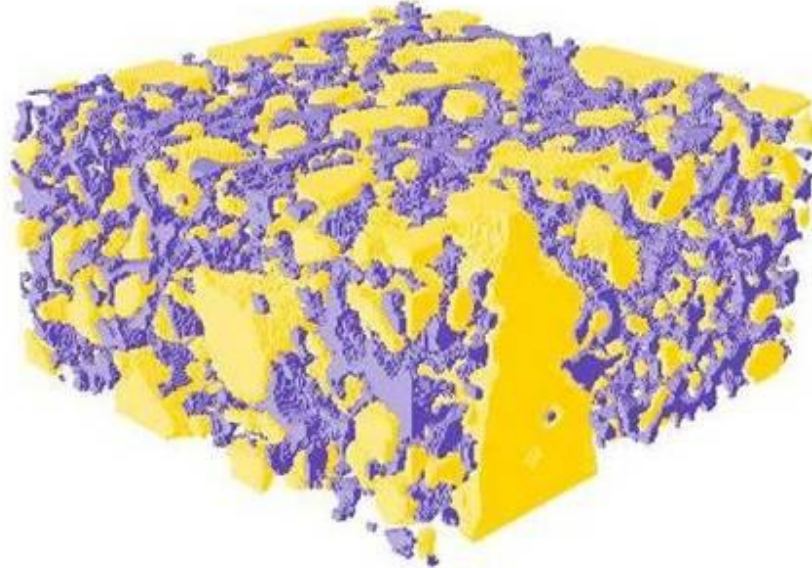




- **Nanocapillary**

MIS 375233



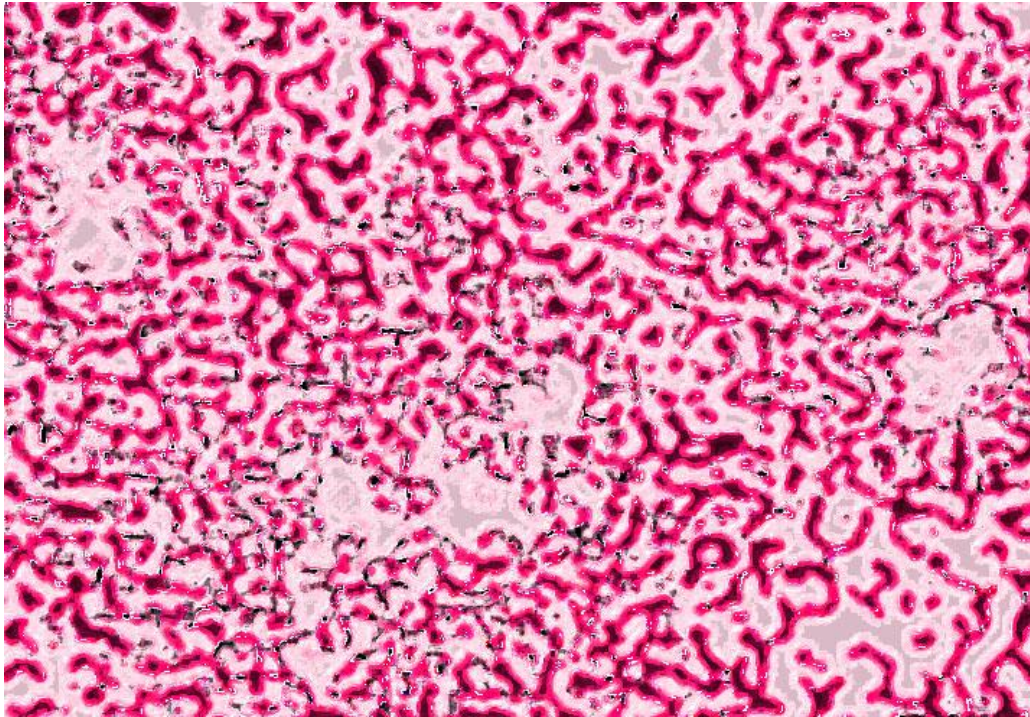
μ

1.		3
2.	Vycor 7930 & CPG	4
3.	μ	7
4.	(SEM)	11
5.	Small Angle X – Ray Scattering	14
	μ	24

