

Sample: 4full

Operator:

Submitter:

File: C:\Users\barto\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Sz...HF_H2SO4_1_3 full.SMP

Started:	14.03.2023 14:41:36	Analysis adsorptive:	N2
Completed:	15.03.2023 02:52:01	Analysis bath temp.:	77,300 K
Report time:	19.10.2023 08:58:25	Thermal correction:	Yes
Sample mass:	0,2650 g	Ambient free space:	28,3430 cm ³ Entered
Analysis free space:	83,7525 cm ³	Equilibration interval:	30 s
Low pressure dose:	1,0000 cm ³ /g STP	Sample density:	1,000 g/cm ³
Automatic degas:	No		

Summary Report

Surface Area

BET Surface Area: 2,6490 m²/gt-Plot Micropore Area: 2,9039 m²/gt-Plot external surface area: -0,2549 m²/g

DFT Pore Size

Volume in Pores	<	1,308 nm	0,00031 cm ³ /g
Total Volume in Pores	<=	18,466 nm	0,00181 cm ³ /g
Area in Pores	>	18,466 nm	0,000 m ² /g
Total Area in Pores	>=	1,308 nm	1,477 m ² /g

Horvath-Kawazoe

Maximum pore volume at p/p° = 0,160160178: 0,001046 cm³/g

Median pore width: 1,0864 nm

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Automatic degas:	No		

Isotherm Tabular Report

Relative Pressure (p/p°)	Absolute Pressure (kPa)	Quantity Adsorbed (cm ³ /g STP)	Elapsed Time (h:min)	Saturation Pressure (kPa)
			04:58	100.1421946
0.001853194	0.1859097	0.3508	05:54	100.3185229
0.004392445	0.4409318	0.4162	06:23	100.3841262
0.007022509	0.7052868	0.4532	06:53	100.4323156
0.009659543	0.9705379	0.4787	07:17	100.4745159
0.011975334	1.2048822	0.4954	08:49	100.6136566
0.059994403	6.0368162	0.6269	08:54	100.6229901
0.110135098	11.0840408	0.6688	09:00	100.6404040
0.160160178	16.1186072	0.6764	09:05	100.6405424
0.210066330	21.1423295	0.6696	09:11	100.6459700
0.279676199	28.1540083	0.6517	09:16	100.6664436
0.329608880	33.1855130	0.6367	09:21	100.6814895
0.379589812	38.2203642	0.6221	09:27	100.6885934
0.429516666	43.2513156	0.6021	09:32	100.6976422
0.479477654	48.2857456	0.5865	09:37	100.7048926
0.529364903	53.3176694	0.5780	09:43	100.7200687
0.579393005	58.3543251	0.5823	09:48	100.7163093
0.629250580	63.3826318	0.6034	09:53	100.7271726
0.679165853	68.4206749	0.6362	09:59	100.7422186
0.729007206	73.4546940	0.7004	10:04	100.7599011
0.778972551	78.4889817	0.8322	10:10	100.7596244
0.809875398	81.6068005	0.9558	10:15	100.7646370
0.859489922	86.6166110	1.2687	10:20	100.7767617
0.909130742	91.6283664	1.8885	10:26	100.7867869
0.957451428	96.5027225	3.4853	10:32	100.7912462
0.988491857	99.6252692	7.4713	10:42	100.7851187
0.889572882	89.6636349	1.7612	10:48	100.7940291
0.777571149	78.3818941	0.8677	10:54	100.8035010
0.676195256	68.1701949	0.6036	10:59	100.8143644
0.575837072	58.0569780	0.4998	11:05	100.8218833
0.475585807	47.9591937	0.4474	11:10	100.8423569
0.375523221	37.8714182	0.4283	11:16	100.8497375
0.275250359	27.7615336	0.4473	11:21	100.8592093
0.175286384	17.6816880	0.4438	11:27	100.8731405
0.130309928	13.1455701	0.4365	11:32	100.8792679

Sample: 4full

Operator:

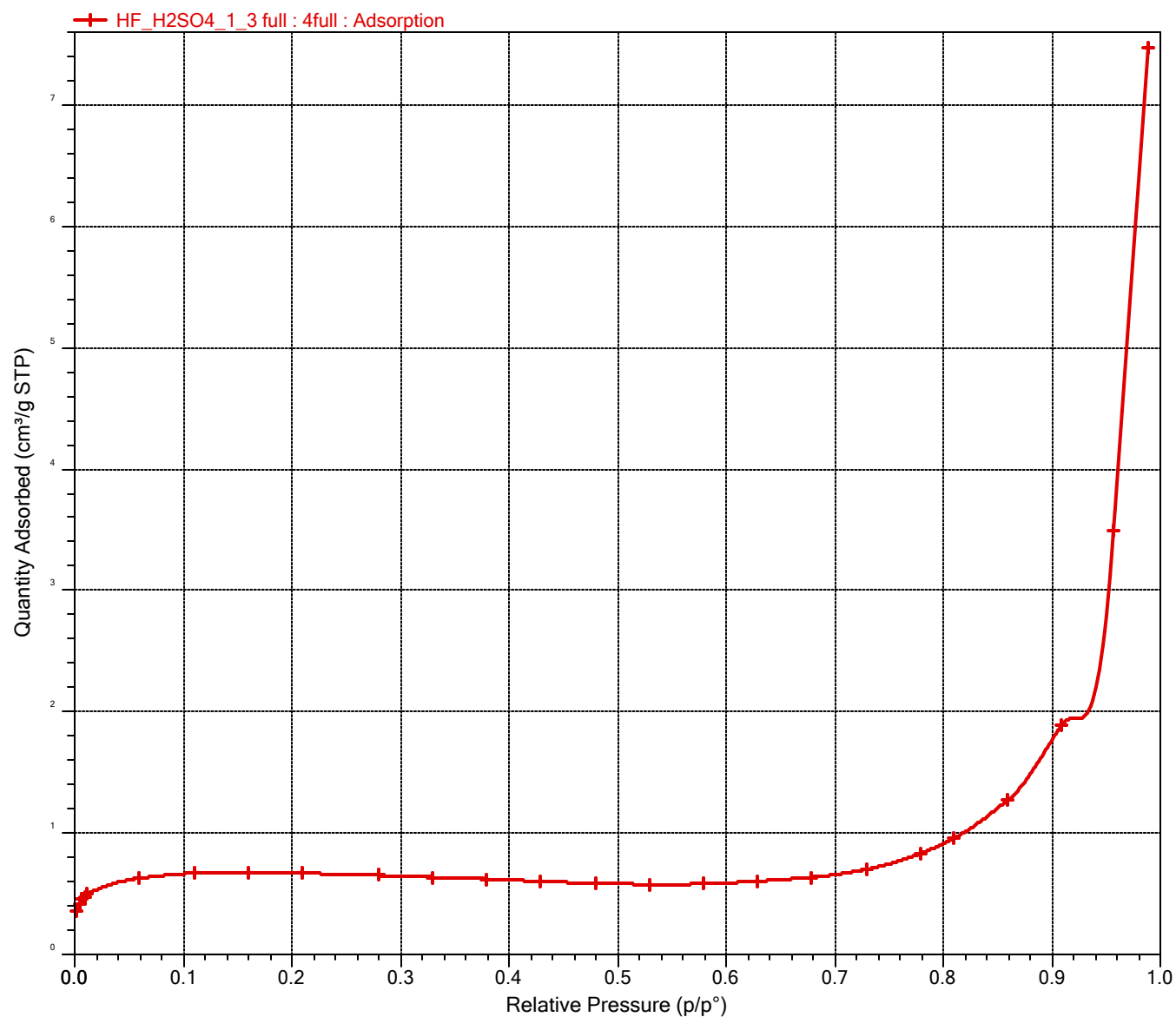
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Low pressure dose: 1,0000 cm³/g STP
Automatic degas: No

Analysis adsorptive: N2
Analysis bath temp.: 77,300 K
Thermal correction: Yes
Ambient free space: 28,3430 cm³ Entered
Equilibration interval: 30 s
Sample density: 1,000 g/cm³

Isotherm Linear Plot



Sample: 4full

Operator:

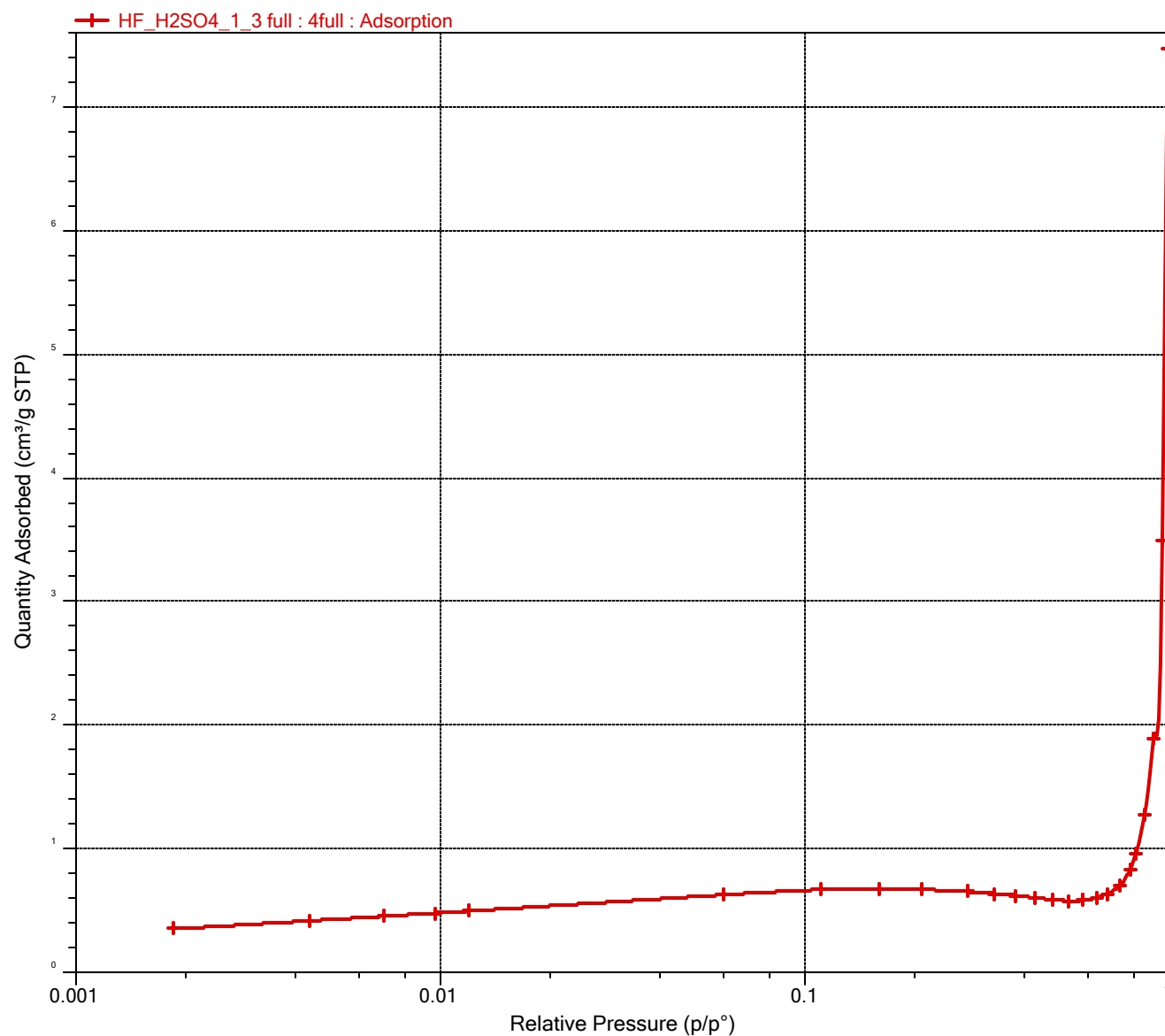
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Isotherm Log Plot



