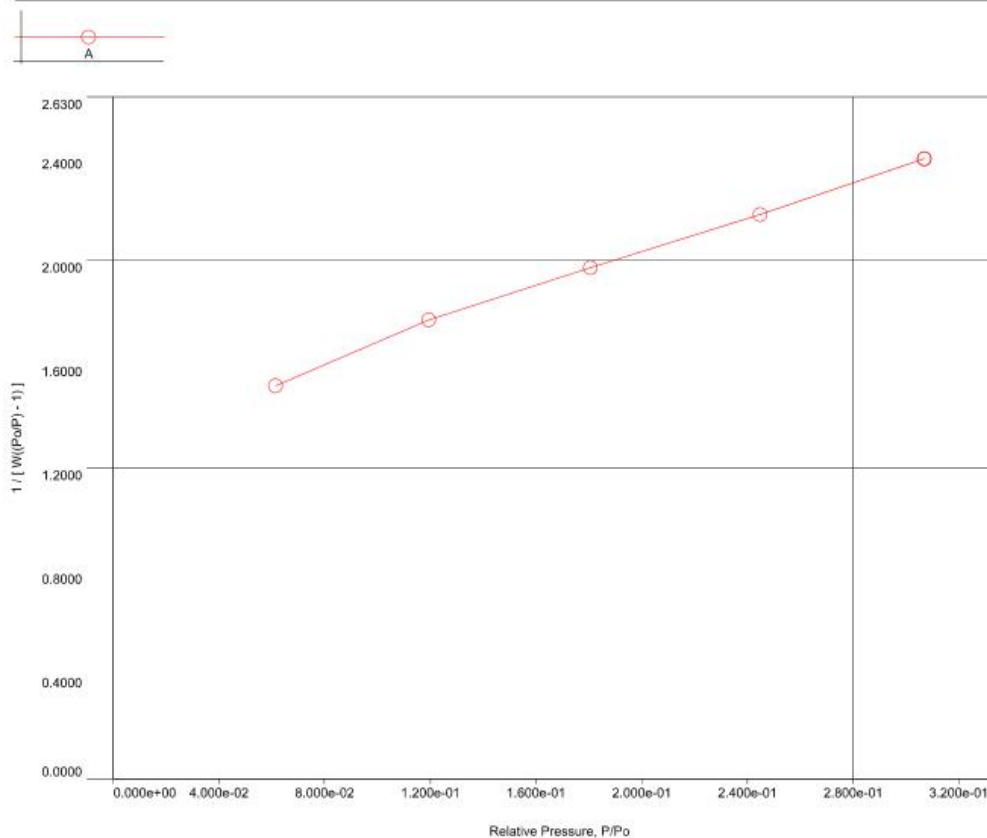


Analysis		Report	
Operator:	Abdulrahman Abdulkareem	Operator:	Abdulrahman Abdulkareem
Sample ID:	NaOH 0.5M	Filename:	NaOH 0.5M.qps
Sample Desc:		Comment:	
Sample weight:	0.15 g	Sample Volume:	1 cc
Outgas Time:	3.0 hrs	Outgas Temp:	250.0 C
Analysis gas:	Nitrogen	Bath Temp:	273.0 K
Press. Tolerance:	0.100/0.100 (ads/des)	Equil time:	60/60 sec (ads/des)
Analysis Time:	117.0 min	End of run:	2023/08/09 8:31:20
Cell ID:	3	Equil timeout:	240/240 sec (ads/des)
		Instrument:	Nova Station C

Multi-Point BET Plot

Adsorbate		Data Reduction Parameters	
Nitrogen		Temperature	77.350K
Molec. Wt.:	28.013	Cross Section:	16.200 Å²
		Liquid Density:	0.808 g/cc

