

ASAP 2020 V3.02 G

Unit 1

Serial #: 407

Page 1

Sample: PS12  
Operator:  
Submitter:  
File: C:\2020\DATA\PS12.SMP

Started: 1/11/2012 3:33:33PM	Analysis Adsorptive: N2
Completed: 1/11/2012 7:09:52PM	Analysis Bath Temp.: -194.596 °C
Report Time: 3/5/2012 1:31:27PM	Thermal Correction: No
Sample Mass: 0.3920 g	Warm Free Space: 18.0703 cm <sup>3</sup> Measured
Cold Free Space: 52.1961 cm <sup>3</sup>	Equilibration Interval: 5 s
Low Pressure Dose: None	Automatic Degas: Yes

### Summary Report

#### Surface Area

Single point surface area at P/Po = 0.313574795: 8.6918 m<sup>2</sup>/g

BET Surface Area: 3.9933 m<sup>2</sup>/g

BJH Adsorption cumulative surface area of pores  
between 17.000 Å and 3000.000 Å diameter: 7.754 m<sup>2</sup>/g

BJH Desorption cumulative surface area of pores  
between 17.000 Å and 3000.000 Å diameter: 9.6100 m<sup>2</sup>/g

#### Pore Volume

Single point adsorption total pore volume of pores  
less than 9.498 Å diameter at P/Po = 0.010802644: 0.002432 cm<sup>3</sup>/g

BJH Adsorption cumulative volume of pores  
between 17.000 Å and 3000.000 Å diameter: 0.061477 cm<sup>3</sup>/g

BJH Desorption cumulative volume of pores  
between 17.000 Å and 3000.000 Å diameter: 0.053881 cm<sup>3</sup>/g

#### Pore Size

Adsorption average pore width (4V/A by BET): 24.3597 Å

BJH Adsorption average pore diameter (4V/A): 317.137 Å

BJH Desorption average pore diameter (4V/A): 224.269 Å

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Analysis Bath Temp.: -194.596 °C  
Thermal Correction: No  
Warm Free Space: 18.0703 cm<sup>3</sup> Measured  
Equilibration Interval: 5 s  
Automatic Degas: Yes

### Isotherm Tabular Report

Relative Pressure (P/Po)	Absolute Pressure (mmHg)	Quantity Adsorbed (cm <sup>3</sup> /g STP)	Elapsed Time (h:min)	Saturation Pressure (mmHg)
			01:01	871.197876
0.010802644	9.417426	1.5722	01:17	
0.059866438	52.191936	1.9997	01:18	
0.096576490	84.202904	2.1638	01:20	
0.140223373	122.262672	2.3217	01:21	
0.183526463	160.032364	2.4682	01:23	
0.226832024	197.802292	2.6127	01:24	
0.270003728	235.458588	2.7580	01:25	
0.313574795	273.477478	2.9088	01:27	
0.356438332	310.872742	3.0597	01:28	
0.399779208	348.687408	3.2092	01:29	
0.444038010	387.321716	3.3608	01:31	
0.488520751	426.140228	3.5168	01:32	
0.532768461	464.756897	3.6819	01:33	
0.577265217	503.614655	3.8631	01:35	
0.621519582	542.245056	4.0621	01:36	
0.665859895	580.953613	4.3033	01:37	
0.710113789	619.615356	4.5983	01:39	
0.754387376	658.273621	4.9862	01:40	
0.798600379	696.910767	5.5222	01:42	
0.819968445	715.587280	5.8942	01:43	
0.840979418	733.953674	6.3478	01:44	
0.861614932	752.024719	6.9475	01:46	
0.882534660	770.346802	7.8003	01:48	
0.903416977	788.639221	9.0461	01:50	
0.923971895	806.648804	10.9419	01:52	
0.944223661	824.464233	14.0714	01:56	
0.962662322	840.736511	19.8616	02:01	
0.983571024	859.419434	40.0744	02:13	
0.968215493	846.175415	34.9677	02:18	
0.948414205	829.107605	23.4380	02:25	
0.918594390	803.302002	14.2092	02:33	
0.896537524	784.109741	11.2885	02:36	
0.871733272	762.478394	9.3438	02:38	
0.848036783	741.812500	8.1080	02:40	
0.825473249	722.134338	7.2867	02:42	
0.803554827	702.988586	6.6977	02:43	
0.781948333	684.142151	6.2571	02:45	
0.752704071	658.582703	5.8151	02:46	
0.708432521	619.897766	5.3389	02:48	
0.664238133	581.250244	4.9878	02:49	
0.619880805	542.456970	4.7109	02:50	
0.575518390	503.676666	4.4830	02:52	
0.531288790	464.987244	4.2889	02:53	
0.488802902	427.838318	3.6171	02:55	
0.442016996	386.903473	3.3909	02:56	
0.381795501	334.218109	3.1800	02:58	
0.355062451	310.829102	3.0846	02:59	
0.311529554	272.741791	2.9404	03:01	

