



Full Report Set

ASAP 2020 V3.00 H

Unit 1

Serial #: 531

Page 1

Sample: Satheesh / Bare Iron Oxide
Operator: A Narayanan
Submitter: Chemistry, Thiagarajar College, Madurai
File: C:\2020\DATA\2013\EXT-185.SMP

Started: 7/24/2013 8:17:47AM	Analysis Adsorptive: N2
Completed: 7/24/2013 7:50:43PM	Analysis Bath Temp.: -195.665 °C
Report Time: 11/10/2014 4:09:00PM	Thermal Correction: No
Sample Mass: 0.4924 g	Warm Free Space: 16.6573 cm ³ Measured
Cold Free Space: 51.4145 cm ³	Equilibration Interval: 5 s
Low Pressure Dose: None	Automatic Degas: Yes

Comments: Sample outgassed at 200 C 12 hrs.

Summary Report

Surface Area

BET Surface Area: 65.8879 m²/g

Pore Volume

Single point adsorption total pore volume of pores
less than 704.647 Å radius at P/Po = 0.986074778: 0.301539 cm³/g

Pore Size

BJH Desorption average pore radius (2V/A): 68.278 Å

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Isotherm Tabular Report

Relative Pressure (P/Po)	Absolute Pressure (mmHg)	Quantity Adsorbed (cm ³ /g STP)	Saturation Pressure (mmHg)
			773.45380
0.010983800	8.49053	10.3349	
0.022138487	17.11210	11.6625	
0.031848655	24.61662	12.4080	
0.039658829	30.65235	12.8882	
0.050347207	38.91220	13.4450	
0.059292924	45.82471	13.8567	
0.070726555	54.65953	14.3334	
0.080519660	62.22663	14.7053	
0.100577978	77.72554	15.4134	
0.120707966	93.27887	16.0697	
0.140615570	108.65939	16.6860	
0.160710398	124.18362	17.2863	
0.180821456	139.72087	17.8741	
0.201103872	155.38828	18.4590	
0.249123989	192.48631	19.8217	
0.302291771	233.55685	21.3498	
0.352442931	272.29620	22.8440	
0.400885750	309.71011	24.3543	
0.451108758	348.49979	26.0195	
0.501149362	387.14212	27.8413	
0.551351353	425.90591	29.8817	
			772.46039
0.600873119	464.12753	32.2389	
0.650262348	502.25180	35.0777	
0.699650695	540.37158	38.7175	
0.740414712	571.82123	42.6163	
0.771083695	595.47119	46.3345	
0.800513921	618.16174	50.6768	
0.820752449	633.74579	54.3962	
0.841269755	649.54938	58.7561	
0.860221747	664.13593	63.5916	
0.875695557	676.03528	68.4014	
0.891041306	687.83411	73.8900	
0.905089350	698.62262	80.0930	
0.916132168	707.08990	85.9520	
0.925286536	714.10553	91.7930	
0.933661166	720.51843	97.5083	
0.939997080	725.35724	102.8881	
0.946601639	730.40265	109.1677	
0.951902328	734.44135	115.4214	
0.957170282	738.44684	122.2164	

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Relative Pressure (P/Po)	Absolute Pressure (mmHg)	Quantity Adsorbed (cm ³ /g STP)	Saturation Pressure (mmHg)
			771.48181
0.961872015	742.03333	129.2275	
0.965910041	745.11487	135.7078	
0.968931925	747.41711	141.8499	
0.971784954	749.58411	148.2050	
0.974691154	751.79675	154.5704	
0.976715788	753.32928	160.1301	
0.978642291	754.78601	165.7607	
0.980309362	756.04254	171.4097	
0.981869798	757.21674	177.2180	
0.983400120	758.36761	183.2819	
0.984733796	759.36676	189.1627	
0.986074778	760.37146	194.9440	
0.969060919	747.19897	178.2765	
0.957515462	738.22546	160.4371	
0.951140389	733.25372	151.1759	
0.932789939	719.05139	129.5414	
			770.85107
0.915120046	705.48199	114.0993	
0.905493481	698.11078	107.1827	
0.874764377	674.48236	89.0527	
0.858997776	662.37311	82.4922	
0.812051902	626.24500	66.8559	
0.767934556	592.26892	56.6304	
0.729962771	563.01550	50.1100	
0.684043354	527.62842	44.0222	
0.637665398	491.88004	39.3076	
0.594005404	458.21817	35.7888	
0.549367698	423.79965	32.9197	
0.505079049	389.64795	30.5721	
0.464383825	358.26865	27.8579	
0.411569734	317.53207	25.2096	
			771.52570
0.372332589	287.26416	23.8573	
0.330483921	254.97684	22.5569	
0.284013625	219.12381	21.1620	
0.239335579	184.65355	19.8624	
0.195305679	150.68335	18.5875	
0.151216772	116.66763	17.2847	

