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APPENDICES

APPENDIX A

Table A-1 Frequency shift, ΔF (Hz) of QCM of three pairs of multilayer film in the presence of 0.5M NaCl.

Number of Layers	Frequency Shift, ΔF (Hz)		
	(HTACC-PAA)	(PAH-SCC)	(PAH-SFC)
1	20	29	12
2	28	68	46
3	61	93	67
4	74	153	140
5	128	181	161
6	143	277	250
7	241	317	281
8	270	417	413
9	478	472	465
10	498	630	616

Table A-2 Water contact angle of treated PET-(HTACC-PAA)$_n$ assemblies, 0.5 M NaCl was added to both polyelectrolyte solutions.

Top layer	Number of layers (n)	Water contact angle (°)
Treated PET	0	63.6 ± 1.4
HTACC	9	73.4 ± 6.8
PAA	10	58.7 ± 4.6
HTACC	13	73.6 ± 6.8
PAA	14	56.8 ± 2.6
HTACC	15	72.7 ± 2.9
PAA	16	56.6 ± 3.0.

Table A-3 Water contact angle of treated PET-(PAH-SCC)$_n$ assemblies, 0.5 M NaCl was added to both polyelectrolyte solutions.

Top layer	Number of layer (n)	Water contact angle (°)
Treated PET	0	63.6 ± 1.4
PAH	9	107.1 ± 4.2
SCC	10	97.2 ± 4.3
PAH	13	111.0 ± 6.1
SCC	14	96.4 ± 6.0
PAH	15	110.5 ± 2.2
SCC	16	95.0 ± 3.2

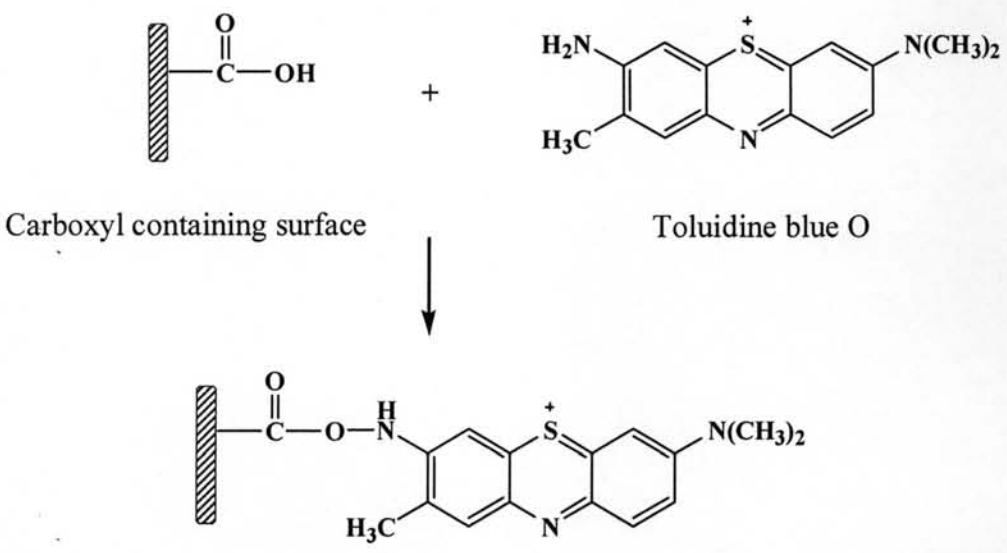
Table A-4 Water contact angle of treated PET-(PAH-SFC)$_n$ assemblies, 0.5 M NaCl was added to both polyelectrolyte solutions.

Top layer	Number of layer (n)	Water contact angle (°)
Treated PET	0	63.6 ± 1.4
PAH	9	101.4 ± 7.6
SFC	10	85.4 ± 8.4
PAH	13	106.6 ± 3.3
SFC	14	87.1 ± 8.0
PAH	15	108.1 ± 4.0
SFC	16	89.6 ± 4.2

APPENDIX B

Toluidine blue O assay

Toluidine blue O assay is a method used for determination of the amount of carboxyl groups. The complex formed by the carboxyl group and toluidine blue O has the λ_{max} at 633 nm.