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Low Pressure Dose: None

Analysis Adsorptive: N2  
Analysis Bath Temp.: -194.596 °C  
Thermal Correction: No  
Warm Free Space: 18.0703 cm<sup>3</sup> Measured  
Equilibration Interval: 5 s  
Automatic Degas: Yes

**Isotherm Tabular Report**

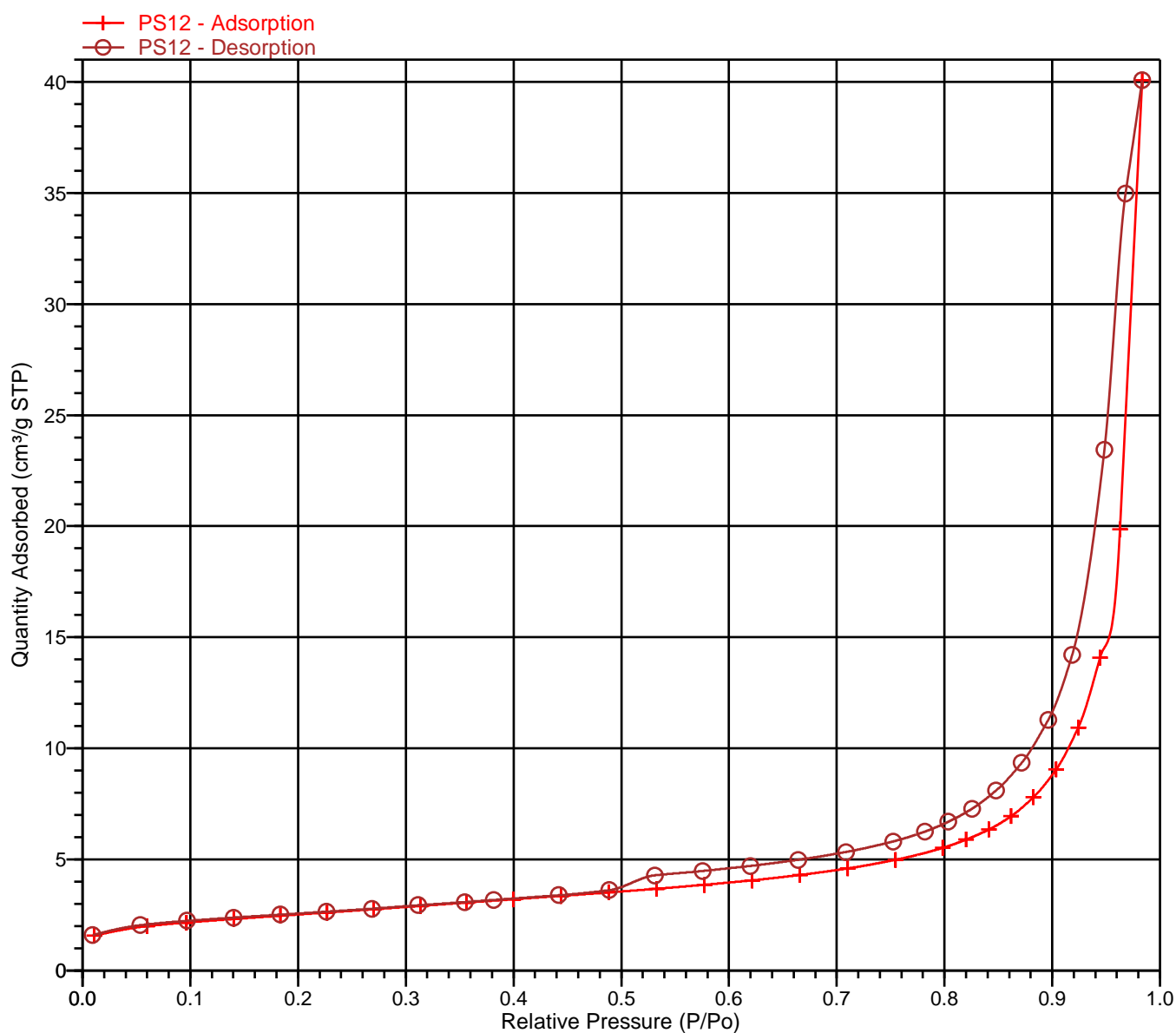
Relative Pressure (P/Po)	Absolute Pressure (mmHg)	Quantity Adsorbed (cm <sup>3</sup> /g STP)	Elapsed Time (h:min)	Saturation Pressure (mmHg)
			03:03	875.564087
0.268691424	235.256561	2.7872	03:05	
0.226477567	198.295624	2.6522	03:07	
0.183385578	160.565826	2.5205	03:09	
0.140085193	122.653564	2.3861	03:10	
0.096778230	84.735542	2.2408	03:13	
0.053433649	46.784584	2.0435	03:15	
0.009496866	8.315115	1.5919	03:20	

