

Sample: FULL- N2@77K- ADS/DES

Operator:

Submitter:

File: D:\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Szczecinie\Doktorat\BET\...\Bi_FULL.SMP

Started:	18.11.2022 14:39:39	Analysis adsorptive:	N2
Completed:	21.11.2022 18:42:54	Analysis bath temp.:	77,300 K
Report time:	22.11.2022 14:22:21	Thermal correction:	Yes
Sample mass:	0,8062 g	Ambient free space:	28,0000 cm ³ Entered
Analysis free space:	83,0000 cm ³	Equilibration interval:	30 s
Low pressure dose:	0,00062 mmol/g	Sample density:	1,000 g/cm ³
Automatic degas:	No		

Summary Report

Surface Area

BET Surface Area: 1,1007 m²/g

DFT Pore Size

Volume in Pores	<	9,51 Å	0,00000 cm ³ /g
Total Volume in Pores	<=	17,02 Å	0,00042 cm ³ /g
Area in Pores	>	17,02 Å	0,000 m ² /g
Total Area in Pores	>=	9,51 Å	1,342 m ² /g

Horvath-Kawazoe

Maximum pore volume at $p/p^\circ = 0,006201703$: 0,000380 cm³/g

Median pore width: 9,116 Å

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Automatic degas:	No		

Isotherm Tabular Report

Relative Pressure (p/p°)	Absolute Pressure (kPa)	Quantity Adsorbed (mmol/g)	Elapsed Time (h:min)	Saturation Pressure (kPa)
			04:47	101.6087166
0.000013955	0.0014181	0.00156	06:20	101.6245681
0.000056106	0.0057028	0.00277	08:37	101.6442768
0.000093030	0.0094543	0.00338	10:34	101.6256667
0.000141197	0.0143391	0.00393	13:36	101.5541393
0.000176600	0.0179111	0.00426	15:38	101.4222491
0.000225367	0.0228281	0.00466	17:43	101.2931174
0.000259936	0.0263007	0.00488	19:55	101.1813427
0.000287510	0.0290781	0.00505	21:30	101.1375231
0.000319209	0.0324880	0.00520	23:21	101.7765820
0.000359867	0.0365812	0.00541	24:41	101.6521293
0.000418517	0.0424873	0.00570	26:12	101.5185872
0.000483301	0.0490480	0.00599	27:35	101.4855089
0.000554587	0.0562596	0.00628	28:53	101.4440247
0.000624758	0.0633588	0.00654	30:09	101.4132899
0.000685264	0.0694917	0.00673	31:44	101.4087411
0.000737759	0.0747803	0.00689	33:12	101.3614712
0.000781432	0.0791715	0.00701	34:44	101.3159915
0.000825075	0.0835513	0.00711	36:52	101.2651412
0.000910811	0.0921842	0.00734	38:29	101.2111173
0.000978816	0.0990334	0.00751	39:23	101.1767940
0.001019699	0.1031390	0.00760	40:19	101.1464742
0.001249802	0.1264101	0.00815	40:42	101.1441306
0.001447074	0.1463590	0.00852	41:05	101.1413802
0.001776799	0.1796726	0.00906	41:28	101.1215332
0.002062965	0.2086036	0.00944	41:51	101.1183596
0.002282746	0.2308055	0.00968	42:13	101.1087169
0.002569529	0.2597925	0.00994	42:36	101.1051283
0.002754673	0.2784785	0.01008	42:59	101.0931420
0.003131871	0.3165533	0.01032	43:21	101.0748085
0.003378741	0.3415084	0.01044	43:44	101.0756385
0.003658366	0.3697101	0.01056	44:07	101.0588268
0.003799977	0.3839683	0.01061	44:30	101.0449037
0.003914867	0.3955240	0.01064	44:54	101.0312655
0.004162028	0.4204484	0.01072	45:17	101.0201011
0.004557920	0.4603724	0.01081	45:40	101.0049412
0.004838299	0.4886781	0.01086	46:02	101.0020443
0.005125742	0.5176532	0.01090	46:25	100.9908799
0.005384764	0.5437749	0.01093	46:48	100.9839875
0.005765824	0.5821216	0.01096	47:10	100.9606984
0.005874755	0.5930999	0.01096	47:33	100.9573946

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Automatic degas:	No		

Isotherm Tabular Report

Relative Pressure (p/p°)	Absolute Pressure (kPa)	Quantity Adsorbed (mmol/g)	Elapsed Time (h:min)	Saturation Pressure (kPa)
0.006201703	0.6260095	0.01097	47:56	100.9415431
0.006310224	0.6368838	0.01097	48:19	100.9288651
0.006620339	0.6680400	0.01097	48:41	100.9072279
0.006749299	0.6810409	0.01097	49:04	100.9054376
0.007095833	0.7159318	0.01096	49:26	100.8946801
0.007262877	0.7326806	0.01095	49:49	100.8802118
0.007569547	0.7635862	0.01094	50:12	100.8760781
0.007938662	0.8007183	0.01091	50:34	100.8631234
0.008330413	0.8401649	0.01088	50:57	100.8551325
0.008727257	0.8802969	0.01085	51:20	100.8675338
0.009036163	0.9113372	0.01081	51:43	100.8544408
0.009300785	0.9379896	0.01078	52:06	100.8505837
0.009586568	0.9667740	0.01074	52:28	100.8467266
0.010005982	1.0089712	0.01069	52:51	100.8367991
0.070258527	7.1259425	-0.00413	68:43	101.4245927
0.128457554	13.0283485	-0.02210	68:48	101.4214272
0.181473980	18.4011725	-0.03896	68:54	101.3984067
0.231248436	23.4512507	-0.05520	68:59	101.4114997
0.281274698	28.5256128	-0.07169	69:04	101.4154951
0.331237268	33.5951494	-0.08847	69:10	101.4232174
0.381262847	38.6579219	-0.10515	69:15	101.3944112
0.431263156	43.7195918	-0.12221	69:20	101.3756709
0.481277509	48.7782224	-0.13958	69:26	101.3515518
0.531154770	53.8233327	-0.15671	69:31	101.3326731
0.581091272	58.8767228	-0.17385	69:37	101.3209553
0.630949618	63.9269394	-0.19095	69:42	101.3186118
0.680830291	68.9741207	-0.20753	69:47	101.3088307
0.730812681	74.0297201	-0.22384	69:53	101.2978046
0.780656921	79.0690366	-0.23918	69:58	101.2852568
0.830425398	84.0956589	-0.25311	70:03	101.2681683
0.880086325	89.1124838	-0.26535	70:09	101.2542534
0.929180805	94.0730064	-0.27231	70:15	101.2429507
0.975349078	98.7263846	-0.25722	70:23	101.2215901
0.990399116	100.2542785	-0.22264	70:32	101.2261389
0.884920558	89.5635536	-0.26634	70:40	101.2108407
0.772933352	78.2183658	-0.23711	70:45	101.1967793
0.672516427	68.0417590	-0.20571	70:51	101.1748654
0.572046939	57.8694405	-0.17261	70:56	101.1620491
0.471822058	47.7244391	-0.13885	71:02	101.1492328
0.371666298	37.5913020	-0.10509	71:07	101.1426171
0.271452457	27.4540291	-0.07157	71:13	101.1375231

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Automatic degas:	No		

Isotherm Tabular Report

Relative Pressure (p/p°)	Absolute Pressure (kPa)	Quantity Adsorbed (mmol/g)	Elapsed Time (h:min)	Saturation Pressure (kPa)
0.171404955	17.3346929	-0.03844	71:18	101.1329743
0.128527110	12.9979921	-0.02441	71:23	101.1303541

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Operator:

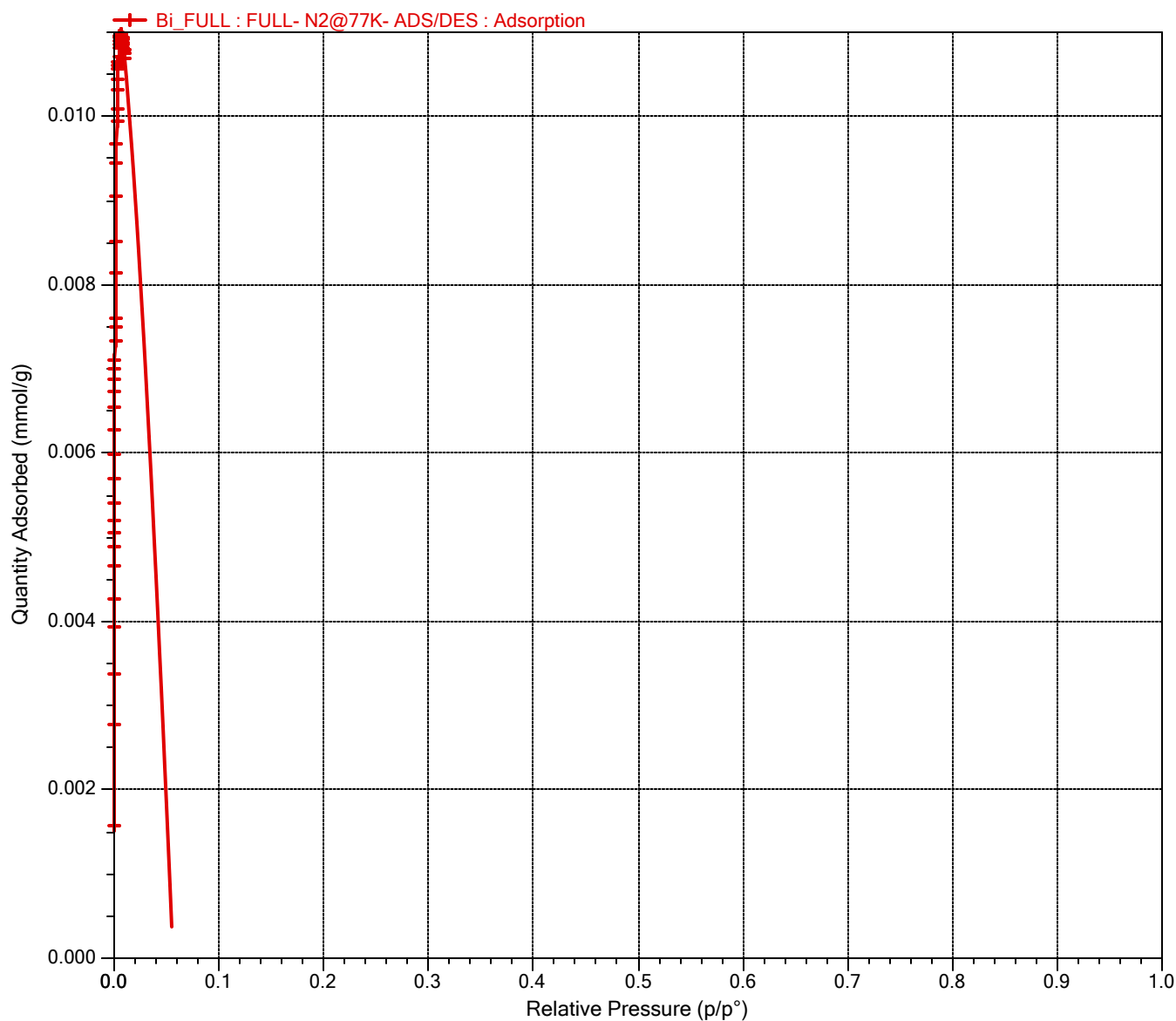
Submitter:

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Low pressure dose: 0,00062 mmol/g
Automatic degas: No

Analysis adsorptive: N2
Analysis bath temp.: 77,300 K
Thermal correction: Yes
Ambient free space: 28,0000 cm³ Entered
Equilibration interval: 30 s
Sample density: 1,000 g/cm³

Isotherm Linear Plot



Sample: FULL- N2@77K- ADS/DES

Operator:

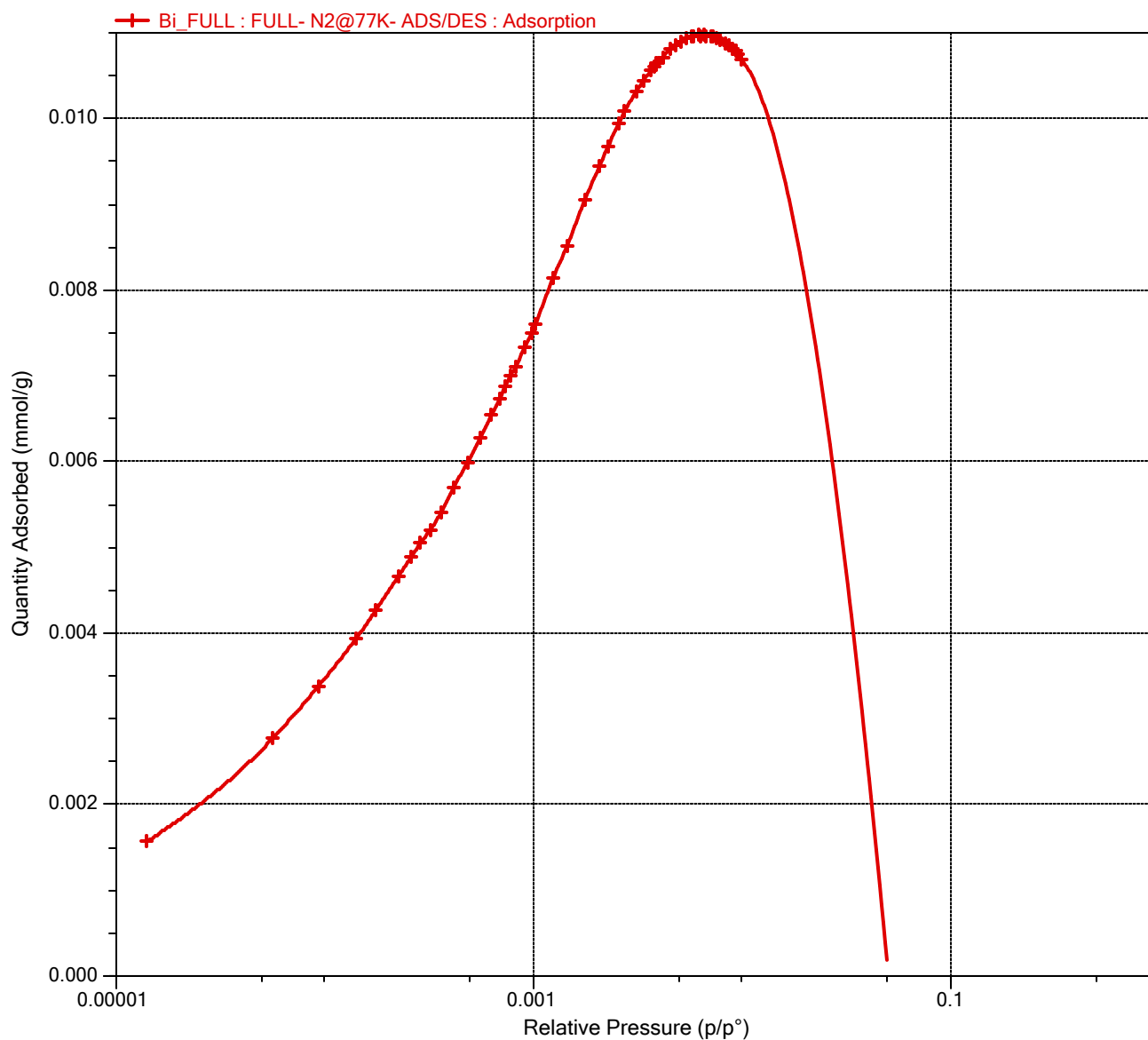
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Thermal correction: Yes
Ambient free space: 28,0000 cm³ Entered
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Isotherm Log Plot



Sample: FULL- N2@77K- ADS/DES

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Automatic degas:	No		

BET Report

BET surface area: 1,1007 ± 0,0058 m²/g
 Slope: 88,60462 ± 0,47103 g/mmol
 Y-intercept: 0,03094 ± 0,00220 g/mmol
 C: 2 864,382301
 Qm: 0,01128 mmol/g
 Correlation coefficient: 0,9992660
 Molecular cross-sectional area: 0,1620 nm²

Relative Pressure (p/p°)	Quantity Adsorbed (mmol/g)	1/[Q(p°/p - 1)]
0.000013955	0.00156	0.00892
0.000056106	0.00277	0.02026
0.000093030	0.00338	0.02750
0.000141197	0.00393	0.03591
0.000176600	0.00426	0.04142
0.000225367	0.00466	0.04836
0.000259936	0.00488	0.05326
0.000287510	0.00505	0.05700
0.000319209	0.00520	0.06139
0.000359867	0.00541	0.06655
0.000418517	0.00570	0.07342
0.000483301	0.00599	0.08068
0.000554587	0.00628	0.08835
0.000624758	0.00654	0.09564
0.000685264	0.00673	0.10190
0.000737759	0.00689	0.10721
0.000781432	0.00701	0.11164
0.000825075	0.00711	0.11616
0.000910811	0.00734	0.12426
0.000978816	0.00751	0.13049
0.001019699	0.00760	0.13431
0.001249802	0.00815	0.15362
0.001447074	0.00852	0.17013
0.001776799	0.00906	0.19642
0.002062965	0.00944	0.21901
0.002282746	0.00968	0.23638
0.002569529	0.00994	0.25918
0.002754673	0.01008	0.27409
0.003131871	0.01032	0.30446
0.003378741	0.01044	0.32466
0.003658366	0.01056	0.34774
0.003799977	0.01061	0.35961
0.003914867	0.01064	0.36931

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Relative Pressure (p/p°)	Quantity Adsorbed (mmol/g)	1/[Q(p°/p - 1)]
0.004162028	0.01072	0.39002
0.004557920	0.01081	0.42354
0.004838299	0.01086	0.44762
0.005125742	0.01090	0.47264
0.005384764	0.01093	0.49540
0.005765824	0.01096	0.52917
0.005874755	0.01096	0.53922
0.006201703	0.01097	0.56875
0.006310224	0.01097	0.57896
0.006620339	0.01097	0.60749
0.006749299	0.01097	0.61959
0.007095833	0.01096	0.65206
0.007262877	0.01095	0.66815
0.007569547	0.01094	0.69751
0.007938662	0.01091	0.73319
0.008330413	0.01088	0.77184
0.008727257	0.01085	0.81179
0.009036163	0.01081	0.84328
0.009300785	0.01078	0.87066
0.009586568	0.01074	0.90086
0.010005982	0.01069	0.94537

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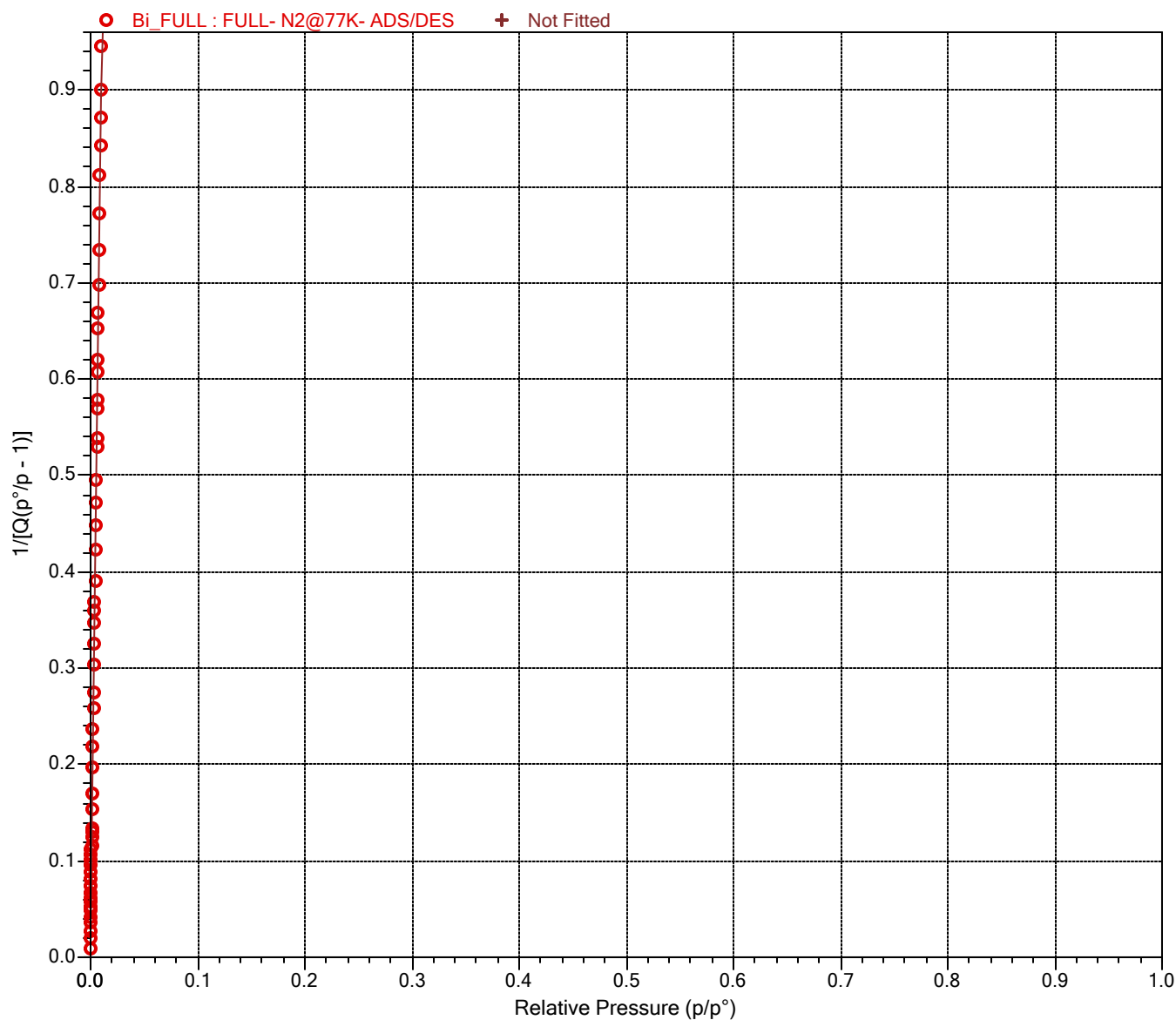
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BET Surface Area Plot



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Automatic degas:	No		

Langmuir Reports

Primary Data

At least two points must be selected for this calculation.

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Automatic degas:	No		

Freundlich Tabular Report

Qm·C: 0,0128 ± 0,0001 mmol/g

m: 3,7233 ± 0,1214

Correlation coefficient: 0,973439

Absolute Pressure (kPa)	Quantity Adsorbed (mmol/g)	log(p)	log(Q)
0.0014181	0.00156	-2.84828	-2.8057
0.0057028	0.00277	-2.24391	-2.5576
0.0094543	0.00338	-2.02437	-2.4707
0.0143391	0.00393	-1.84348	-2.4053
0.0179111	0.00426	-1.74688	-2.3702
0.0228281	0.00466	-1.64153	-2.3315
0.0263007	0.00488	-1.58003	-2.3114
0.0290781	0.00505	-1.53643	-2.2971
0.0324880	0.00520	-1.48828	-2.2839
0.0365812	0.00541	-1.43674	-2.2668
0.0424873	0.00570	-1.37174	-2.2439
0.0490480	0.00599	-1.30938	-2.2223
0.0562596	0.00628	-1.24980	-2.2020
0.0633588	0.00654	-1.19819	-2.1846
0.0694917	0.00673	-1.15807	-2.1720
0.0747803	0.00689	-1.12621	-2.1620
0.0791715	0.00701	-1.10143	-2.1546
0.0835513	0.00711	-1.07805	-2.1482
0.0921842	0.00734	-1.03534	-2.1345
0.0990334	0.00751	-1.00422	-2.1245
0.1031390	0.00760	-0.98658	-2.1192
0.1264101	0.00815	-0.89822	-2.0891
0.1463590	0.00852	-0.83458	-2.0697
0.1796726	0.00906	-0.74552	-2.0428
0.2086036	0.00944	-0.68068	-2.0251
0.2308055	0.00968	-0.63675	-2.0142
0.2597925	0.00994	-0.58537	-2.0026
0.2784785	0.01008	-0.55521	-1.9966
0.3165533	0.01032	-0.49955	-1.9864
0.3415084	0.01044	-0.46660	-1.9812
0.3697101	0.01056	-0.43214	-1.9764
0.3839683	0.01061	-0.41570	-1.9744
0.3955240	0.01064	-0.40283	-1.9730
0.4204484	0.01072	-0.37629	-1.9700
0.4603724	0.01081	-0.33689	-1.9661
0.4886781	0.01086	-0.31098	-1.9641
0.5176532	0.01090	-0.28596	-1.9625