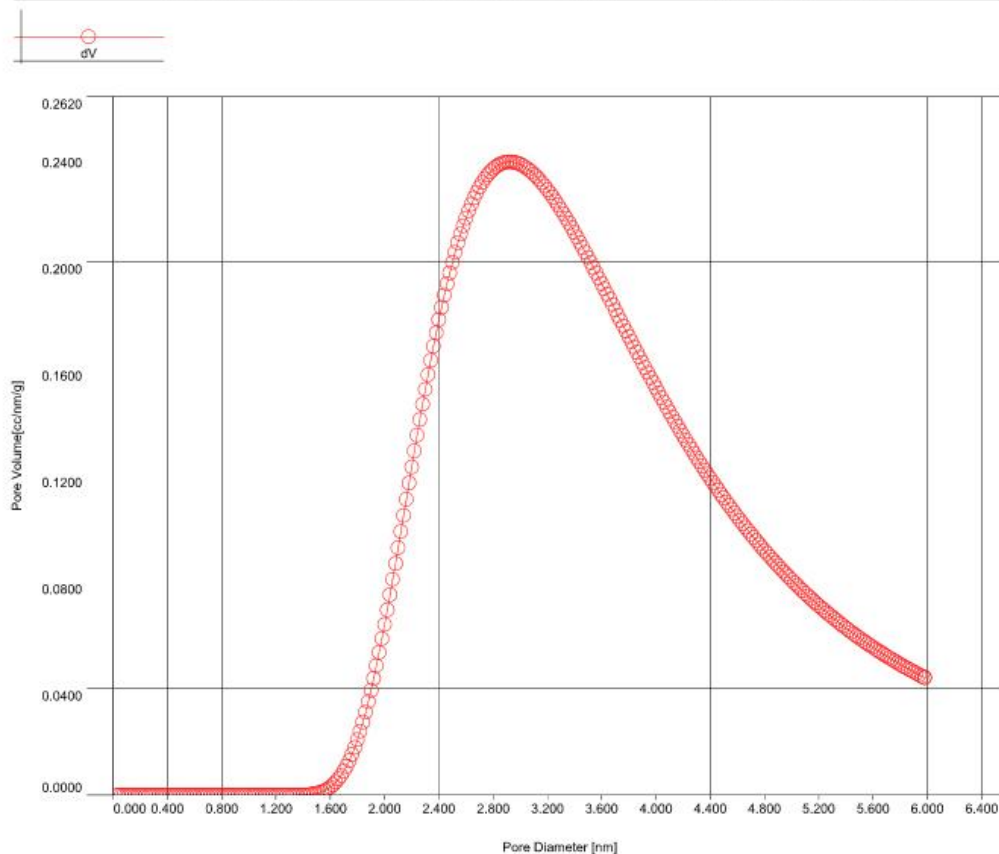


BET summary	
Slope =	3.494
Intercept =	1.327e+00
Correlation coefficient, r =	0.998243
C constant =	3.634
Surface Area =	722.489 m²/g

Analysis		Report	
Operator:	Abdulrahman Abdulkareem	Operator:	Abdulrahman Abdulkareem
Sample ID:	NaOH 0.5M	Filename:	NaOH 0.5M.qps
Sample Desc:		Comment:	
Sample weight:	0.15 g	Sample Volume:	1 cc
Outgas Time:	3.0 hrs	Outgas Temp:	250.0 C
Analysis gas:	Nitrogen	Bath Temp:	273.0 K
Press. Tolerance:	0.100/0.100 (ads/des)	Equil time:	60/60 sec (ads/des)
Analysis Time:	117.0 min	End of run:	2023/08/09 8:31:20
Cell ID:	3	Equil timeout:	240/240 sec (ads/des)
		Instrument:	Nova Station C