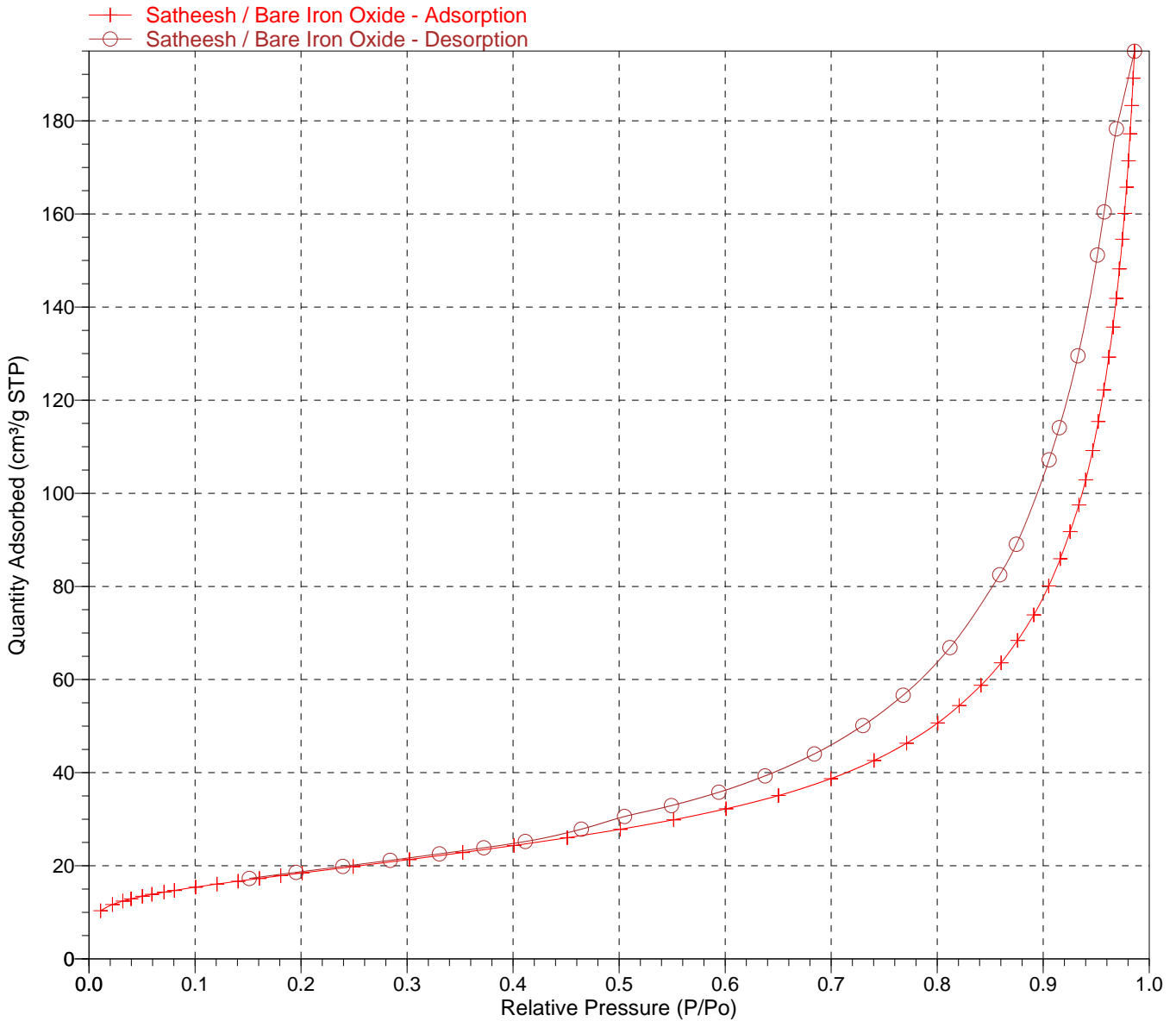
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Operator: A Narayanan
Submitter: Chemistry, Thiagarajar College, Madurai
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Comments: Sample outgassed at 200 C 12 hrs.

