

Elution Characteristics of High Hollow Filaments for Nylon according to Elution Conditions

Ji Man Kang, Dae Hyun Cho, Jae Sung Han

Korea Textile Development Institute,
1337 Gukchaebosangro, Seo-Gu, Daegu, 703-712, Korea
E-mail: jmkang@textile.or.kr

1. Introduction

This study is aiming to develop multi-functional Nylon high hollow filament by application of high reduction technology of PET as a core. For this purpose, the elution conditions are chosen as concentration of NaOH, bath temperature and elution time. The yarn physical properties such as thermal shrinkage, tensile property and reduction rate are measured and discussed. And finally the nylon fabric is woven by using Nylon hollow filament yarn reduced with various process conditions, the physical properties of the these fabrics are measured and discussed with various process conditions..

2. Experimental

Specimen: Nylon high hollow filaments DTY 50d/24f using POY 75d/24f (Sheath:Core = 70:30)

Scouring :

- NaOH 0.5g/L, scouring agent 1.0g/L, desizing agent 1.0g/L (95 °C * 30min)

Elution condition :

Table 1. The elution condition of hollow filament

NaOH (g/l)	20, 40
bath temp. (°C)	100, 110, 120
elution time (min.)	0, 10, 20, 30, 40, 50, 60

3. Result and Discussion

The concentration of NaOH, bath temperature and elution time as a condition to determine the eluting condition were chosen. Fig. 1 shows the eluting rate of 70:30(sheath/core) hollow filaments according to eluting condition. It is shown that the elution rate of hollow filaments is increased with increasing the concentration of NaOH, bath temperature and elution time. The elution rate shows 30.2% when the bath temperature is 120 °C and concentration of NaOH is 40g/l. Considering this results, it's suitable elution condition which is 110 °C, 40min as good it is low temperature and less time.

Table2. Elution rate of the tube knitted fabric according to the eluting condition

Time Temp.	0 min	10 min	20 min	30 min	40 min	50 min	60 min
100 °C	5.2	9.3	16.1	18.3	27.5	26.5	26.3
110 °C	4.6	9.1	15.3	22.1	29.2	31.9	31.5
120 °C	12.8	20.5	22.2	30.7	30.2	30.2	30.2

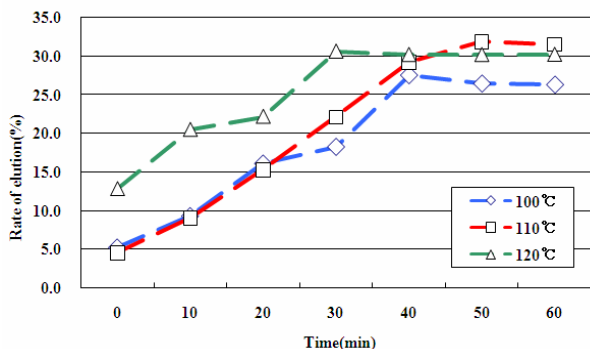


Fig.1. Elution rate of the tube knitted fabric according to the elution time

4. Conclusions

The following results were obtained:

-The elution rate of hollow filaments is increased with increasing the concentration of NaOH, bath temperature and elution time. Especially, the elution rates are largely affected by NaOH concentration and eluting temperature.

-The suitable elution condition which is 110 °C , 40min as good it is low temperature and less time.

-It is necessary to additional study hereafter so that choose the optimum sheath/core ratio, polymer composite and improve tearing strength for Nylon high hollow fabric.

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