**Pyrolysis of oil sludge from the offshore petroleum industry: influence of different mesoporous zeolites catalysts to obtain paraffinic products**

Jônatas V. Milato1\*, Rodrigo José França1 and Mônica R. C. Marques1

1Chemistry Institute, State University of Rio de Janeiro (UERJ), Rio de Janeiro, 20550-900, Brazil.

**\***Correspondence: [jonatasmilato@gmail.com](mailto:jonatasmilato@gmail.com); Tel.: +55 21 9 9929-3676

**APPENDIX B. Nitrogen ad/desorption date**

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| Sample: | CBV 720 |  |  |
| Started: | 22/3/2018 9:18:42 | Analysis Adsorptive: | N2 |
| Completed: | 22/3/2018 18:12:48 | Analysis Bath Temp.: | -194.980 °C |
| Report Time: | 20/7/2018 17:29:24 | Thermal Correction: | No |
| Sample Mass: | 0.2636 g | Warm Free Space: | 17.1524 cm³ Measured |
| Cold Free Space: | 52.4007 cm³ | Equilibration Interval: | 10 s |
| Low Pressure Dose: | None | Automatic Degas: | Yes |

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| Summary Report |  |
| Surface Area |  |
| Single point surface area at P/Po = 0.326327828: | 790.2165 m²/g |
| BET Surface Area: | 785.3294 m²/g |
| Langmuir Surface Area: | 1065.4841 m²/g |
| BJH Adsorption cumulative surface area of pores |  |
| between 17.000 Å and 3000.000 Å diameter: | 102.637 m²/g |
| BJH Desorption cumulative surface area of pores |  |
| between 17.000 Å and 3000.000 Å diameter: | 146.8384 m²/g |

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| BET Surface Area Report |  |
| BET Surface Area: | 785.3294 ± 41.5733 m²/g |
| Slope: | 0.005655 ± 0.000287 g/cm³ STP |
| Y-Intercept: | -0.000112 ± 0.000061 g/cm³ STP |
| C: | -49.386584 |
| Qm: | 180.4028 cm³/g STP |
| Correlation Coefficient: | 0.9961598 |
| Molecular Cross-Sectional Area: | 0.1620 nm² |
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|  |  |
| Relative Pressure (P/Po) | Quantity Adsorbed (cm³/g STP) |
| 0,048237 | 238,8578 |
| 0,117209 | 250,9719 |
| 0,200636 | 259,9858 |
| 0,254914 | 264,8119 |
| 0,326328 | 269,4567 |

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| BET Surface Area Plot |  |
| CBV 720 |  |
| Relative Pressure (P/Po) | 1/[Q(Po/P - 1)] |
| 0,048237 | 0,000212 |
| 0,117209 | 0,000529 |
| 0,200636 | 0,000965 |
| 0,254914 | 0,001292 |
| 0,326328 | 0,001798 |

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| Langmuir Surface Area Report |  |
| Langmuir Surface Area: | 1065.4841 ± 6.3480 m²/g |
| Slope: | 0.004086 ± 0.000024 g/cm³ STP |
| Y-Intercept: | 0.004581 ± 0.000669 mmHg·g/cm³ STP |
| b: | 0.891827 1/mmHg |
| Qm: | 244.7589 cm³/g STP |
| Correlation Coefficient: | 0.999947 |
| Molecular Cross-Sectional Area: | 0.1620 nm² |
| Pressure (mmHg) | Quantity Adsorbed (cm³/g STP) |
| 8,030784 | 218,4438 |
| 17,15042 | 228,3 |
| 24,71269 | 232,899 |
| 34,28329 | 236,8394 |
| 40,38773 | 238,8578 |
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| Langmuir Surface Area Plot |  |
| CBV 720 |  |
| Pressure (mmHg) | P/Q (mmHg·g/cm³ STP) |
| 8,030784 | 0,036764 |
| 17,15042 | 0,075122 |
| 24,71269 | 0,106109 |
| 34,28329 | 0,144753 |
| 40,38773 | 0,169087 |