Isotherm Linear Plot



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BET Surface Area Report

BET Surface Area: 65.8879 ± 0.2729 m²/g
 Slope: 0.065495 ± 0.000270 g/cm³ STP
 Y-Intercept: 0.000575 ± 0.000044 g/cm³ STP
 C: 114.931081
 Qm: 15.1355 cm³/g STP
 Correlation Coefficient: 0.9998724
 Molecular Cross-Sectional Area: 0.1620 nm²

Relative Pressure (P/Po)	Quantity Adsorbed (cm ³ /g STP)	1/[Q(Po/P - 1)]
0.010983800	10.3349	0.001075
0.022138487	11.6625	0.001941
0.031848655	12.4080	0.002651
0.039658829	12.8882	0.003204
0.050347207	13.4450	0.003943
0.059292924	13.8567	0.004549
0.070726555	14.3334	0.005310
0.080519660	14.7053	0.005955
0.100577978	15.4134	0.007255
0.120707966	16.0697	0.008543
0.140615570	16.6860	0.009806
0.160710398	17.2863	0.011077
0.180821456	17.8741	0.012349
0.201103872	18.4590	0.013637
0.249123989	19.8217	0.016738
0.302291771	21.3498	0.020294
0.352442931	22.8440	0.023825

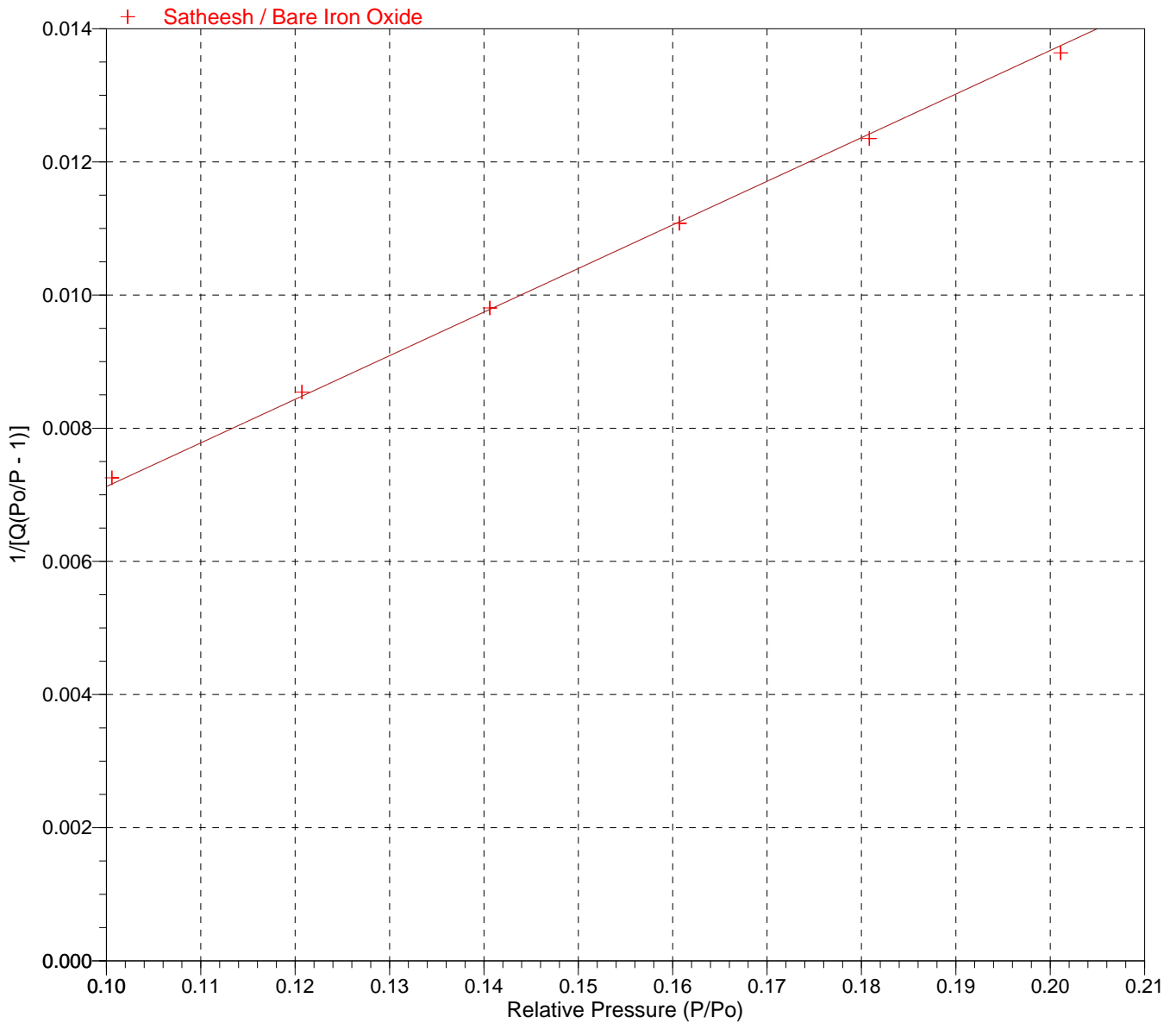
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Thermal Correction: No
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Comments: Sample outgassed at 200 C 12 hrs.

