

Elution Characteristics of PET High Hollow Filaments

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1. Introduction

This study is aiming to develop multi-functional PET high hollow filament by application of high reduction technology of soluble PET in NaOH(PXD-II) 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 PET fabric is woven by using PET 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:

PET high hollow filaments SDY 70d/34f and DTY 70d/34f (multi core type)

Scouring :

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

Elution condition :

Table 1. The elution condition of hollow filament

NaOH (wt%)	10
PXD-II in NaOH (%)	25, 30, 35
elution time (min.)	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 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 about 50% when the content rate

of PXD-II is 30% and 35%. Considering this results, it's suitable elution condition which is PXD-II 30~35%, 40min as good it is low temperature(98°C) and less time.

Table 2. Elution rate of the tube knitted fabric according to the eluting condition

Time (min)	Elution rate of SDY (%)			Elution rate of DTY (%)		
	25%	30%	35%	25%	30%	35%
10	6.38	6.52	7.00	5.61	6.26	6.28
20	12.19	12.56	13.58	11.54	13.39	16.57
30	22.04	24.16	32.24	18.43	27.93	39.27
40	34.08	52.08	57.75	48.63	59.74	59.55
50	43.95	62.19	66.17	53.22	65.38	69.30
60	62.79	69.21	80.77	62.06	68.98	76.20

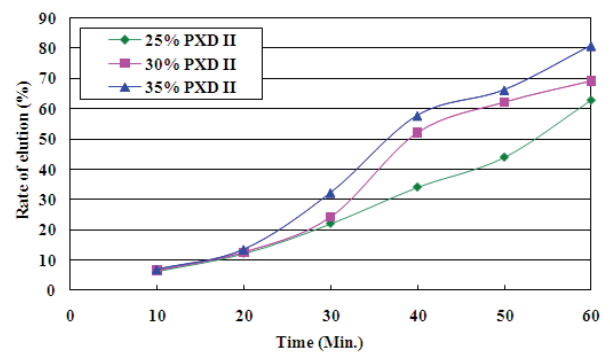


Fig. 1. Elution rate of the tube knitted fabric according to the elution time (SDY)

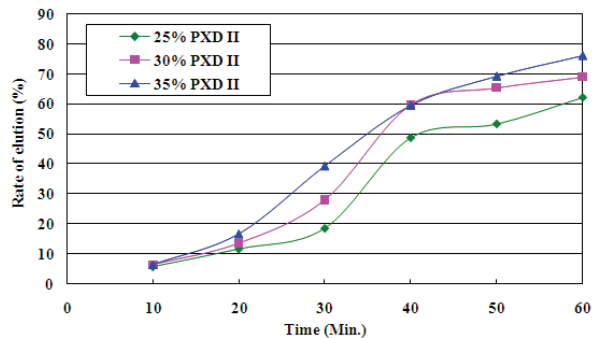


Fig. 2. Elution rate of the tube knitted fabric according to the elution time (DTY)

4. Conclusions

The following results were obtained:

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

- The suitable elution condition which is PXD-II 30~35%, 40min as good it is low temperature(98°C) and less time.

- It is necessary to additional study hereafter so that choose the optimum elution conditions, polymer composite and improve touch and easy elution for PET high hollow fabric.

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