DA Plot

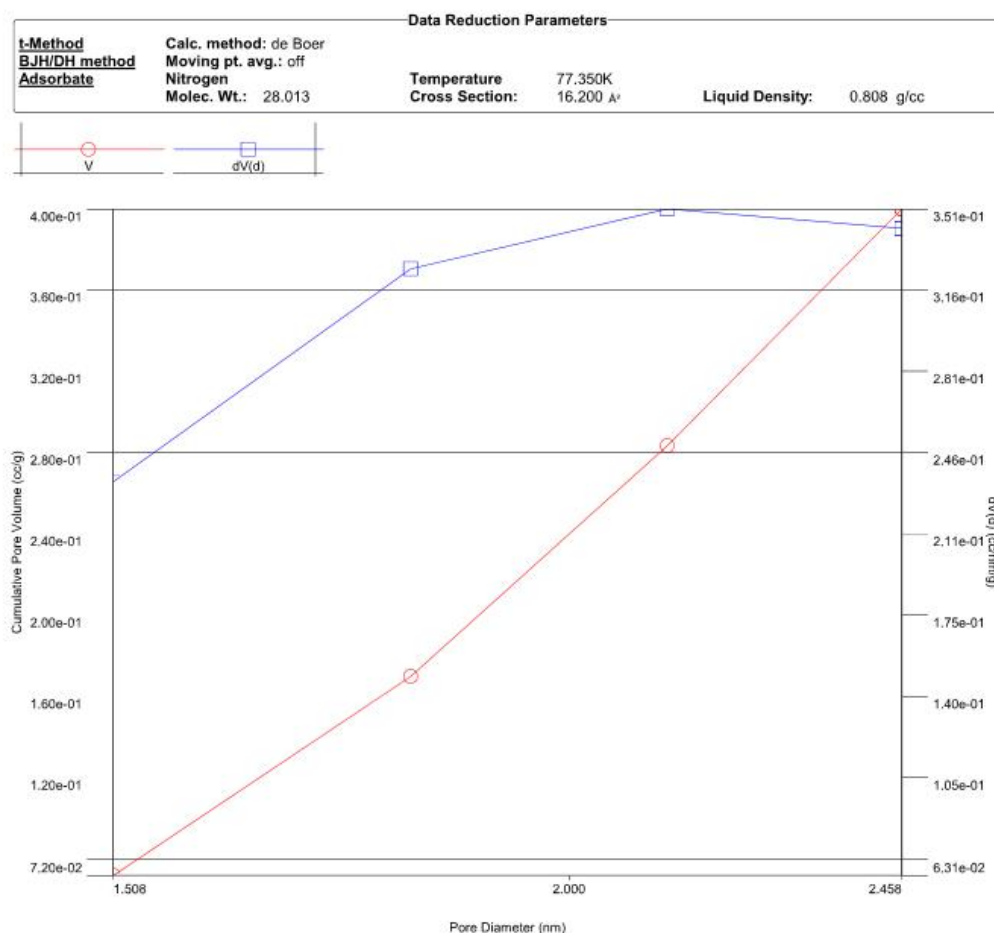
DA Method		Data Reduction Parameters	
Adsorbate	Incr. E: 500.000	Incr. n: 0.100	Interact. Const. (K): 2.960nm ² x kJ / mol
	Nitrogen	Temperature 77.350K	
	Molec. Wt.: 28.013	Cross Section: 16.200 Å ²	Liquid Density: 0.808 g/cc



DA method summary	
Best E =	0.711 kJ/mol
Best n =	1.000
DA Micropore Volume =	0.658 cc/g
Pore Diameter (mode) =	2.920e+00 nm

Analysis		Report	
Operator:	Abdulrahman Abdulkareem	Operator:	Abdulrahman Abdulkareem
Sample ID:	NaOH 0.5M	Filename:	NaOH 0.5M.qps
Sample Desc:		Comment:	
Sample weight:	0.15 g	Sample Volume:	1 cc
Outgas Time:	3.0 hrs	Outgas Temp:	250.0 C
Analysis gas:	Nitrogen	Bath Temp:	273.0 K
Press. Tolerance:	0.100/0.100 (ads/des)	Equil time:	60/60 sec (ads/des)
Analysis Time:	117.0 min	End of run:	2023/08/09 8:31:20
Cell ID:	3	Equil timeout:	240/240 sec (ads/des)
		Instrument:	Nova Station C

