Materials Research

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Supplementary Material to "Effects of ionizing radiation on the physicochemical properties of polyester multifilaments"

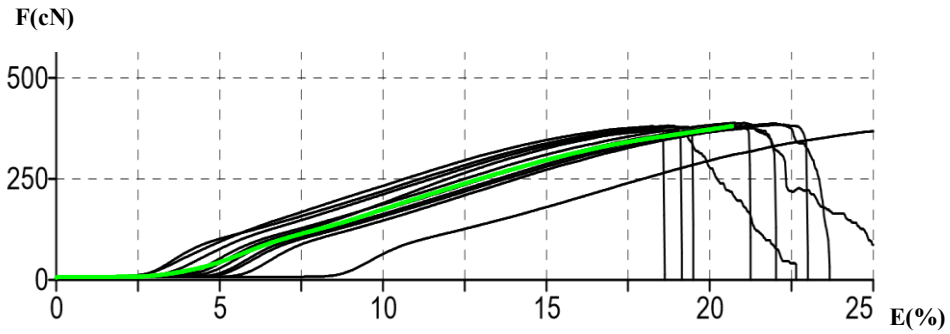
Supplement S1 - Mechanics and statistical data for multifilament textile non-irradiated and irradiated with 0, 50, 70, 90, 100, 130, 160, 180 and 200 kGy.

(a) 0 kGy

Test No.	Elongation (%)	Force (cN)	Tenacity (cN tex^{-1})
1	18.46	373.02	43.88
2	18.90	379.78	44.68
3	20.56	381.78	44.92
4	21.92	387.31	45.57
5	21.99	384.78	45.27
6	21.21	376.25	44.26
7	20.73	388.93	45.76
8	26.13	375.78	44.21
9	18.66	382.24	44.97
10	18.24	380.63	44.78

Specimens used	Statistics to	Mean ± SD
10	Elongation (Fmax, %)	20.68 ± 2.39
10	Maximum force (cN)	381.05 ± 5.10
10	Work to break (cN*cm)	888.90 ± 65.35
10	Toughness at break (cN tex^{-1})	4.4102 ± 0.32
10	Tenacity (cN tex^{-1})	44.83 ± 0.60
1	Linear density (dtex)	85.00

Force/Elongation-diagram to 10 specimens set

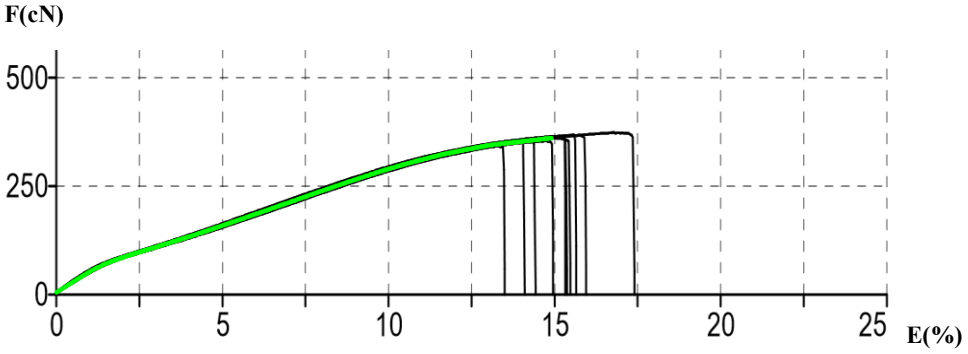


(b) 50 kGy

Test No.	Elongation (%)	Force (cN)	Tenacity (cN tex^{-1})
1	16.75	374.94	44.11
2	13.95	355.96	41.88
3	14.69	355.96	41.88
4	15.51	369.10	43.42
5	14.85	363.80	42.80
6	13.25	342.82	40.33
7	15.05	363.11	42.72
8	15.23	362.18	42.61
9	15.71	368.87	43.40
10	14.09	357.80	42.09

Specimens used	Statistics to	Mean ± SD
10	Elongation (Fmax, %)	14.91 ± 1.00
10	Maximum force (cN)	8.98 ± 2.48
10	Work to break (cN*cm)	809.57 ± 89.97
10	Toughness at break (cN tex^{-1})	3.80 ± 0.42
10	Tenacity (cN tex^{-1})	42.52 ± 1.06
1	Linear density (dtex)	85.00