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Equilibration Interval: 5 s  
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### Isotherm Linear Plot

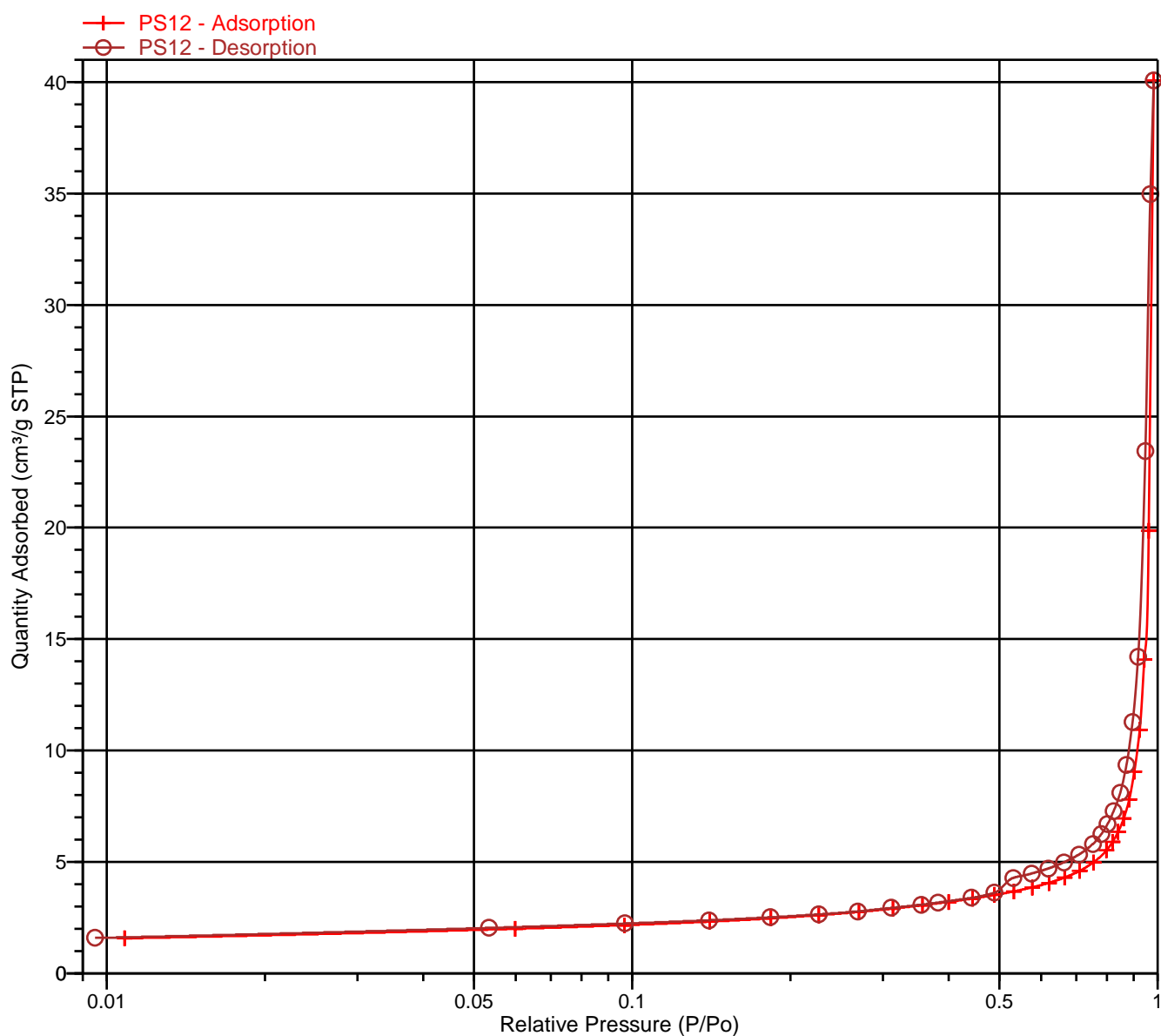


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### Isotherm Log Plot



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Equilibration Interval: 5 s  
Automatic Degas: Yes

### BET Surface Area Report

BET Surface Area: 3.9933 ± 0.4320 m<sup>2</sup>/g  
Slope: 1.306219 ± 0.099264 g/cm<sup>3</sup> STP  
Y-Intercept: -0.216100 ± 0.063687 g/cm<sup>3</sup> STP  
C: -5.044517  
Qm: 0.9173 cm<sup>3</sup>/g STP  
Correlation Coefficient: 0.9324441  
Molecular Cross-Sectional Area: 0.1620 nm<sup>2</sup>