BJH method Adsorption dV(d)



BJH adsorption summary	
Surface Area =	809.741 m ² /g
Pore Volume =	0.400 cc/g
Pore Diameter Dv(d) =	2.126 nm

Analysis		Report	
Operator:	Abdulrahman Abdulkareem	Operator:	Abdulrahman Abdulkareem
Sample ID:	NaOH 0.5M	Filename:	NaOH 0.5M.qps
Sample Desc:		Comment:	
Sample weight:	0.15 g	Sample Volume:	1 cc
Outgas Time:	3.0 hrs	Outgas Temp:	250.0 C
Analysis gas:	Nitrogen	Bath Temp:	273.0 K
Press. Tolerance:	0.100/0.100 (ads/des)	Equil time:	60/60 sec (ads/des)
Analysis Time:	117.0 min	End of run:	2023/08/09 8:31:20
Cell ID:	3	Equil timeout:	240/240 sec (ads/des)
		Instrument:	Nova Station C

Multi-Point BET

Data Reduction Parameters Data

Adsorbate	Nitrogen	Temperature	77.350K	Liquid Density:	0.808 g/cc
	Molec. Wt.: 28.013	Cross Section:	16.200 Å²		

Multi-Point BET Data

Relative Pressure [P/Po]	Volume @ STP [cc/g]	1 / [W((Po/P) - 1)]	Relative Pressure [P/Po]	Volume @ STP [cc/g]	1 / [W((Po/P) - 1)]
6.13860e-02	34.5300	1.5154e+00	2.44862e-01	119.2378	2.1759e+00
1.19437e-01	61.3101	1.7701e+00	3.07016e-01	148.2633	2.3909e+00
1.80663e-01	89.4957	1.9713e+00			

BET summary

Slope = 3.494
 Intercept = 1.327e+00
 Correlation coefficient, r = 0.998243
 C constant = 3.634
 Surface Area = 722.489 m²/g



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Analysis		Report	
Operator:	Abdulrahman Abdulkareem	Operator:	Abdulrahman Abdulkareem
Sample ID:	NaOH 0.5M	Filename:	NaOH 0.5M.qps
Sample Desc:		Comment:	
Sample weight:	0.15 g	Sample Volume:	1 cc
Outgas Time:	3.0 hrs	Outgas Temp:	250.0 C
Analysis gas:	Nitrogen	Bath Temp:	273.0 K
Press. Tolerance:	0.100/0.100 (ads/des)	Equil time:	60/60 sec (ads/des)
Analysis Time:	117.0 min	End of run:	2023/08/09 8:31:20
Cell ID:	3	Equil timeout:	240/240 sec (ads/des)
		Instrument:	Nova Station C

Langmuir

Data Reduction Parameters Data

Adsorbate	Nitrogen	Temperature	77.350K	Liquid Density:	0.808 g/cc
	Molec. Wt.: 28.013	Cross Section:	16.200 Å²		

Langmuir Data

P/Po	P/Po/W [(g/g)]	P/Po	P/Po/W [(g/g)]
6.13860e-02	1.4224e+00	2.44862e-01	1.6431e+00
1.19437e-01	1.5587e+00	3.07016e-01	1.6568e+00
1.80663e-01	1.6152e+00		

Langmuir summary

Slope = 0.89027
Intercept = 1.41660
Correlation coefficient, r = 0.910
Surface Area = 3911.758 m²/g



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Analysis		Report	
Operator:	Abdulrahman Abdulkareem	Operator:	Abdulrahman Abdulkareem
Sample ID:	NaOH 0.5M	Filename:	NaOH 0.5M.qps
Sample Desc:		Comment:	
Sample weight:	0.15 g	Sample Volume:	1 cc
Outgas Time:	3.0 hrs	Outgas Temp:	250.0 C
Analysis gas:	Nitrogen	Bath Temp:	273.0 K
Press. Tolerance:	0.100/0.100 (ads/des)	Equil time:	60/60 sec (ads/des)
Analysis Time:	117.0 min	End of run:	2023/08/09 8:31:20
Cell ID:	3	Equil timeout:	240/240 sec (ads/des)
		Instrument:	Nova Station C