Force/Elongation-diagram to 10 specimens set

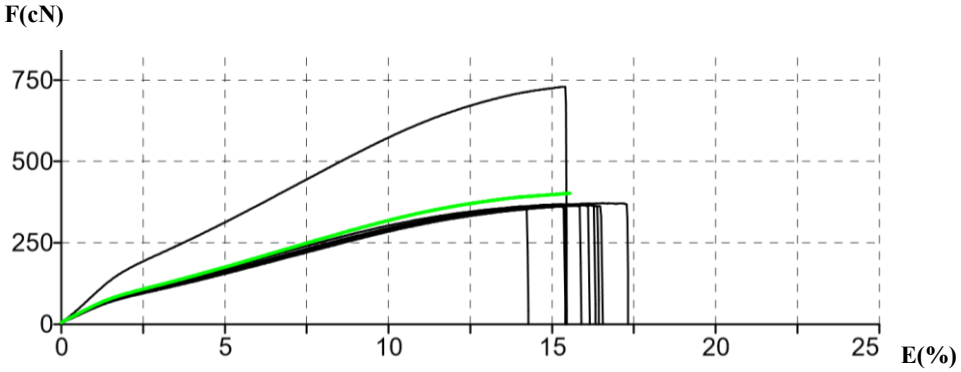


(c) 70 kGy

Test No.	Elongation (%)	Force (cN)	Tenacity (cN tex^{-1})
1	16.02	367.49	43.23
2	15.71	365.41	42.99
3	15.91	370.48	43.59
4	15.11	362.41	42.64
5	13.97	355.42	41.81
6	16.05	365.87	43.04
7	15.27	369.10	43.42
8	16.53	371.87	43.75
9	15.50	367.72	43.26
10	15.32	729.21	85.79

Specimens used	Statistics to	Mean ± SD
10	Elongation (Fmax, %)	15.54 ± 0.70
10	Maximum force (cN)	402.50 ± 114.89
10	Work to break (cN*cm)	952.55 ± 260.14
10	Toughness at break (cN tex^{-1})	4.47 ± 1.22
10	Tenacity (cN tex^{-1})	47.35 ± 13.52
1	Linear density (dtex)	85.00

Force/Elongation-diagram to 10 specimens set

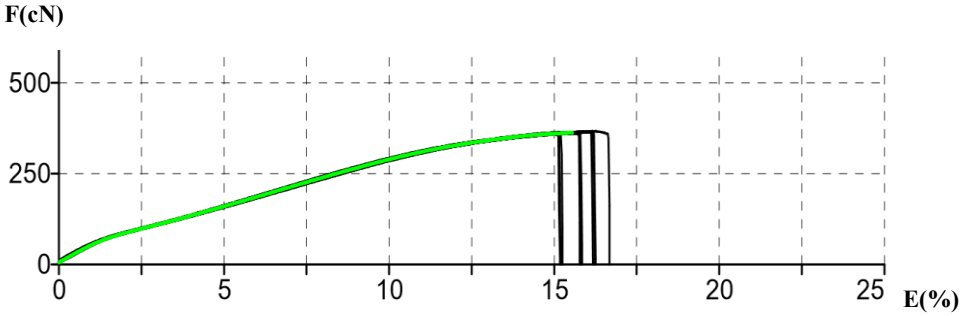


(d) 90 kGy

Test No.	Elongation (%)	Force (cN)	Tenacity (cN tex^{-1})
1	15.07	361.26	42.50
2	15.66	361.03	42.47
3	14.86	361.26	42.50
4	15.98	363.80	42.80
5	15.89	367.49	43.23
6	16.17	368.87	43.40
7	15.98	367.25	43.21
8	15.32	361.49	42.53
9	15.47	364.49	42.88
10	14.92	359.19	42.26

Specimens used	Statistics to	Mean ± SD
10	Elongation (Fmax, %)	15.53 ± 0.48
10	Maximum force (cN)	363.61 ± 3.31
10	Work to break (cN*cm)	865.43 ± 40.28
10	Toughness at break (cN tex^{-1})	4.06 ± 0.18
10	Tenacity (cN tex^{-1})	42.78 ± 0.39
1	Linear density (dtex)	85.00