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| BJH Adsorption Pore Distribution Report | | | | | |
| Faas Correction | | | | | |
| Halsey | | | | | |
| t = 3.54 [ -5 / ln(P/Po) ] ^ 0.333 | | | | | |
| 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 (cm³/g)** | **Cumulative Pore Volume (cm³/g)** | **Incremental Pore Area (m²/g)** | **Cumulative Pore Area (m²/g)** |
| 2209.6 - 1678.3 | 1871,48 | 0,008761 | 0,008761 | 0,187252 | 0,187252 |
| 1678.3 - 1130.5 | 1299,388 | 0,008026 | 0,016787 | 0,247069 | 0,434321 |
| 1130.5 - 837.8 | 940,4335 | 0,005571 | 0,022358 | 0,236937 | 0,671258 |
| 837.8 - 717.3 | 767,9993 | 0,003253 | 0,025611 | 0,169438 | 0,840697 |
| 717.3 - 525.1 | 591,1176 | 0,005495 | 0,031106 | 0,371837 | 1,212534 |
| 525.1 - 416.1 | 457,5525 | 0,005222 | 0,036327 | 0,456492 | 1,669026 |
| 416.1 - 298.1 | 337,0768 | 0,015345 | 0,051673 | 1,820973 | 3,489999 |
| 298.1 - 219.3 | 246,176 | 0,026681 | 0,078354 | 4,33528 | 7,825279 |
| 219.3 - 168.7 | 187,0111 | 0,024752 | 0,103105 | 5,294189 | 13,11947 |
| 168.7 - 135.4 | 148,1386 | 0,015811 | 0,118916 | 4,269221 | 17,38869 |
| 135.4 - 107.6 | 118,024 | 0,013708 | 0,132625 | 4,645917 | 22,03461 |
| 107.6 - 81.2 | 90,26547 | 0,017678 | 0,150303 | 7,833784 | 29,86839 |
| 81.2 - 60.2 | 67,13643 | 0,018551 | 0,168853 | 11,05259 | 40,92098 |
| 60.2 - 46.2 | 51,04639 | 0,013812 | 0,182665 | 10,8228 | 51,74378 |
| 46.2 - 36.9 | 40,28815 | 0,010995 | 0,19366 | 10,91594 | 62,65972 |
| 36.9 - 31.0 | 33,3193 | 0,009383 | 0,203043 | 11,2649 | 73,92462 |
| 31.0 - 24.8 | 27,04709 | 0,019415 | 0,222458 | 28,7126 | 102,6372 |

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| BJH Adsorption Cumulative Pore Volume |  |
| Halsey : Faas Correction |  |
| CBV 720 |  |
| Pore Diameter (Å) | Pore Volume (cm³/g) |
| 1678,323 | 0,008761 |
| 1130,497 | 0,016787 |
| 837,8136 | 0,022358 |
| 717,3446 | 0,025611 |
| 525,1044 | 0,031106 |
| 416,0591 | 0,036327 |
| 298,0525 | 0,051673 |
| 219,2883 | 0,078354 |
| 168,7418 | 0,103105 |
| 135,4444 | 0,118916 |
| 107,6124 | 0,132625 |
| 81,15902 | 0,150303 |
| 60,18761 | 0,168853 |
| 46,22684 | 0,182665 |
| 36,91008 | 0,19366 |
| 31,02688 | 0,203043 |
| 24,84896 | 0,222458 |

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| BJH Adsorption dV/dlog(D) Pore Volume | |
| Halsey : Faas Correction | |
| CBV 720 | |
| Pore Diameter (Å) | dV/dlog(D) Pore Volume (cm³/g·Å) |
| 1871,48 | 0,073349 |
| 1299,388 | 0,04677 |
| 940,4335 | 0,042811 |
| 767,9993 | 0,048253 |
| 591,1176 | 0,040559 |
| 457,5525 | 0,051654 |
| 337,0768 | 0,10593 |
| 246,176 | 0,200192 |
| 187,0111 | 0,217516 |
| 148,1386 | 0,165626 |
| 118,024 | 0,137221 |
| 90,26547 | 0,14428 |
| 67,13643 | 0,142886 |
| 51,04639 | 0,120507 |
| 40,28815 | 0,112477 |
| 33,3193 | 0,124438 |

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| BJH Desorption Cumulative Pore Volume |  |
| Halsey : Faas Correction | |
| CBV 720 |  |
| Pore Diameter (Å) | **Pore Volume (cm³/g)** |
| 1124,552 | 0,006887 |
| 806,036 | 0,013283 |
| 606,7459 | 0,021463 |
| 519,7737 | 0,023931 |
| 377,1502 | 0,03052 |
| 331,1002 | 0,032454 |
| 287,2683 | 0,036082 |
| 224,6061 | 0,044098 |
| 163,5915 | 0,068869 |
| 124,0509 | 0,096866 |
| 101,9771 | 0,110289 |
| 79,10147 | 0,12454 |
| 60,94375 | 0,136081 |
| 46,8418 | 0,145751 |
| 36,85882 | 0,210736 |
| 29,42164 | 0,223722 |
| 24,18769 | 0,238958 |



