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APPENDIX

Appendix A Experimental Data of BET Surface Area Analysis

Ideally five data points from the isotherm, with a minimum of three data points, in the P/P_0 range 0.025 to 0.30 should be used to successfully determine the surface area using the BET equation. The computer program takes over and a least-squares linear regression is used to fit the best straight line through a transformed data set consisting of the following pairs of values: $1 / [W((P_o/P) - 1)]$ and P/P_o The total surface area can be calculated using the following equation.

The monolayer capacity, V_m, is calculated from the slope, s, and the intercept, i, of the straight line which can be obtained using least squares regression.

$$V_m = \frac{1}{s+i}$$

Once X_m is determined, the total surface area S_t can be calculated with the following equation.

$$S_t = \frac{V_m L_{AV} A_m}{M_v}$$

Where L_{av} is Avogadro's number and equals 6.02×10^{23}, A_m is the cross sectional area of the adsorbate and equals 0.162 nm^2 for an absorbed nitrogen molecule, and M_v is the molar volume and equals 22414 mL. All surface area results are finally reported normalized by sample weight, or mass, as square meters per gram, written m^2/g or m^2g^{-1}.

Table A1 Raw data of multi-point BET of TiO_2 fibers

Relative pressure [P/P_o]	Volume @ STP [cc/g]	1 / [$W((P_o/P) - 1)$]
4.98112e-02	3.9903	1.0512e+01
1.00416e-01	5.2218	1.7104e+01
1.50344e-01	6.5068	2.1759e+01
2.00353e-01	7.4241	2.7003e+01
2.50309e-01	8.2890	3.2229e+01
3.00271e-01	9.0302	3.8023e+01

Slope	107.414
Intercept	5.614
Correlation coefficient, r	0.999195
C constant	20.134

Table A2 Raw data of multi-point BET of TiO_2 hollow fibers

Relative pressure [P/P_o]	Volume @ STP [cc/g]	1 / [$W((P_o/P) - 1)$]
4.96553e-02	4.6058	9.0769e+00
1.00324e-01	6.3354	1.4083e+01
1.50328e-01	7.7396	1.8291e+01
2.00255e-01	9.2026	2.1771e+01
2.50210e-01	10.5306	2.5355e+01
3.00294e-01	11.0683	3.1024e+01

Slope	83.894
Intercept	5.237
Correlation coefficient, r	0.997304
C constant	17.019

Table A3 Raw data of multi-point BET of calcined Zn/TiO_2 composite hollow fibers

Relative pressure [P/P_o]	Volume @ STP [cc/g]	1 / [$W((P_o/P) - 1)$]
5.02964e-02	8.5101	4.9793e+00
1.00064e-01	10.2497	8.6798e+00
1.50028e-01	11.9278	1.1840e+01
2.00014e-01	13.4326	1.4893e+01
2.50052e-01	14.7656	1.8068e+01
2.99966e-01	16.0970	2.1299e+01

Slope	64.528
Intercept	1.996
Correlation coefficient, r	0.999577
C constant	33.323

Table A4 Raw data of multi-point BET of ZnO-TiO_2 composite hollow fibers at 115 °C 1 h

Relative pressure [P/P_o]	Volume @ STP [cc/g]	1 / [$W((P_o/P) - 1)$]
5.02237e-02	0.9421	4.4909e+01
1.00349e-01	1.6241	5.4951e+01
1.50304e-01	2.2411	6.3154e+01
2.00239e-01	2.8888	6.9346e+01
2.50133e-01	3.5504	7.5174e+01
3.00029e-01	4.2820	8.0092e+01

Slope	138.877
Intercept	4.027e+01
Correlation coefficient, r	0.991158
C constant	4.449

Table A5 Raw data of multi-point BET of ZnO-TiO_2 composite hollow fibers at 115 °C 0.75 h

Relative pressure [P/P_o]	Volume @ STP [cc/g]	1 / [W((P_o/P) - 1)]
5.11496e-02	1.3029	3.3106e+01
1.00923e-01	2.1646	4.1492e+01
1.50896e-01	3.0260	4.6990e+01
2.00840e-01	3.8336	5.2453e+01
2.50899e-01	4.6178	5.8034e+01
3.00824e-01	5.2209	6.5938e+01

