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APPENDICES

Appendix A Calibration of Volume Spaces

Run	P1 average(psia)	P2 average(psia)
1	136.5600	103.1605
2	143.5498	108.6550
3	140.4390	106.2290
4	141.1720	106.6490
5	141.4360	106.8650
6	141.7361	107.3760
7	141.2080	106.6970
8	140.9800	106.5890

Table A-1. Average pressure of raw data without adding known volume

Run	P1 average(psia)	P2 average(psia)
1	141.4420	117.9080
2	141.3690	117.8180
3	141.1590	117.6860
4	141.1060	117.7160

Table A-2. Average pressure of raw data with adding known volume

Beattie-Bridgeman Equation of State and mass balance around the system were used to calculate volume of manifold and sample cylinder.

	Run (with adding known volume)			
Run without adding known volume	1	2	3	4
1	165.034	165.435	164.854	163.859
2	168.688	169.107	168.500	167.460
3	167.415	167.828	167.230	166.206
4	165.179	165.580	164.998	164.001
5	165.456	165.859	165.275	164.275
6	170.278	170.705	170.087	169.027
7	165.523	165.927	165.342	164.341
8	166.593	167.002	166.410	165.395

Table A-3. Calculated volume of manifold of each run

	Run (with adding known volume)			
Run without adding known volume	1	2	3	4
1	53.168	53.297	53.110	52.789
2	53.894	54.027	53.834	53.501
3	53.641	53.773	53.582	53.253
4	53.197	53.326	53.139	52.817
5	53.252	53.382	53.194	52.872
6	54.209	54.345	54.148	53.811
7	53.265	53.395	53.207	52.885
8	53.478	53.609	53.419	53.093

Table A-4. Calculated volume of sample cylinder of each run

Appendix B Collection Data of MWNTs

P1avg (psia)	141.0939	241.3100	340.3430	441.3880	551.4100	637.4669	739.7364
P2avg (psia) 5 min	104.6536	180.2151	254.6840	330.7094	413.0721	477.5472	553.9694
P2avg (psia) 10 min	104.7390	180.0500	254.6046	330.6240	412.9376	477.3333	553.8535
P2avg (psia) 20 min	104.7146	180.1723	254.5436	330.4288	412.6384	477.1318	553.6644
P2avg (psia) 30 min	104.5865	180.3006	254.4641	330.3922	412.5164	476.9366	553.5180
P2avg (psia) 60 min	104.5072	180.1357	254.2257	329.9343	412.2358	476.1183	552.5593
P2avg (psia) 90 min	104.6170	179.7324	254.1036	329.4152	411.7049	475.6668	551.8695
P2avg (psia) 120 min	104.6353	179.6592	253.7193	329.2749	411.1002	475.1482	551.0271

Table B-1. Average pressure of raw data of 2 g MWNT method 1

P1avg (psia)	141.0993	240.8864	341.430	441.1584	541.3946	639.2556	737.9795
P in sample cylinder (psia)	0.0000	104.4693	204.1735	304.493	392.7474	494.3426	592.712
P2avg (psia) 5 min	104.6536	207.5654	307.7484	407.4006	504.5865	603.2188	697.1811
P2avg (psia) 10 min	104.7390	207.4189	307.6751	407.2725	504.5987	602.9866	697.120
P2avg (psia) 20 min	104.7146	207.3274	307.6142	407.0956	504.1894	602.5776	696.4666
P2avg (psia) 30 min	104.5865	207.4433	307.4433	407.0589	503.9328	602.2116	695.9844
P2avg (psia) 60 min	104.5072	207.2542	307.1016	406.5274	503.1638	601.3200	694.916
P2avg (psia) 90 min	104.6170	207.4433	306.6434	406.0759	502.4800	600.4958	693.9757
P2avg (psia) 120 min	104.6353	206.9918	306.5701	405.5872	501.7166	599.409	692.9011

Table B-2. Average pressure of raw data of 2 g MWNT method 2

P1avg (psia)	P in sample cylinder (psia)	P2avg (psia) 5 min	P2avg (psia) 10 min	P2avg (psia) 20 min	P2avg (psia) 30 min	P2avg (psia) 60 min	P2avg (psia) 90 min	P2avg (psia) 120 min
140.853	0.0000	105.477	105.428	105.349	105.434	105.346	105.464	105.269
240.517	104.650	208.255	208.292	208.188	208.225	208.036	207.980	207.705
341.640	200.392	307.895	307.797	307.711	307.589	307.160	307.089	306.612
441.178	302.590	408.048	407.974	407.791	407.547	407.093	406.588	405.972
541.195	401.095	507.242	507.193	506.887	506.863	506.193	505.574	504.763
641.333	475.742	601.246	601.039	600.770	600.434	599.257	598.212	597.364
739.070	581.855	700.953	700.709	700.318	700.056	699.011	697.608	696.460
841.400	685.980	803.200	802.962	802.412	801.869	800.278	798.548	797.089
941.351	783.158	902.040	901.784	901.265	900.660	898.728	897.028	895.385
1042.32	880.876	1002.15	1001.86	1001.24	1000.57	998.632	996.558	994.189

Table B-3. Average pressure of raw data of 7 g MWNT method 2

Appendix C Collection Data of AC

P1avg(psia)	P2avg(psia) 5 min	P2avg(psia) 10 min	P2avg(psia) 30 min	P2avg(psia) 60 min	P2avg(psia) 90 min
140.775	100.905	100.755	100.611	100.514	100.569
241.106	174.317	174.421	174.451	174.287	174.275
340.971	248.020	248.088	247.793	247.523	247.341
440.877	321.845	321.743	321.585	321.319	321.074
540.799	395.766	395.791	395.448	394.761	394.644
640.510	469.547	469.406	468.715	468.215	467.764
741.044	544.059	543.874	543.389	542.738	541.767
843.063	619.644	619.361	618.782	617.719	616.911
940.841	691.66	691.423	690.800	689.594	688.593
1041.553	766.947	766.728	765.901	764.803	763.478

Table C-1 Average pressure of raw data of 22 g AC method 1

Appendix D Collection Data of Blank Test

P1 avg(psia)	141.135	240.763	341.310	440.883	541.376	641.339	741.664	841.021	940.072	1039385
P2 avg(psia) 5 min	104.189	179.281	254.781	328.896	404.354	478.884	553.548	627.125	700.544	774.525
P2 avg(psia) 10 min	104.164	179.226	254.732	328.957	404.275	478.805	553.347	626.979	700.434	774.213
P2 avg(psia) 20 min	104.158	179.067	254.690	329.067	404.103	478.578	553.066	626.613	699.940	773.615
P2 avg(psia) 30 min	104.073	179.036	254.714	328.774	403.938	478.249	552.559	626.283	699.616	773.041
P2 avg(psia) 60 min	103.908	178.841	254.237	328.310	403.218	477.418	551.838	625.257	698.163	771.521
P2 avg(psia) 90 min	103.853	178.4933	254.012	327.925	402.638	476.716	550.911	624.268	696.863	768.725
P2 avg(psia) 120 min	103.676	178.328	253.609	327.559	402.034	476.038	550.196	623.230	695.733	765.727
P2 avg(psia) 180 min	103.579	177.980	253.493	326.723	400.947	474.708	548.218	621.240	693.261	765.727
P2 avg(psia) 240 min	103.487	177.553	252.797	326.142	399.928	473.322	546.625	619.000	691.014	762.797
P2 avg(psia) 300 min	103.188	-	252.382	325.465	398.707	471.845	545.019	616.918	688.786	760.190

Table D-1 Average pressure of blank test method 1

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