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| BJH Desorption dV/dlog(D) Pore Volume | |
| Halsey : Faas Correction |  |
| CBV 720 |  |
| Pore Diameter (Å) | dV/dlog(D) Pore Volume (cm³/g·Å) |
| 1342,881 | 0,023479 |
| 912,7639 | 0,04422 |
| 677,8977 | 0,066323 |
| 556,3134 | 0,036732 |
| 425,3416 | 0,047297 |
| 350,9766 | 0,034191 |
| 305,9032 | 0,058826 |
| 247,8656 | 0,075014 |
| 183,9908 | 0,179943 |
| 137,9537 | 0,232998 |
| 110,62 | 0,157733 |
| 87,30034 | 0,129186 |
| 67,32433 | 0,101894 |
| 51,71899 | 0,084606 |
| 40,3956 | 0,624303 |
| 32,0825 | 0,132683 |
| 26,12991 | 0,179091 |

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| Sample: | CBV 760 |  |  |
| Started: | 22/3/2018 18:27:43 | Analysis Adsorptive: | N2 |
| Completed: | 23/3/2018 4:04:09 | Analysis Bath Temp.: | -194.965 °C |
| Report Time: | 20/7/2018 17:32:41 | Thermal Correction: | No |
| Sample Mass: | 0.2875 g | Warm Free Space: | 16.9546 cm³ Measured |
| Cold Free Space: | 51.9020 cm³ | Equilibration Interval: | 10 s |
| Low Pressure Dose: | None | Automatic Degas: | Yes |

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| Summary Report |  |
| Surface Area |  |
| Single point surface area at P/Po = 0.329742166: | 787.3485 m²/g |
| BET Surface Area: | 783.2473 m²/g |
| Langmuir Surface Area: | 1058.4009 m²/g |
| BJH Adsorption cumulative surface area of pores |  |
| between 17.000 Å and 3000.000 Å diameter: | 109.696 m²/g |
| BJH Desorption cumulative surface area of pores |  |
| between 17.000 Å and 3000.000 Å diameter: | 151.4649 m²/g |

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| BET Surface Area Report | | |
| BET Surface Area: | 783.2473 ± 41.7217 m²/g |  |
| Slope: | 0.005670 ± 0.000289 g/cm³ STP |  |
| Y-Intercept: | -0.000112 ± 0.000062 g/cm³ STP |  |
| C: | -49.669686 |  |
| Qm: | 179.9245 cm³/g STP |  |
| Correlation Coefficient: | 0.9961129 |  |
| Molecular Cross-Sectional Area: | 0.1620 nm² |  |
| Relative Pressure (P/Po) | **Quantity Adsorbed (cm³/g STP)** | **1/[Q(Po/P - 1)]** |
| 0,048403 | **236,428** | **0,000215** |
| 0,11731 | **249,5707** | **0,000533** |
| 0,20051 | **259,2232** | **0,000967** |
| 0,255173 | **264,5538** | **0,001295** |
| 0,329742 | **269,8464** | **0,001823** |

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| BET Surface Area Plot |  |
| CBV 760 |  |
| Relative Pressure (P/Po) | **1/[Q(Po/P - 1)]** |
| 0,048403 | **0,000215** |
| 0,11731 | 0,000533 |
| 0,20051 | 0,000967 |
| 0,255173 | 0,001295 |
| 0,329742 | 0,001823 |

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| Langmuir Surface Area Report | | |
| Langmuir Surface Area: | 1058.4009 ± 6.5613 m²/g |  |
| Slope:  0.004113 ± 0.000025 g/cm³ STP | | |
| Y-Intercept: | 0.005283 ± 0.000715 mmHg·g/cm³ STP |  |
| b: | 0.778588 1/mmHg |  |
| Qm: | 243.1318 cm³/g STP |  |
| Correlation Coefficient: | 0.999942 |  |
| Molecular Cross-Sectional Area: | 0.1620 nm² |  |
| Pressure (mmHg) | **Quantity Adsorbed (cm³/g STP)** | **P/Q (mmHg·g/cm³ STP)** |
| 8,091829 | 213,4092 | 0,037917 |
| 16,81377 | 224,4775 | 0,074902 |
| 26,06838 | 230,3544 | 0,113166 |
| 35,38392 | 234,5187 | 0,150879 |
| 40,63381 | 236,428 | 0,171865 |