Scheme B-1 Formation of the complex between toluidine blue O and carboxyl group

Determination of Carboxyl Groups on Plasma-treated PET

A number of carboxyl (COOH) groups on the plasma-treated PET substrate after the pretreatment was determined by a reaction with toluidine blue O, generating the absorbance at 633 nm. The COOH group was obtained from a calibration plot of the optical density versus dye concentration assuming a 1:1 stoichiometric ratio (Figure B-1) between the dye and the COOH group.

Table B-1 UV absorbance at λ = 633 nm as a function of toluidine blue O concentration [77].

Toluidine blue O concentration (x 10^{-3} M)	Absorbance
0.001	0.013
0.005	0.112
0.007	0.177
0.010	0.216
0.030	0.939
0.050	1.490

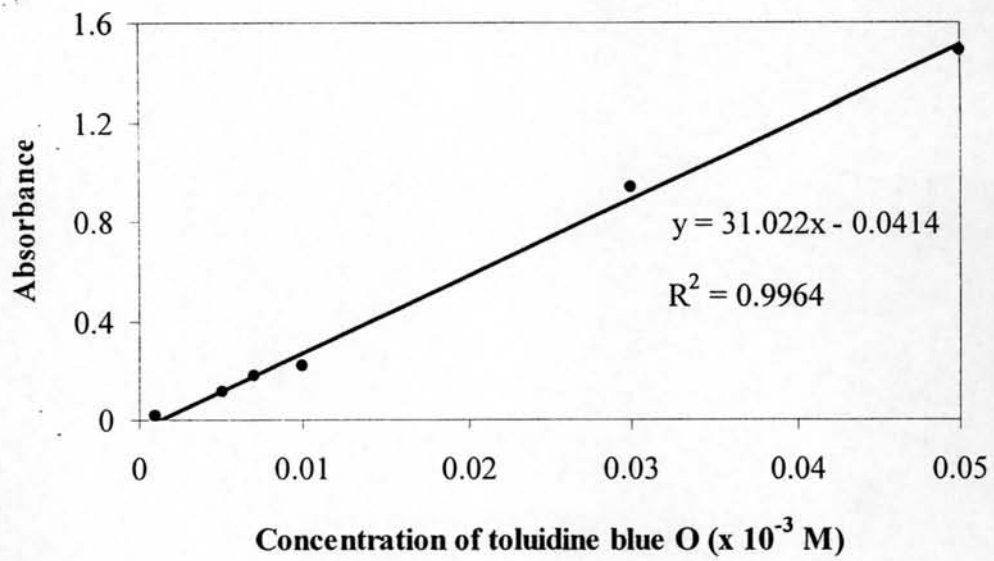


Figure B-1 Calibration curve of UV absorbance as a function of toluidine blue O concentration [77].

APPENDIX C

Table C-1 Fibroblast (L929) cell adhesion and proliferation on treated PET substrates and treated PET substrates with multilayer films.

Materials	12-h Adhesion		2-day Proliferation		4-day Proliferation	
	OD	% relative to TCPS	OD	% relative to TCPS	OD	% relative to TCPS
TCPS	0.240	100.0	0.287	100.0	0.699	100.0
Treated PET	0.207	86.3	0.279	97.2	0.586	83.8
HTACC-PAA~9	0.208	86.7	0.292	101.7	0.554	79.3
HTACC-PAA~10	0.254	105.8	0.257	89.5	0.636	91.0
HTACC-PAA~15	0.219	91.3	0.232	80.8	0.482	69.0
HTACC-PAA~16	0.244	101.7	0.290	101.0	0.759	108.6
PAH-SCC~9	0.213	88.8	0.341	118.8	0.626	89.6
PAH-SCC~10	0.174	72.5	0.270	94.1	0.565	80.8
PAH-SCC~15	0.216	90.0	0.376	131.0	0.723	103.4
PAH-SCC~16	0.173	72.1	0.254	88.5	0.557	79.7
PAH-SFC~9	0.295	122.9	0.364	126.8	0.719	102.9
PAH-SFC~10	0.239	99.6	0.279	97.2	0.581	83.1
PAH-SFC~15	0.248	103.3	0.243	84.7	0.642	91.8
PAH-SFC~16	0.191	79.6	0.211	73.5	0.610	87.3

For HTACC-PAA~n, PAH-SCC~n, and PAH-SFC~n, n is the number of layers.

VITAE

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