Sample: 4full

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Automatic degas:	No		

BET Report

BET surface area: 2,6490 ± 0,0343 m²/g
 Slope: 1,639333 ± 0,021267 g/cm³ STP
 Y-intercept: 0,003763 ± 0,000543 g/cm³ STP
 C: 436,646101
 Qm: 0,6086 cm³/g STP
 Correlation coefficient: 0,9996636
 Molecular cross-sectional area: 0,1620 nm²

Relative Pressure (p/p°)	Quantity Adsorbed (cm ³ /g STP)	1/[Q(p°/p - 1)]
0.001853194	0.3508	0.005293
0.004392445	0.4162	0.010601
0.007022509	0.4532	0.015604
0.009659543	0.4787	0.020375
0.011975334	0.4954	0.024464
0.059994403	0.6269	0.101810

Sample: 4full

Operator:

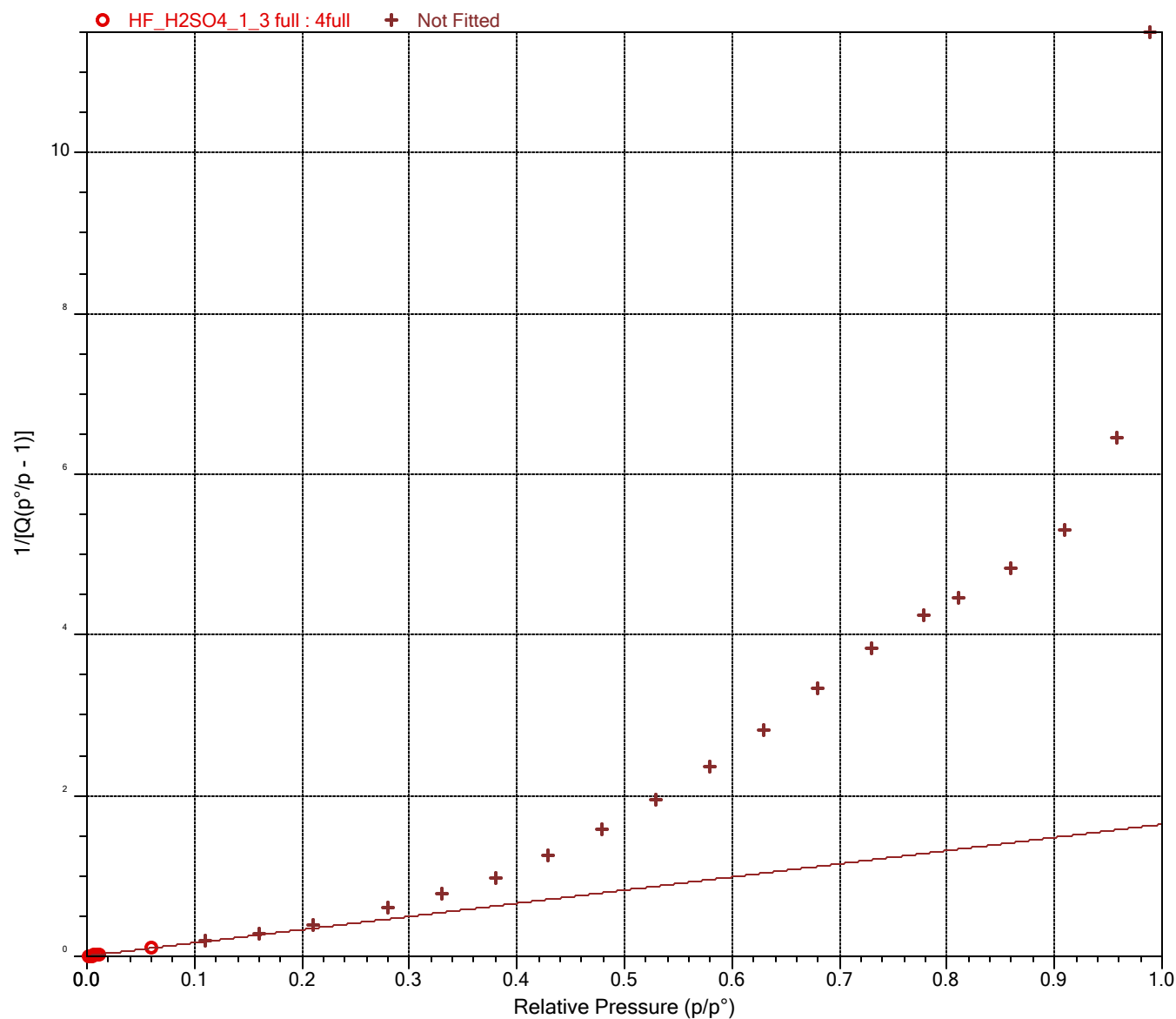
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Analysis adsorptive: N2
Analysis bath temp.: 77,300 K
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Equilibration interval: 30 s
Sample density: 1,000 g/cm³

BET Surface Area Plot



Sample: 4full

Operator:

Submitter:

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Low pressure dose:	1,0000 cm ³ /g STP	Sample density:	1,000 g/cm ³
Automatic degas:	No		

t-Plot Report

Micropore volume:	0,001139 cm ³ /g
Micropore area:	2,9039 m ² /g
External surface area:	-0,2549 m ² /g
Slope:	-0,164806 ± 0,096851 cm ³ /g-nm STP
Y-intercept:	0,736522 ± 0,041279 cm ³ /g STP
Correlation coefficient:	-0,769072
Surface area correction factor:	1,000
Density conversion factor:	0,0015468
Total surface area (BET):	2,6490 m ² /g
Thickness range:	0,35000 to 0,50000 nm
Thickness equation:	Carbon Black STSA

Thickness Curve

$$t = 2.98 + 6.45 (p/p^\circ) + 0.88 (p/p^\circ)^2$$

t-Plot Report - Data

Relative Pressure (p/p°)	Statistical Thickness (nm)	Quantity Adsorbed (cm ³ /g STP)	Fitted
0.059994403	0.33701	0.6269	
0.110135098	0.37010	0.6688	
0.160160178	0.40356	0.6764	
0.210066330	0.43738	0.6696	
0.279676199	0.48527	0.6517	
0.329608880	0.52016	0.6367	
0.379589812	0.55552	0.6221	
0.429516666	0.59127	0.6021	
0.479477654	0.62749	0.5865	
0.529364903	0.66410	0.5780	
0.579393005	0.70125	0.5823	
0.629250580	0.73871	0.6034	
0.679165853	0.77665	0.6362	

Sample: 4full

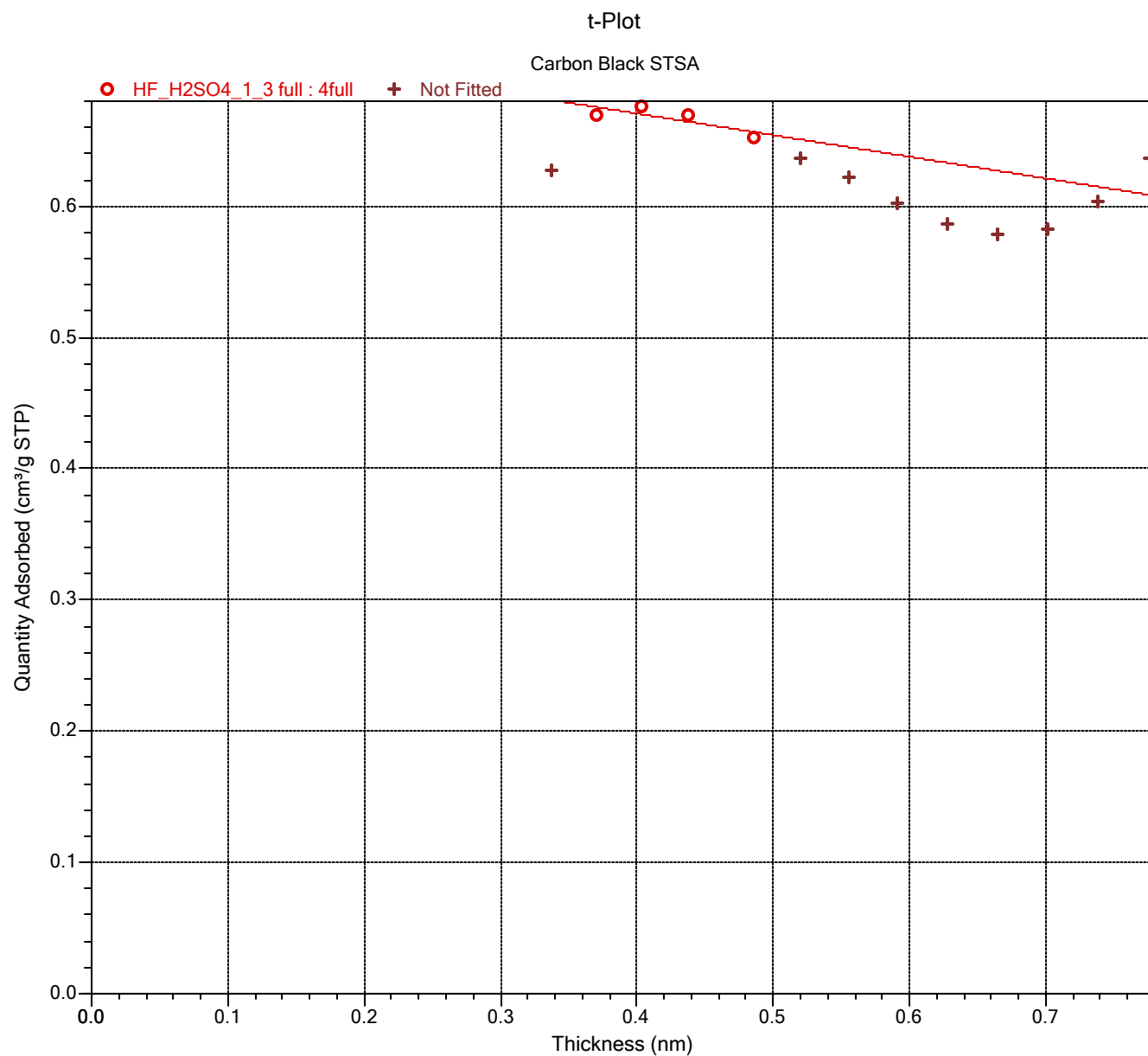
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Analysis adsorptive: N2
Analysis bath temp.: 77,300 K
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Equilibration interval: 30 s
Sample density: 1,000 g/cm³