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| Langmuir Surface Area Plot | |
| CBV 760 |  |
| Pressure (mmHg) | **P/Q (mmHg·g/cm³ STP)** |
| 8,091829 | 0,037917 |
| 16,81377 | 0,074902 |
| 26,06838 | 0,113166 |
| 35,38392 | 0,150879 |
| 40,63381 | 0,171865 |

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| BJH Adsorption Pore Distribution Report | | | | | |
| Faas Correction | | | | | |
| Halsey |  |  |  |  |  |
| t = 3.54 [ -5 / ln(P/Po) ] ^ 0.333 | | | | | |
| 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 (cm³/g) | Cumulative Pore Volume (cm³/g) | Incremental Pore Area (m²/g) | Cumulative Pore Area (m²/g) |
| 2673.2 - 1968.0 | 2214,253 | 0,008704 | 0,008704 | 0,157227 | 0,157227 |
| 1968.0 - 1351.4 | 1546,984 | 0,009165 | 0,017869 | 0,236987 | 0,394214 |
| 1351.4 - 937.0 | 1069,849 | 0,010872 | 0,028741 | 0,406476 | 0,80069 |
| 937.0 - 862.8 | 896,7805 | 0,00291 | 0,031651 | 0,129801 | 0,930491 |
| 862.8 - 648.3 | 724,7797 | 0,006936 | 0,038587 | 0,382789 | 1,31328 |
| 648.3 - 478.8 | 537,6352 | 0,007414 | 0,046001 | 0,551607 | 1,864887 |
| 478.8 - 341.8 | 386,9457 | 0,016185 | 0,062185 | 1,67307 | 3,537956 |
| 341.8 - 277.6 | 302,7285 | 0,019305 | 0,08149 | 2,550757 | 6,088713 |
| 277.6 - 215.9 | 238,615 | 0,022358 | 0,103848 | 3,74796 | 9,836673 |
| 215.9 - 169.1 | 186,4063 | 0,019407 | 0,123255 | 4,164455 | 14,00113 |
| 169.1 - 136.7 | 149,1648 | 0,011884 | 0,135139 | 3,186805 | 17,18793 |
| 136.7 - 108.2 | 118,8185 | 0,012331 | 0,14747 | 4,151138 | 21,33907 |
| 108.2 - 81.0 | 90,30469 | 0,018979 | 0,166448 | 8,40643 | 29,7455 |
| 81.0 - 60.1 | 67,01297 | 0,020663 | 0,187112 | 12,33402 | 42,07952 |
| 60.1 - 46.3 | 51,05474 | 0,01511 | 0,202222 | 11,83856 | 53,91808 |
| 46.3 - 36.8 | 40,23521 | 0,012063 | 0,214285 | 11,99247 | 65,91055 |
| 36.8 - 31.3 | 33,45663 | 0,009681 | 0,223967 | 11,57485 | 77,4854 |
| 31.3 - 24.9 | 27,10966 | 0,02183 | 0,245797 | 32,21064 | 109,696 |

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| BJH Adsorption Cumulative Pore Volume |  |
| Halsey : Faas Correction |  |
| CBV 760 |  |
| Pore Diameter (Å) | Pore Volume (cm³/g) |
| 1967,957 | 0,008704 |
| 1351,441 | 0,017869 |
| 937,0188 | 0,028741 |
| 862,8306 | 0,031651 |
| 648,3378 | 0,038587 |
| 478,7707 | 0,046001 |
| 341,7598 | 0,062185 |
| 277,6294 | 0,08149 |
| 215,8761 | 0,103848 |
| 169,0769 | 0,123255 |
| 136,6976 | 0,135139 |
| 108,2159 | 0,14747 |
| 81,04895 | 0,166448 |
| 60,06855 | 0,187112 |
| 46,26909 | 0,202222 |
| 36,82968 | 0,214285 |
| 31,25016 | 0,223967 |
| 24,86206 | 0,245797 |