BET Surface Area Plot



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BJH Desorption Pore Distribution Report

Faas Correction

$$t = 3.54 \left[-5 / \ln(P/P_0) \right]^{0.333}$$

Radius Range: 8.500 Å to 1500.000 Å

Adsorbate Property Factor: 9.53000 Å

Density Conversion Factor: 0.0015468

Fraction of Pores Open at Both Ends: 0.00

Pore Radius Range (Å)	Average Radius (Å)	Incremental Pore Volume (cm ³ /g)	Cumulative Pore Volume (cm ³ /g)	Incremental Pore Area (m ² /g)	Cumulative Pore Area (m ² /g)
703.1 - 320.8	384.5	0.028313	0.028313	1.473	1.473
320.8 - 235.2	264.7	0.030858	0.059171	2.332	3.804
235.2 - 205.1	218.0	0.016162	0.075332	1.483	5.287
205.1 - 150.1	168.9	0.038346	0.113678	4.540	9.827
150.1 - 119.4	131.1	0.027660	0.141338	4.218	14.045
119.4 - 107.5	112.8	0.012453	0.153791	2.208	16.253
107.5 - 81.5	90.8	0.033267	0.187059	7.332	23.585
81.5 - 72.5	76.4	0.011935	0.198993	3.124	26.709
72.5 - 54.4	60.7	0.029101	0.228094	9.584	36.293
54.4 - 44.0	48.0	0.018946	0.247040	7.896	44.189
44.0 - 37.6	40.2	0.011873	0.258913	5.901	50.090
37.6 - 31.9	34.2	0.010868	0.269780	6.350	56.440
31.9 - 27.5	29.3	0.008080	0.277860	5.507	61.947
27.5 - 24.3	25.7	0.005705	0.283565	4.447	66.394
24.3 - 21.5	22.7	0.004260	0.287825	3.752	70.147
21.5 - 19.3	20.3	0.003147	0.290972	3.108	73.255
19.3 - 17.5	18.3	0.004779	0.295752	5.232	78.486
17.5 - 15.5	16.3	0.003800	0.299551	4.653	83.139
15.5 - 14.2	14.8	0.000992	0.300544	1.346	84.485
14.2 - 12.9	13.5	0.000693	0.301236	1.029	85.514
12.9 - 11.6	12.2	0.000673	0.301910	1.106	86.620
11.6 - 10.5	11.0	0.000495	0.302405	0.902	87.522
10.5 - 9.4	9.9	0.000365	0.302770	0.740	88.262
9.4 - 8.4	8.8	0.000216	0.302986	0.489	88.750

