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APPENDICES

Appendix A Calibration Curve of Standard DBSA

Procedure:

The standard solution of DBSA in distilled water was prepared from stock solution of 5 mM. in volumetric flask 50 ml. The amounts of DBSA in standard Solution was measured by a UV spectrometer at 224 nm.

Calculation of a molar absorbtivity of DBSA from the calibration curve

$$A = \varepsilon bc$$

When, A = Absorbance

ε = The molar absorbtivity (L $mol^{-1}cm^{-1}$)

c = Concentration of solution (mol/L)

From the equation of calibration curve, the molar extinction coefficient of DBSA is the slope of the calibration curve.

At 224 nm;

$$Y = 9524x$$

Therefore, the molar absorbtivity of DBSA at 224 nm is 9.524×10^3 L $mol^{-1}cm^{-1}$

Table A1 Absorbance values of the standard DBSA

[DBSA](μM)	Absorbance		
	I	II	III
10	0.096	0.095	0.095
30	0.316	0.318	0.316
50	0.474	0.475	0.473
70	0.674	0.677	0.675
90	0.841	0.841	0.843

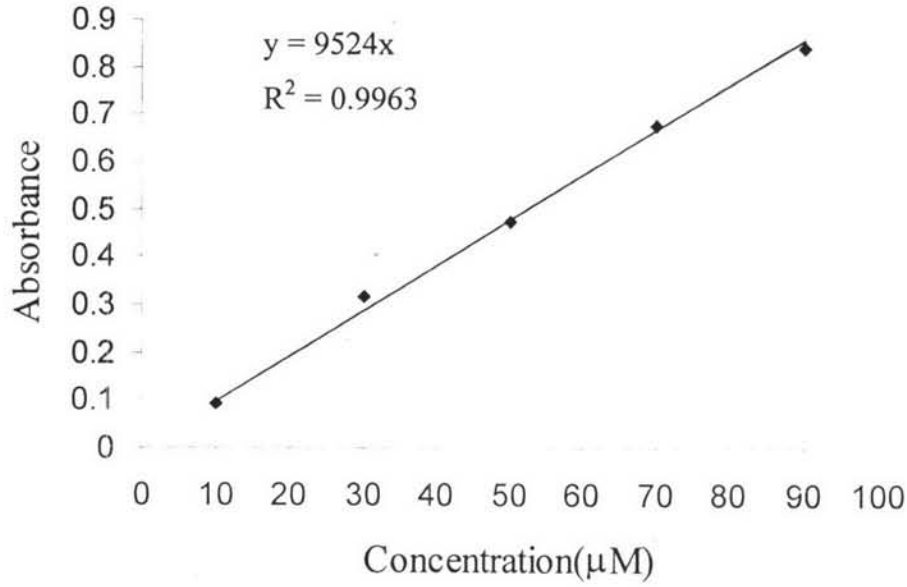

Figure A1 Calibration curve of the standard DBSA.

APPENDIX B Determination of Equilibrium Adsorption Time

The Calculation of $[DBSA]_{equi}$ can be calculated following this equation.

$$y = \text{Absorbance}$$

$$x = [DBSA]$$

$$x = y / 9524M$$

The 0.2 mL supernatant was pipetted and diluted with distilled wate: pH = 4 in volumetric flask 25 mL so, $[DBSA]_{equi}$ can be calculated from

$$C_1V_1 = C_2V_2$$

$$x = C_1 = [DBSA]_{flask}\ ,\ V_1 = 25\ mL$$

$$[DBSA]_{fi} = C_2 = [DBSA]_{vial}\ ,\ V_2 = 0.2\ mL$$

$$C_2 = (x \times 25)/0.2\ M$$

Calculation of the amount of adsorbed DBSA on polyester fabric

$$[DBSA]_{ads} = \{([DBSA]_{ini} - [DBSA]_{fi}) \times V\}/1000$$

$$\text{Adsorption } \mu mol/g\ PES = \{([DBSA]_{ads} \times 26)/1000\}/\text{weight of fabric}$$

Table B1 The equilibrium DBSA concentration at various adsorption time

Time (h)	Average absorbance	[DBSA]equi	[DBSA]PES
6	0.461	0.00488	8.12E-06
8	0.456	0.00483	1.12E-05
10	0.452	0.00479	1.54E-05
12	0.451	0.00478	1.55E-05
14	0.446	0.00472	1.78E-05
16	0.445	0.00471	1.74E-05
25	0.449	0.00476	1.78E-05
27	0.444	0.00470	1.68E-05
29	0.448	0.00475	1.73E-05
32	0.445	0.00471	1.82E-05
35	0.448	0.00475	1.71E-05

Table B2 The amount of adsorbed DBSA at various time

Time (h)	Average $[DBSA]_{PES}$ (μmol/g PES)
6	8.13
8	11.21
10	15.44
12	15.59
14	17.86
16	17.47
25	17.84

Time (h)	Average $[DBSA]_{PES}$ (μmol/g PES)
27	16.82
29	17.36
32	18.25
35	17.15

Appendix C Determination of the Adsorption Isotherm

Table C1 The equilibrium DBSA concentration

$[DBSA]_{ini}$ (μM)	Average $[DBSA]_{equi}$ (μM)
10	0.133
30	0.133
60	0.535
80	0.669
100	0.937
400	2.38
600	2.43
800	2.49
1000	2.51
1200	26.51
1400	2.65
1600	2.65
2000	2.65
4000	2.65
6000	2.65

