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APPENDICES

APPENDIX A

Curve fitting parameters of hydroxyl and carbonyl bands

Table A. The curve fitting parameters of hydroxyl region of irradiated PET by transmission (Fig. 4. 13 (A))

Peak type	Center (cm^{-1})	Height	FWHH	Area
Gaussian/Lorentzian	2885	0.0137	45.804	4.5086
Gaussian/Lorentzian	2962	0.0376	55.000	3.8030
Gaussian/Lorentzian	3019	0.0195	243.889	6.6426
Gaussian/Lorentzian	3076	0.0082	67.520	0.8044
Gaussian/Lorentzian	3220	0.0362	266.366	10.2657
Gaussian/Lorentzian	3407	0.0255	272.810	7.3927
Gaussian/Lorentzian	3529	0.0145	172.169	2.6490

Table B. The curve fitting parameters of hydroxyl region of irradiated PET under the UV evanescent field irradiation (Fig. 4. 13 (B))

Peak type	Center (cm^{-1})	Height	FWHH	Area
Gaussian/Lorentzian	2888	0.0137	45.803	1.2009
Gaussian/Lorentzian	2961	0.0375	55.120	3.2008
Gaussian/Lorentzian	2994	0.0236	289.564	7.8418
Gaussian/Lorentzian	3073	0.0084	67.520	0.9164
Gaussian/Lorentzian	3224	0.0202	174.051	3.8306
Gaussian/Lorentzian	3410	0.0319	255.208	8.6661
Gaussian/Lorentzian	3518	0.0236	160.660	4.7420

Table C. The curve fitting parameters of carbonyl region of un-irradiated PET (Fig. 4. 15 (A))

Peak type	Center (cm^{-1})	Height	FWHH	Area
Gaussian/Lorentzian	1577	0.0466	12.978	0.7935
Gaussian/Lorentzian	1613	0.0266	17.448	0.7976
Gaussian/Lorentzian	1715	1.3795	27.571	49.9402

Table D. The curve fitting parameters of carbonyl region of carbonyl region of irradiated PET by UV transmission (Fig. 4. 15 (B))

Peak type	Center (cm^{-1})	Height	FWHH	Area
Gaussian/Lorentzian	1577	0.0562	11.974	0.8766
Gaussian/Lorentzian	1613	0.0837	27.128	3.8231
Gaussian/Lorentzian	1689	0.2607	32.91	14.4938
Gaussian/Lorentzian	1710	0.2051	20.542	5.7317
Gaussian/Lorentzian	1715	0.8197	45.87	44.9041
Gaussian/Lorentzian	1781	0.1345	48.552	6.9506

Table E. The curve fitting parameters of carbonyl region of irradiated PET by the UV evanescent field irradiation (Fig. 4. 15 (C))

Peak type	Center (cm^{-1})	Height	FWHH	Area
Gaussian/Lorentzian	1577	0.0532	11.29	0.7858
Gaussian/Lorentzian	1613	0.0722	15.852	1.9652
Gaussian/Lorentzian	1686	0.1814	36.738	11.86
Gaussian/Lorentzian	1707	0.3872	21.279	10.2159
Gaussian/Lorentzian	1715	0.7971	37.325	33.8113

APPENDIX B

Calculation of diamond refractive index

At Hg green	546.10 nm	$n = 2.4237$
C-line	654.28 nm	$n = 2.4099$
D-line	589.29 nm	$n = 2.4173$
F-line	486.13 nm	$n = 2.4355$
Near cut-off in UV at	226.5 nm	$n = 2.7151$

Brewster angle (at D-line) = 67.53

Coefficient of reflection = 0.17

where $\varepsilon_1 = 0.3306$, $\varepsilon_2 = 4.3356$, $\lambda_1 = 175$ nm, $\lambda_2 = 106$ nm

$$n(\lambda) = \sqrt{\left[\left(\frac{\varepsilon_1 \lambda^2}{\lambda^2 - \lambda_1^2}\right) + \left(\frac{\varepsilon_2 \lambda^2}{\lambda^2 - \lambda_2^2}\right) + 1\right]}$$

APPENDIX C

Infrared and Raman spectra library of PET

Library name: Sprouse polymer by ATR

Compound name: Poly (ethylene terephthalate)