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| BJH Adsorption dV/dlog(D) Pore Volume | |
| Halsey : Faas Correction |  |
| CBV 760 |  |
| Pore Diameter (Å) | **dV/dlog(D) Pore Volume (cm³/g·Å)** |
| 2214,253 | 0,065434 |
| 1546,984 | 0,056154 |
| 1069,849 | 0,068355 |
| 896,7805 | 0,081235 |
| 724,7797 | 0,055879 |
| 537,6352 | 0,056306 |
| 386,9457 | 0,110546 |
| 302,7285 | 0,213889 |
| 238,615 | 0,204629 |
| 186,4063 | 0,182877 |
| 149,1648 | 0,128721 |
| 118,8185 | 0,121522 |
| 90,30469 | 0,15117 |
| 67,01297 | 0,158827 |
| 51,05474 | 0,1333 |
| 40,23521 | 0,121734 |
| 33,45663 | 0,135697 |
| 27,10966 | 0,21981 |

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| BJH Desorption Pore Distribution Report | | | | | |
| Faas Correction | | | | | |
| Halsey |  |  |  |  |  |
| t = 3.54 [ -5 / ln(P/Po) ] ^ 0.333 | | | | | |
| 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 (cm³/g)** | **Cumulative Pore Volume (cm³/g)** | **Incremental Pore Area (m²/g)** | **Cumulative Pore Area (m²/g)** |
| 2673.2 - 1410.0 | 1680,049 | 0,006947 | 0,006947 | 0,16539 | 0,16539 |
| 1410.0 - 1105.0 | 1220,224 | 0,007043 | 0,01399 | 0,230878 | 0,396267 |
| 1105.0 - 861.8 | 952,98 | 0,008012 | 0,022002 | 0,336288 | 0,732556 |
| 861.8 - 752.5 | 799,5627 | 0,00413 | 0,026132 | 0,206636 | 0,939191 |
| 752.5 - 610.8 | 666,5842 | 0,006029 | 0,032161 | 0,361758 | 1,30095 |
| 610.8 - 447.0 | 503,1125 | 0,007734 | 0,039895 | 0,61493 | 1,91588 |
| 447.0 - 370.8 | 401,4685 | 0,004695 | 0,04459 | 0,46779 | 2,38367 |
| 370.8 - 292.0 | 321,656 | 0,00729 | 0,05188 | 0,90655 | 3,290219 |
| 292.0 - 209.4 | 236,5373 | 0,023364 | 0,075244 | 3,950927 | 7,241147 |
| 209.4 - 162.0 | 179,2316 | 0,025693 | 0,100936 | 5,733986 | 12,97513 |
| 162.0 - 123.0 | 136,7096 | 0,02046 | 0,121396 | 5,986324 | 18,96146 |
| 123.0 - 103.9 | 111,6614 | 0,008959 | 0,130355 | 3,209273 | 22,17073 |
| 103.9 - 78.0 | 86,83955 | 0,012148 | 0,142503 | 5,595677 | 27,76641 |
| 78.0 - 61.3 | 67,3065 | 0,009335 | 0,151838 | 5,547857 | 33,31426 |
| 61.3 - 46.6 | 51,5969 | 0,00999 | 0,161828 | 7,744591 | 41,05885 |
| 46.6 - 37.1 | 40,50439 | 0,066271 | 0,228099 | 65,4457 | 106,5045 |
| 37.1 - 29.3 | 32,05355 | 0,015527 | 0,243626 | 19,37597 | 125,8805 |
| 29.3 - 24.3 | 26,20933 | 0,016764 | 0,260389 | 25,58435 | 151,4649 |

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| BJH Desorption Cumulative Pore Volume |  |
| Halsey : Faas Correction |  |
| CBV 760 |  |
| Pore Diameter (Å) | Pore Volume (cm³/g) |
| 1410,007 | 0,006947 |
| 1105,024 | 0,01399 |
| 861,8016 | 0,022002 |
| 752,5225 | 0,026132 |
| 610,8179 | 0,032161 |
| 446,9811 | 0,039895 |
| 370,7529 | 0,04459 |
| 292,0456 | 0,05188 |
| 209,3549 | 0,075244 |
| 161,9972 | 0,100936 |
| 122,9702 | 0,121396 |
| 103,9168 | 0,130355 |
| 77,99261 | 0,142503 |
| 61,252 | 0,151838 |
| 46,61346 | 0,161828 |
| 37,06378 | 0,228099 |
| 29,32527 | 0,243626 |
| 24,32569 | 0,260389 |