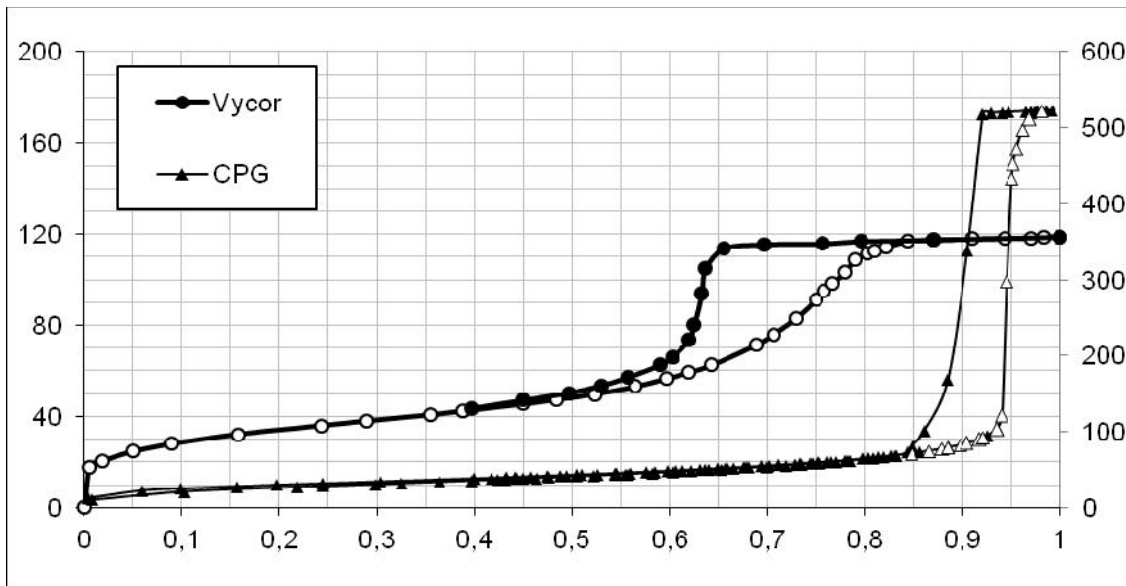
2. Vycor 7930 & CPG

	Vycor	CPG			
	μ	μ			μ
		μ			μ
μ	μ	μ	μ	μ	μ
		μ			
		μ	μ	μ	μ
		μ	μ	μ	
		μ			μ
7930	CPG – 80.	Vycor	CPG		Vycor
μ	SiO ₂ – B ₂ O ₃ – Na ₂ O.				
					Vycor
7930	μ 96% SiO ₂ , 0.3%B ₂ O ₃	0.4Na ₂ O	CPG 80	50% - 75%	
SiO ₂ , 0.1% - 1% B ₂ O ₃		Na ₂ O.			
μ		μ	μ		
μ					μ
μ					
Vycor 7930	μ	μ		μ	
Corning. H				μ	
	μ			μ	
		μ			
		1938	Hood	Nordberg ⁱⁱ	
				μ	
μ	μ				μ μ
75% SiO ₂ , 5% Na ₂ O		20% B ₂ O ₃		μ	

μ μ μ
 μ μ Vycor μ μ
 10 μ 0,5mm. μ μ
 μ μ (SEM). μ
 μ 30% μ μ 350°C μ
 μ μ μ
 μ :) ,)) SAXS.



1. μ μ μ
 μ Vycor^y.