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Automatic degas:	No		

Absolute Pressure (kPa)	Quantity Adsorbed (mmol/g)	log(p)	log(Q)
0.5437749	0.01093	-0.26458	-1.9614
0.5821216	0.01096	-0.23499	-1.9602
0.5930999	0.01096	-0.22687	-1.9602
0.6260095	0.01097	-0.20342	-1.9597
0.6368838	0.01097	-0.19594	-1.9599
0.6680400	0.01097	-0.17520	-1.9598
0.6810409	0.01097	-0.16683	-1.9599
0.7159318	0.01096	-0.14513	-1.9602
0.7326806	0.01095	-0.13509	-1.9606
0.7635862	0.01094	-0.11714	-1.9612
0.8007183	0.01091	-0.09652	-1.9620
0.8401649	0.01088	-0.07564	-1.9632
0.8802969	0.01085	-0.05537	-1.9648
0.9113372	0.01081	-0.04032	-1.9660
0.9379896	0.01078	-0.02780	-1.9673
0.9667740	0.01074	-0.01468	-1.9688
1.0089712	0.01069	0.00388	-1.9710

Sample: FULL- N2@77K- ADS/DES

Operator:

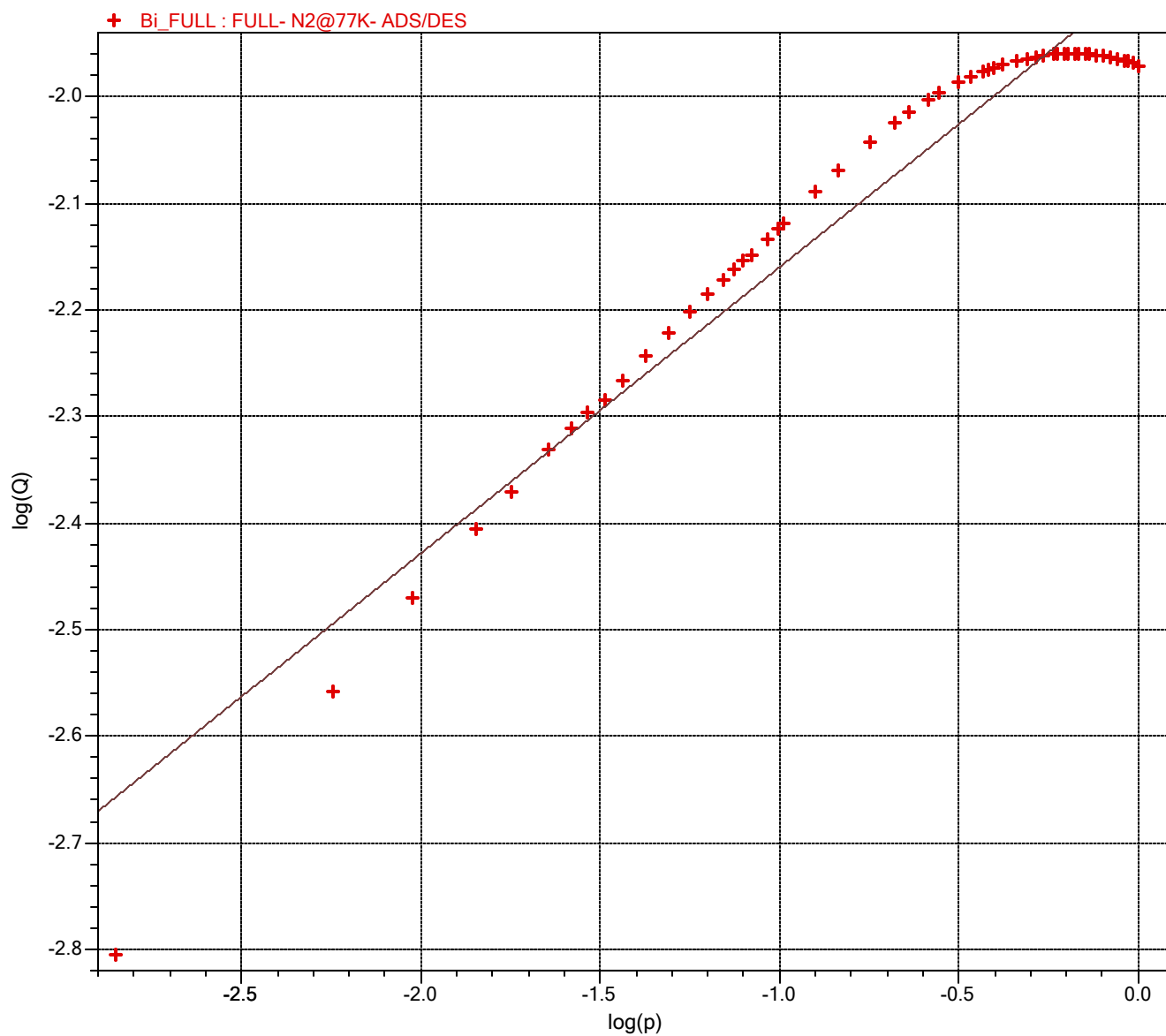
Submitter:

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Szczecinie\Doktorat\BET\...\Bi_FULL.SMP

Started: 18.11.2022 14:39:39
Completed: 21.11.2022 18:42:54
Report time: 22.11.2022 14:22:21
Sample mass: 0,8062 g
Analysis free space: 83,0000 cm³
Low pressure dose: 0,00062 mmol/g
Automatic degas: No

Analysis adsorptive: N2
Analysis bath temp.: 77,300 K
Thermal correction: Yes
Ambient free space: 28,0000 cm³ Entered
Equilibration interval: 30 s
Sample density: 1,000 g/cm³

Freundlich Plot



Sample: FULL- N2@77K- ADS/DES

Operator:

Submitter:

File: D:\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Szczecinie\Doktorat\BET\...\Bi_FULL.SMP

Started:	18.11.2022 14:39:39	Analysis adsorptive:	N2
Completed:	21.11.2022 18:42:54	Analysis bath temp.:	77,300 K
Report time:	22.11.2022 14:22:21	Thermal correction:	Yes
Sample mass:	0,8062 g	Ambient free space:	28,0000 cm ³ Entered
Analysis free space:	83,0000 cm ³	Equilibration interval:	30 s
Low pressure dose:	0,00062 mmol/g	Sample density:	1,000 g/cm ³
Automatic degas:	No		

Temkin Tabular Report

q·alpha/Qm: 369,172452 ± 9,273802 kJ/mol·(mmol/g)

A: 802,3782 ± 138,3039 kPa

Correlation coefficient: 0,983986

Absolute Pressure (kPa)	Quantity Adsorbed (mmol/g)	ln(p)
0.0014181	0.00156	-6.55841
0.0057028	0.00277	-5.16679
0.0094543	0.00338	-4.66129
0.0143391	0.00393	-4.24476
0.0179111	0.00426	-4.02233
0.0228281	0.00466	-3.77976
0.0263007	0.00488	-3.63816
0.0290781	0.00505	-3.53777
0.0324880	0.00520	-3.42688
0.0365812	0.00541	-3.30822
0.0424873	0.00570	-3.15855
0.0490480	0.00599	-3.01495
0.0562596	0.00628	-2.87778
0.0633588	0.00654	-2.75894
0.0694917	0.00673	-2.66655
0.0747803	0.00689	-2.59320
0.0791715	0.00701	-2.53614
0.0835513	0.00711	-2.48229
0.0921842	0.00734	-2.38397
0.0990334	0.00751	-2.31230
0.1031390	0.00760	-2.27168
0.1264101	0.00815	-2.06822
0.1463590	0.00852	-1.92169
0.1796726	0.00906	-1.71662
0.2086036	0.00944	-1.56732
0.2308055	0.00968	-1.46618
0.2597925	0.00994	-1.34787
0.2784785	0.01008	-1.27841
0.3165533	0.01032	-1.15026
0.3415084	0.01044	-1.07438
0.3697101	0.01056	-0.99504
0.3839683	0.01061	-0.95720
0.3955240	0.01064	-0.92754
0.4204484	0.01072	-0.86643
0.4603724	0.01081	-0.77572
0.4886781	0.01086	-0.71605
0.5176532	0.01090	-0.65845

Sample: FULL- N2@77K- ADS/DES

Operator:

Submitter:

File: D:\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Szczecinie\Doktorat\BET\...\Bi_FULL.SMP

Started:	18.11.2022 14:39:39	Analysis adsorptive:	N2
Completed:	21.11.2022 18:42:54	Analysis bath temp.:	77,300 K
Report time:	22.11.2022 14:22:21	Thermal correction:	Yes
Sample mass:	0,8062 g	Ambient free space:	28,0000 cm ³ Entered
Analysis free space:	83,0000 cm ³	Equilibration interval:	30 s
Low pressure dose:	0,00062 mmol/g	Sample density:	1,000 g/cm ³
Automatic degas:	No		

Absolute Pressure (kPa)	Quantity Adsorbed (mmol/g)	ln(p)
0.5437749	0.01093	-0.60922
0.5821216	0.01096	-0.54108
0.5930999	0.01096	-0.52239
0.6260095	0.01097	-0.46839
0.6368838	0.01097	-0.45117
0.6680400	0.01097	-0.40341
0.6810409	0.01097	-0.38413
0.7159318	0.01096	-0.33417
0.7326806	0.01095	-0.31105
0.7635862	0.01094	-0.26973
0.8007183	0.01091	-0.22225
0.8401649	0.01088	-0.17416
0.8802969	0.01085	-0.12750
0.9113372	0.01081	-0.09284
0.9379896	0.01078	-0.06402
0.9667740	0.01074	-0.03379
1.0089712	0.01069	0.00893

Sample: FULL- N2@77K- ADS/DES

Operator:

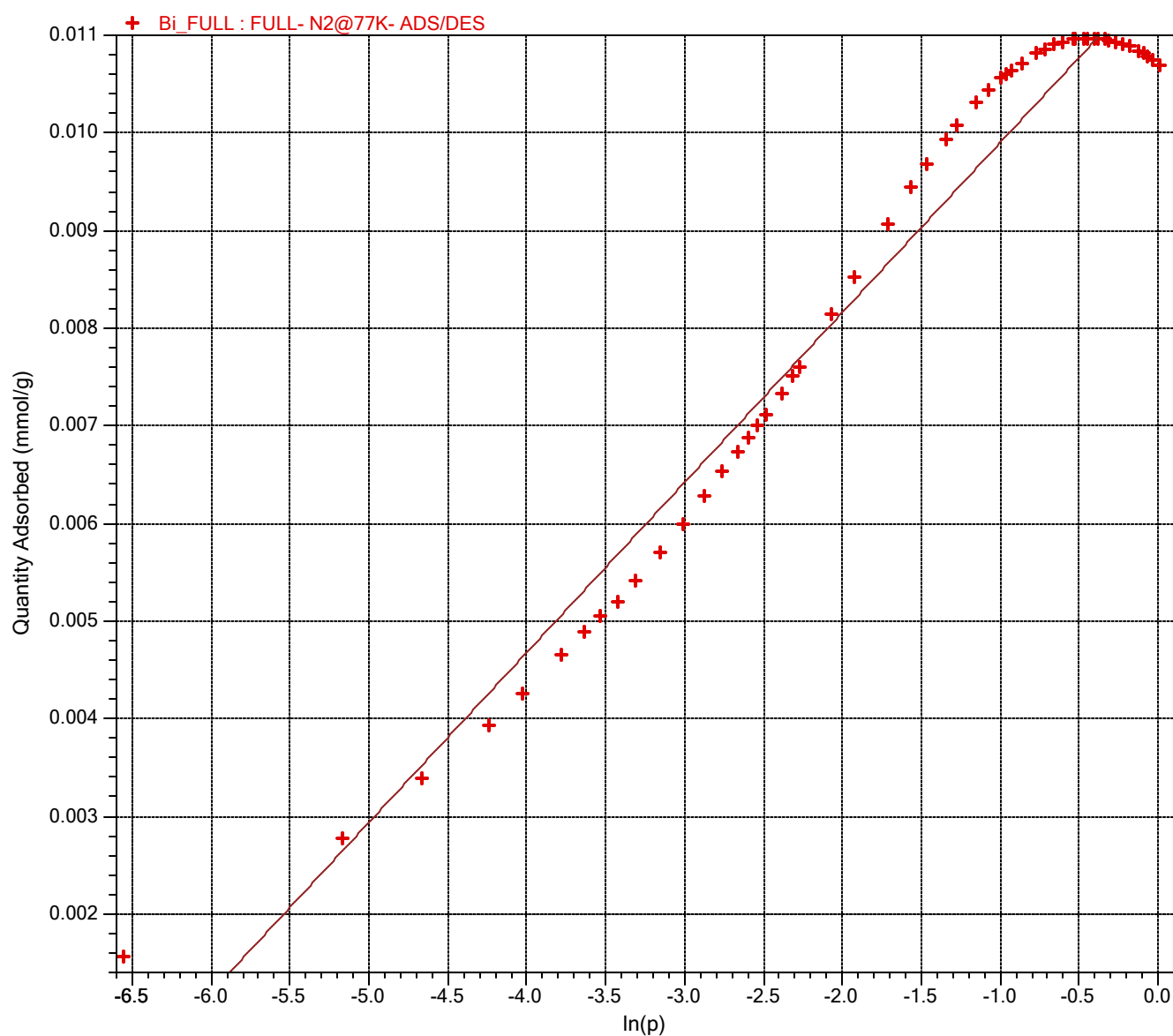
Submitter:

File: D:\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Szczecinie\Doktorat\BET\...\Bi_FULL.SMP

Started: 18.11.2022 14:39:39
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Report time: 22.11.2022 14:22:21
Sample mass: 0,8062 g
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Low pressure dose: 0,00062 mmol/g
Automatic degas: No

Analysis adsorptive: N2
Analysis bath temp.: 77,300 K
Thermal correction: Yes
Ambient free space: 28,0000 cm³ Entered
Equilibration interval: 30 s
Sample density: 1,000 g/cm³

Temkin Plot



Sample: FULL- N2@77K- ADS/DES

Operator:

Submitter:

File: D:\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Szczecinie\Doktorat\BET...\Bi_FULL.SMP

Started:	18.11.2022 14:39:39	Analysis adsorptive:	N2
Completed:	21.11.2022 18:42:54	Analysis bath temp.:	77,300 K
Report time:	22.11.2022 14:22:21	Thermal correction:	Yes
Sample mass:	0,8062 g	Ambient free space:	28,0000 cm ³ Entered
Analysis free space:	83,0000 cm ³	Equilibration interval:	30 s
Low pressure dose:	0,00062 mmol/g	Sample density:	1,000 g/cm ³
Automatic degas:	No		

t-Plot Reports

Primary Data

4053- At least two data points must be selected for t-Plot calculations.