Table C2 The amount of adsorbed DBSA at equilibrium

$[DBSA]_{ini}$ (μM)	Average $[DBSA]_{PES}$ (μmol/g PES)
10	0.32
30	0.33
60	1.28
80	1.59
100	2.23
400	5.77
600	5.85
800	6.05
1000	6.12
1200	6.33
1400	6.39
1600	6.41
2000	6.37
4000	6.37
6000	6.36

APPENDIX D Determination of Monomer Adsolubilization Isotherm

The Calculation of $[AA]_{equi}$ can be calculated following this equation.

$$y = TOC\ (mg/l)$$

$$x = [AA]$$

$$x = y / 40161M$$

The 0.2 mL supernatant was pipetted and diluted with distilled water pH = 4 in volumetric flask 25 mL so, $[AA]_{equi}$ can be calculated from

$$C_1V_1 = C_2V_2$$

$$x = C_1 = [AA]_{flask}\ ,\ V_1 = 25\ mL$$

$$[AA]_{fi} = C_2 = [AA]_{vial}\ ,\ V_2 = 0.2\ mL$$

$$C_2 = (x \times 25)/0.2\ M$$

Calculation of the amount of adsorbed AA on polyester fabric

$$[AA]_{ads} = \{([AA]_{ini} - [AA]_{fi}) \times V\}/1000$$

$$\text{Adsorption } \mu mol/g\ PES = \{([AA]_{ads} \times 26)/1000\}/\text{weight of fabric}$$

Table D1 TOC value of standard the acrylic acid

Concentration of standard of acrylic acid (M)	TOC of standard of acrylic acid (mg/l)
0.0002	9.173
0.0004	16.58
0.0006	25.06
0.0008	39.76
0.001	40.76
0.0012	50.44
0.0014	58.83
0.0016	69.98
0.0018	76.3
0.002	83.44
0.003	125.3
0.004	164.8
0.005	200.7
0.01	405.9
0.015	612.6
0.02	841.1
0.025	1029
0.03	1150

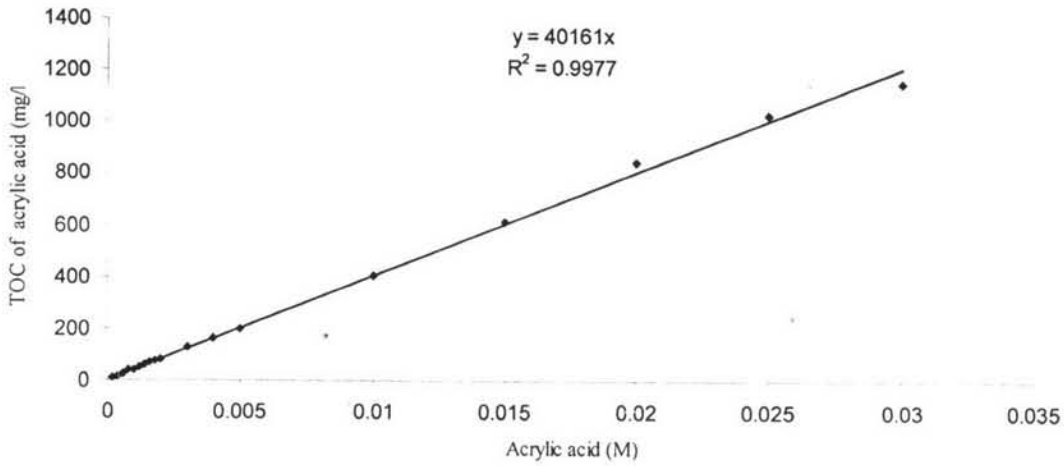

Figure D1 Calibration curve of the standard acrylic acid.

Table D2 The equilibrium acrylic acid concentration without added salt at various concentration

Concentration of acrylic acid (M)	Average [AA]equi	Average AA (mol/g) of PES
0.0002	0.000138766	6.99957E-06
0.0004	0.0002485	1.31204E-05
0.0006	0.000277882	1.50695E-05
0.0008	0.000559249	2.90972E-05
0.001	0.000367521	2.09235E-05
0.0012	0.000327183	1.61373E-05
0.0014	0.000493763	2.61319E-05
0.0016	0.000544807	2.71521E-05
0.0018	0.000610045	3.20317E-05
0.002	0.0006708	3.54358E-05
0.003	0.000854062	4.47387E-05
0.004	0.0010682	5.92293E-05
0.005	0.001392383	9.69955E-05
0.01	0.002348049	0.000118738
0.015	0.003620428	0.000188564
0.02	0.003697617	0.000202831
0.025	0.003993924	0.000230863
0.03	0.005238913	0.000286671

Table D3 The equilibrium acrylic acid concentration with added salt at various concentration

Concentration of acrylic acid (M)	Average [AA]equi	Average AA (mol/g) of PES
0.0002	0.000181096	1.06747E-05
0.0004	0.000325689	1.79394E-05
0.0006	0.000325191	1.76399E-05
0.0008	0.000576679	3.10627E-05
0.001	0.00040238	2.21088E-05
0.0012	0.000469112	2.55091E-05
0.0014	0.000553522	3.11492E-05
0.0016	0.000584647	3.36778E-05
0.0018	0.000699684	3.96984E-05
0.002	0.000792809	4.27045E-05
0.003	0.001349568	6.87678E-05
0.004	0.001683225	8.96525E-05
0.005	0.002006922	0.000114355
0.01	0.00336396	0.000171194
0.015	0.004096014	0.000221048
0.02	0.004332561	0.000232933
0.025	0.004778267	0.00026211
0.03	0.005973457	0.00032394

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