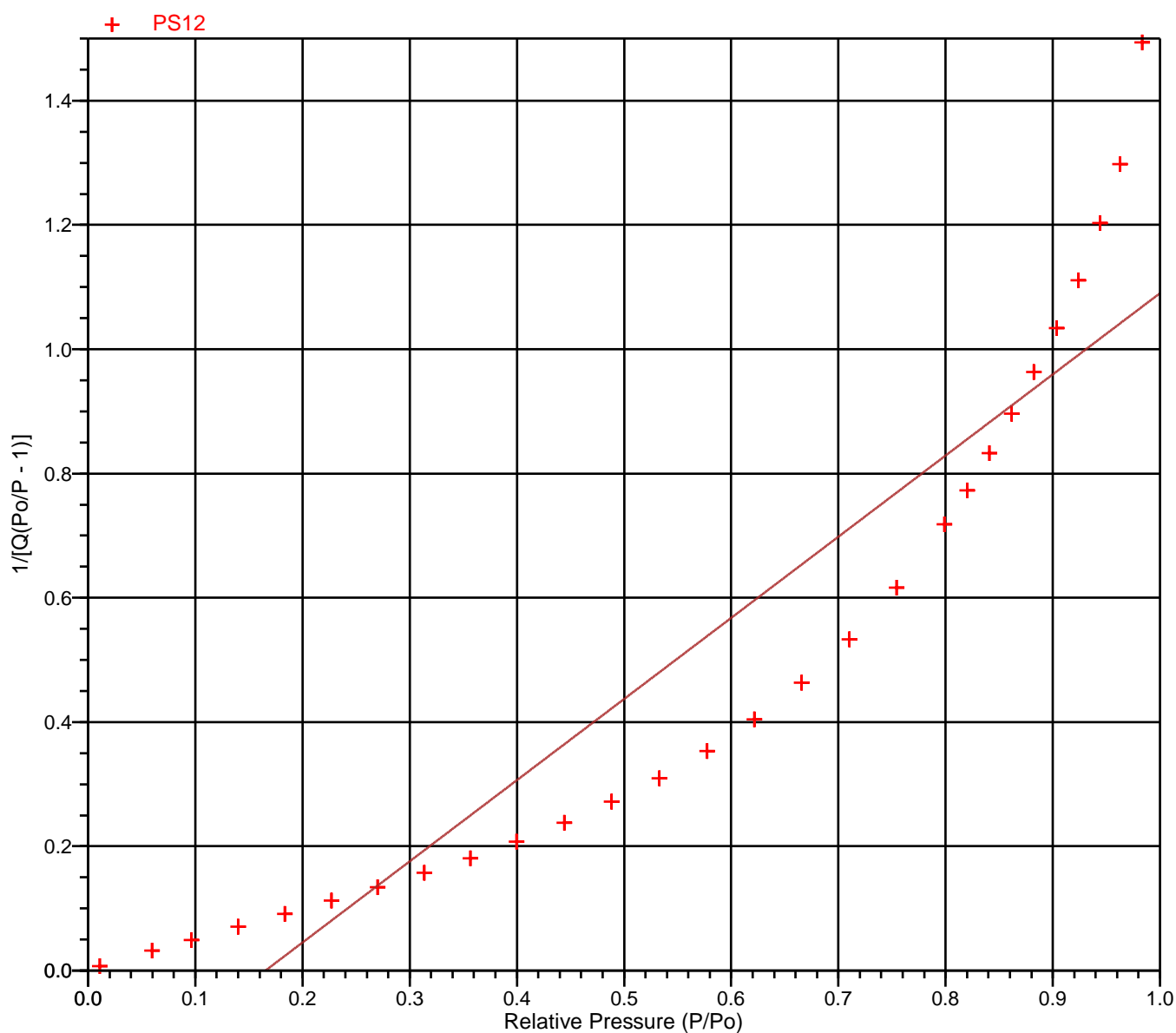
Relative Pressure (P/Po)	Quantity Adsorbed (cm <sup>3</sup> /g STP)	1/[Q(Po/P - 1)]
0.010802644	1.5722	0.006946
0.059866438	1.9997	0.031844
0.096576490	2.1638	0.049403
0.140223373	2.3217	0.070246
0.183526463	2.4682	0.091069
0.226832024	2.6127	0.112288
0.270003728	2.7580	0.134109
0.313574795	2.9088	0.157050
0.356438332	3.0597	0.181018
0.399779208	3.2092	0.207542
0.444038010	3.3608	0.237649
0.488520751	3.5168	0.271585
0.532768461	3.6819	0.309693
0.577265217	3.8631	0.353483
0.621519582	4.0621	0.404259
0.665859895	4.3033	0.463080
0.710113789	4.5983	0.532724
0.754387376	4.9862	0.615996
0.798600379	5.5222	0.718055
0.819968445	5.8942	0.772717
0.840979418	6.3478	0.833118
0.861614932	6.9475	0.896178
0.882534660	7.8003	0.963184
0.903416977	9.0461	1.034016
0.923971895	10.9419	1.110691
0.944223661	14.0714	1.203060
0.962662322	19.8616	1.298110
0.983571024	40.0744	1.493924

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### BET Surface Area Plot



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 Equilibration Interval: 5 s  
 Automatic Degas: Yes