Sample: FULL- N2@77K- ADS/DES

Operator:

Submitter:

File: D:\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Szczecinie\Doktorat\BET\...\Bi_FULL.SMP

Started:	18.11.2022 14:39:39	Analysis adsorptive:	N2
Completed:	21.11.2022 18:42:54	Analysis bath temp.:	77,300 K
Report time:	22.11.2022 14:22:21	Thermal correction:	Yes
Sample mass:	0,8062 g	Ambient free space:	28,0000 cm ³ Entered
Analysis free space:	83,0000 cm ³	Equilibration interval:	30 s
Low pressure dose:	0,00062 mmol/g	Sample density:	1,000 g/cm ³
Automatic degas:	No		

BJH Adsorption Reports

Primary Data

4148- Calculations failed for BJH primary data.

4146- Fewer than 2 points available for BJH Adsorption calculations.

Sample: FULL- N2@77K- ADS/DES

Operator:

Submitter:

File: D:\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Szczecinie\Doktorat\BET\...\Bi_FULL.SMP

Started:	18.11.2022 14:39:39	Analysis adsorptive:	N2
Completed:	21.11.2022 18:42:54	Analysis bath temp.:	77,300 K
Report time:	22.11.2022 14:22:21	Thermal correction:	Yes
Sample mass:	0,8062 g	Ambient free space:	28,0000 cm ³ Entered
Analysis free space:	83,0000 cm ³	Equilibration interval:	30 s
Low pressure dose:	0,00062 mmol/g	Sample density:	1,000 g/cm ³
Automatic degas:	No		

BJH Desorption Reports

Primary Data

4148- Calculations failed for BJH primary data.

4146- Fewer than 2 points available for BJH Desorption calculations.

Sample: FULL- N2@77K- ADS/DES

Operator:

Submitter:

File: D:\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Szczecinie\Doktorat\BET\...\Bi_FULL.SMP

Started:	18.11.2022 14:39:39	Analysis adsorptive:	N2
Completed:	21.11.2022 18:42:54	Analysis bath temp.:	77,300 K
Report time:	22.11.2022 14:22:21	Thermal correction:	Yes
Sample mass:	0,8062 g	Ambient free space:	28,0000 cm ³ Entered
Analysis free space:	83,0000 cm ³	Equilibration interval:	30 s
Low pressure dose:	0,00062 mmol/g	Sample density:	1,000 g/cm ³
Automatic degas:	No		

Horvath-Kawazoe Report

Cylinder Pore Geometry (Saito-Foley)

Maximum pore volume: 0,000380 cm³/g
 at Relative Pressure: 0,006201703
 Median pore width: 9,116 Å
 Relative pressure range: 1e-09 to 0.18

Diameter of adsorptive molecule: 3,000 Å
 Adsorptive density: 6.710e+14 molecules/cm²
 Adsorptive dispersion constant: 7.777e-59
 Diameter of sample atom: 3,400 Å
 Sample Density: 3.845e+15 molecules/cm²
 Sample dispersion constant: 6.036e-59

Density conversion factor: 0,0015468

Absolute Pressure (kPa)	Relative Pressure (p/p°)	Quantity Adsorbed (mmol/g)	Pore Width (Å)	Cumulative Pore Volume (cm ³ /g)	Smoothed Differential Pore Volume (cm ³ /g·Å)
0.00142	0.000013955	0.00156	7.136	0.0001	0.0001
0.00570	0.000056106	0.00277	7.850	0.0001	0.0001
0.00945	0.000093030	0.00338	8.156	0.0001	0.0001
0.01434	0.000141197	0.00393	8.433	0.0001	0.0001
0.01791	0.000176600	0.00426	8.591	0.0001	0.0001
0.02283	0.000225367	0.00466	8.771	0.0002	0.0001
0.02630	0.000259936	0.00488	8.882	0.0002	0.0001
0.02908	0.000287510	0.00505	8.962	0.0002	0.0001
0.03249	0.000319209	0.00520	9.047	0.0002	0.0001
0.03658	0.000359867	0.00541	9.146	0.0002	0.0001
0.04249	0.000418517	0.00570	9.277	0.0002	0.0001
0.04905	0.000483301	0.00599	9.405	0.0002	0.0001
0.05626	0.000554587	0.00628	9.532	0.0002	0.0001
0.06336	0.000624758	0.00654	9.646	0.0002	0.0001
0.06949	0.000685264	0.00673	9.736	0.0002	0.0001
0.07478	0.000737759	0.00689	9.809	0.0002	0.0001
0.07917	0.000781432	0.00701	9.869	0.0002	0.0001
0.08355	0.000825075	0.00711	9.924	0.0002	0.0001
0.09218	0.000910811	0.00734	10.028	0.0003	0.0001
0.09903	0.000978816	0.00751	10.105	0.0003	0.0001
0.10314	0.001019699	0.00760	10.149	0.0003	0.0001
0.12641	0.001249802	0.00815	10.380	0.0003	0.0001
0.14636	0.001447074	0.00852	10.553	0.0003	0.0001
0.17967	0.001776799	0.00906	10.809	0.0003	0.0001

Sample: FULL- N2@77K- ADS/DES

Operator:

Submitter:

File: D:\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Szczecinie\Doktorat\BET\...\Bi_FULL.SMP

Started:	18.11.2022 14:39:39	Analysis adsorptive:	N2
Completed:	21.11.2022 18:42:54	Analysis bath temp.:	77,300 K
Report time:	22.11.2022 14:22:21	Thermal correction:	Yes
Sample mass:	0.8062 g	Ambient free space:	28,0000 cm ³ Entered
Analysis free space:	83,0000 cm ³	Equilibration interval:	30 s
Low pressure dose:	0,00062 mmol/g	Sample density:	1,000 g/cm ³
Automatic degas:	No		

Absolute Pressure (kPa)	Relative Pressure (p/p°)	Quantity Adsorbed (mmol/g)	Pore Width (Å)	Cumulative Pore Volume (cm ³ /g)	Smoothed Differential Pore Volume (cm ³ /g·Å)
0.20860	0.002062965	0.00944	11.005	0.0003	0.0001
0.23081	0.002282746	0.00968	11.143	0.0003	0.0001
0.25979	0.002569529	0.00994	11.310	0.0003	0.0001
0.27848	0.002754673	0.01008	11.410	0.0003	0.0000
0.31655	0.003131871	0.01032	11.603	0.0004	0.0000
0.34151	0.003378741	0.01044	11.721	0.0004	0.0000
0.36971	0.003658366	0.01056	11.847	0.0004	0.0000
0.38397	0.003799977	0.01061	11.908	0.0004	0.0000
0.39552	0.003914867	0.01064	11.958	0.0004	0.0000
0.42045	0.004162028	0.01072	12.060	0.0004	0.0000
0.46037	0.004557920	0.01081	12.214	0.0004	0.0000
0.48868	0.004838299	0.01086	12.320	0.0004	0.0000
0.51765	0.005125742	0.01090	12.424	0.0004	0.0000
0.54377	0.005384764	0.01093	12.514	0.0004	0.0000
0.58212	0.005765824	0.01096	12.642	0.0004	0.0000
0.59310	0.005874755	0.01096	12.677	0.0004	0.0000
0.62601	0.006201703	0.01097	12.781	0.0004	0.0000
0.63688	0.006310224	0.01097	12.814	0.0004	0.0000
0.66804	0.006620339	0.01097	12.910	0.0004	-0.0000
0.68104	0.006749299	0.01097	12.949	0.0004	-0.0000
0.71593	0.007095833	0.01096	13.050	0.0004	-0.0000
0.73268	0.007262877	0.01095	13.098	0.0004	-0.0000
0.76359	0.007569547	0.01094	13.184	0.0004	-0.0000
0.80072	0.007938662	0.01091	13.283	0.0004	-0.0000
0.84016	0.008330413	0.01088	13.390	0.0004	-0.0000
0.88030	0.008727257	0.01085	13.491	0.0004	-0.0000
0.91134	0.009036163	0.01081	13.570	0.0004	-0.0000
0.93799	0.009300785	0.01078	13.634	0.0004	-0.0000
0.96677	0.009586568	0.01074	13.703	0.0004	-0.0000
1.00897	0.010005982	0.01069	13.803	0.0004	-0.0000

Sample: FULL- N2@77K- ADS/DES

Operator:

Submitter:

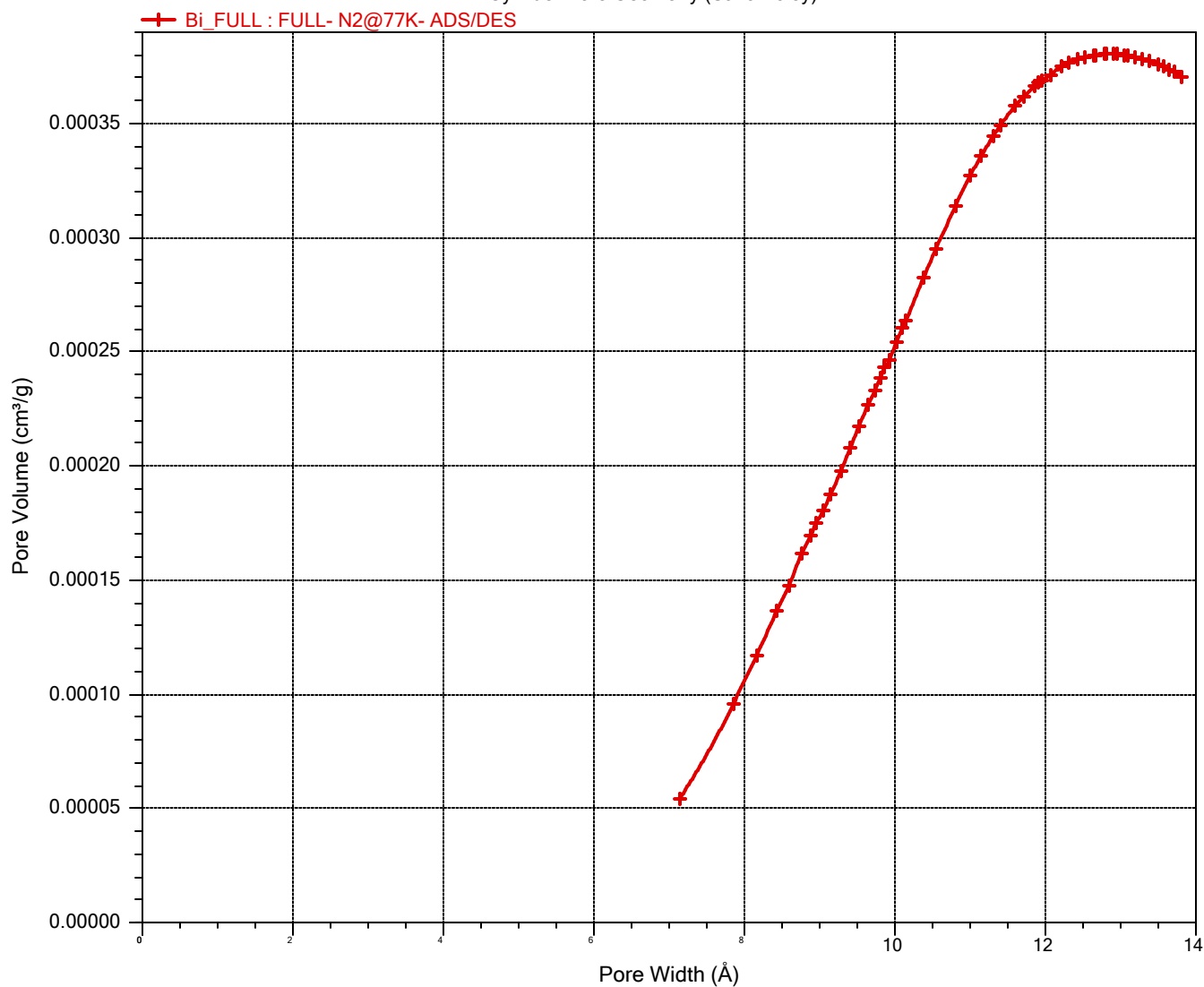
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Szczecinie\Doktorat\BET\...\Bi_FULL.SMP