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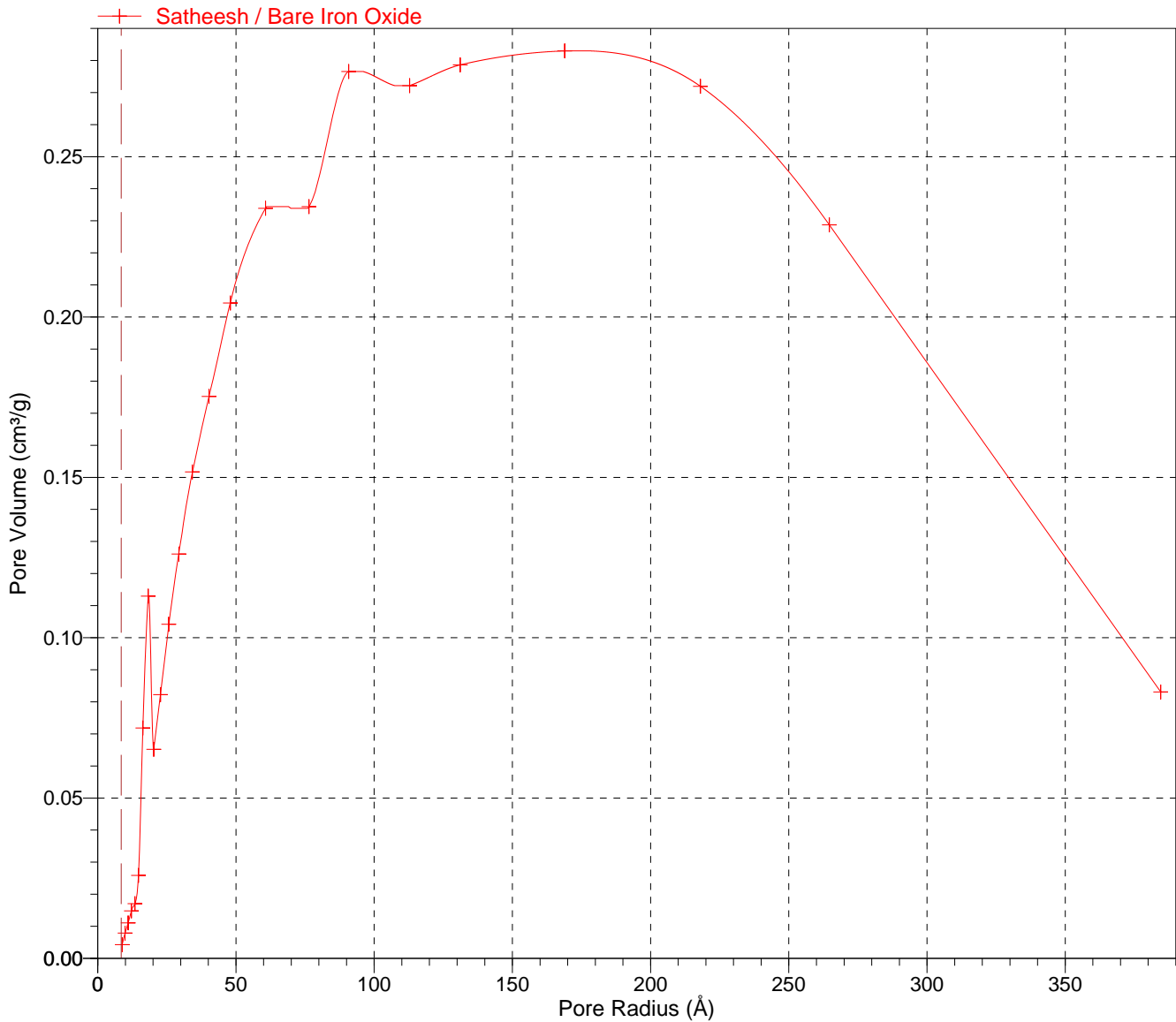
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Automatic Degas: Yes

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BJH Desorption dV/dlog(r) Pore Volume

Faas Correction



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 Automatic Degas: Yes

Comments: Sample outgassed at 200 C 12 hrs.

Horvath-Kawazoe Report

Slit Pore Geometry (Original H-K)

Maximum Pore Volume: 0.301539 cm³/g
 at Relative Pressure: 0.986074778
 Median Pore Width: 454.287 Å
 Relative Pressure Range: 1.098e-02 to 9.861e-01

Diameter of Adsorptive Molecule: 3.000 Å
 Diameter of Adsorptive at Zero Interaction Energy: 2.574 Å
 Diameter of Sample Atom: 3.400 Å
 Diameter of Sample Atom at Zero Interaction Energy: 2.917 Å
 Interaction Parameter: 3.73e-43 erg-cm⁴