### BJH Adsorption Pore Distribution Report

Faas Correction

Harkins and Jura

$$t = [ 13.99 / ( 0.034 - \log(P/P_0) ) ] ^{0.5}$$

Diameter Range: 17.000 Å to 3000.000 Å

Adsorbate Property Factor: 9.53000 Å

Density Conversion Factor: 0.0015468

Fraction of Pores Open at Both Ends: 0.00

Pore Diameter Range (Å)	Average Diameter (Å)	Incremental Pore Volume (cm <sup>3</sup> /g)	Cumulative Pore Volume (cm <sup>3</sup> /g)	Incremental Pore Area (m <sup>2</sup> /g)	Cumulative Pore Area (m <sup>2</sup> /g)
1187.8 - 534.5	639.0	0.034835	0.034835	2.181	2.181
534.5 - 363.3	415.7	0.010169	0.045004	0.978	3.159
363.3 - 270.0	302.3	0.005519	0.050523	0.730	3.889
270.0 - 214.8	235.7	0.003312	0.053835	0.562	4.451
214.8 - 178.1	192.7	0.002120	0.055955	0.440	4.892
178.1 - 152.1	162.9	0.001388	0.057343	0.341	5.232
152.1 - 133.0	141.2	0.000914	0.058257	0.259	5.491
133.0 - 117.9	124.5	0.000634	0.058891	0.204	5.695