Started: 18.11.2022 14:39:39
Completed: 21.11.2022 18:42:54
Report time: 22.11.2022 14:22:21
Sample mass: 0,8062 g
Analysis free space: 83,0000 cm³
Low pressure dose: 0,00062 mmol/g
Automatic degas: No

Analysis adsorptive: N2
Analysis bath temp.: 77,300 K
Thermal correction: Yes
Ambient free space: 28,0000 cm³ Entered
Equilibration interval: 30 s
Sample density: 1,000 g/cm³

Horvath-Kawazoe Cumulative Pore Volume Plot

Cylinder Pore Geometry (Saito-Foley)



Sample: FULL- N2@77K- ADS/DES

Operator:

Submitter:

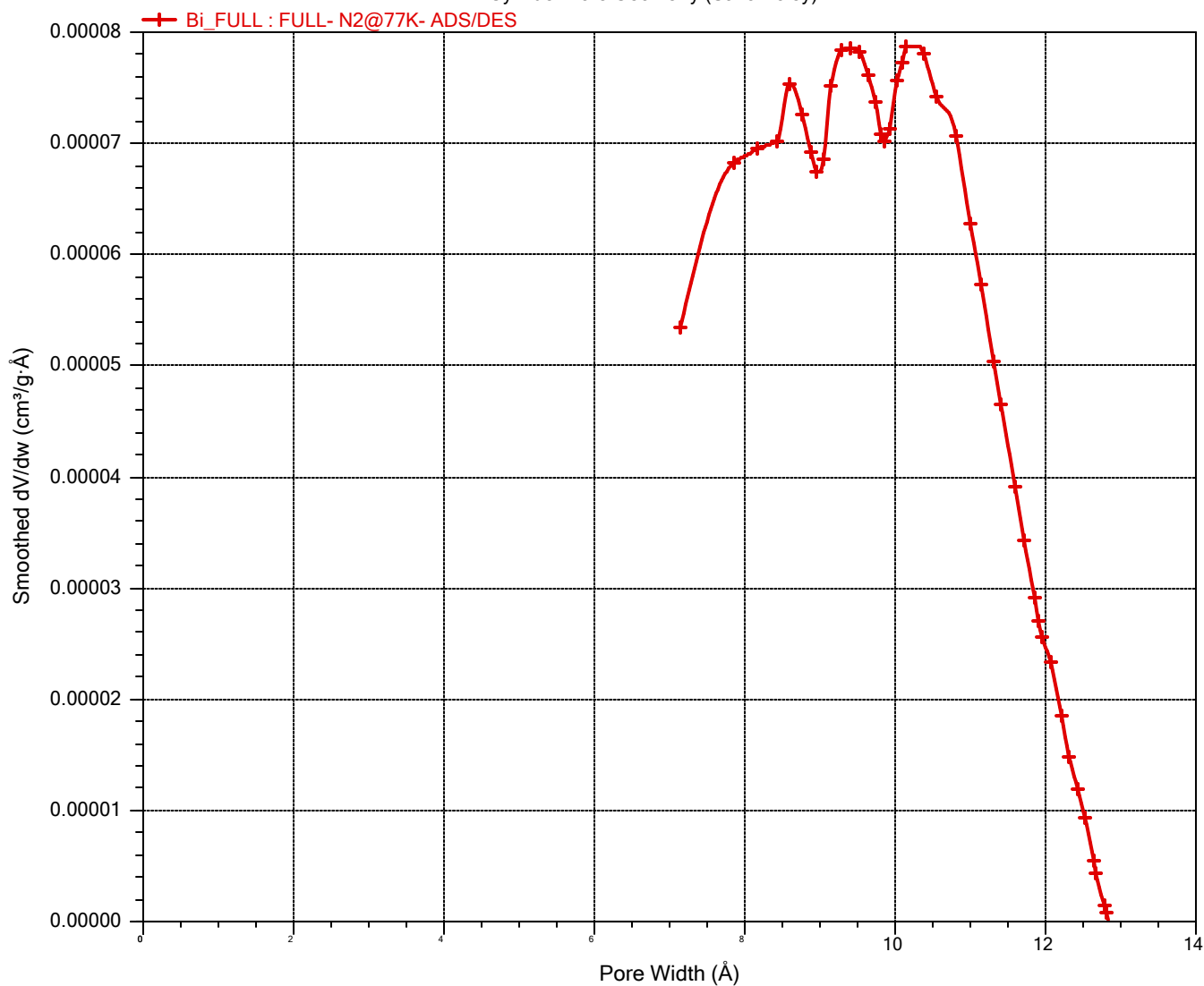
File: D:\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
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Started: 18.11.2022 14:39:39
Completed: 21.11.2022 18:42:54
Report time: 22.11.2022 14:22:21
Sample mass: 0,8062 g
Analysis free space: 83,0000 cm³
Low pressure dose: 0,00062 mmol/g
Automatic degas: No

Analysis adsorptive: N2
Analysis bath temp.: 77,300 K
Thermal correction: Yes
Ambient free space: 28,0000 cm³ Entered
Equilibration interval: 30 s
Sample density: 1,000 g/cm³

Horvath-Kawazoe Differential Pore Volume Plot

Cylinder Pore Geometry (Saito-Foley)



Sample: FULL- N2@77K- ADS/DES

Operator:

Submitter:

File: D:\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Szczecinie\Doktorat\BET\...\Bi_FULL.SMP

Started:	18.11.2022 14:39:39	Analysis adsorptive:	N2
Completed:	21.11.2022 18:42:54	Analysis bath temp.:	77,300 K
Report time:	22.11.2022 14:22:21	Thermal correction:	Yes
Sample mass:	0,8062 g	Ambient free space:	28,0000 cm ³ Entered
Analysis free space:	83,0000 cm ³	Equilibration interval:	30 s
Low pressure dose:	0,00062 mmol/g	Sample density:	1,000 g/cm ³
Automatic degas:	No		

Porosity Distribution by
Model: N2 - Cylindrical Pores - Oxide Surface
Method: Non-negative Regularization: 0,01000
Standard Deviation of Fit: 0,000318 mmol/g

Volume in Pores	<	9,51 Å	0,00000 cm ³ /g
Total Volume in Pores	<=	17,02 Å	0,00042 cm ³ /g
Area in Pores	>	17,02 Å	0,000 m ² /g
Total Area in Pores	>=	9,51 Å	1,342 m ² /g

Pore Table				
Pore Width (Å)	Cumulative Pore Volume (cm ³ /g)	Incremental Pore Volume (cm ³ /g)	Cumulative Pore Area (m ² /g)	Incremental Pore Area (m ² /g)
9.51	0.00000	0.00000	0.000	0.000
9.87	0.00000	0.00000	0.000	0.000
10.22	0.00000	0.00000	0.000	0.000
10.58	0.00000	0.00000	0.000	0.000
10.94	0.00000	0.00000	0.000	0.000
11.30	0.00000	0.00000	0.000	0.000
11.65	0.00000	0.00000	0.000	0.000
12.01	0.00001	0.00001	0.043	0.043
12.37	0.00022	0.00021	0.728	0.685
12.73	0.00042	0.00020	1.342	0.615
13.08	0.00042	0.00000	1.342	0.000
13.44	0.00042	0.00000	1.342	0.000
13.80	0.00042	0.00000	1.342	0.000
14.16	0.00042	0.00000	1.342	0.000
14.51	0.00042	0.00000	1.342	0.000
14.87	0.00042	0.00000	1.342	0.000
15.23	0.00042	0.00000	1.342	0.000
15.59	0.00042	0.00000	1.342	0.000
15.94	0.00042	0.00000	1.342	0.000
16.30	0.00042	0.00000	1.342	0.000
16.66	0.00042	0.00000	1.342	0.000
17.02	0.00042	0.00000	1.342	0.000

Sample: FULL- N2@77K- ADS/DES

Operator:

Submitter:

File: D:\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Szczecinie\Doktorat\BET\...\Bi_FULL.SMP

Started:	18.11.2022 14:39:39	Analysis adsorptive:	N2
Completed:	21.11.2022 18:42:54	Analysis bath temp.:	77,300 K
Report time:	22.11.2022 14:22:21	Thermal correction:	Yes
Sample mass:	0,8062 g	Ambient free space:	28,0000 cm ³ Entered
Analysis free space:	83,0000 cm ³	Equilibration interval:	30 s
Low pressure dose:	0,00062 mmol/g	Sample density:	1,000 g/cm ³
Automatic degas:	No		

Porosity Distribution by
Model: N2 - Cylindrical Pores - Oxide Surface
Method: Non-negative Regularization: 0,01000
Standard Deviation of Fit: 0,000318 mmol/g

Isotherm Table				
Relative Pressure (p/p°)	Experimental Quantity Adsorbed (mmol/g)	Fitted Quantity Adsorbed (mmol/g)	Absolute Residual (mmol/g)	Relative Residual
0.000015849	0.00163	0.00203	-0.00040	-0.245436
0.000019953	0.00177	0.00223	-0.00046	-0.258904
0.000025119	0.00194	0.00243	-0.00049	-0.254481
0.000031623	0.00214	0.00264	-0.00050	-0.234363
0.000039811	0.00238	0.00286	-0.00049	-0.204107
0.000050119	0.00264	0.00309	-0.00045	-0.171552
0.000063096	0.00291	0.00333	-0.00042	-0.145778
0.000079433	0.00319	0.00358	-0.00039	-0.120769
0.000100000	0.00347	0.00383	-0.00037	-0.105421
0.000125892	0.00377	0.00410	-0.00032	-0.086131
0.000158490	0.00410	0.00437	-0.00027	-0.066103
0.000199526	0.00446	0.00466	-0.00020	-0.044618
0.000251188	0.00483	0.00497	-0.00014	-0.028512
0.000316228	0.00519	0.00531	-0.00012	-0.023027
0.000398107	0.00560	0.00577	-0.00016	-0.029182
0.000501187	0.00607	0.00616	-0.00009	-0.014798
0.000630958	0.00656	0.00655	0.00001	0.001673
0.000794328	0.00704	0.00700	0.00004	0.005133
0.001000000	0.00756	0.00757	-0.00001	-0.001334
0.001258925	0.00817	0.00832	-0.00015	-0.018887
0.001584895	0.00876	0.00885	-0.00010	-0.011284
0.001995263	0.00936	0.00944	-0.00008	-0.008755
0.002511882	0.00989	0.00977	0.00012	0.011862
0.003162276	0.01034	0.01002	0.00032	0.030914
0.003981066	0.01066	0.01021	0.00045	0.042103
0.005011868	0.01089	0.01038	0.00050	0.046305
0.006309579	0.01097	0.01053	0.00044	0.039756
0.007943276	0.01091	0.01067	0.00025	0.022514
0.010000000	0.01069	0.01079	-0.00010	-0.009413

Sample: FULL- N2@77K- ADS/DES

Operator:

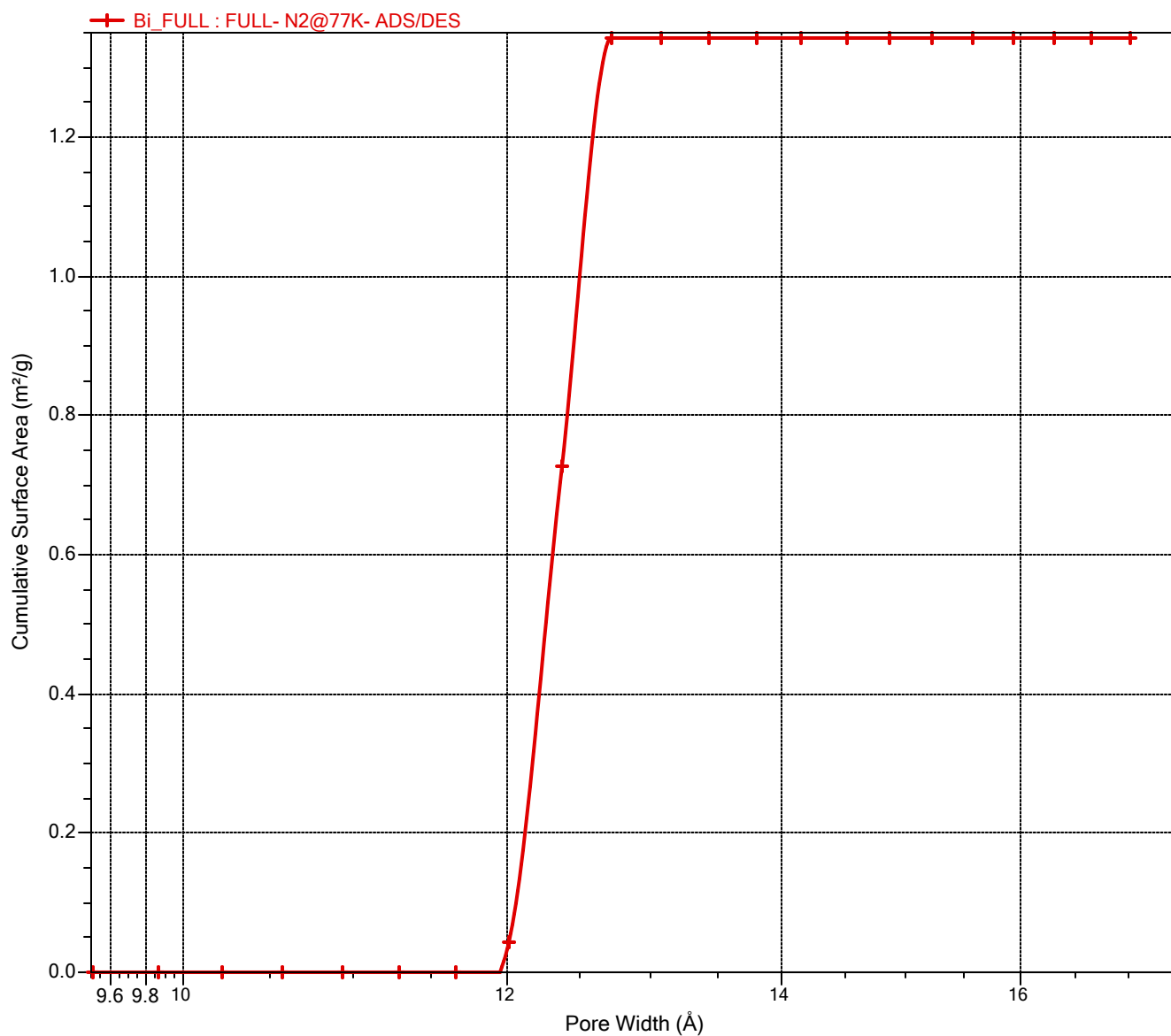
Submitter:

File: D:\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Szczecinie\Doktorat\BET\...\Bi_FULL.SMP

Started: 18.11.2022 14:39:39
Completed: 21.11.2022 18:42:54
Report time: 22.11.2022 14:22:21
Sample mass: 0,8062 g
Analysis free space: 83,0000 cm³
Low pressure dose: 0,00062 mmol/g
Automatic degas: No

Analysis adsorptive: N2
Analysis bath temp.: 77,300 K
Thermal correction: Yes
Ambient free space: 28,0000 cm³ Entered
Equilibration interval: 30 s
Sample density: 1,000 g/cm³

Cumulative Surface Area vs. Pore Width



Sample: FULL- N2@77K- ADS/DES

Operator:

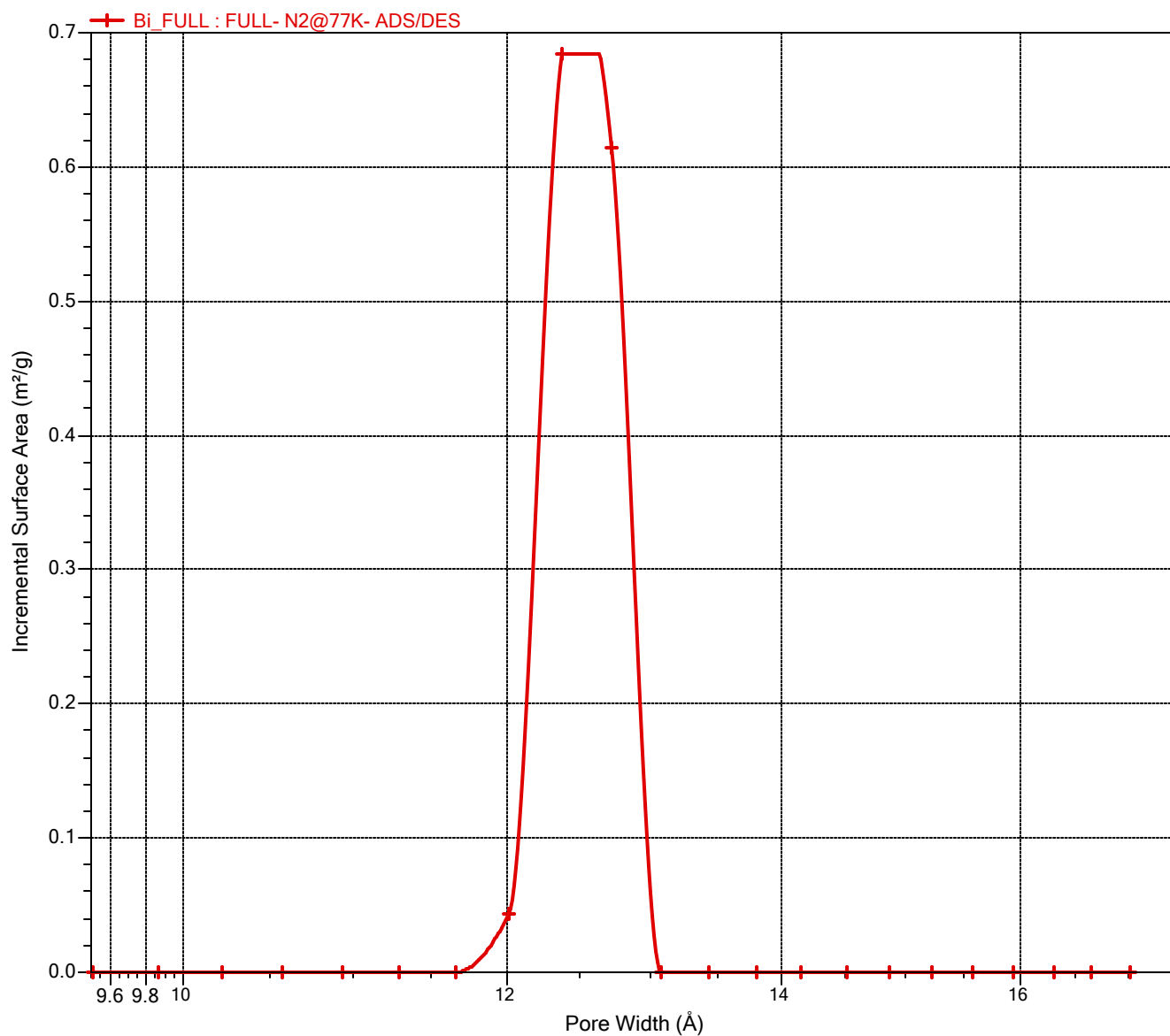
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Analysis bath temp.: 77,300 K
Thermal correction: Yes
Ambient free space: 28,0000 cm³ Entered
Equilibration interval: 30 s
Sample density: 1,000 g/cm³

Incremental Surface Area vs. Pore Width



Sample: FULL- N2@77K- ADS/DES

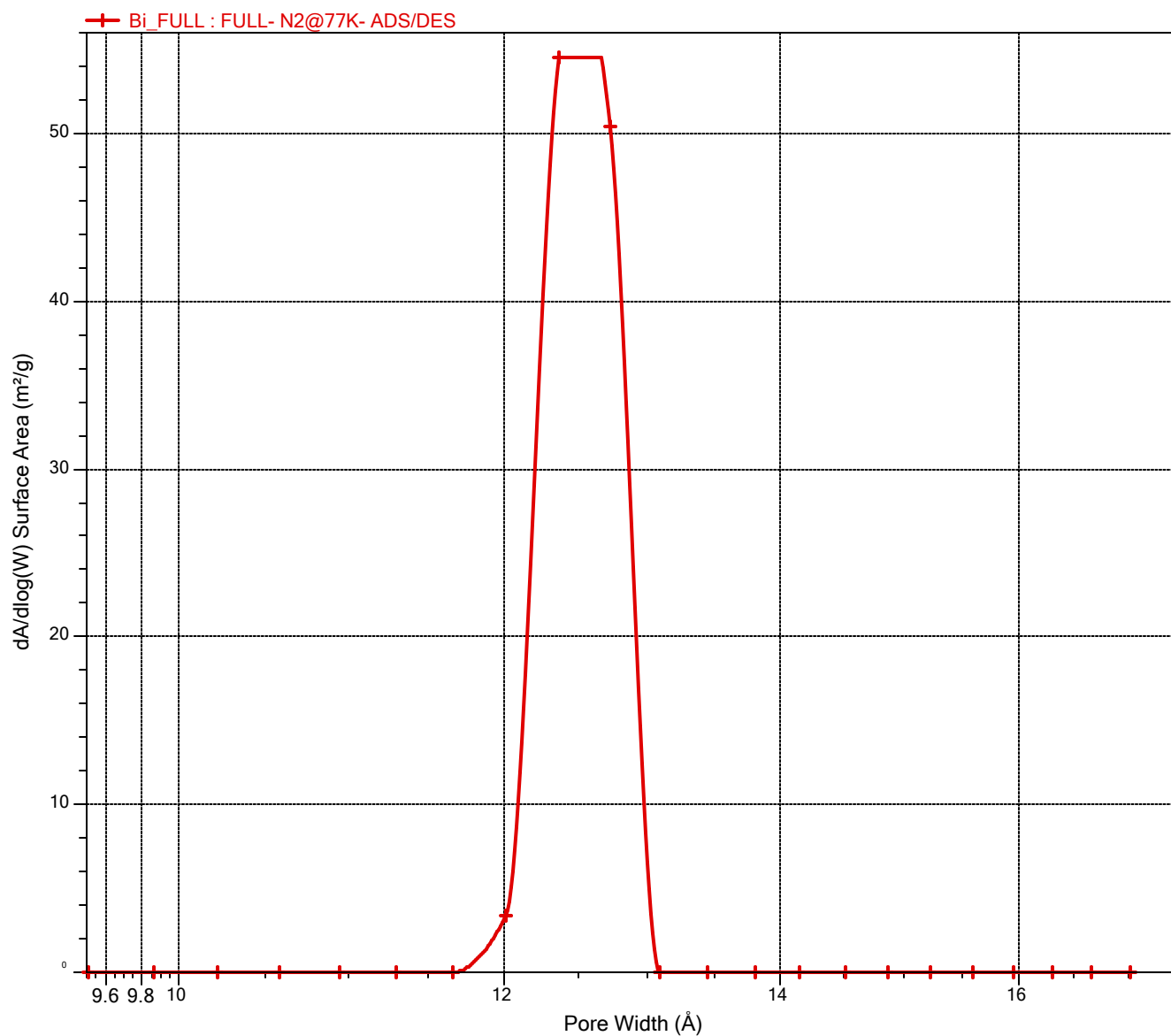
Operator:

Submitter:

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Completed:	21.11.2022 18:42:54	Analysis bath temp.:	77,300 K
Report time:	22.11.2022 14:22:21	Thermal correction:	Yes
Sample mass:	0,8062 g	Ambient free space:	28,0000 cm ³ Entered
Analysis free space:	83,0000 cm ³	Equilibration interval:	30 s
Low pressure dose:	0,00062 mmol/g	Sample density:	1,000 g/cm ³
Automatic degas:	No		

dA/dlog(W) Surface Area vs. Pore Width



Sample: FULL- N2@77K- ADS/DES

Operator:

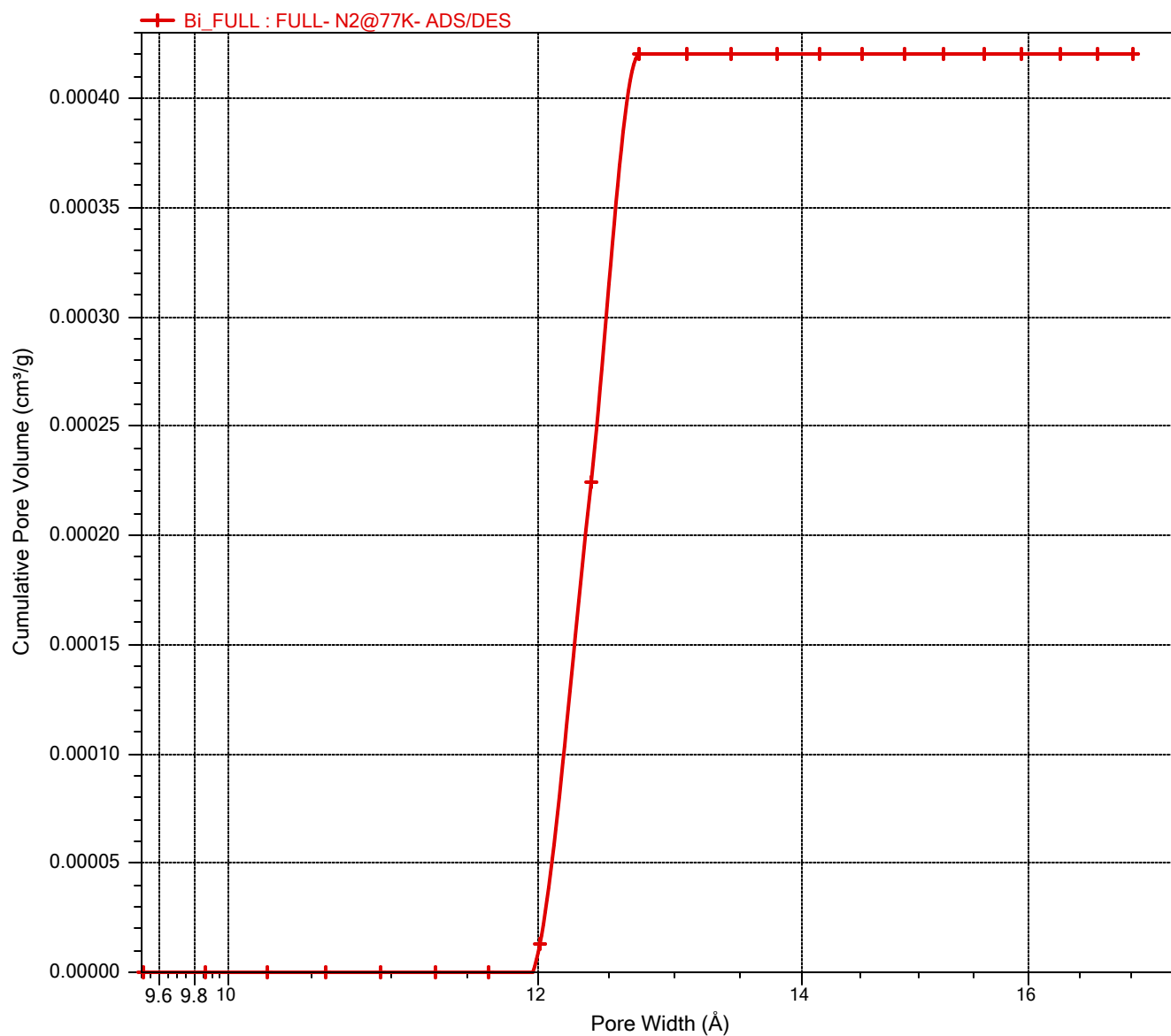
Submitter:

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Automatic degas: No

Analysis adsorptive: N2
Analysis bath temp.: 77,300 K
Thermal correction: Yes
Ambient free space: 28,0000 cm³ Entered
Equilibration interval: 30 s
Sample density: 1,000 g/cm³

Cumulative Pore Volume vs. Pore Width



Sample: FULL- N2@77K- ADS/DES

Operator:

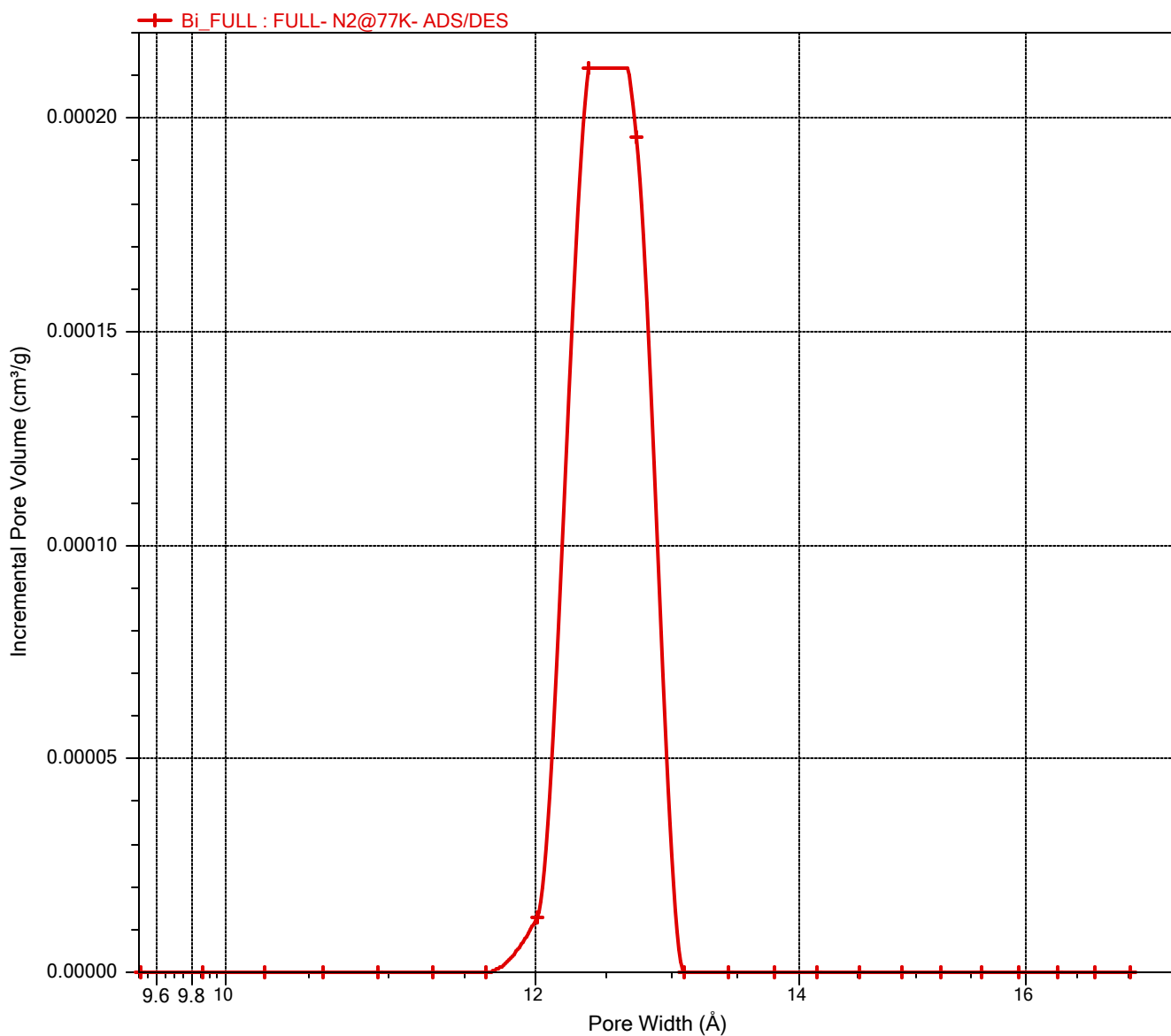
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Analysis bath temp.: 77,300 K
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Ambient free space: 28,0000 cm³ Entered
Equilibration interval: 30 s
Sample density: 1,000 g/cm³

Incremental Pore Volume vs. Pore Width



Sample: FULL- N2@77K- ADS/DES

Operator:

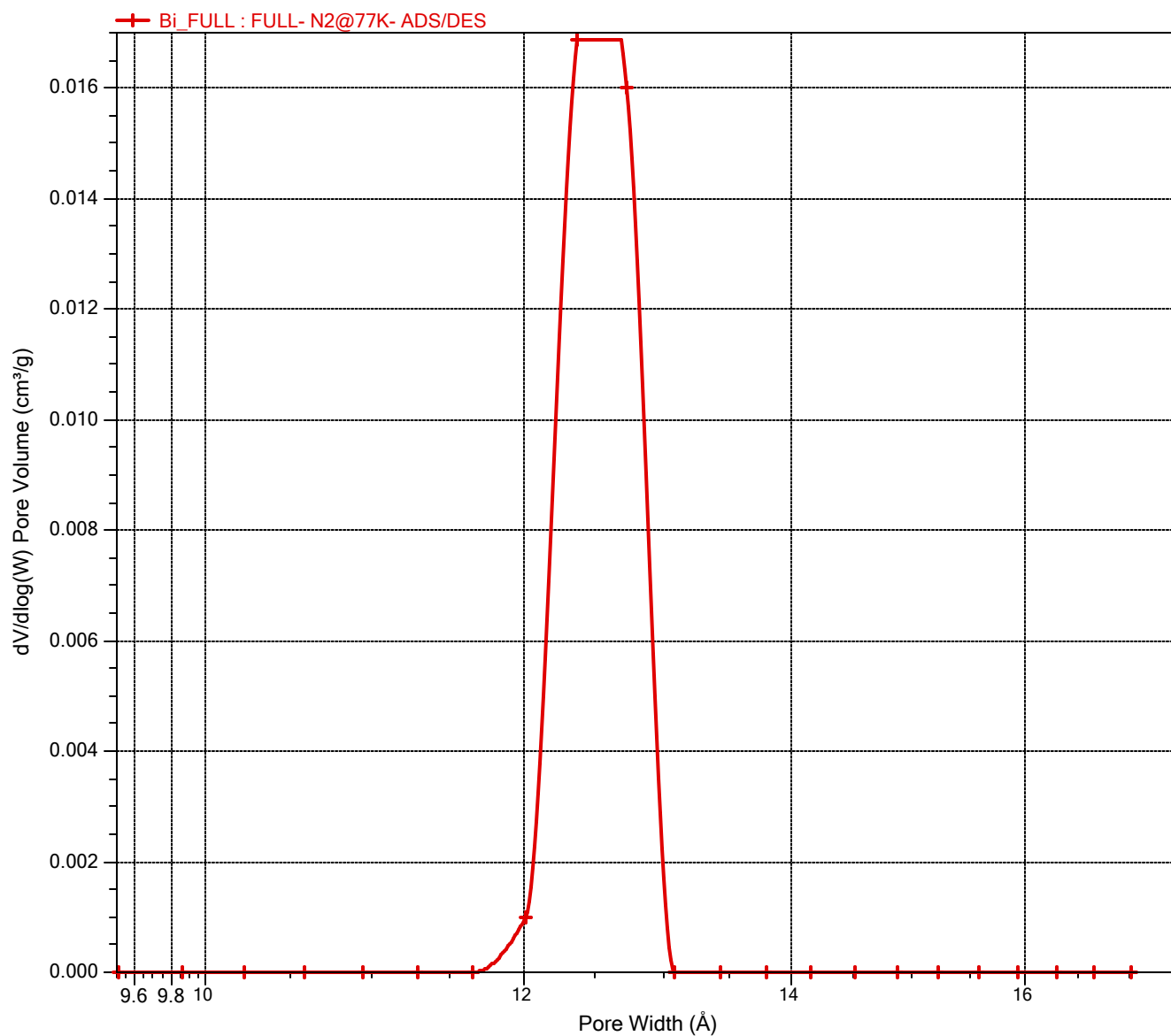
Submitter:

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Analysis bath temp.: 77,300 K
Thermal correction: Yes
Ambient free space: 28,0000 cm³ Entered
Equilibration interval: 30 s
Sample density: 1,000 g/cm³

dV/dlog(W) Pore Volume vs. Pore Width



Sample: FULL- N2@77K- ADS/DES

Operator:

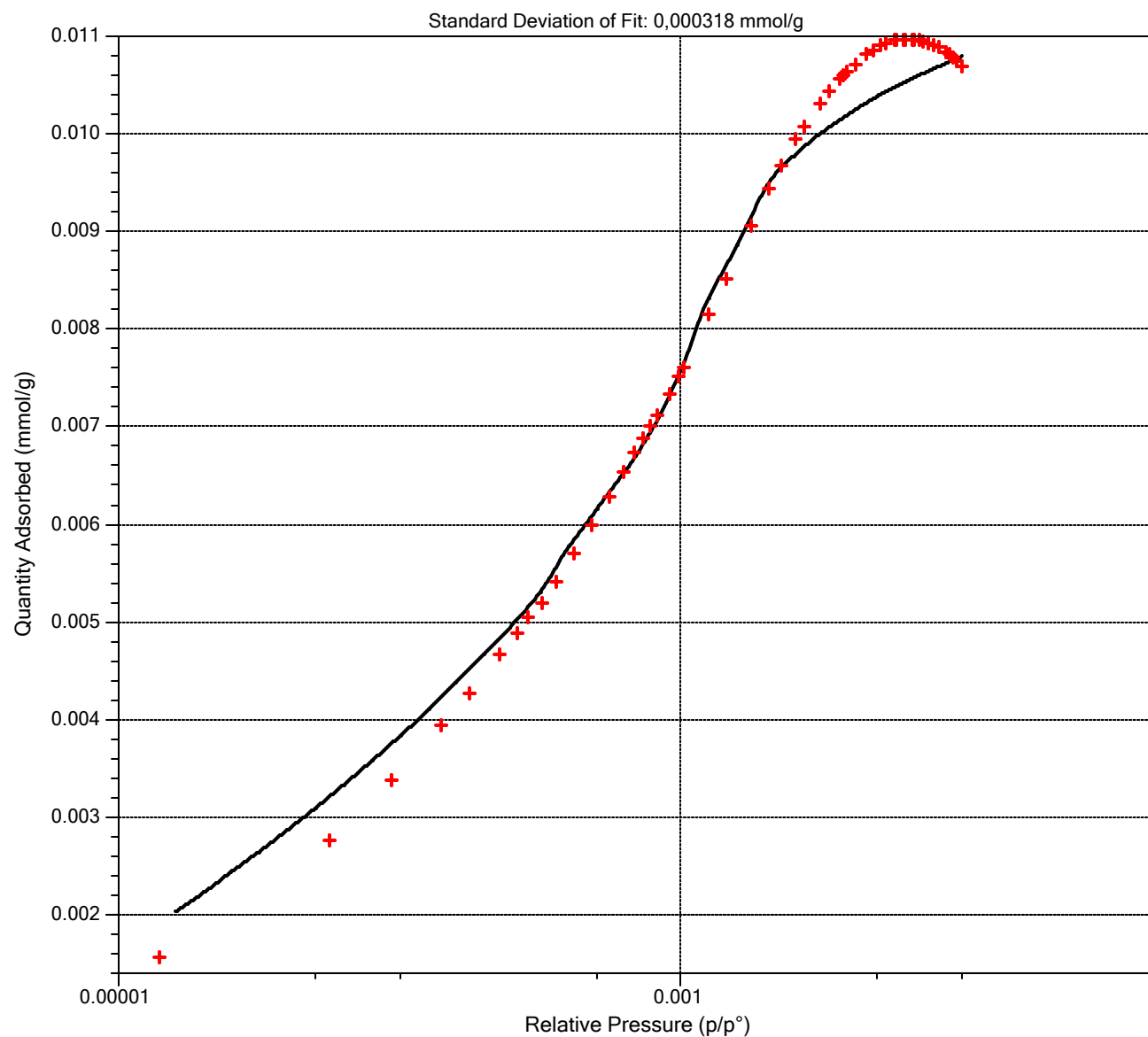
Submitter:

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Sample density: 1,000 g/cm³

Goodness of Fit



Sample: FULL- N2@77K- ADS/DES

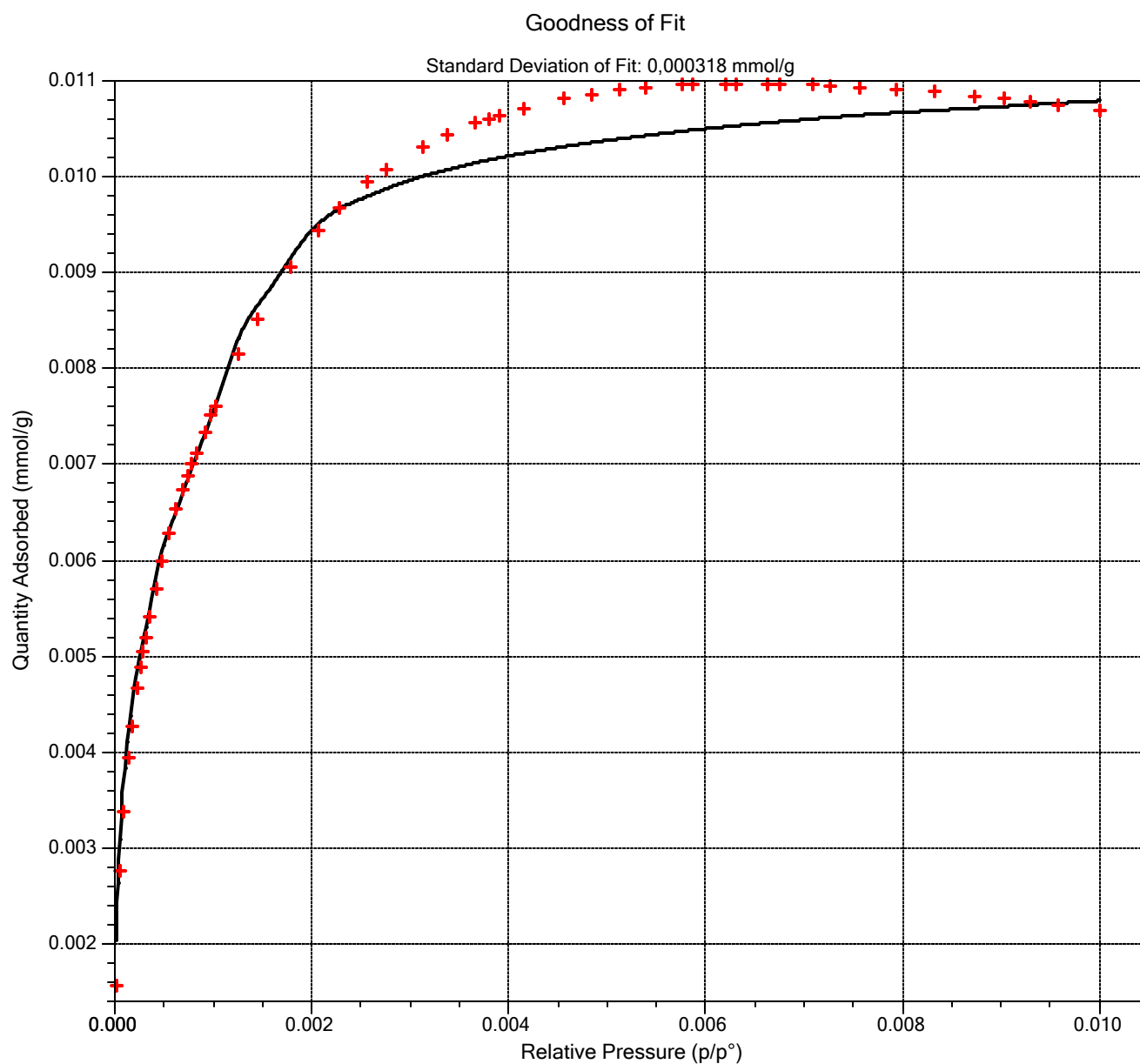
Operator:

Submitter:

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Ambient free space: 28,0000 cm³ Entered
Equilibration interval: 30 s
Sample density: 1,000 g/cm³



Sample: FULL- N2@77K- ADS/DES

Operator:

Submitter:

File: D:\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Szczecinie\Doktorat\BET\...\Bi_FULL.SMP

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Low pressure dose:	0,00062 mmol/g	Sample density:	1,000 g/cm ³
Automatic degas:	No		

Sample Information

Method: FULL- N2@77K- ADS/DES
 Sample: FULL- N2@77K- ADS/DES
 Operator:
 Submitter:
 Mass type: Entered
 Sample mass: 0,8062 g
 Density: 1,000 g/cm³
 Type of data: Automatically collected
 Instrument type: 2460
 Original instrument type: 2460
 Comments:

Sample Tube

Sample tube: W1
 Ambient free space: 1,0000 cm³
 Analysis free space: 1,0000 cm³
 Non-ideality factor: 0,0000620
 Use isothermal jacket: Yes
 Use filler rod: No
 Vacuum seal type: None

Degas Conditions

Degas conditions: FULL- N2@77K- ADS/DES

Smart VacPrep evacuation
 Backfill sample tube: Automatic
 Evacuation rate: 0,27 kPa/s
 Unrest. evacuation from: 0,27 kPa
 Vacuum level: 7e-02 kPa
 Evacuation time: 60 min
 Temperature ramp rate: 10,0 K/min
 Target temperature: 363 K
 Hold pressure: 13,3 kPa

Heating Phase

Sample prep: Stage	Temperature (K)	Ramp Rate (K/min)	Time (min)
1	523	10,0	720

Analysis Conditions

Sample: FULL- N2@77K- ADS/DES

Operator:

Submitter:

File: D:\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Szczecinie\Doktorat\BET\...\Bi_FULL.SMP

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Analysis free space:	83,0000 cm ³	Equilibration interval:	30 s
Low pressure dose:	0,00062 mmol/g	Sample density:	1,000 g/cm ³
Automatic degas:	No		

Analysis conditions: FULL- N2@77K- ADS/DES
 Isotherm collection: Target Pressure
 Absolute pressure dosing: No

Pressure Table		
Starting Pressure (p/p°)	Pressure Increment (p/p°)	Ending Pressure (p/p°)
0,000000000		0,010000000
0,010000000	0,050000000	0,995000000
0,995000000	0,100000000	0,150000000

Preparation

Fast evacuation: No
 Evacuation rate: 0,27 kPa/s
 Unrestricted evacuation from: 0,27 kPa
 Vacuum setpoint: 1,3 Pa
 Evacuation time: 4,00 h

Leak test: No
 Use TranSeal: No

Free Space

Entered

Ambient free space: 28,0000 cm³
 Analysis free space: 83,0000 cm³

p° and Temperature

p° type: Measured in Psat tube for each point
 Temperature type: Entered
 Temperature: 77,300 K

Dosing

Use first pressure fixed dose: No
 Use maximum volume increment: No
 Target tolerance: 5.0% or 0,6666 kPa
 Low pressure dosing: Yes
 Dose amount: 0,00062 mmol/g
 Minimum equilibration delay: 0,50 h
 Maximum equilibration delay: 2,00 h
 Maximum number of decants: 6

Sample: FULL- N2@77K- ADS/DES

Operator:

Submitter:

File: D:\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Szczecinie\Doktorat\BET\...\Bi_FULL.SMP

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Analysis free space:	83,0000 cm ³	Equilibration interval:	30 s
Low pressure dose:	0,00062 mmol/g	Sample density:	1,000 g/cm ³
Automatic degas:	No		

	Equilibration Relative Pressure (p/p°)	Equilibration Interval (s)
1	1,000000000	30

Minimum equilibration delay at p/p° >= 0.995: 600 s

Sample Backfill

Backfill at start of analysis: Yes

Backfill at end of analysis: Yes

Backfill gas: N2

Adsorptive Properties

Adsorptive:	Nitrogen @ 77.35 K (N2)
Non-condensing adsorptive:	No
Maximum manifold pressure:	123,323 kPa
Therm. tran. hard-sphere diameter:	3,8600 Å
Molecular cross-sectional area:	0,162 nm ²
Adsorbate molecular weight:	28,01
Thermal conductivity:	1,00
Non-ideality factor:	0,0000620
Density conversion factor:	0,0015468
Dosing method:	Normal

Psat vs. Temperature Table

	Saturation Pressure (kPa)	Temperature (K)
1	80,0192	75,40
2	84,5947	75,85
3	89,9104	76,35
4	96,0481	76,90
5	98,9411	77,15
6	101,3028	77,35
7	103,7071	77,55
8	107,3945	77,85
9	113,7597	78,35
10	120,4064	78,85

Report Options

Inside diameter of sample tube: 9,53 mm

Sample: FULL- N2@77K- ADS/DES

Operator:

Submitter:

File: D:\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Szczecinie\Doktorat\BET\...\Bi_FULL.SMP

Started:	18.11.2022 14:39:39	Analysis adsorptive:	N2
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Analysis free space:	83,0000 cm ³	Equilibration interval:	30 s
Low pressure dose:	0,00062 mmol/g	Sample density:	1,000 g/cm ³
Automatic degas:	No		

Sample Log

Date	Time	Log Message
18.11.2022	14:39:39	Starting a sample analysis for C:\ASAP 2460\data\2022\Kędzierski\Sikora\Bi_FULL.SMP on port 1.
18.11.2022	19:45:20	Low pressure data collection started
21.11.2022	11:17:39	Standard data collection started.
21.11.2022	18:19:28	Termination started.
21.11.2022	18:42:54	Finished a sample analysis for C:\ASAP 2460\data\2022\Kędzierski\Sikora\Bi_FULL.SMP on port 1.