Isotherm

Data Reduction Parameters Data

Adsorbate	Nitrogen	Temperature	77.350K	
	Molec. Wt.: 28.013	Cross Section:	16.200 Å²	Liquid Density: 0.808 g/cc

Isotherm Data

Relative Pressure	Volume @ STP [cc/g]	Relative Pressure	Volume @ STP [cc/g]	Relative Pressure	Volume @ STP [cc/g]
6.13860e-02	34.5300	1.80663e-01	89.4957	3.07016e-01	148.2633
1.19437e-01	61.3101	2.44862e-01	119.2378		

Analysis		Report	
Operator:	Abdulrahman Abdulkareem	Operator:	Abdulrahman Abdulkareem
Sample ID:	NaOH 0.5M	Filename:	NaOH 0.5M.qps
Sample Desc:		Comment:	
Sample weight:	0.15 g	Sample Volume:	1 cc
Outgas Time:	3.0 hrs	Outgas Temp:	250.0 C
Analysis gas:	Nitrogen	Bath Temp:	273.0 K
Press. Tolerance:	0.100/0.100 (ads/des)	Equil time:	60/60 sec (ads/des)
Analysis Time:	117.0 min	End of run:	2023/08/09 8:31:20
Cell ID:	3	Equil timeout:	240/240 sec (ads/des)
		Instrument:	Nova Station C

DR method

Data Reduction Parameters Data

DR method	Affinity coefficient (B): 0.3300	Temperature	77.350K	Liquid Density:	0.808 g/cc
Adsorbate	Nitrogen	Cross Section:	16.200 Å²	SuperCritic. K.:	1.000
	Molec. Wt.: 28.013	Critical Press.:	33.500 atm		
Adsorbent	Carbon				
	DR. Exp (n): 2.000				

DR method Data

Log2(P/Po)	Weight Adsorbed [(g)]	Log2(P/Po)	Weight Adsorbed [(g)]
1.468776e+00	6.4735e-03	3.734171e-01	2.2354e-02
8.516726e-01	1.1494e-02	2.630038e-01	2.7796e-02
5.522434e-01	1.6778e-02		

DR method summary

Slope = -5.131e-01
 Intercept = 3.452e-02
 Correlation Coefficient = 0.9901
 Average Pore width = 6.296nm
 Adsorption energy = 4.130 kJ/mol
 Micropore volume = 0.285 cc/g
 Micropore surface area = 801.390 m²/g

Analysis
Operator: Abdulrahman Abdulkareem **Date:** 2023/08/09
Sample ID: NaOH 0.5M **Filename:** NaOH 0.5M.qps
Report
Operator: Abdulrahman Abdulkareem **Date:** 2023/08/09
NaOH 0.5M.qps