117.9 - 105.7	111.1	0.000487	0.059379	0.175	5.871
105.7 - 86.9	94.2	0.000575	0.059954	0.244	6.115
86.9 - 73.5	79.0	0.000330	0.060284	0.167	6.282
73.5 - 63.5	67.7	0.000183	0.060467	0.108	6.391
63.5 - 55.7	59.0	0.000112	0.060579	0.076	6.466
55.7 - 49.4	52.1	0.000054	0.060633	0.042	6.508
49.4 - 44.1	46.4	0.000051	0.060684	0.044	6.552
44.1 - 39.7	41.6	0.000047	0.060732	0.046	6.597
39.7 - 35.9	37.5	0.000052	0.060784	0.055	6.653
35.9 - 32.5	34.0	0.000070	0.060853	0.082	6.735
32.5 - 29.6	30.9	0.000097	0.060950	0.126	6.860
29.6 - 27.0	28.1	0.000125	0.061075	0.178	7.038
27.0 - 24.5	25.6	0.000127	0.061202	0.198	7.236
24.5 - 22.3	23.3	0.000109	0.061311	0.187	7.423
22.3 - 20.1	21.1	0.000093	0.061404	0.178	7.600
20.1 - 18.0	18.9	0.000073	0.061477	0.154	7.754



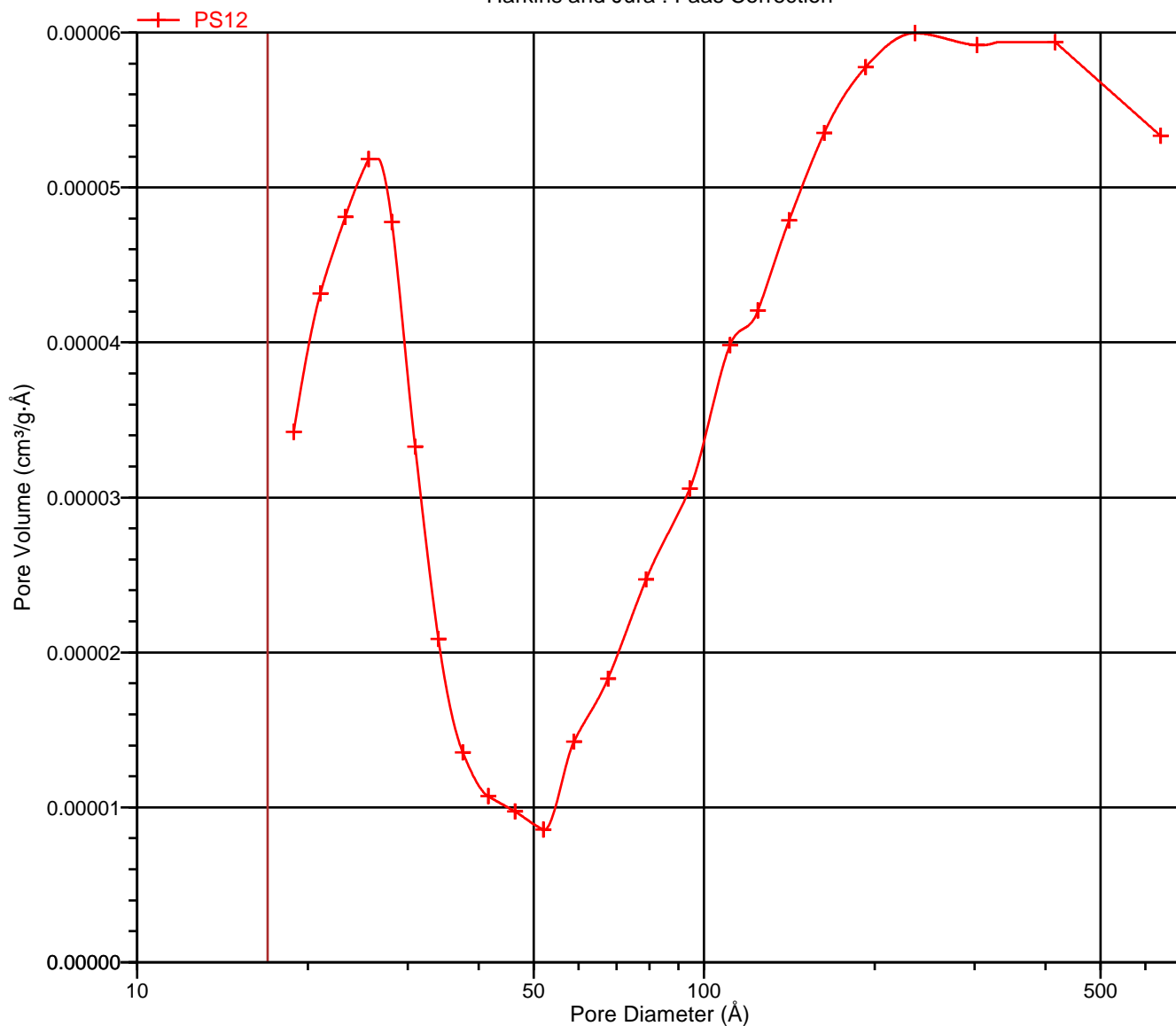
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### BJH Adsorption dV/dD Pore Volume