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| BJH Desorption dV/dlog(D) Pore Volume |  |
| Halsey : Faas Correction |  |
| CBV 760 |  |
| Pore Diameter (Å) | dV/dlog(D) Pore Volume (cm³/g·Å) |
| 1680,049 | 0,025005 |
| 1220,224 | 0,066538 |
| 952,98 | 0,074209 |
| 799,5627 | 0,070141 |
| 666,5842 | 0,066535 |
| 503,1125 | 0,057029 |
| 401,4685 | 0,057818 |
| 321,656 | 0,070343 |
| 236,5373 | 0,16161 |
| 179,2316 | 0,230686 |
| 136,7096 | 0,170914 |
| 111,6614 | 0,122532 |
| 86,83955 | 0,097472 |
| 67,3065 | 0,088963 |
| 51,5969 | 0,084226 |
| 40,50439 | 0,665628 |
| 32,05355 | 0,15266 |
| 26,20933 | 0,206508 |

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| Sample: | CBV 780 |  |  |
| Started: | 23/3/2018 9:04:49 | Analysis Adsorptive: | N2 |
| Completed: | 23/3/2018 17:10:35 | Analysis Bath Temp.: | -194.979 °C |
| Report Time: | 20/7/2018 17:31:18 | Thermal Correction: | No |
| Sample Mass: | 0.2287 g | Warm Free Space: | 17.0606 cm³ Measured |
| Cold Free Space: | 51.7690 cm³ | Equilibration Interval: | 10 s |
| Low Pressure Dose: | None | Automatic Degas: | Yes |

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| --- | --- |
| Summary Report |  |
| Surface Area |  |
| Single point surface area at P/Po = 0.322502317: | 760.7308 m²/g |
| BET Surface Area: | 756.9313 m²/g |
| Langmuir Surface Area: | 980.7630 m²/g |
| BJH Adsorption cumulative surface area of pores |  |
| between 17.000 Å and 3000.000 Å diameter: | 132.696 m²/g |
| BJH Desorption cumulative surface area of pores |  |
| between 17.000 Å and 3000.000 Å diameter: | 178.6197 m²/g |

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| BET Surface Area Report |  |  |
|  |  |  |
| BET Surface Area: | 756.9313 ± 33.9826 m²/g |  |
| Slope:  0.005846 ± 0.000253 g/cm³ STP | |  |
| Y-Intercept:  -0.000095 ± 0.000053 g/cm³ STP | |  |
| C: | -60.432655 |  |
| Qm: | 173.8793 cm³/g STP |  |
| Correlation Coefficient: | 0.9972094 |  |
| Molecular Cross-Sectional Area: | 0.1620 nm² |  |
| Relative Pressure (P/Po) | **Quantity Adsorbed (cm³/g STP)** | **1/[Q(Po/P - 1)]** |
| 0,048507512 | **217,9412** | **0,000234** |
| 0,112783577 | **232,165** | **0,000548** |
| 0,191571109 | **243,4229** | **0,000973** |
| 0,253682082 | **250,8181** | **0,001355** |
| 0,322502317 | **257,9376** | **0,001845** |

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| BET Surface Area Plot |  |
| CBV 780 |  |
| Relative Pressure (P/Po) | 1/[Q(Po/P - 1)] |
| 0,048508 | 0,000234 |
| 0,112784 | 0,000548 |
| 0,191571 | 0,000973 |
| 0,253682 | 0,001355 |
| 0,322502 | 0,001845 |

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| Langmuir Surface Area Report | | | |
| Langmuir Surface Area: | 980.7630 ± 8.3912 m²/g |  |  |
| Slope: | 0.004439 ± 0.000038 g/cm³ STP |  |  |
| Y-Intercept: | 0.006895 ± 0.001041 mmHg·g/cm³ STP |  |  |
| b: | 0.643715 1/mmHg |  |  |
| Qm: | 225.2971 cm³/g STP |  |  |
| Correlation Coefficient: | 0.999890 |  |  |
| Molecular Cross-Sectional Area: | 0.1620 nm² |  |  |
| Pressure (mmHg) | **Quantity Adsorbed (cm³/g STP)** | **P/Q (mmHg·g/cm³ STP)** |  |
| 7,968141 | 193,1074 | 0,041263 |  |
| 16,95282 | 204,666 | 0,082832 |  |
| 24,29384 | 210,0732 | 0,115645 |  |
| 33,85766 | 215,1791 | 0,157346 |  |
| 40,81854 | 217,9412 | 0,187292 |  |