DA Method Micropore Analysis Data continued

Diameter	dV(d)	Diameter	dV(d)
[nm]	[cc/nm/g]	[nm]	[cc/nm/g]
4.66000e+00	1.00383e-01	5.34000e+00	6.50118e-02
4.68000e+00	9.90939e-02	5.36000e+00	6.42033e-02
4.70000e+00	9.78212e-02	5.38000e+00	6.34061e-02
4.72000e+00	9.65650e-02	5.40000e+00	6.26201e-02
4.74000e+00	9.53254e-02	5.42000e+00	6.18450e-02
4.76000e+00	9.41021e-02	5.44000e+00	6.10808e-02
4.78000e+00	9.28949e-02	5.46000e+00	6.03273e-02
4.80000e+00	9.17038e-02	5.48000e+00	5.95842e-02
4.82000e+00	9.05286e-02	5.50000e+00	5.88516e-02
4.84000e+00	8.93691e-02	5.52000e+00	5.81292e-02
4.86000e+00	8.82251e-02	5.54000e+00	5.74169e-02
4.88000e+00	8.70966e-02	5.56000e+00	5.67146e-02
4.90000e+00	8.59833e-02	5.58000e+00	5.60220e-02
4.92000e+00	8.48851e-02	5.60000e+00	5.53391e-02
4.94000e+00	8.38018e-02	5.62000e+00	5.46658e-02
4.96000e+00	8.27333e-02	5.64000e+00	5.40018e-02
4.98000e+00	8.16793e-02	5.66000e+00	5.33471e-02
5.00000e+00	8.06398e-02	5.68000e+00	5.27015e-02
5.02000e+00	7.96145e-02	5.70000e+00	5.20649e-02
5.04000e+00	7.86033e-02	5.72000e+00	5.14371e-02
5.06000e+00	7.76060e-02	5.74000e+00	5.08181e-02
5.08000e+00	7.66225e-02	5.76000e+00	5.02077e-02
5.10000e+00	7.56526e-02	5.78000e+00	4.96057e-02
5.12000e+00	7.46960e-02	5.80000e+00	4.90121e-02
5.14000e+00	7.37527e-02	5.82000e+00	4.84267e-02
5.16000e+00	7.28225e-02	5.84000e+00	4.78494e-02
5.18000e+00	7.19052e-02	5.86000e+00	4.72802e-02
5.20000e+00	7.10006e-02	5.88000e+00	4.67187e-02
5.22000e+00	7.01087e-02	5.90000e+00	4.61651e-02
5.24000e+00	6.92291e-02	5.92000e+00	4.56191e-02
5.26000e+00	6.83618e-02	5.94000e+00	4.50805e-02
5.28000e+00	6.75065e-02	5.96000e+00	4.45495e-02
5.30000e+00	6.66632e-02	5.98000e+00	4.40257e-02
5.32000e+00	6.58317e-02		

DA method summary

Best E = 0.711 kJ/mol
 Best n = 1.000
 DA Micropore Volume = 0.658 cc/g
 Pore Diameter (mode) = 2.920e+00 nm

Analysis
Operator: Abdulrahman Abdulkareem Date: 2023/08/09
Sample ID: NaOH 0.5M
Sample Desc:
Sample weight: 0.15 g
Outgas Time: 3.0 hrs
Analysis gas: Nitrogen
Press. Tolerance: 0.100/0.100 (ads/des)
Analysis Time: 117.0 min
Cell ID: 3

Report
Operator: Abdulrahman Abdulkareem Date: 2023/08/09
Sample ID: NaOH 0.5M.qps
Sample Volume: 1 cc
Outgas Temp: 250.0 C
Bath Temp: 273.0 K
Equil time: 60/60 sec (ads/des)
End of run: 2023/08/09 8:31:20
Equil timeout: 240/240 sec (ads/des)
Instrument: Nova Station C

DFT method Pore Size Distribution

Data Reduction Parameters Data

DFT method	Calc. Model: N2 at 77 K on carbon (slit pore, NLDFT equilibrium model)	Moving pt. avg: off
Adsorbate	Rel. press. range: 0.0000 - 1.0000	
	Nitrogen	Temperature 77.350K
	Molec. Wt.: 28.013	Cross Section: 16.200 Å²
		Liquid Density: 0.808 g/cc