Harkins and Jura : Faas Correction



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Thermal Correction: No  
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Equilibration Interval: 5 s  
Automatic Degas: Yes

### BJH Desorption Pore Distribution Report

Faas Correction

Harkins and Jura

$$t = [ 13.99 / ( 0.034 - \log(P/P_0) ) ] ^{0.5}$$

Diameter Range: 17.000 Å to 3000.000 Å

Adsorbate Property Factor: 9.53000 Å

Density Conversion Factor: 0.0015468

Fraction of Pores Open at Both Ends: 0.00

Pore Diameter Range (Å)	Average Diameter (Å)	Incremental Pore Volume (cm <sup>3</sup> /g)	Cumulative Pore Volume (cm <sup>3</sup> /g)	Incremental Pore Area (m <sup>2</sup> /g)	Cumulative Pore Area (m <sup>2</sup> /g)
623.2 - 390.2	453.6	0.020479	0.020479	1.806	1.806
390.2 - 251.5	290.6	0.017025	0.037504	2.344	4.150
251.5 - 199.7	219.3	0.005305	0.042809	0.968	5.117
199.7 - 162.3	176.8	0.003443	0.046252	0.779	5.896
162.3 - 137.6	147.7	0.002104	0.048356	0.570	6.466
137.6 - 120.2	127.6	0.001314	0.049669	0.412	6.878
120.2 - 106.9	112.7	0.000870	0.050540	0.309	7.186
106.9 - 96.4	101.1	0.000585	0.051124	0.231	7.418
96.4 - 84.9	89.8	0.000493	0.051617	0.219	7.637
84.9 - 71.7	77.1	0.000393	0.052010	0.204	7.841
71.7 - 61.8	65.9	0.000187	0.052197	0.114	7.955
61.8 - 54.0	57.3	0.000077	0.052275	0.054	8.009
54.0 - 47.8	50.5	0.000015	0.052290	0.012	8.021
47.8 - 38.4	40.2	0.001526	0.053816	1.518	9.539
38.4 - 34.3	36.1	0.000064	0.053881	0.071	9.610

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### BJH Desorption dV/dD Pore Volume

Harkins and Jura : Faas Correction