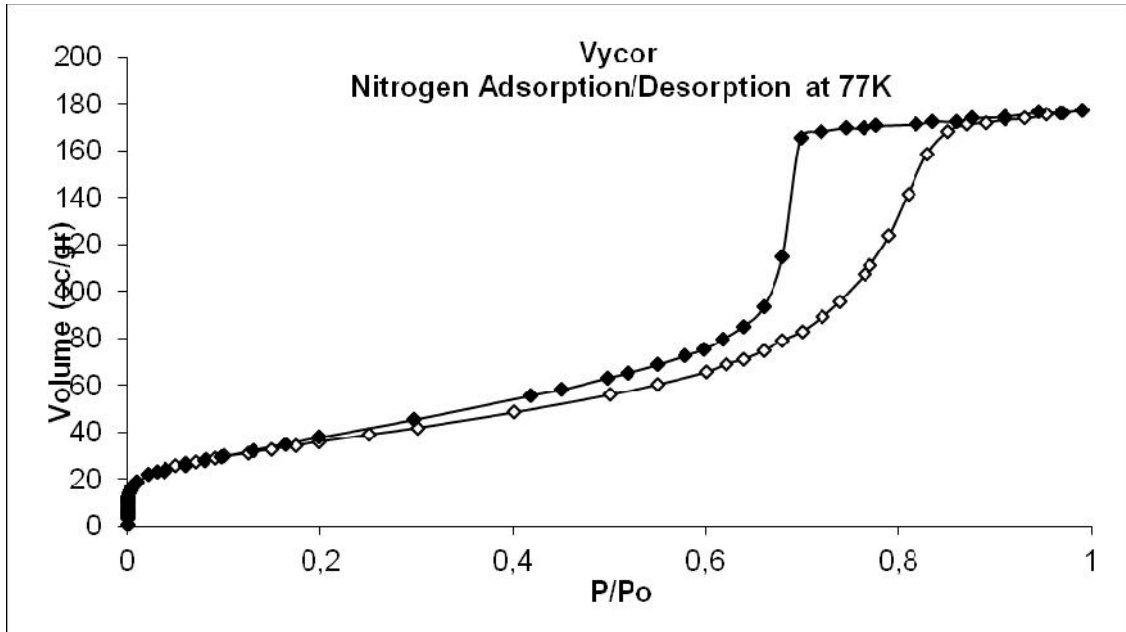


. 2. μ CPG -80 Vycor 7930

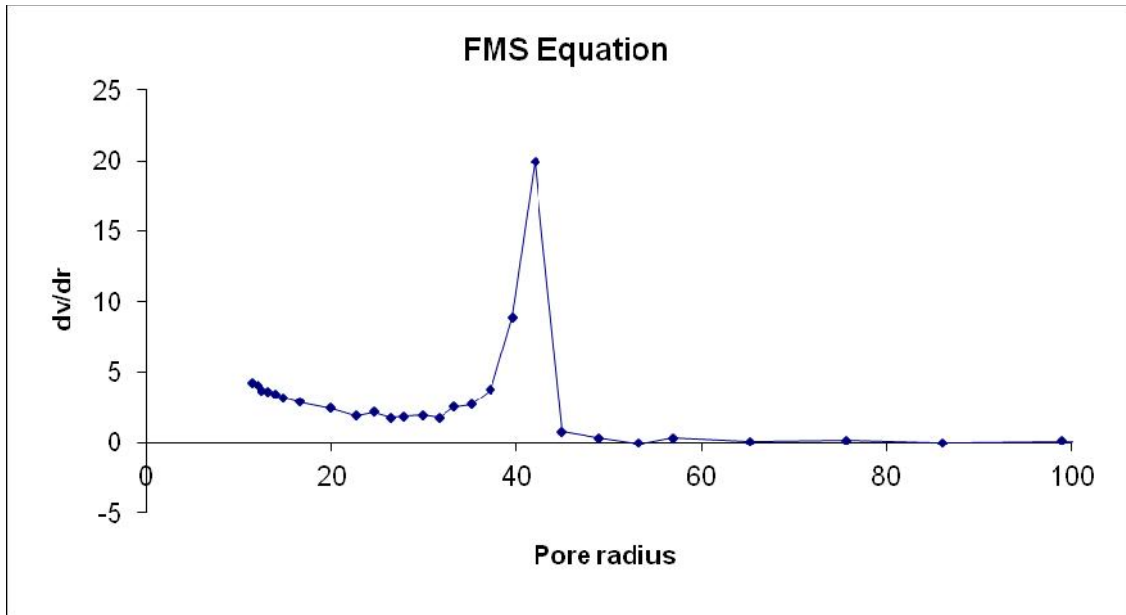
μ 1 μ μ Vycor
 CPG. μ μ μ μ Poremaster
 Quantachrome. 50000psi. μ 2