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| --- | --- |
| Langmuir Surface Area Plot |  |
| CBV 780 |  |
| Pressure (mmHg) | P/Q (mmHg·g/cm³ STP) |
| 7,968141 | 0,041263 |
| 16,95282 | 0,082832 |
| 24,29384 | 0,115645 |
| 33,85766 | 0,157346 |
| 40,81854 | 0,187292 |

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| BJH Adsorption Pore Distribution Report | | | | | |
| Faas Correction | | | | | |
| Halsey |  |  |  |  |  |
| t = 3.54 [ -5 / ln(P/Po) ] ^ 0.333 | | | | | |
| 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 (cm³/g) | Cumulative Pore Volume (cm³/g) | Incremental Pore Area (m²/g) | Cumulative Pore Area (m²/g) |
| 1634.0 - 1107.7 | 1271,361 | 0,01093 | 0,01093 | 0,343872 | 0,343872 |
| 1107.7 - 873.3 | 962,4247 | 0,005329 | 0,016259 | 0,221482 | 0,565354 |
| 873.3 - 825.7 | 848,1618 | 0,001832 | 0,018091 | 0,086408 | 0,651762 |
| 825.7 - 711.2 | 759,7116 | 0,003837 | 0,021927 | 0,202005 | 0,853767 |
| 711.2 - 491.3 | 560,9372 | 0,007859 | 0,029787 | 0,560434 | 1,414202 |
| 491.3 - 333.3 | 381,75 | 0,013198 | 0,042984 | 1,382844 | 2,797046 |
| 333.3 - 231.4 | 263,47 | 0,028893 | 0,071877 | 4,386464 | 7,18351 |
| 231.4 - 174.7 | 194,6545 | 0,025788 | 0,097665 | 5,299335 | 12,48285 |
| 174.7 - 138.4 | 152,0238 | 0,015887 | 0,113552 | 4,180078 | 16,66292 |
| 138.4 - 109.0 | 119,8785 | 0,013212 | 0,126764 | 4,408472 | 21,0714 |
| 109.0 - 82.5 | 91,68446 | 0,016119 | 0,142883 | 7,03244 | 28,10384 |
| 82.5 - 60.5 | 67,67489 | 0,018037 | 0,160921 | 10,66127 | 38,7651 |
| 60.5 - 46.1 | 50,9792 | 0,01546 | 0,17638 | 12,13027 | 50,89537 |
| 46.1 - 37.2 | 40,48023 | 0,012084 | 0,188464 | 11,94017 | 62,83554 |
| 37.2 - 31.3 | 33,585 | 0,012374 | 0,200838 | 14,7375 | 77,57304 |
| 31.3 - 24.8 | 27,05346 | 0,037282 | 0,23812 | 55,12338 | 132,6964 |

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| BJH Adsorption Cumulative Pore Volume |  |
| Halsey : Faas Correction |  |
| CBV 780 |  |
| Pore Diameter (Å) | Pore Volume (cm³/g) |
| 1107,656 | 0,01093 |
| 873,3453 | 0,016259 |
| 825,7283 | 0,018091 |
| 711,2225 | 0,021927 |
| 491,3105 | 0,029787 |
| 333,3094 | 0,042984 |
| 231,4092 | 0,071877 |
| 174,6737 | 0,097665 |
| 138,4404 | 0,113552 |
| 109 | 0,126764 |
| 82,50999 | 0,142883 |
| 60,50826 | 0,160921 |
| 46,06193 | 0,17638 |
| 37,21038 | 0,188464 |
| 31,27077 | 0,200838 |
| 24,78689 | 0,23812 |
|  |  |

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| BJH Adsorption dV/dlog(D) Pore Volume | |
| Halsey : Faas Correction |  |
| CBV 780 |  |
| Pore Diameter (Å) | dV/dlog(D) Pore Volume (cm³/g·Å) |
| 1271,361 | 0,064727 |
| 962,4247 | 0,051628 |
| 848,1618 | 0,075248 |
| 759,7116 | 0,059179 |
| 560,9372 | 0,048921 |
| 381,75 | 0,07832 |
| 263,47 | 0,182326 |
| 194,6545 | 0,211116 |
| 152,0238 | 0,15735 |
| 119,8785 | 0,127239 |
| 91,68446 | 0,133304 |
| 67,67489 | 0,133917 |
| 50,9792 | 0,130493 |
| 40,48023 | 0,130382 |
| 33,585 | 0,163838 |
| 27,05346 | 0,369433 |

