가

가 . , 66

가 .

5.2 6

6 가 ( 1.14) 가

(3.5~5%, 65% RH )

6

|                             | 스테이플 파이버 | 필라멘트사    | 고강력 필라멘트사 |
|-----------------------------|----------|----------|-----------|
| 강도(g/d)                     | 3        | 4.5      | 8.5       |
| 신도(%)                       | 40       | ~ 3.5    | ~ 20      |
| 견습강도비(%)                    | 83~90    | 84~92    | 84~92     |
| 루프강도(g/d)                   | 7.0~11.0 | 8.5~11.5 | 10.7~14.3 |
| 매듭강도(g/d)                   | 3.7~5.5  | 4.3~6.0  | 5.4~6.5   |
| 초기탄성계수(kg/mm <sup>2</sup> ) | 20~250   | 200~450  | 280~510   |
| 공정수분율(%)                    |          | 4.5      |           |

6

215~220

180

가

가

6

가

가



가

가

가  
 가  
 가 (Heat setting) 가  
 가



6.

66  
 6 가 가  
 가  
 가  
 66 200d  
 200~800d 가 ,  
 . 800d 가

,  
 (BCF)  
 .  
 6 ,  
 . , , ,  
 .  
 6 , , , , ,  
 , , , , ,  
 , , , , ,  
 가 , ,  
 . 가 , 가  
 , , 100%  
 6 .