DFT method Pore Size Distribution Data

Pore width [nm]	Cumulative Pore Volume [cc/g]	Cumulative Surface Area [m²/g]	dV(d) [cc/nm/g]	dS(d) [m²/nm/g]
1.7656	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
1.8469	5.6898e-03	6.1614e+00	7.0012e-02	7.5816e+01
1.9319	1.9985e-02	2.0961e+01	1.6817e-01	1.7409e+02
2.0208	3.1933e-02	3.2785e+01	1.3436e-01	1.3297e+02
2.1138	3.2722e-02	3.3532e+01	8.4856e-03	8.0286e+00
2.2111	4.7906e-02	4.7266e+01	1.5606e-01	1.4116e+02
2.3129	7.6958e-02	7.2387e+01	2.8545e-01	2.4683e+02
2.4194	1.0300e-01	9.3917e+01	2.4464e-01	2.0223e+02
2.5307	1.3534e-01	1.1947e+02	2.9040e-01	2.2950e+02
2.6472	1.7474e-01	1.4924e+02	3.3820e-01	2.5551e+02
2.7691	2.1269e-01	1.7665e+02	3.1150e-01	2.2499e+02

DFT method summary

Pore volume = 0.213 cc/g
Surface area = 176.651 m²/g
Lower confidence limit = 1.766 nm
Fitting error = 2.653 %
Pore width (Mode) = 2.647 nm
Moving point average : off



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Analysis		Report	
Operator:	Abdulrahman Abdulkareem	Operator:	Abdulrahman Abdulkareem
Sample ID:	NaOH 0.5M	Filename:	NaOH 0.5M.qps
Sample Desc:		Comment:	
Sample weight:	0.15 g	Sample Volume:	1 cc
Outgas Time:	3.0 hrs	Outgas Temp:	250.0 C
Analysis gas:	Nitrogen	Bath Temp:	273.0 K
Press. Tolerance:	0.100/0.100 (ads/des)	Equil time:	60/60 sec (ads/des)
Analysis Time:	117.0 min	End of run:	2023/08/08 8:31:20
Cell ID:	3	Equil timeout:	240/240 sec (ads/des)
		Instrument:	Nova Station C

Area-Volume Summary

Data Reduction Parameters Data

t-Method	Thermal Transpiration: on	Eff. mol. diameter (D): 3.54 Å	Eff. cell stem diam. (d): 4.0000 mm
BJH/DH method	Calc. method: de Boer		
DR method	Moving pt. avg.: off		
HK method	Affinity coefficient (B): 0.3300		
SF method	Tabulated data interval: 1		
DFT method	Tabulated data interval: 1		
	Calc. Model: N2 at 77 K on carbon (slit pore, NLDFT equilibrium model)		
	Rel. press. range: 0.0000 - 1.0000		
Adsorbate	Nitrogen	Temperature	77.350K
	Molec. Wt.: 28.013	Cross Section:	16.200 Å²
	Critical Temp.: 126.200 K	Critical Press.:	33.500 atm
Adsorbent	Carbon		
	DR. Exp (n): 2.000		

Surface Area Data

SinglePoint BET.....	4.472e+02 m²/g
MultiPoint BET.....	7.225e+02 m²/g
Langmuir surface area.....	3.912e+03 m²/g
BJH method cumulative adsorption surface area.....	8.097e+02 m²/g
DH method cumulative adsorption surface area.....	8.594e+02 m²/g
t-method external surface area.....	7.225e+02 m²/g
DR method micropore area.....	8.014e+02 m²/g
DFT cumulative surface area.....	1.767e+02 m²/g

Pore Volume Data

BJH method cumulative adsorption pore volume.....	3.998e-01 cc/g
DH method cumulative adsorption pore volume.....	4.081e-01 cc/g
DR method micropore volume.....	2.848e-01 cc/g
HK method micropore volume.....	1.183e-01 cc/g
SF method micropore volume.....	2.541e-02 cc/g
DFT method cumulative pore volume.....	2.127e-01 cc/g

Pore Size Data

BJH method adsorption pore Diameter (Mode Dv(d)).....	2.126e+00 nm
DH method adsorption pore Diameter (Mode Dv(d)).....	2.126e+00 nm
DR method micropore Pore width.....	6.296e+00 nm
DA method pore Diameter (Mode).....	2.920e+00 nm
HK method pore Diameter (Mode).....	1.847e+00 nm
SF method pore Diameter (Mode).....	3.423e+00 nm
DFT pore Diameter (Mode).....	2.647e+00 nm