Force/Elongation-diagram to 10 specimens set

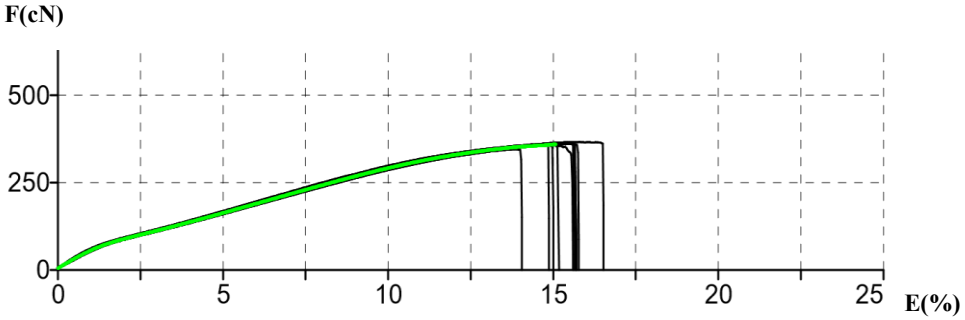


(e) 100 kGy

Test No.	Elongation (%)	Force (cN)	Tenacity (cN tex^{-1})
1	15.44	361.72	42.56
2	15.49	364.95	42.94
3	15.80	366.56	43.13
4	14.72	360.57	42.42
5	15.33	361.49	42.53
6	14.84	358.49	42.18
7	14.98	358.03	42.12
8	15.29	362.87	42.69
9	13.86	345.58	40.66
10	14.81	357.57	42.07

Specimens used	Statistics to	Mean ± SD
10	Elongation (Fmax, %)	15.06 ± 0.55
10	Maximum force (cN)	359.79 ± 5.78
10	Work to break (cN*cm)	829.44 ± 53.67
10	Toughness at break (cN tex^{-1})	3.90 ± 0.25
10	Tenacity (cN tex^{-1})	42.33 ± 0.68
1	Linear density (dtex)	85.00

Force/Elongation-diagram to 10 specimens set

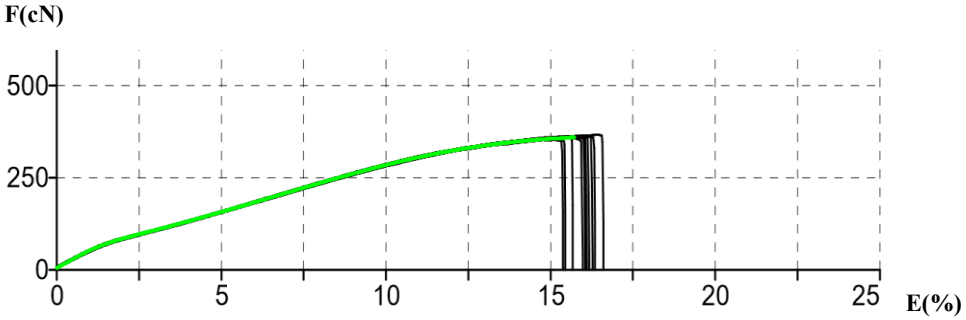


(f) 130 kGy

Test No.	Elongation (%)	Force (cN)	Tenacity (cN tex^{-1})
1	15.96	362.64	42.66
2	15.27	358.49	42.18
3	15.02	354.81	41.74
4	15.84	359.19	42.26
5	15.98	364.03	42.83
6	16.34	367.49	43.23
7	15.82	361.03	42.47
8	14.67	352.96	41.52
9	15.51	358.49	42.18
10	15.99	361.49	42.53

Specimens used	Statistics to	Mean ± SD
10	Elongation (Fmax, %)	15.64 ± 0.51
10	Maximum force (cN)	360.06 ± 4.27
10	Work to break (cN*cm)	861.75 ± 47.79
10	Toughness at break (cN tex^{-1})	4.05 ± 0.22
10	Tenacity (cN tex^{-1})	42.36 ± 0.50
1	Linear density (dtex)	85.00