Density Conversion Factor: 0.0015468

Absolute Pressure (mmHg)	Relative Pressure (P/Po)	Quantity Adsorbed (cm ³ /g STP)	Pore Width (Å)	Cumulative Pore Volume (cm ³ /g)	Differential Pore Volume (cm ³ /g.Å)
8.49053	0.010983800	10.3349	9.540	0.0160	0.0017
17.11210	0.022138487	11.6625	10.847	0.0180	0.0016
24.61662	0.031848655	12.4080	11.727	0.0192	0.0013
30.65235	0.039658829	12.8882	12.347	0.0199	0.0012
38.91220	0.050347207	13.4450	13.129	0.0208	0.0011
45.82471	0.059292924	13.8567	13.737	0.0214	0.0010
54.65953	0.070726555	14.3334	14.474	0.0222	0.0010
62.22663	0.080519660	14.7053	15.081	0.0227	0.0009
77.72554	0.100577978	15.4134	16.283	0.0238	0.0009
93.27887	0.120707966	16.0697	17.444	0.0249	0.0009
108.65939	0.140615570	16.6860	18.590	0.0258	0.0008
124.18362	0.160710398	17.2863	19.751	0.0267	0.0008
139.72087	0.180821456	17.8741	20.909	0.0276	0.0008
155.38828	0.201103872	18.4590	22.100	0.0286	0.0008
192.48631	0.249123989	19.8217	25.084	0.0307	0.0007
233.55685	0.302291771	21.3498	28.673	0.0330	0.0007
272.29620	0.352442931	22.8440	32.457	0.0353	0.0006
309.71011	0.400885750	24.3543	36.617	0.0377	0.0006
348.49979	0.451108758	26.0195	41.579	0.0402	0.0005
387.14212	0.501149362	27.8413	47.471	0.0431	0.0005
425.90591	0.551351353	29.8817	54.593	0.0462	0.0004
464.12753	0.600873119	32.2389	63.292	0.0499	0.0004
502.25180	0.650262348	35.0777	74.296	0.0543	0.0004
540.37158	0.699650695	38.7175	89.058	0.0599	0.0004
571.82123	0.740414712	42.6163	105.053	0.0659	0.0004
595.47119	0.771083695	46.3345	121.321	0.0717	0.0004
618.16174	0.800513921	50.6768	141.276	0.0784	0.0003
633.74579	0.820752449	54.3962	158.638	0.0841	0.0003
649.54938	0.841269755	58.7561	181.323	0.0909	0.0003

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664.13593	0.860221747	63.5916	207.184	0.0984	0.0003
676.03528	0.875695557	68.4014	234.560	0.1058	0.0003
687.83411	0.891041306	73.8900	270.254	0.1143	0.0002
698.62262	0.905089350	80.0930	314.039	0.1239	0.0002
707.08990	0.916132168	85.9520	355.306	0.1330	0.0002
714.10553	0.925286536	91.7930	401.938	0.1420	0.0002
720.51843	0.933661166	97.5083	454.631	0.1508	0.0002
725.35724	0.939997080	102.8881	500.435	0.1591	0.0002
730.40265	0.946601639	109.1677	570.971	0.1689	0.0001
734.44135	0.951902328	115.4214	628.409	0.1785	0.0002
738.44684	0.957170282	122.2164	691.589	0.1890	0.0002
742.03333	0.961872015	129.2275	809.738	0.1999	0.0001
745.11487	0.965910041	135.7078	891.051	0.2099	0.0001
747.41711	0.968931925	141.8499	980.496	0.2194	0.0001
749.58411	0.971784954	148.2050	1078.886	0.2292	0.0001
751.79675	0.974691154	154.5704	1187.115	0.2391	0.0001
753.32928	0.976715788	160.1301	1306.166	0.2477	0.0001
754.78601	0.978642291	165.7607	1437.123	0.2564	0.0001
756.04254	0.980309362	171.4097	1581.175	0.2651	0.0001
757.21674	0.981869798	177.2180	1739.633	0.2741	0.0001
758.36761	0.983400120	183.2819	1913.936	0.2835	0.0001
759.36676	0.984733796	189.1627	2105.669	0.2926	0.0000
760.37146	0.986074778	194.9440	2316.576	0.3015	0.0000

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Horvath-Kawazoe Differential Pore Volume Plot

Slit Pore Geometry (Original H-K)