μ μ 77 μ
 μ Vycor. μ
 μ μ Quantachrome Autosorb-1, μ

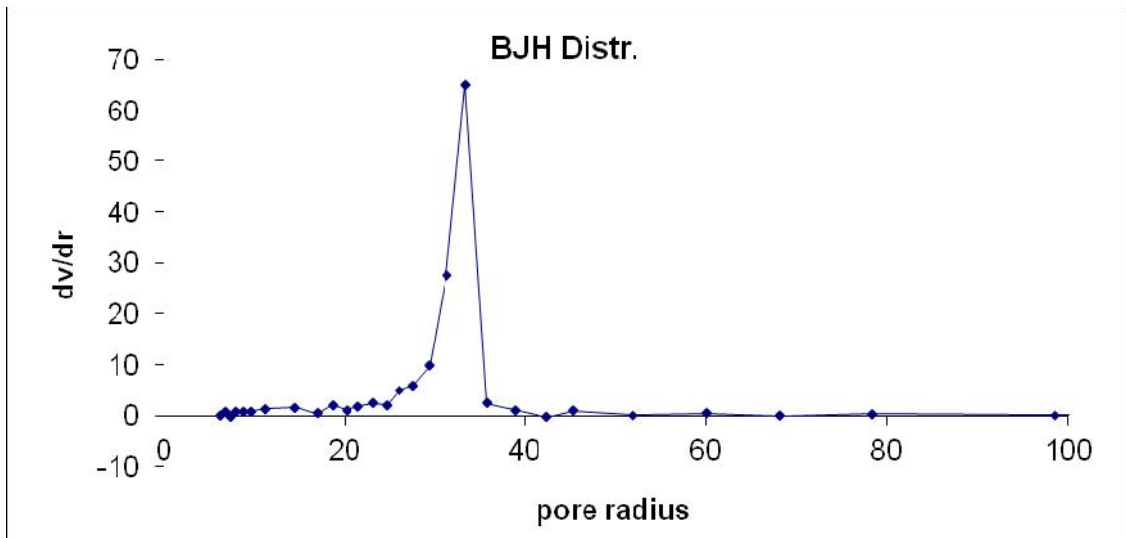
μ Kr . μ μ μ μ
 (Edwards E2M5) μ μ μ (turbo molecular – Edwards EXC
 300) μ (0-10 Torr
), μ μ manifold.



. 3. μ Vycor 7930 μ .

