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APPENDICES

APPENDIX A

Table A-1 Langmuir model data

Initial concentration	B5			
	Adsorbance	Conc. (ppm.)	qt (mg/g-adsorbent)	Ce/Qe
10	0.003	0.123	19.754	0.006
20	0.045	1.946	36.108	0.054
40	0.252	10.990	58.020	0.189
60	0.597	26.097	67.806	0.385
80	0.903	43.787	72.426	0.605
100	1.187	57.531	84.938	0.677
Initial concentration	R31			
	Adsorbance	Conc. (ppm.)	qt (mg/g-adsorbent)	Ce/Qe
10	0.042	2.287	15.426	0.148
20	0.140	7.572	24.856	0.305
40	0.452	24.423	31.154	0.784
60	0.828	44.721	30.558	1.463
80	1.146	63.483	33.034	1.922
100	1.496	82.870	34.260	2.419
Initial concentration	MB			
	Adsorbance	Conc. (ppm.)	qt (mg/g-adsorbent)	Ce/Qe
10	0.033	6.501	6.998	0.929
20	0.074	14.781	10.438	1.416
40	0.163	32.608	14.784	2.206
60	0.260	52.098	15.804	3.296
80	0.348	69.625	20.749	3.356
100	0.445	88.947	22.107	4.023

Table A-2 Freundlich model data

Initial concentration	B5				
	Adsorbance	Conc. (ppm.)	qt (mg/g)	log qe	log Ce
10	0.003	0.123	19.754	1.296	0.91009489
20	0.045	1.946	36.108	1.558	0.28914283
40	0.252	10.990	58.020	1.764	1.04099769
60	0.597	26.097	67.806	1.831	1.41659058
80	0.903	43.787	72.426	1.860	1.64134654
100	1.187	57.531	84.938	1.929	1.75990355
Initial concentration	R31				
	Adsorbance	Conc. (ppm.)	qt (mg/g)	log qe	log Ce
10	0.042	2.287	15.426	1.188	0.35926616
20	0.140	7.572	24.856	1.395	0.87921060
40	0.452	24.423	31.154	1.494	1.38779900
60	0.828	44.721	30.558	1.485	1.65051150
80	1.146	63.483	33.034	1.519	1.80265906
100	1.496	82.870	34.260	1.535	1.91839779
Initial concentration	MB				
	Adsorbance	Conc. (ppm.)	qt (mg/g)	log qe	log Ce
10	0.033	6.501	6.998	0.845	0.81299486
20	0.074	14.781	10.438	1.019	1.16970969
40	0.163	32.608	14.784	1.170	1.51332149
60	0.260	52.098	15.804	1.199	1.71681938
80	0.348	69.625	20.749	1.317	1.84276770
100	0.445	88.947	22.107	1.345	1.94912935

APPENDIX B

International research papers

Publications Co-Authored by N. Akrapattangkul:

Charinpanitkul, T., Sano, N., Puengjinda, P., Klanwan, J., **Akrapattangkul, N.**, and Tanthapanichakoon W. Naphthalene as an alternative carbon source for pyrolytic synthesis of carbon nanostructures. Journal of Analytical and Applied Pyrolysis 86 (2009): 386-390.

Klanwan, J., **Akrapattangkul, N.**, Pavarajarn, V., Seto, T., Otani, Y., and Charinpanitkul, T. Single-step synthesis of MWCNT/ZnO nanocomposite using co-chemical vapor deposition method. Materials Letters 64 (2010): 80-82.

VITA

Mr. Nattapol Akrapattangkul was born in Songkhla, Thailand, on March 24, 1986. After completing his high-school level at Saengthong Vittaya school in Songkhla, in March 2004. He entered Prince of Songkla University, Songkhla, in June, 2004. After earning the degree of Bachelor of Engineering in Chemical Engineering in March, 2008, he gained admission to the Graduate School of Chulalongkorn University in June 2008. In April 2011, he was awarded the degree of Master of Engineering in Chemical Engineering with the thesis entitled “Removal dye pollutants using multi-walled carbon nanotubes with magnetic characteristics”.