Sample: 4full

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Low pressure dose:	1,0000 cm ³ /g STP	Sample density:	1,000 g/cm ³
Automatic degas:	No		

Horvath-Kawazoe Report

Cylinder Pore Geometry (Saito-Foley)

Maximum pore volume: 0,001046 cm³/g
 at Relative Pressure: 0,160160178
 Median pore width: 1,0864 nm
 Relative pressure range: 1e-09 to 0.18

Diameter of adsorptive molecule: 0,3000 nm
 Adsorptive density: 6.710e+14 molecules/cm²
 Adsorptive dispersion constant: 7.777e-59
 Diameter of sample atom: 0,3400 nm
 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 (cm ³ /g STP)	Pore Width (nm)	Cumulative Pore Volume (cm ³ /g)	Smoothed Differential Pore Volume (cm ³ /g·nm)
0.18591	0.001853194	0.35080	1.086	0.0005	0.0009
0.44093	0.004392445	0.41617	1.215	0.0006	0.0007
0.70529	0.007022509	0.45324	1.303	0.0007	0.0006
0.97054	0.009659543	0.47871	1.372	0.0007	0.0005
1.20488	0.011975334	0.49544	1.424	0.0008	0.0005
6.03682	0.059994403	0.62689	2.056	0.0010	0.0002
11.08404	0.110135098	0.66883	2.525	0.0010	0.0000
16.11861	0.160160178	0.67643	2.967	0.0010	0.0000

Sample: 4full

Operator:

Submitter:

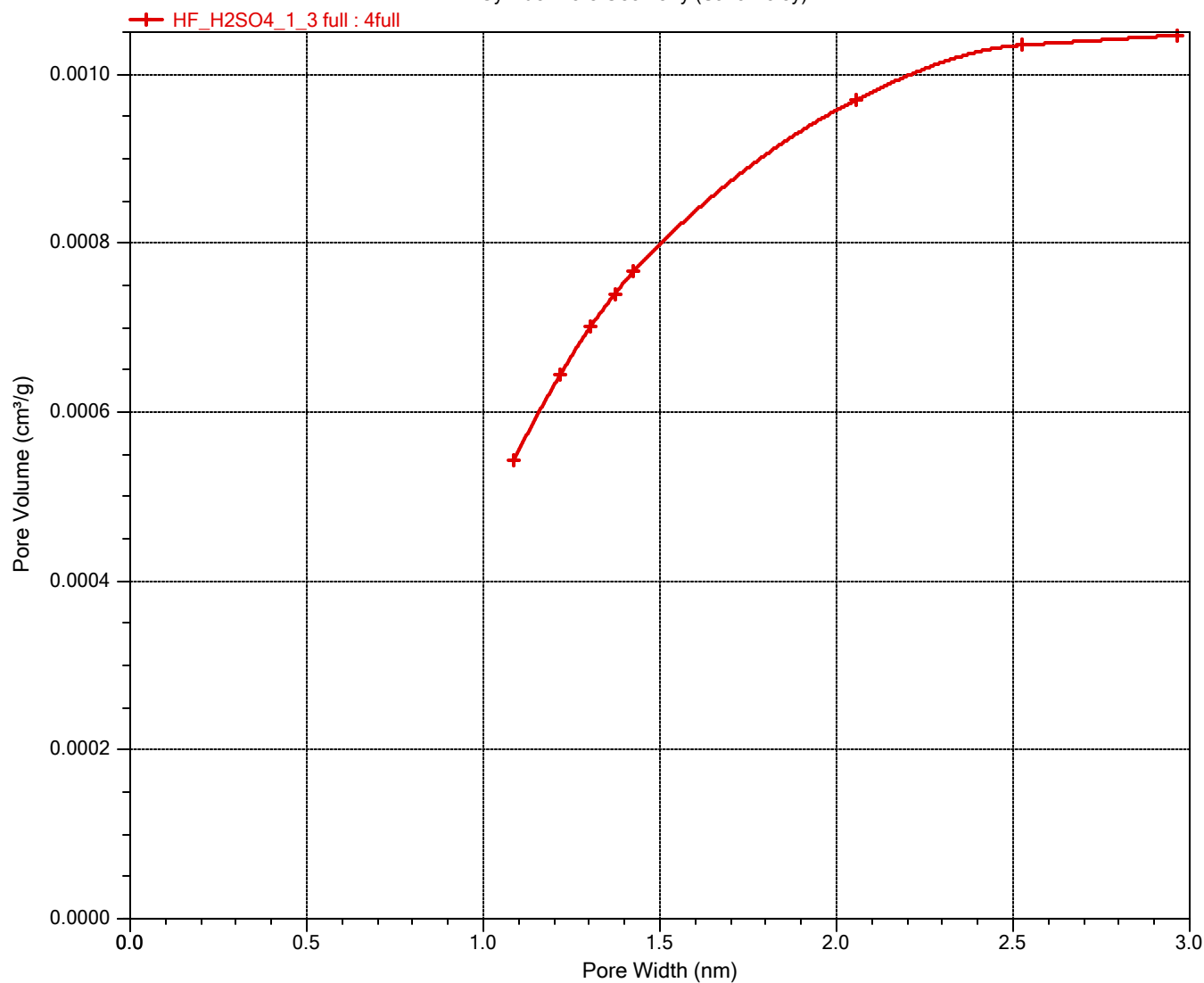
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Equilibration interval: 30 s
Sample density: 1,000 g/cm³

Horvath-Kawazoe Cumulative Pore Volume Plot

Cylinder Pore Geometry (Saito-Foley)



Sample: 4full

Operator:

Submitter:

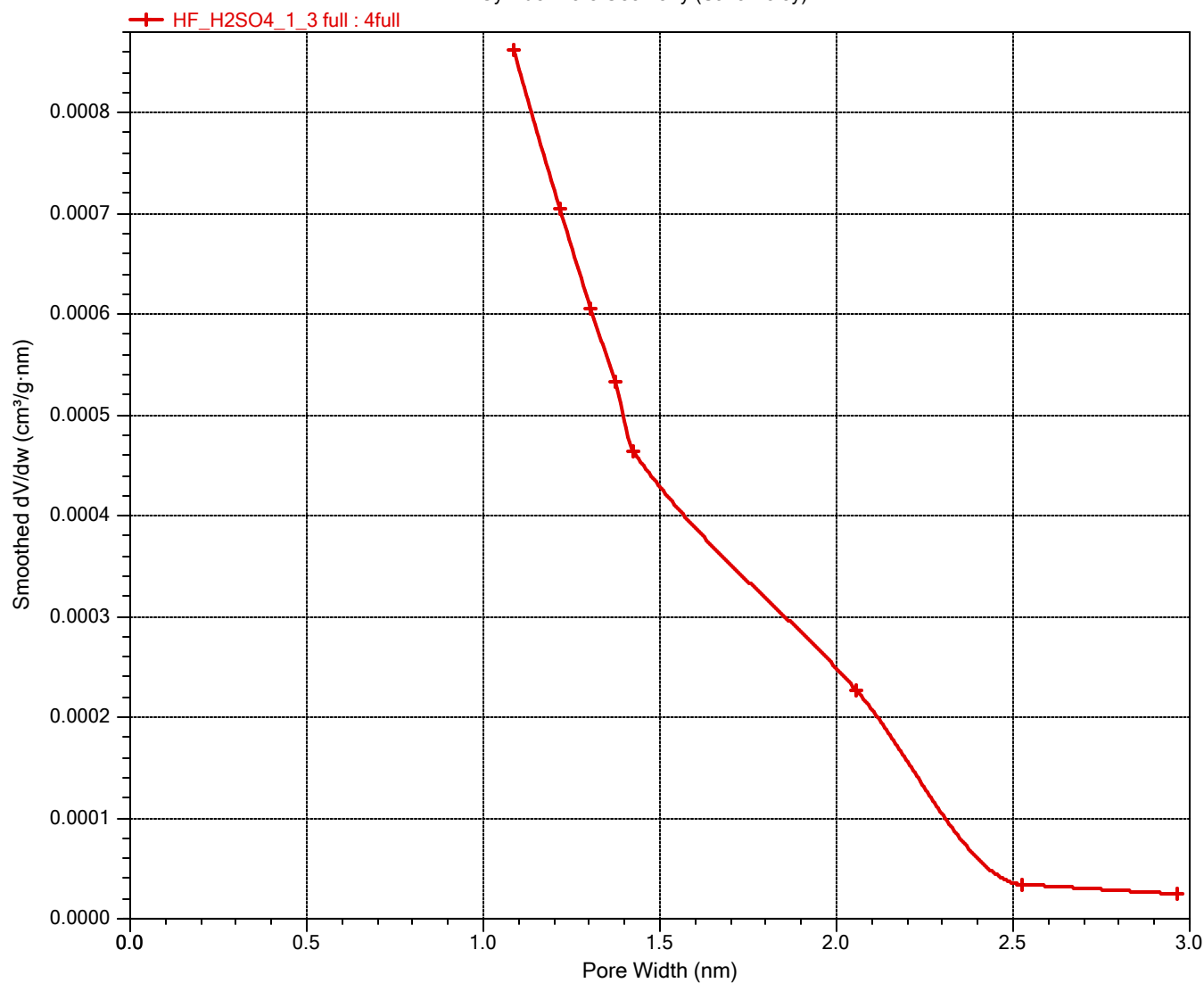
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Automatic degas: No

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Thermal correction: Yes
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Equilibration interval: 30 s
Sample density: 1,000 g/cm³

Horvath-Kawazoe Differential Pore Volume Plot

Cylinder Pore Geometry (Saito-Foley)