Library index: 37

CAS number: 25038-59-9

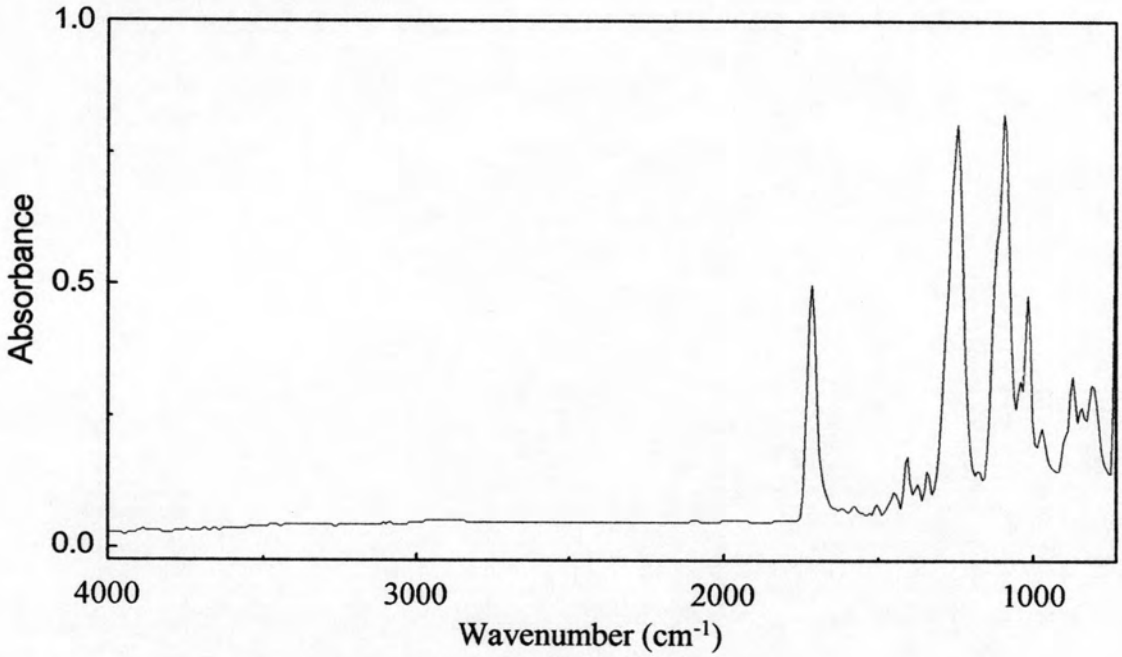

Fig. 1. ATR FT-IR spectrum of PET from Sprouse polymer library.

Library name: Aldrich Raman
Compound name: Poly (ethylene terephthalate)
Library index: 13705
Aldrich number: 20025-5
CAS number: 25038-59-9

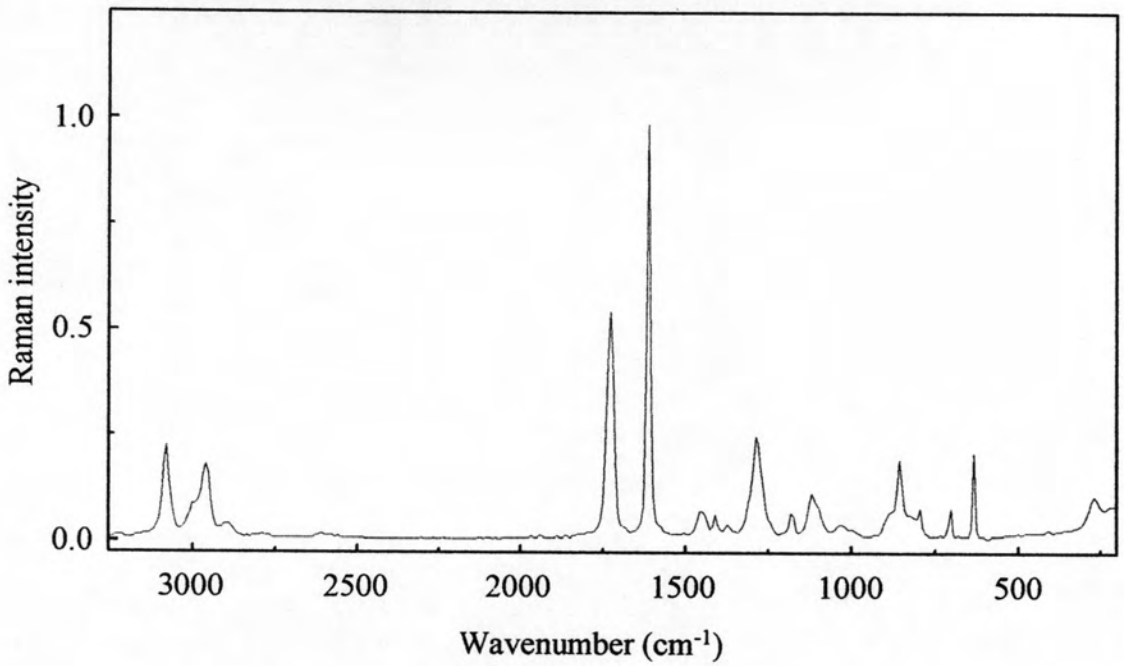

Fig. 2. Raman spectrum of PET from Aldrich Raman library.

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