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| BJH Desorption Pore Distribution Report | | | | | |
| Faas Correction |  |  |  |  |  |
| Halsey |  |  |  |  |  |
| t = 3.54 [ -5 / ln(P/Po) ] ^ 0.333 | | | | | |
| 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 (cm³/g)** | **Cumulative Pore Volume (cm³/g)** | **Incremental Pore Area (m²/g)** | **Cumulative Pore Area (m²/g)** |
| 1634.0 - 926.8 | 1095,353 | 0,005938 | 0,005938 | 0,216854 | 0,216854 |
| 926.8 - 651.3 | 740,9299 | 0,007507 | 0,013445 | 0,405281 | 0,622135 |
| 651.3 - 466.0 | 527,6147 | 0,008123 | 0,021568 | 0,615815 | 1,23795 |
| 466.0 - 425.7 | 443,944 | 0,002041 | 0,02361 | 0,183921 | 1,421871 |
| 425.7 - 332.9 | 367,5462 | 0,00539 | 0,029 | 0,586624 | 2,008495 |
| 332.9 - 270.7 | 295,0656 | 0,005811 | 0,034811 | 0,787779 | 2,796274 |
| 270.7 - 216.3 | 237,0511 | 0,010279 | 0,04509 | 1,734515 | 4,53079 |
| 216.3 - 169.7 | 186,9641 | 0,019981 | 0,065071 | 4,274812 | 8,805601 |
| 169.7 - 126.5 | 141,3163 | 0,02833 | 0,093401 | 8,018925 | 16,82453 |
| 126.5 - 101.8 | 111,2069 | 0,015513 | 0,108914 | 5,579896 | 22,40442 |
| 101.8 - 76.8 | 85,43231 | 0,014142 | 0,123056 | 6,621245 | 29,02567 |
| 76.8 - 57.6 | 64,0439 | 0,011209 | 0,134265 | 7,000686 | 36,02635 |
| 57.6 - 46.6 | 50,70483 | 0,007786 | 0,14205 | 6,141969 | 42,16832 |
| 46.6 - 35.5 | 39,20983 | 0,062692 | 0,204742 | 63,95491 | 106,1232 |
| 35.5 - 29.2 | 31,52976 | 0,016729 | 0,221471 | 21,22335 | 127,3466 |
| 29.2 - 23.9 | 25,84394 | 0,033127 | 0,254599 | 51,27313 | 178,6197 |

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| BJH Desorption Cumulative Pore Volume |  |
| Halsey : Faas Correction |  |
| CBV 780 |  |
| Pore Diameter (Å) | Pore Volume (cm³/g) |
| 926,787 | 0,005938 |
| 651,2756 | 0,013445 |
| 466,0444 | 0,021568 |
| 425,6682 | 0,02361 |
| 332,9279 | 0,029 |
| 270,6853 | 0,034811 |
| 216,276 | 0,04509 |
| 169,6653 | 0,065071 |
| 126,4919 | 0,093401 |
| 101,8217 | 0,108914 |
| 76,84257 | 0,123056 |
| 57,57102 | 0,134265 |
| 46,59848 | 0,14205 |
| 35,48368 | 0,204742 |
| 29,15922 | 0,221471 |
| 23,90459 | 0,254599 |
|  |  |

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| BJH Desorption dV/dlog(D) Pore Volume |  |
| Halsey : Faas Correction |  |
| CBV 780 |  |
| Pore Diameter (Å) | dV/dlog(D) Pore Volume (cm³/g·Å) |
| 1095,353 | 0,024112 |
| 740,9299 | 0,048997 |
| 527,6147 | 0,055889 |
| 443,944 | 0,051867 |
| 367,5462 | 0,050508 |
| 295,0656 | 0,064651 |
| 237,0511 | 0,105475 |
| 186,9641 | 0,189545 |
| 141,3163 | 0,222144 |
| 111,2069 | 0,164644 |
| 85,43231 | 0,115689 |
| 64,0439 | 0,089386 |
| 50,70483 | 0,084782 |
| 39,20983 | 0,529744 |
| 31,52976 | 0,19623 |
| 25,84394 | 0,383888 |