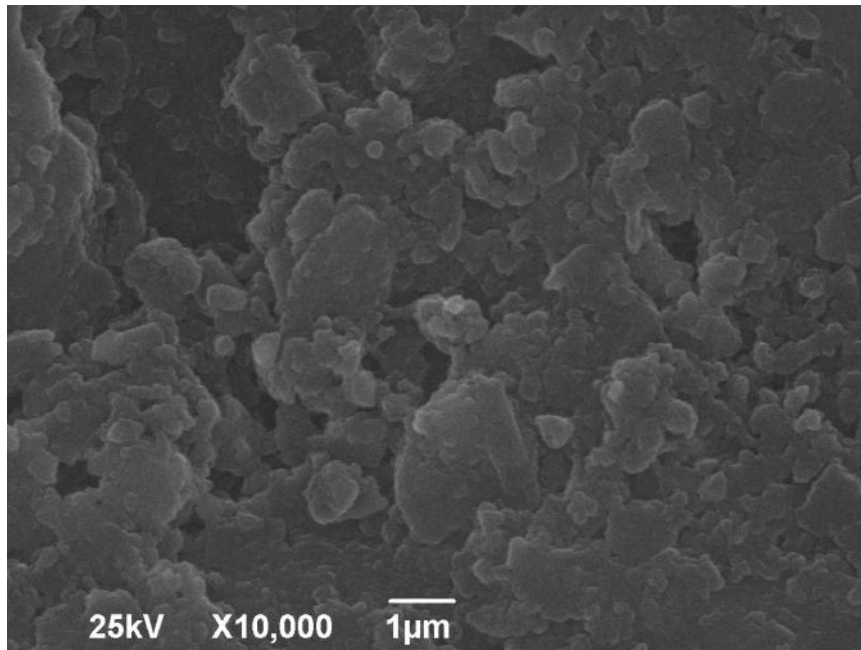


. 4. μ μ Vycor μ FMS

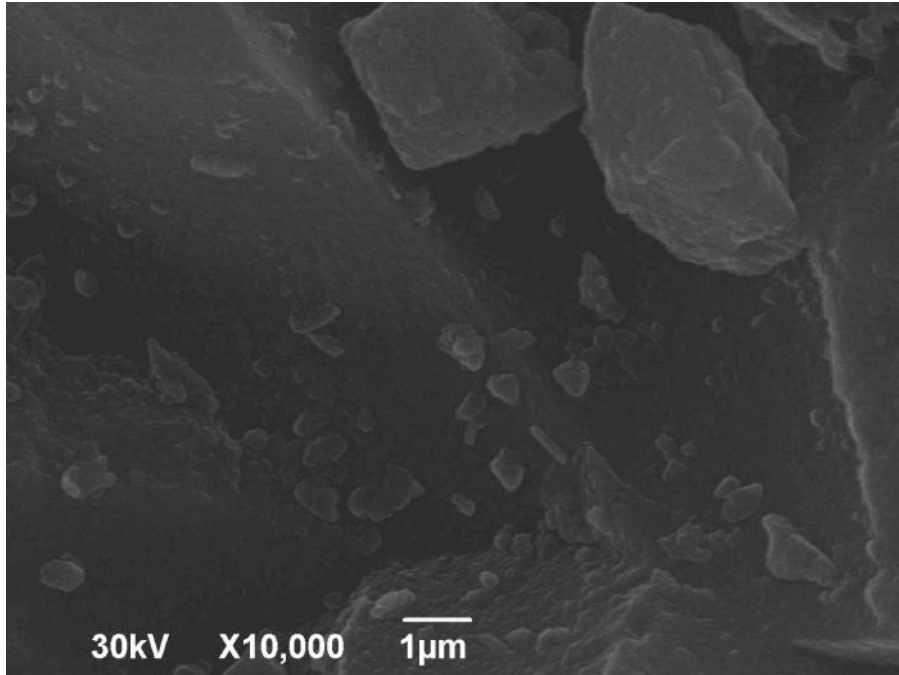


. 5. μ μ Vycor μ FMS

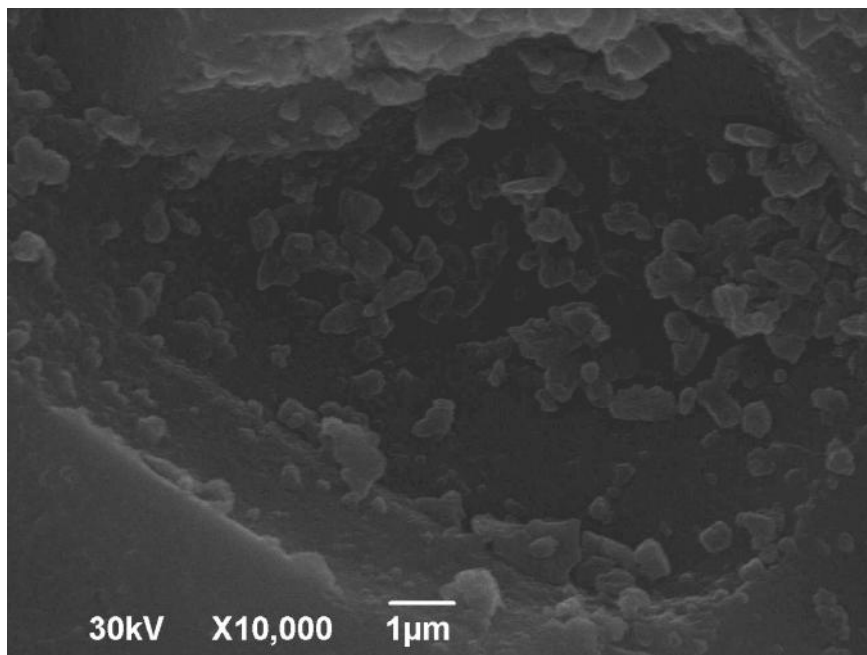
μ Vycor μ μ
JEOL – SEM
(. 6 – 9) μ
μ .



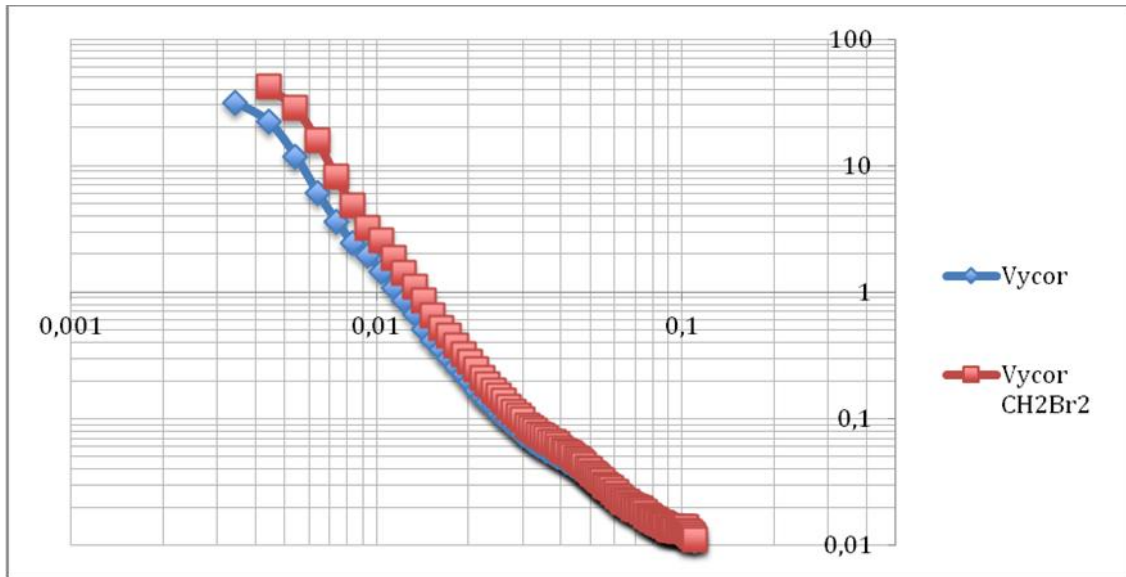
. 6. Vycor - SEM 25kV X10.000



.7. Vycor - SEM 30kV X10.000



.8. Vycor - SEM 30kV X10.000



12. μ SAXS Vycor Vycor
(preliminary data)

11 12 μ μ -
(SAXS) CH₂Br₂. 11
 μ μ μ . 12
 μ (preliminary data) Vycor μ CH₂Br₂
 μ vycor