Slope	125.405
Intercept	2.761e+01
Correlation coefficient, r	0.997014
C constant	5.542

Table A6 Raw data of multi-point BET of ZnO-TiO_2 composite hollow fibers at 115 °C 0.5 h

Relative pressure [P/P_o]	Volume @ STP [cc/g]	1 / [W((P_o/P) - 1)]
5.08183e-02	1.6215	2.6418e+01
1.00621e-01	2.5440	3.5187e+01
1.50649e-01	3.3939	4.1816e+01
2.00633e-01	4.2630	4.7108e+01
2.50577e-01	5.1710	5.1736e+01
3.00458e-01	6.1502	5.5878e+01

Slope	115.692
Intercept	2.271e+01
Correlation coefficient, r	0.989745
C constant	6.095

Table A7 Raw data of multi-point BET of calcined Ag/TiO_2 composite hollow fibers

Relative pressure [P/P_o]	Volume @ STP [cc/g]	1 / [W((P_o/P) - 1)]
4.95494e-02	6.2422	6.6823e+00
1.00403e-01	7.7345	1.1546e+01
1.50459e-01	8.8637	1.5987e+01
2.00377e-01	9.8586	2.0338e+01
2.50334e-01	10.7297	2.4901e+01
3.00318e-01	11.3185	3.0342e+01

Slope	92.792
Intercept	2.039
Correlation coefficient, r	0.999406
C constant	46.517

Table A8 Raw data of multi-point BET of Ag_2O-TiO_2 composite hollow fibers at 110 °C 1 h

Relative pressure [P/P_o]	Volume @ STP [cc/g]	1 / [W((P_o/P) - 1)]
5.02959e-02	1.3926	3.0427e+01
1.00315e-01	2.5547	3.4922e+01
1.50235e-01	3.7525	3.7697e+01
2.00085e-01	5.2237	3.8314e+01
2.50118e-01	6.4059	4.1661e+01
2.99985e-01	7.9532	4.3113e+01

Slope	48.217
Intercept	2.924e+01
Correlation coefficient, r	0.978400
C constant	2.649

Table A9 Raw data of multi-point BET of Ag_2O-TiO_2 composite hollow fibers at 115 °C 1 h

Relative pressure [P/P_o]	Volume @ STP [cc/g]	1 / [$W((P_o/P) - 1)$]
5.06183e-02	1.1475	3.7177e+01
1.00252e-01	2.3419	3.8069e+01
1.50237e-01	3.4730	4.0731e+01
2.00285e-01	4.5120	4.4413e+01
2.50195e-01	5.7250	4.6635e+01
3.00216e-01	6.8014	5.0469e+01

Slope	54.842
Intercept	3.330e+01
Correlation coefficient, r	0.988545
C constant	2.647

Table A10 Raw data of multi-point BET of Ag_2O-TiO_2 composite hollow fibers at 120 °C 1 h

Relative pressure [P/P_o]	Volume @ STP [cc/g]	1 / [$W((P_o/P) - 1)$]
5.05097e-02	0.7749	5.4929e+01
1.00515e-01	1.3752	6.5017e+01
1.50471e-01	1.8850	7.5183e+01
2.00451e-01	2.2950	8.7404e+01
2.50373e-01	2.8035	9.5323e+01
3.00357e-01	3.1184	1.1015e+02

Slope	216.860
Intercept	4.329e+01
Correlation coefficient, r	0.997689
C constant	6.010

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Presentations:

1. Sirimekanont, T.; Supaphol, P.; and Sombatmankhong, K. (2013, March 11-15) Novel electrospun nanofibrous materials as anode in lithium-ion batteries. Paper presented at POLYCHAR 21 World Forum on Advance Materials, Gwangju, Republic of Korea.
2. Sirimekanont, T.; Supaphol, P.; and Sombatmankhong, K. (2013, April 23) Novel electrospun titanium (IV) oxide hollow fibers as anode in lithium-ion batteries. Paper presented at Proceedings of the 19th PPC Symposium on Petroleum, Petrochems, and Polymers, Bangkok, Thailand.