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Automatic degas:	No		

Porosity Distribution by
Model: N2 - Cylindrical Pores - Oxide Surface
Method: Non-negative Regularization: 0,01000
Standard Deviation of Fit: 0,05359 cm³/g STP

Volume in Pores	<	1,308 nm	0,00031 cm ³ /g
Total Volume in Pores	<=	18,466 nm	0,00181 cm ³ /g
Area in Pores	>	18,466 nm	0,000 m ² /g
Total Area in Pores	>=	1,308 nm	1,477 m ² /g

Pore Width (nm)	Cumulative Pore Volume (cm ³ /g)	Incremental Pore Volume (cm ³ /g)	Cumulative Pore Area (m ² /g)	Incremental Pore Area (m ² /g)
1.308	0.00031	0.00000	0.000	0.000
1.344	0.00031	0.00000	0.000	0.000
1.380	0.00031	0.00000	0.000	0.000
1.416	0.00031	0.00000	0.000	0.000
1.451	0.00031	0.00000	0.000	0.000
1.487	0.00045	0.00014	0.377	0.377
1.523	0.00066	0.00021	0.929	0.552
1.559	0.00075	0.00009	1.172	0.243
1.594	0.00075	0.00000	1.172	0.000
1.630	0.00075	0.00000	1.172	0.000
1.666	0.00075	0.00000	1.172	0.000
1.702	0.00075	0.00000	1.172	0.000
1.737	0.00075	0.00000	1.172	0.000
1.773	0.00075	0.00000	1.172	0.000
1.809	0.00075	0.00000	1.172	0.000
1.844	0.00075	0.00000	1.172	0.000
1.880	0.00075	0.00000	1.172	0.000
1.916	0.00075	0.00000	1.172	0.000
1.952	0.00075	0.00000	1.172	0.000
1.987	0.00075	0.00000	1.172	0.000
2.023	0.00075	0.00000	1.172	0.000
2.059	0.00075	0.00000	1.172	0.000
2.095	0.00075	0.00000	1.172	0.000
2.130	0.00075	0.00000	1.172	0.000
2.166	0.00075	0.00000	1.172	0.000
2.238	0.00075	0.00000	1.172	0.000
2.309	0.00075	0.00000	1.172	0.000
2.381	0.00075	0.00000	1.172	0.000
2.452	0.00075	0.00000	1.172	0.000
2.524	0.00075	0.00000	1.172	0.000
2.595	0.00075	0.00000	1.172	0.000

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Automatic degas:	No		

Pore Width (nm)	Cumulative Pore Volume (cm ³ /g)	Pore Table		
		Incremental Pore Volume (cm ³ /g)	Cumulative Pore Area (m ² /g)	Incremental Pore Area (m ² /g)
2.667	0.00075	0.00000	1.172	0.000
2.738	0.00075	0.00000	1.172	0.000
2.810	0.00075	0.00000	1.172	0.000
2.881	0.00075	0.00000	1.172	0.000
2.953	0.00075	0.00000	1.172	0.000
3.024	0.00075	0.00000	1.172	0.000
3.096	0.00075	0.00000	1.172	0.000
3.167	0.00075	0.00000	1.172	0.000
3.239	0.00075	0.00000	1.172	0.000
3.310	0.00075	0.00000	1.172	0.000
3.382	0.00075	0.00000	1.172	0.000
3.453	0.00075	0.00000	1.172	0.000
3.525	0.00075	0.00000	1.172	0.000
3.596	0.00075	0.00000	1.172	0.000
3.668	0.00075	0.00000	1.172	0.000
3.739	0.00075	0.00000	1.172	0.000
3.811	0.00075	0.00000	1.172	0.000
3.882	0.00075	0.00000	1.172	0.000
3.954	0.00075	0.00000	1.172	0.000
4.025	0.00075	0.00000	1.172	0.000
4.096	0.00075	0.00000	1.172	0.000
4.168	0.00075	0.00000	1.172	0.000
4.239	0.00075	0.00000	1.172	0.000
4.311	0.00075	0.00000	1.172	0.000
4.382	0.00075	0.00000	1.172	0.000
4.454	0.00075	0.00000	1.172	0.000
4.525	0.00075	0.00000	1.172	0.000
4.597	0.00075	0.00000	1.172	0.000
4.668	0.00075	0.00000	1.172	0.000
4.740	0.00075	0.00000	1.172	0.000
4.811	0.00075	0.00000	1.172	0.000
4.883	0.00075	0.00000	1.172	0.000
4.954	0.00075	0.00000	1.172	0.000
5.026	0.00075	0.00000	1.172	0.000
5.205	0.00075	0.00000	1.172	0.000
5.491	0.00075	0.00000	1.172	0.000
5.777	0.00075	0.00000	1.172	0.000
6.098	0.00075	0.00000	1.172	0.000
6.420	0.00075	0.00000	1.172	0.000
6.742	0.00075	0.00000	1.172	0.000
7.099	0.00075	0.00000	1.172	0.000

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Automatic degas:	No		

Pore Width (nm)	Cumulative Pore Volume (cm ³ /g)	Pore Table		
		Incremental Pore Volume (cm ³ /g)	Cumulative Pore Area (m ² /g)	Incremental Pore Area (m ² /g)
7.457	0.00075	0.00000	1.172	0.000
7.850	0.00075	0.00000	1.172	0.000
8.279	0.00075	0.00000	1.172	0.000
8.708	0.00075	0.00000	1.172	0.000
9.137	0.00075	0.00000	1.172	0.000
9.637	0.00075	0.00000	1.172	0.000
10.138	0.00075	0.00000	1.172	0.000
10.638	0.00080	0.00005	1.190	0.018
11.210	0.00087	0.00007	1.216	0.025
11.782	0.00099	0.00012	1.256	0.040
12.390	0.00107	0.00008	1.282	0.026
13.033	0.00115	0.00008	1.306	0.024
13.676	0.00125	0.00010	1.334	0.028
14.391	0.00136	0.00012	1.366	0.032
15.106	0.00147	0.00011	1.395	0.029
15.893	0.00163	0.00016	1.436	0.041
16.715	0.00177	0.00014	1.469	0.033
17.573	0.00181	0.00004	1.477	0.008
18.466	0.00181	0.00000	1.477	0.000

Sample: 4full
Operator:
Submitter:

File: C:\Users\barto\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Sz...HF_H2SO4_1_3 full.SMP

Started:	14.03.2023 14:41:36	Analysis adsorptive:	N2
Completed:	15.03.2023 02:52:01	Analysis bath temp.:	77,300 K
Report time:	19.10.2023 08:58:25	Thermal correction:	Yes
Sample mass:	0,2650 g	Ambient free space:	28,3430 cm ³ Entered
Analysis free space:	83,7525 cm ³	Equilibration interval:	30 s
Low pressure dose:	1,0000 cm ³ /g STP	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: 0,05359 cm³/g STP

Isotherm Table				
Relative Pressure (p/p°)	Experimental Quantity Adsorbed (cm ³ /g STP)	Fitted Quantity Adsorbed (cm ³ /g STP)	Absolute Residual (cm ³ /g STP)	Relative Residual
0.001995263	0.3553	0.4084	-0.0532	-0.149727
0.002511882	0.3709	0.4179	-0.0470	-0.126635
0.003162276	0.3891	0.4276	-0.0385	-0.099037
0.003981066	0.4083	0.4375	-0.0291	-0.071376
0.005011868	0.4265	0.4476	-0.0212	-0.049650
0.006309579	0.4450	0.4581	-0.0131	-0.029401
0.007943276	0.4627	0.4689	-0.0063	-0.013530
0.010000000	0.4816	0.4802	0.0014	0.002900
0.012355640	0.4972	0.4923	0.0049	0.009900
0.015186320	0.5101	0.5080	0.0021	0.004073
0.018485530	0.5241	0.5189	0.0052	0.009918
0.022294740	0.5391	0.5272	0.0118	0.021979
0.026653420	0.5547	0.5343	0.0204	0.036803
0.031598160	0.5705	0.5405	0.0299	0.052486
0.037162240	0.5859	0.5462	0.0397	0.067804
0.043374470	0.6005	0.5515	0.0490	0.081639
0.050259210	0.6135	0.5564	0.0571	0.093110
0.057835260	0.6244	0.5610	0.0634	0.101520
0.066115920	0.6336	0.5654	0.0682	0.107699
0.075109080	0.6433	0.5694	0.0738	0.114801
0.084815920	0.6529	0.5733	0.0797	0.121994
0.095232370	0.6615	0.5769	0.0846	0.127893
0.106348200	0.6677	0.5804	0.0872	0.130648
0.118147500	0.6708	0.5839	0.0869	0.129598
0.130609100	0.6738	0.5874	0.0864	0.128246
0.143706600	0.6761	0.5910	0.0851	0.125907
0.157410500	0.6764	0.5945	0.0819	0.121109
0.171685500	0.6754	0.5980	0.0774	0.114555
0.186492100	0.6738	0.6014	0.0724	0.107384
0.201792100	0.6714	0.6048	0.0666	0.099202
0.217539500	0.6678	0.6081	0.0597	0.089406
0.233689500	0.6639	0.6113	0.0525	0.079137
0.250196100	0.6598	0.6146	0.0452	0.068510
0.267011800	0.6553	0.6178	0.0376	0.057313
0.284089500	0.6504	0.6209	0.0295	0.045307

Sample: 4full

Operator:

Submitter:

File: C:\Users\barto\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Sz...HF_H2SO4_1_3 full.SMP

Started:	14.03.2023 14:41:36	Analysis adsorptive:	N2
Completed:	15.03.2023 02:52:01	Analysis bath temp.:	77,300 K
Report time:	19.10.2023 08:58:25	Thermal correction:	Yes
Sample mass:	0,2650 g	Ambient free space:	28,3430 cm ³ Entered
Analysis free space:	83,7525 cm ³	Equilibration interval:	30 s
Low pressure dose:	1,0000 cm ³ /g STP	Sample density:	1,000 g/cm ³
Automatic degas:	No		