Force/Elongation-diagram to 10 specimens set

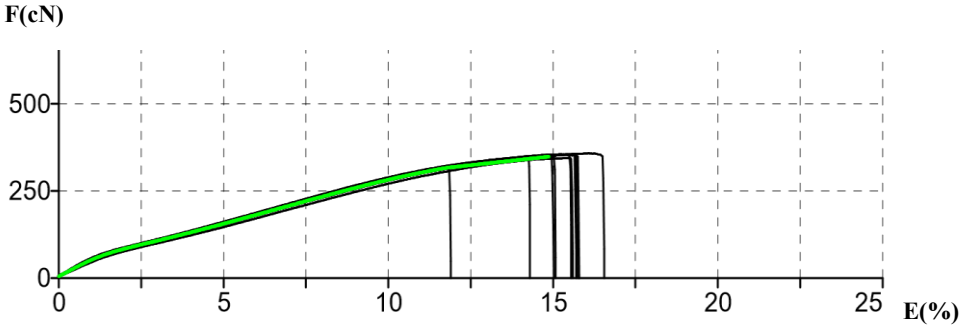


(g) 160 kGy

Test No.	Elongation (%)	Force (cN)	Tenacity (cN tex^{-1})
1	14.61	351.58	41.36
2	14.11	346.74	40.79
3	15.45	354.81	41.74
4	15.19	355.73	41.85
5	15.46	354.11	41.66
6	15.34	355.73	41.85
7	15.39	344.89	40.58
8	16.08	358.72	42.20
9	11.83	314.46	37.00
10	14.76	351.81	41.39

Specimens used	Statistics to	Mean ± SD
10	Elongation (Fmax, %)	14.82 ± 1.19
10	Maximum force (cN)	348.86 ± 12.80
10	Work to break (cN*cm)	782.65 ± 101.66
10	Toughness at break (cN tex^{-1})	3.67 ± 0.48
10	Tenacity (cN tex^{-1})	41.04 ± 1.51
1	Linear density (dtex)	85.00

Force/Elongation-diagram to 10 specimens set

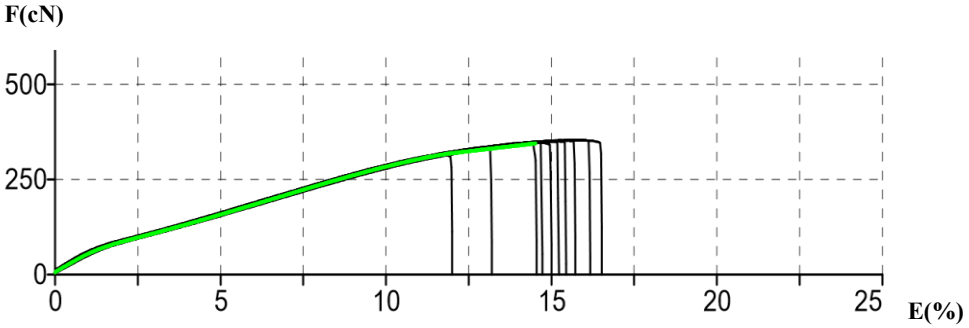


(h) 180 kGy

Test No.	Elongation (%)	Force (cN)	Tenacity (cN tex^{-1})
1	13.14	331.29	38.98
2	14.42	349.96	41.17
3	15.54	355.27	41.80
4	14.73	347.20	40.85
5	11.65	313.54	36.89
6	14.93	352.04	41.42
7	14.44	345.58	40.66
8	15.19	353.42	41.58
9	15.33	352.73	41.50
10	15.11	349.50	41.12

Specimens used	Statistics to	Mean ± SD
10	Elongation (Fmax, %)	14.45 ±1.19
10	Maximum force (cN)	345.05 ± 12.97
10	Work to break (cN*cm)	754.85 ± 104.08
10	Toughness at break (cN tex^{-1})	3.54 ± 0.49
10	Tenacity (cN tex^{-1})	40.59 ± 1.53
1	Linear density (dtex)	85.00

Force/Elongation-diagram to 10 specimens set



(i) 200 kGy

Test No.	Elongation (%)	Force (cN)	Tenacity (cN tex^{-1})
1	15.40	347.89	40.93
2	14.67	343.28	40.39
3	14.13	340.28	40.03
4	14.92	345.12	40.60
5	14.75	344.89	40.58
6	14.24	341.66	40.20
7	14.66	342.82	40.33
8	14.96	341.43	40.17
9	15.86	349.27	41.09
10	14.78	346.28	40.74

Specimens used	Statistics to	Mean ± SD
10	Elongation (Fmax, %)	14.84 ± 0.51
10	Maximum force (cN)	344.29 ± 2.93
10	Work to break (cN*cm)	776.62 ± 39.46
10	Toughness at break (cN tex^{-1})	3.65 ± 0.18
10	Tenacity (cN tex^{-1})	40.51 ± 0.34
1	Linear density (dtex)	85.00

Force/Elongation-diagram to 10 specimens set