Isotherm Table

Relative Pressure (p/p°)	Experimental Quantity Adsorbed (cm ³ /g STP)	Fitted Quantity Adsorbed (cm ³ /g STP)	Absolute Residual (cm ³ /g STP)	Relative Residual
0.301380300	0.6452	0.6240	0.0212	0.032797
0.318838200	0.6399	0.6271	0.0128	0.020035
0.336417100	0.6347	0.6301	0.0045	0.007140
0.354071100	0.6295	0.6332	-0.0036	-0.005754
0.371757900	0.6244	0.6362	-0.0118	-0.018869
0.389435500	0.6187	0.6392	-0.0205	-0.033114
0.407065800	0.6113	0.6422	-0.0308	-0.050422
0.424610500	0.6039	0.6452	-0.0412	-0.068302
0.442034200	0.5977	0.6482	-0.0504	-0.084393
0.459305300	0.5923	0.6512	-0.0589	-0.099449
0.476393400	0.5874	0.6543	-0.0669	-0.113835
0.493271100	0.5832	0.6573	-0.0741	-0.127048
0.509911800	0.5803	0.6604	-0.0801	-0.138030
0.526293400	0.5783	0.6636	-0.0852	-0.147378
0.542394700	0.5780	0.6667	-0.0887	-0.153448
0.558200000	0.5783	0.6699	-0.0916	-0.158416
0.573690800	0.5809	0.6731	-0.0922	-0.158737
0.588853900	0.5851	0.6763	-0.0911	-0.155764
0.603677600	0.5910	0.6795	-0.0885	-0.149690
0.618153900	0.5978	0.6827	-0.0849	-0.141938
0.632272400	0.6049	0.6858	-0.0809	-0.133753
0.646028900	0.6129	0.6890	-0.0761	-0.124156
0.659417100	0.6218	0.6922	-0.0704	-0.113195
0.672435500	0.6312	0.6954	-0.0642	-0.101741
0.685081600	0.6411	0.6986	-0.0575	-0.089732
0.697355300	0.6539	0.7018	-0.0480	-0.073354
0.709256600	0.6693	0.7051	-0.0358	-0.053449
0.720789500	0.6867	0.7084	-0.0217	-0.031553
0.731953900	0.7056	0.7117	-0.0061	-0.008629
0.742756600	0.7286	0.7151	0.0135	0.018500
0.753200000	0.7552	0.7373	0.0179	0.023691
0.763289500	0.7840	0.7687	0.0153	0.019507
0.773030300	0.8136	0.8198	-0.0061	-0.007558
0.782430300	0.8429	0.8225	0.0204	0.024175
0.791496100	0.8715	0.8586	0.0129	0.014806
0.800232900	0.9049	0.8937	0.0112	0.012373
0.808648700	0.9482	0.9374	0.0108	0.011407
0.816752600	0.9991	0.9897	0.0094	0.009448
0.824552600	1.0483	1.0393	0.0090	0.008613
0.832053900	1.0956	1.1137	-0.0181	-0.016488

Sample: 4full

Operator:

Submitter:

File: C:\Users\barto\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Sz...HF_H2SO4_1_3 full.SMP

Started:	14.03.2023 14:41:36	Analysis adsorptive:	N2
Completed:	15.03.2023 02:52:01	Analysis bath temp.:	77,300 K
Report time:	19.10.2023 08:58:25	Thermal correction:	Yes
Sample mass:	0,2650 g	Ambient free space:	28,3430 cm ³ Entered
Analysis free space:	83,7525 cm ³	Equilibration interval:	30 s
Low pressure dose:	1,0000 cm ³ /g STP	Sample density:	1,000 g/cm ³
Automatic degas:	No		

Isotherm Table				
Relative Pressure (p/p°)	Experimental Quantity Adsorbed (cm ³ /g STP)	Fitted Quantity Adsorbed (cm ³ /g STP)	Absolute Residual (cm ³ /g STP)	Relative Residual
0.839267100	1.1411	1.1147	0.0264	0.023176
0.846200000	1.1848	1.1773	0.0076	0.006377
0.852860500	1.2268	1.1945	0.0323	0.026364
0.859257900	1.2672	1.1950	0.0722	0.056971

Sample: 4full

Operator:

Submitter:

File: C:\Users\barto\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Sz...HF_H2SO4_1_3 full.SMP

Started: 14.03.2023 14:41:36

Completed: 15.03.2023 02:52:01

Report time: 19.10.2023 08:58:25

Sample mass: 0,2650 g

Analysis free space: 83,7525 cm³

Low pressure dose: 1,0000 cm³/g STP

Automatic degas: No

Analysis adsorptive: N2

Analysis bath temp.: 77,300 K

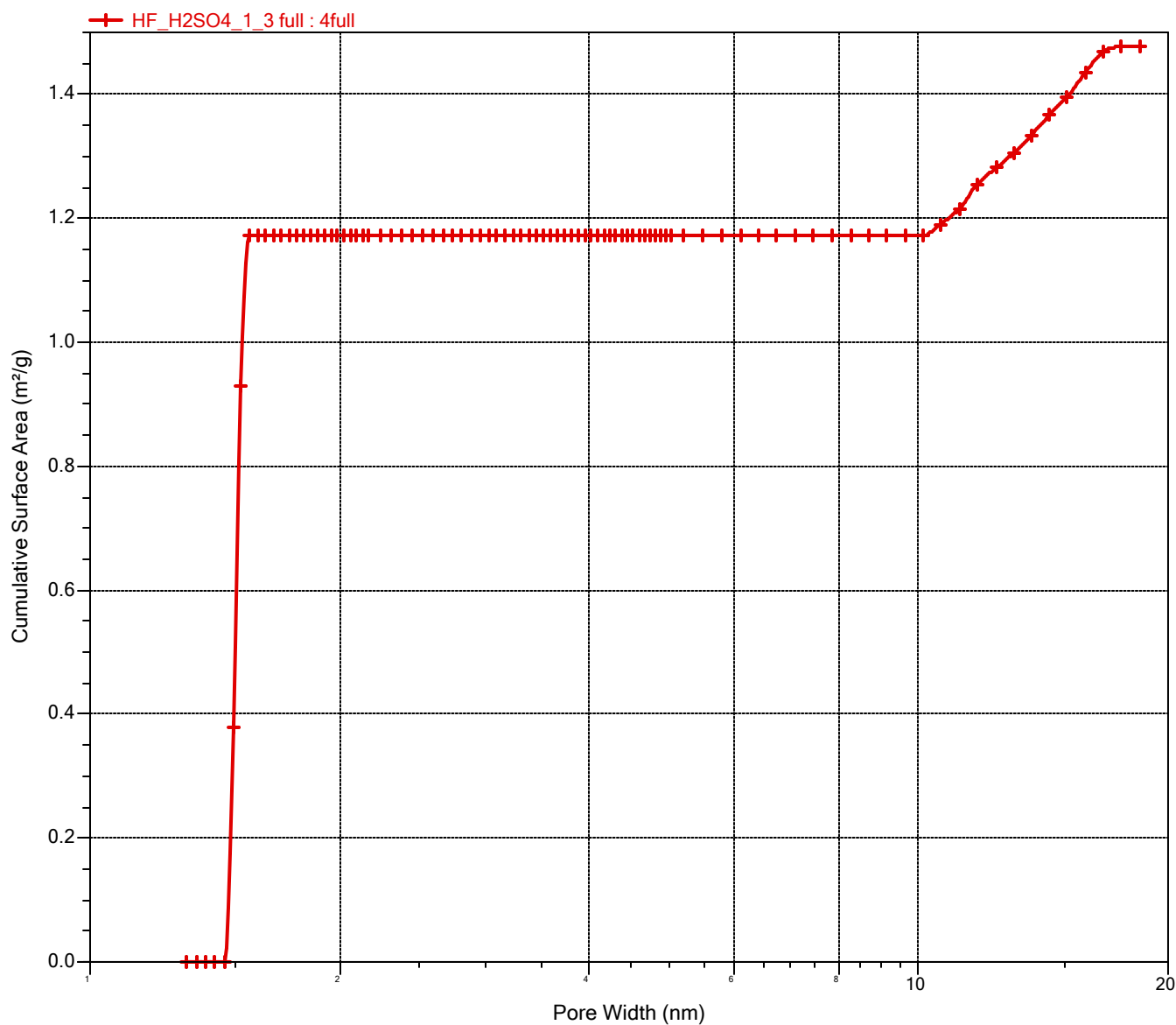
Thermal correction: Yes

Ambient free space: 28,3430 cm³ Entered

Equilibration interval: 30 s

Sample density: 1,000 g/cm³

Cumulative Surface Area vs. Pore Width



Sample: 4full

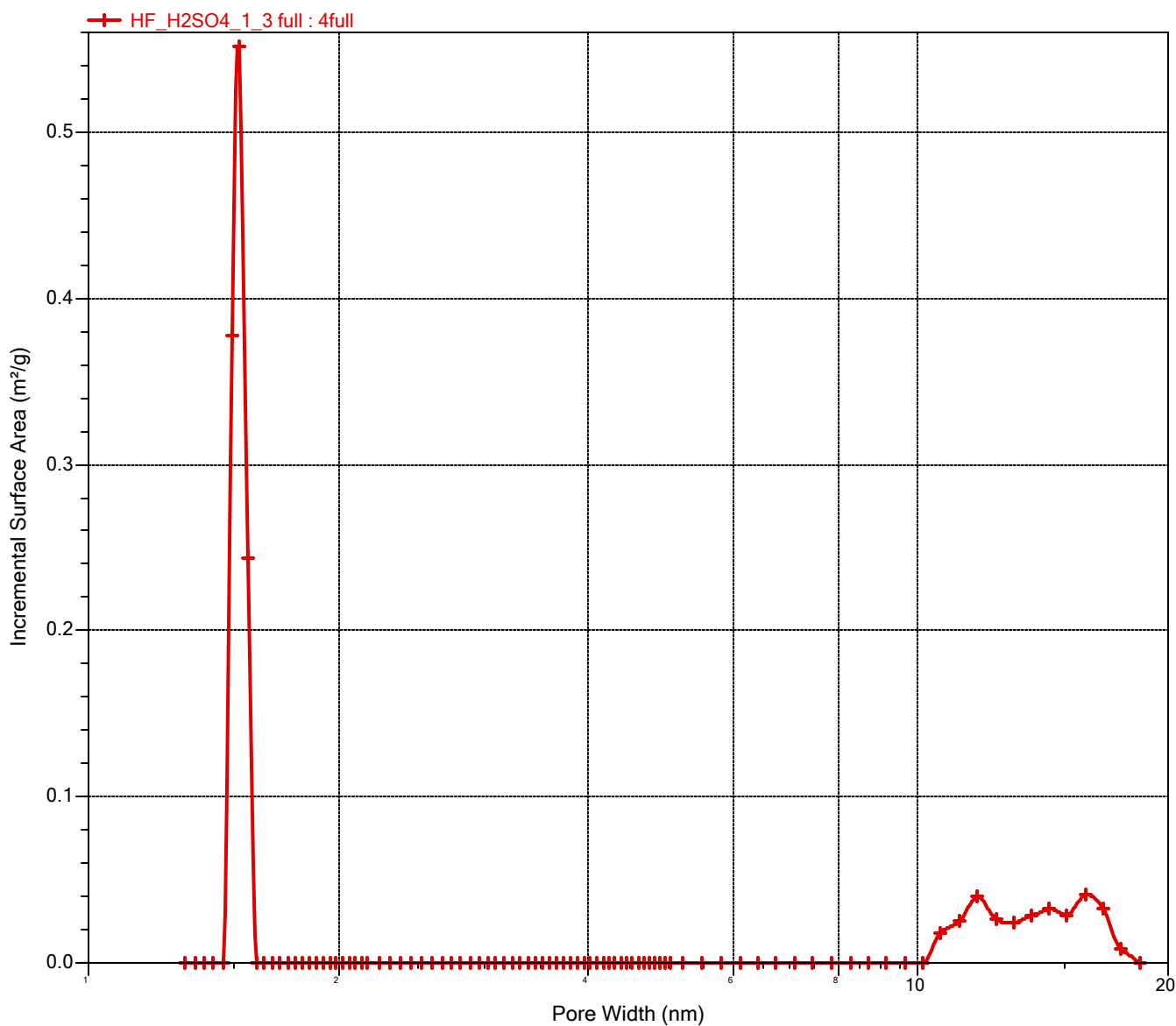
Operator:

Submitter:

File: C:\Users\barto\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Sz...HF_H2SO4_1_3 full.SMP

Started:	14.03.2023 14:41:36	Analysis adsorptive:	N2
Completed:	15.03.2023 02:52:01	Analysis bath temp.:	77,300 K
Report time:	19.10.2023 08:58:25	Thermal correction:	Yes
Sample mass:	0,2650 g	Ambient free space:	28,3430 cm ³ Entered
Analysis free space:	83,7525 cm ³	Equilibration interval:	30 s
Low pressure dose:	1,0000 cm ³ /g STP	Sample density:	1,000 g/cm ³
Automatic degas:	No		

Incremental Surface Area vs. Pore Width



Sample: 4full

Operator:

Submitter:

File: C:\Users\barto\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Sz...HF_H2SO4_1_3 full.SMP

Started: 14.03.2023 14:41:36

Completed: 15.03.2023 02:52:01

Report time: 19.10.2023 08:58:25

Sample mass: 0,2650 g

Analysis free space: 83,7525 cm³

Low pressure dose: 1,0000 cm³/g STP

Automatic degas: No

Analysis adsorptive: N₂

Analysis bath temp.: 77,300 K

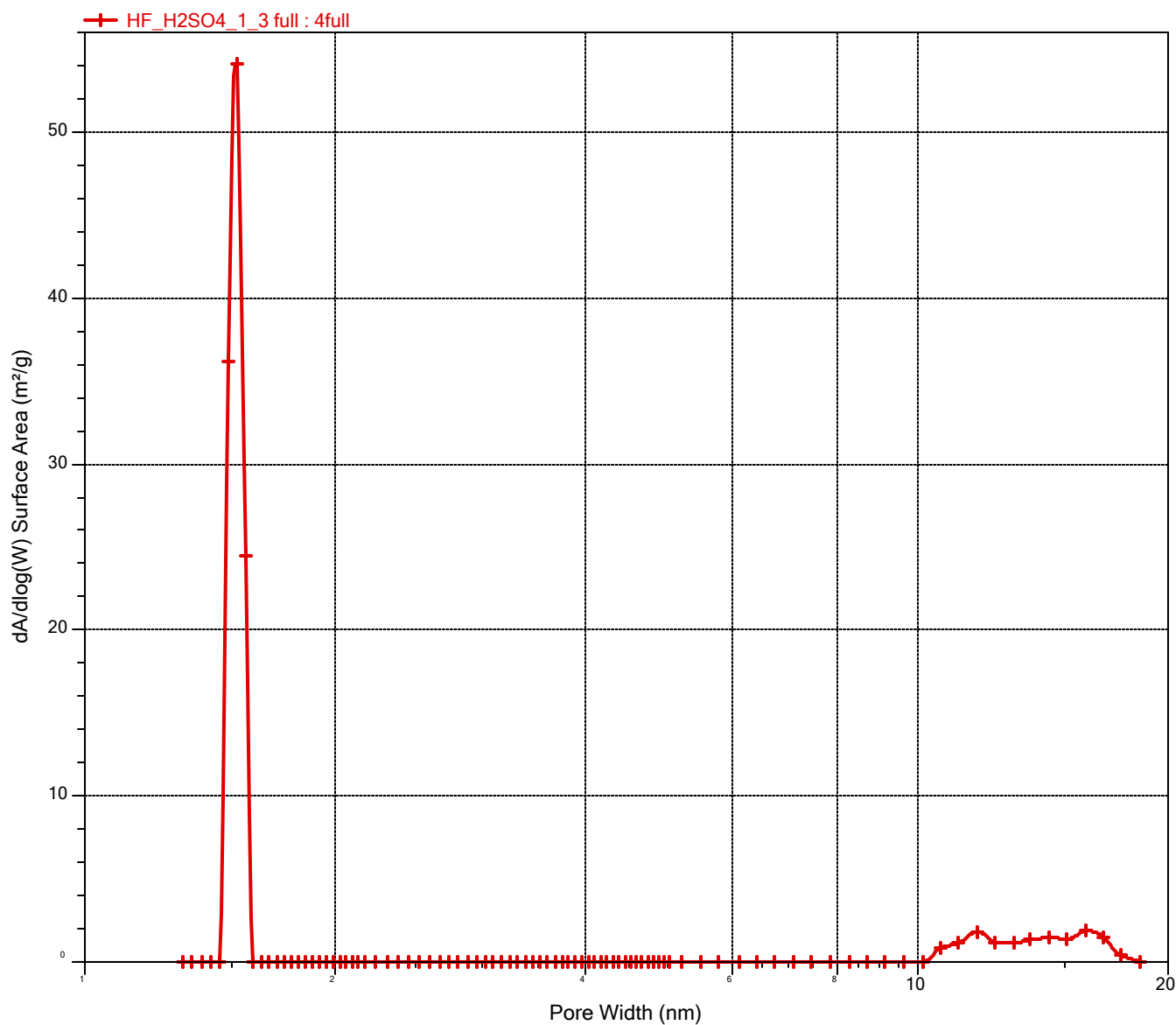
Thermal correction: Yes

Ambient free space: 28,3430 cm³ Entered

Equilibration interval: 30 s

Sample density: 1,000 g/cm³

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



Sample: 4full

Operator:

Submitter:

File: C:\Users\barto\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Sz...HF_H2SO4_1_3 full.SMP

Started: 14.03.2023 14:41:36

Completed: 15.03.2023 02:52:01

Report time: 19.10.2023 08:58:25

Sample mass: 0,2650 g

Analysis free space: 83,7525 cm³Low pressure dose: 1,0000 cm³/g STP

Automatic degas: No

Analysis adsorptive: N₂

Analysis bath temp.: 77,300 K

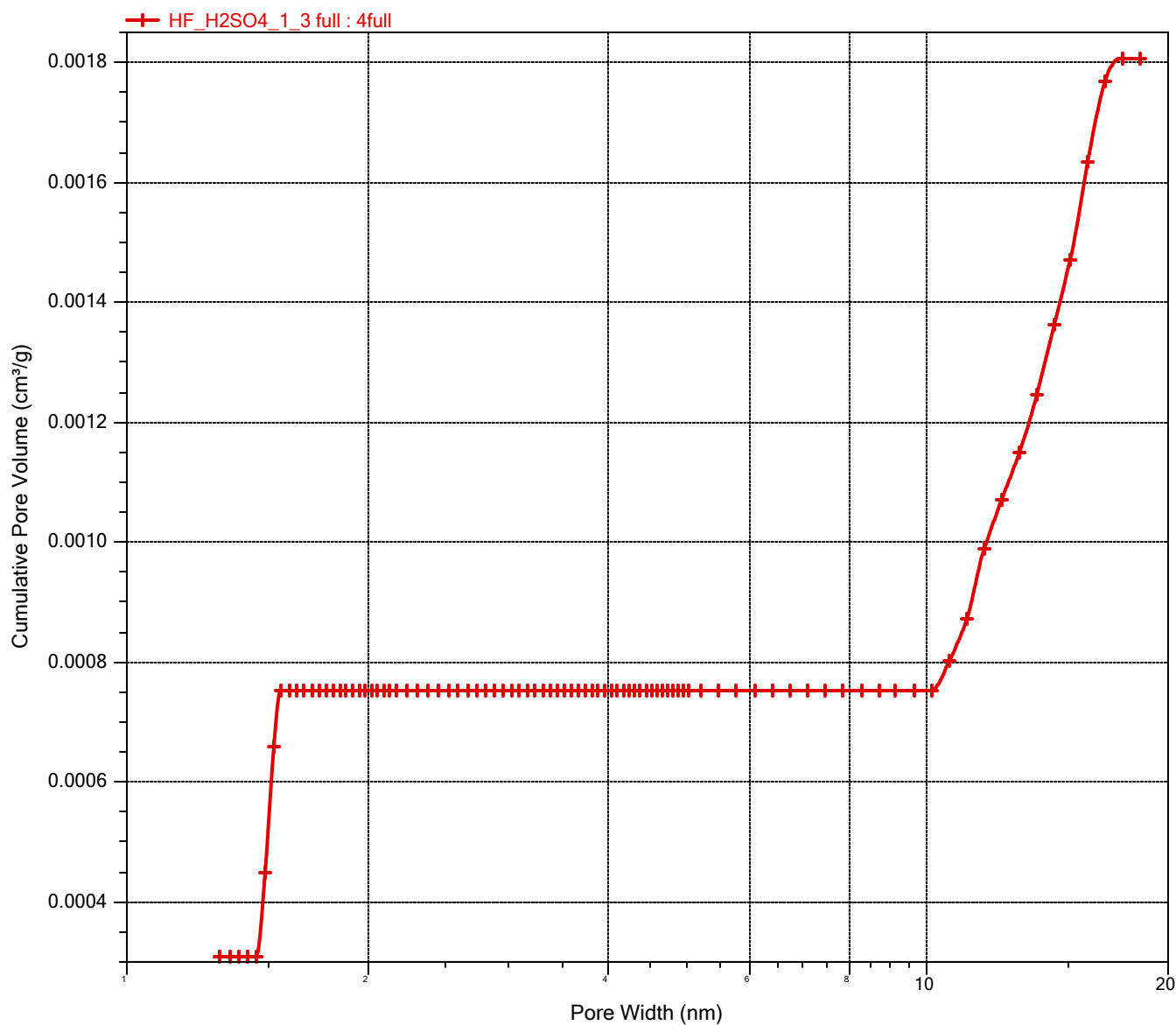
Thermal correction: Yes

Ambient free space: 28,3430 cm³ Entered

Equilibration interval: 30 s

Sample density: 1,000 g/cm³

Cumulative Pore Volume vs. Pore Width



Sample: 4full

Operator:

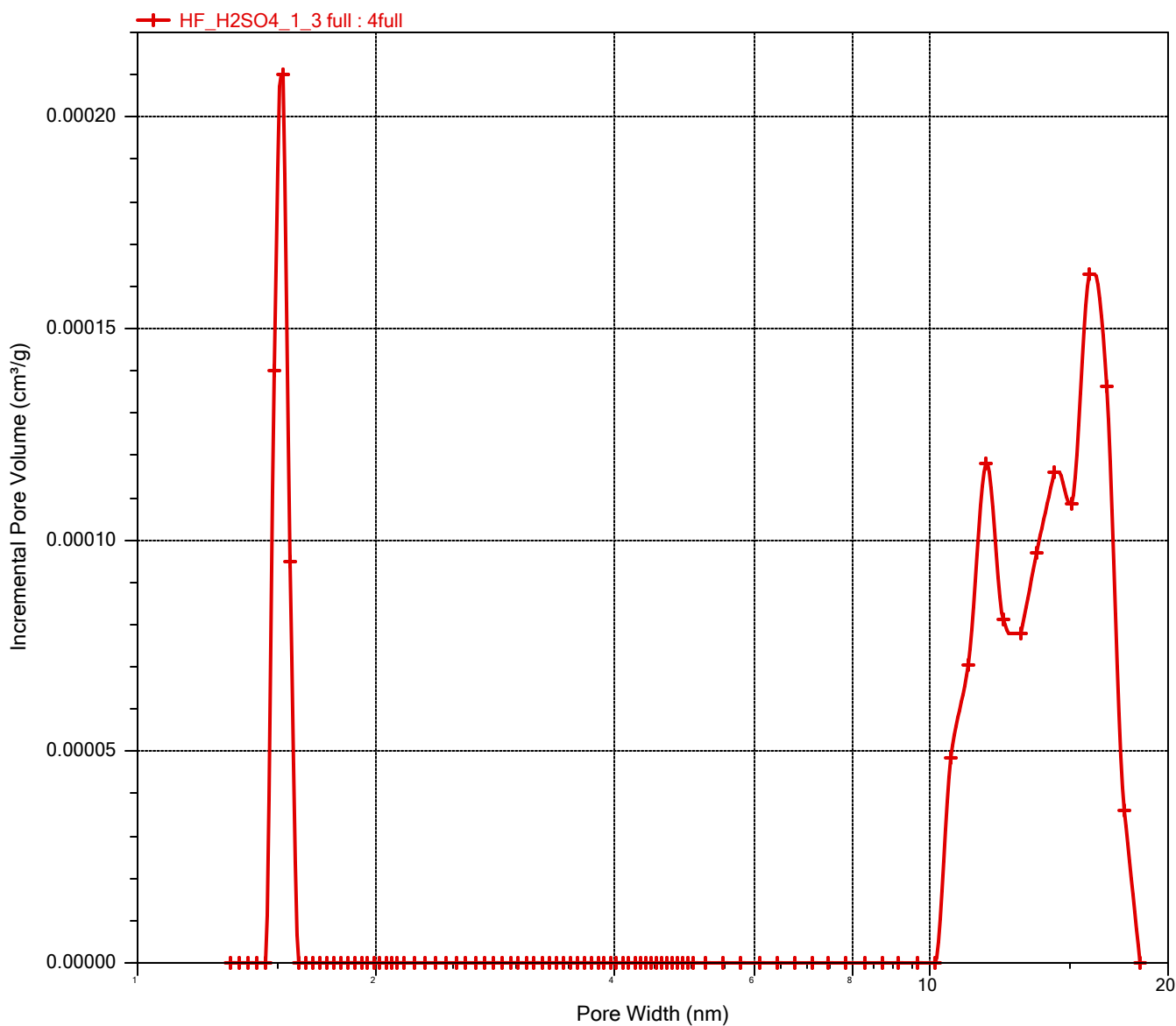
Submitter:

File: C:\Users\barto\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Sz...HF_H2SO4_1_3 full.SMP

Started: 14.03.2023 14:41:36
Completed: 15.03.2023 02:52:01
Report time: 19.10.2023 08:58:25
Sample mass: 0,2650 g
Analysis free space: 83,7525 cm³
Low pressure dose: 1,0000 cm³/g STP
Automatic degas: No

Analysis adsorptive: N₂
Analysis bath temp.: 77,300 K
Thermal correction: Yes
Ambient free space: 28,3430 cm³ Entered
Equilibration interval: 30 s
Sample density: 1,000 g/cm³

Incremental Pore Volume vs. Pore Width



Sample: 4full

Operator:

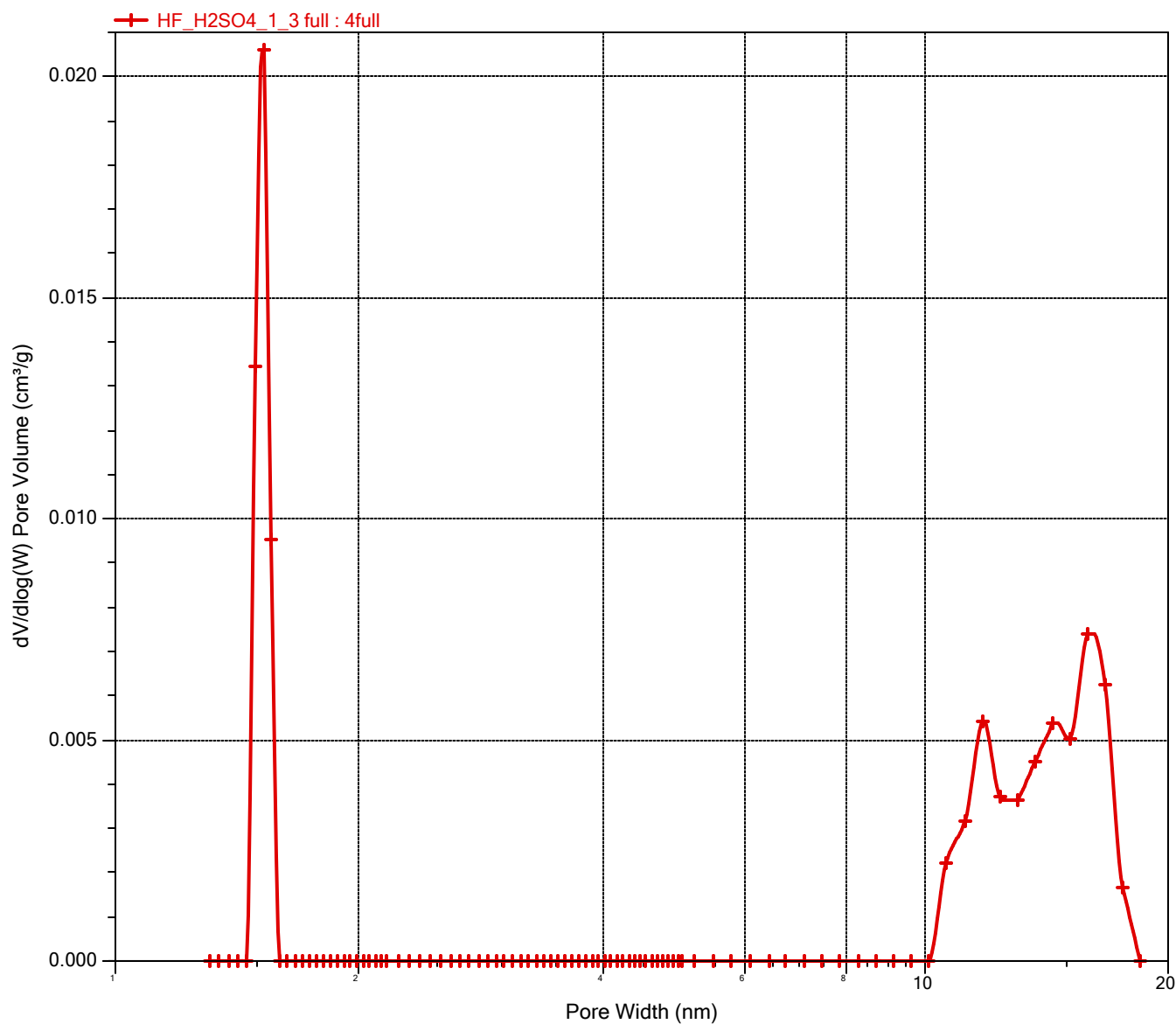
Submitter:

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Sz...HF_H2SO4_1_3 full.SMP

Started: 14.03.2023 14:41:36
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Report time: 19.10.2023 08:58:25
Sample mass: 0,2650 g
Analysis free space: 83,7525 cm³
Low pressure dose: 1,0000 cm³/g STP
Automatic degas: No

Analysis adsorptive: N₂
Analysis bath temp.: 77,300 K
Thermal correction: Yes
Ambient free space: 28,3430 cm³ Entered
Equilibration interval: 30 s
Sample density: 1,000 g/cm³

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



Sample: 4full

Operator:

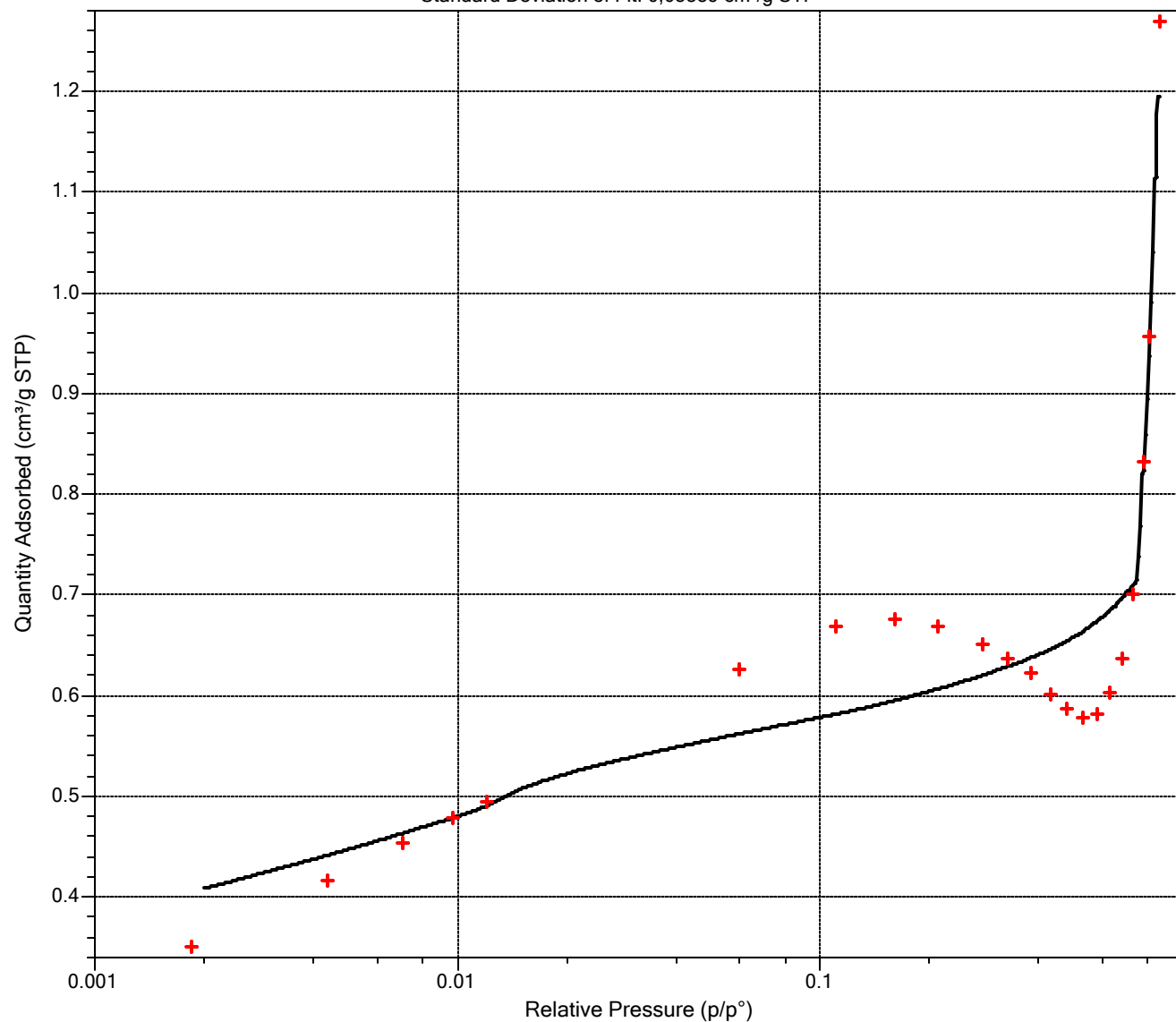
Submitter:

File: C:\Users\barto\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Sz...HF_H2SO4_1_3 full.SMP

Started: 14.03.2023 14:41:36
Completed: 15.03.2023 02:52:01
Report time: 19.10.2023 08:58:25
Sample mass: 0,2650 g
Analysis free space: 83,7525 cm³
Low pressure dose: 1,0000 cm³/g STP
Automatic degas: No

Analysis adsorptive: N2
Analysis bath temp.: 77,300 K
Thermal correction: Yes
Ambient free space: 28,3430 cm³ Entered
Equilibration interval: 30 s
Sample density: 1,000 g/cm³

Goodness of Fit

Standard Deviation of Fit: 0,05359 cm³/g STP


Sample: 4full

Operator:

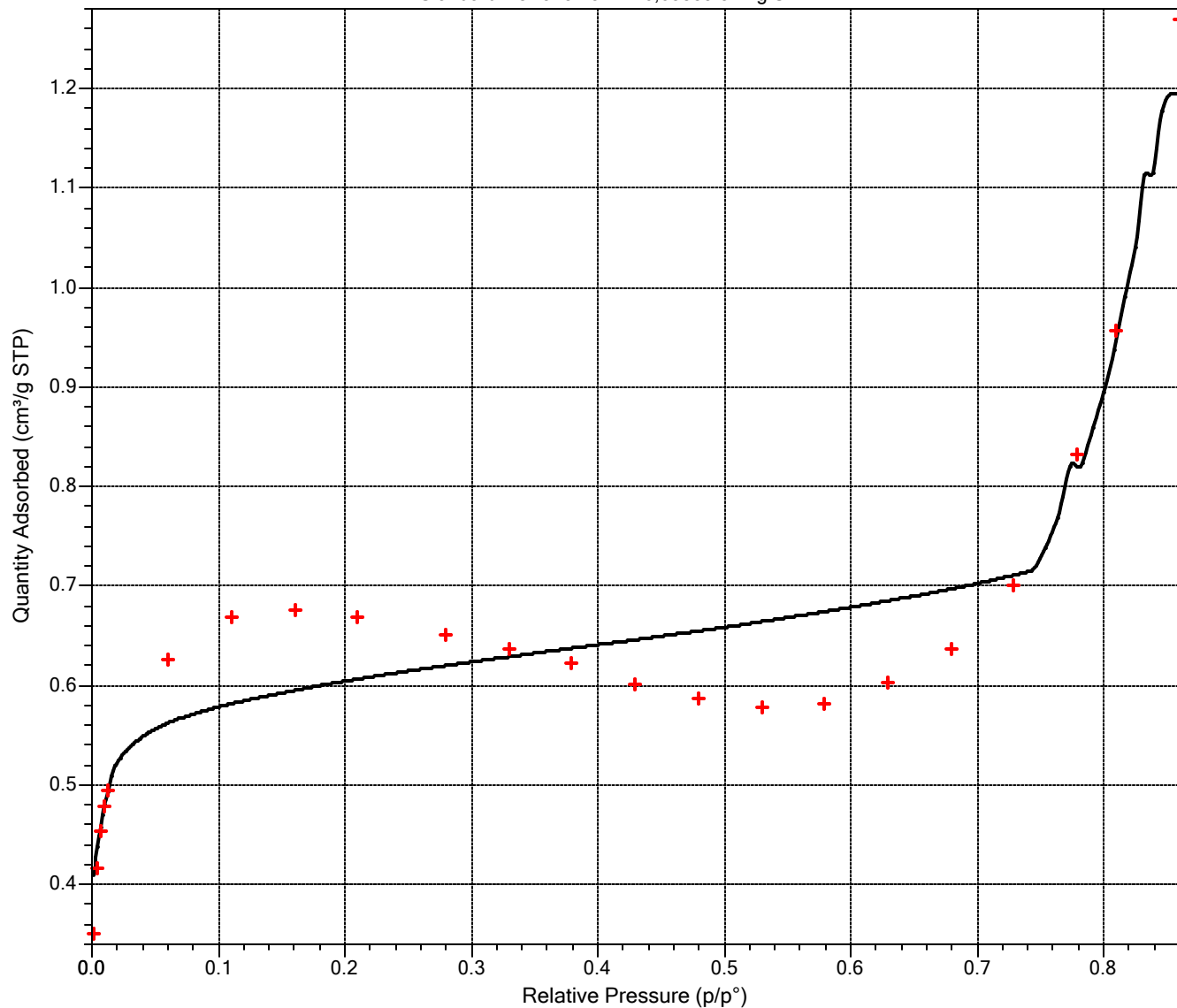
Submitter:

File: C:\Users\barto\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Sz...HF_H2SO4_1_3 full.SMP

Started: 14.03.2023 14:41:36
Completed: 15.03.2023 02:52:01
Report time: 19.10.2023 08:58:25
Sample mass: 0,2650 g
Analysis free space: 83,7525 cm³
Low pressure dose: 1,0000 cm³/g STP
Automatic degas: No

Analysis adsorptive: N2
Analysis bath temp.: 77,300 K
Thermal correction: Yes
Ambient free space: 28,3430 cm³ Entered
Equilibration interval: 30 s
Sample density: 1,000 g/cm³

Goodness of Fit

Standard Deviation of Fit: 0,05359 cm³/g STP


Sample: 4full
 Operator:
 Submitter:
 File: C:\Users\barto\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
 Sz...HF_H2SO4_1_3 full.SMP

Started:	14.03.2023 14:41:36	Analysis adsorptive:	N2
Completed:	15.03.2023 02:52:01	Analysis bath temp.:	77,300 K
Report time:	19.10.2023 08:58:25	Thermal correction:	Yes
Sample mass:	0,2650 g	Ambient free space:	28,3430 cm ³ Entered
Analysis free space:	83,7525 cm ³	Equilibration interval:	30 s
Low pressure dose:	1,0000 cm ³ /g STP	Sample density:	1,000 g/cm ³
Automatic degas:	No		

Sample Information

Method: FULL- N2@77K- ADS/DES
 Sample: 4full
 Operator:
 Submitter:
 Mass type: Entered
 Sample mass: 0,2650 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: 4full

Operator:

Submitter:

File: C:\Users\barto\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Sz...HF_H2SO4_1_3 full.SMP

Started:	14.03.2023 14:41:36	Analysis adsorptive:	N2
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Sample mass:	0,2650 g	Ambient free space:	28,3430 cm ³ Entered
Analysis free space:	83,7525 cm ³	Equilibration interval:	30 s
Low pressure dose:	1,0000 cm ³ /g STP	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: 28,3430 cm³
 Analysis free space: 83,7525 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: 1,0000 cm³/g STP
 Minimum equilibration delay: 0,50 h
 Maximum equilibration delay: 2,00 h
 Maximum number of decants: 6

Sample: 4full

Operator:

Submitter:

File: C:\Users\barto\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Sz...HF_H2SO4_1_3 full.SMP

Started:	14.03.2023 14:41:36	Analysis adsorptive:	N2
Completed:	15.03.2023 02:52:01	Analysis bath temp.:	77,300 K
Report time:	19.10.2023 08:58:25	Thermal correction:	Yes
Sample mass:	0,2650 g	Ambient free space:	28,3430 cm ³ Entered
Analysis free space:	83,7525 cm ³	Equilibration interval:	30 s
Low pressure dose:	1,0000 cm ³ /g STP	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:	0,38600 nm
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: 4full

Operator:

Submitter:

File: C:\Users\barto\OneDrive - Zachodniopomorski Uniwersytet Technologiczny w
Sz...HF_H2SO4_1_3 full.SMP

Started:	14.03.2023 14:41:36	Analysis adsorptive:	N2
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Sample mass:	0,2650 g	Ambient free space:	28,3430 cm ³ Entered
Analysis free space:	83,7525 cm ³	Equilibration interval:	30 s
Low pressure dose:	1,0000 cm ³ /g STP	Sample density:	1,000 g/cm ³
Automatic degas:	No		

Sample Log

Date	Time	Log Message
14.03.2023	14:41:36	Starting a sample analysis for C:\ASAP 2460\data\2023\Bartek\4full.SMP on port 4.
14.03.2023	19:47:35	Low pressure data collection started
14.03.2023	23:24:42	Standard data collection started.
15.03.2023	02:28:45	Termination started.
15.03.2023	02:52:01	Finished a sample analysis for C:\ASAP 2460\data\2023\Bartek\4full.SMP on port 4.