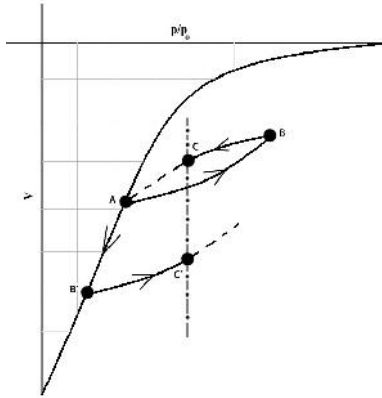
μ 1 “ ” μ
CH₂Br₂ μ Vycor[®] 7930. CH₂Br₂
 μ μ μ
(contrast matching). μ
(scanning) μ μ μ .
 μ μ μ ,

μ μ μ , μ μ *in situ* μ .

μ 2 *in situ* μ CH₂Br₂ Vycor[®] 7930
– . μ μ
μ μ
~5000 rpm. μ
μ μ .

μ μ

μ 1
μ -1 μ Vycor μ μ CH₂Br₂
CH₂Br₂ μ
μ μ (contrast matching).
μ μ (scanning) μ
μ μ . μ μ
μ μ μ μ
μ μ μ - μ μ μ ,
μ μ μ μ μ
μ μ μ
vi . μ



.13

Vycor

Si-OH

15Å [21].

3%

-2

CH₂Br₂.

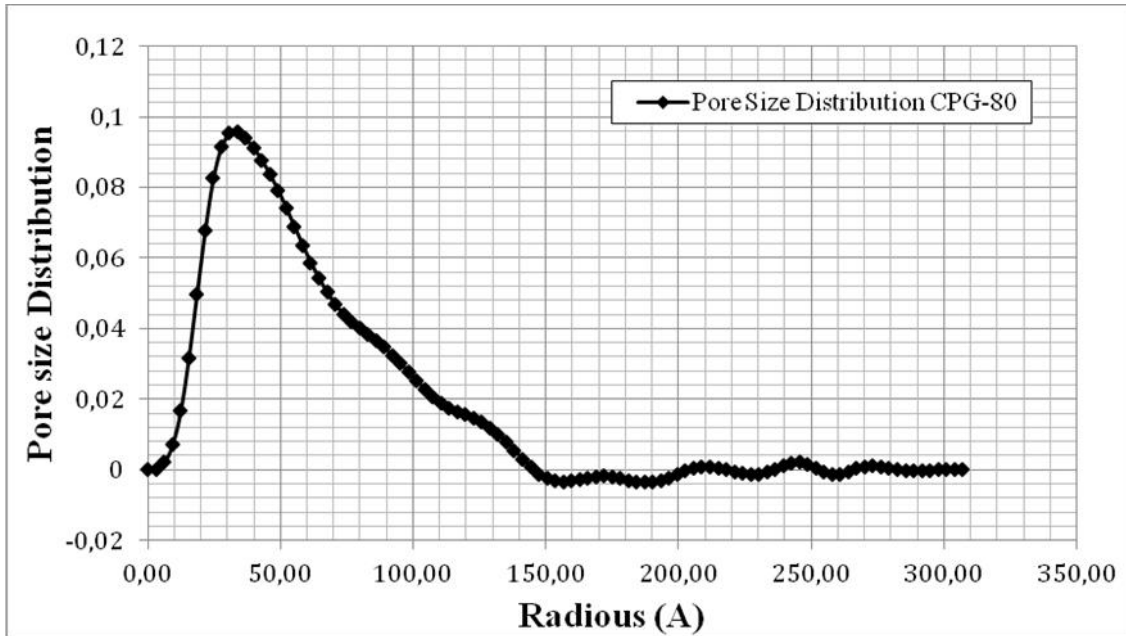
μ μ
 μ (.3).

— μ —
 (steady state).
 μ μ $xy-$ μ μ
 $\mu\mu$ μ μ μ μ μ . μ
 t/T , t
 .



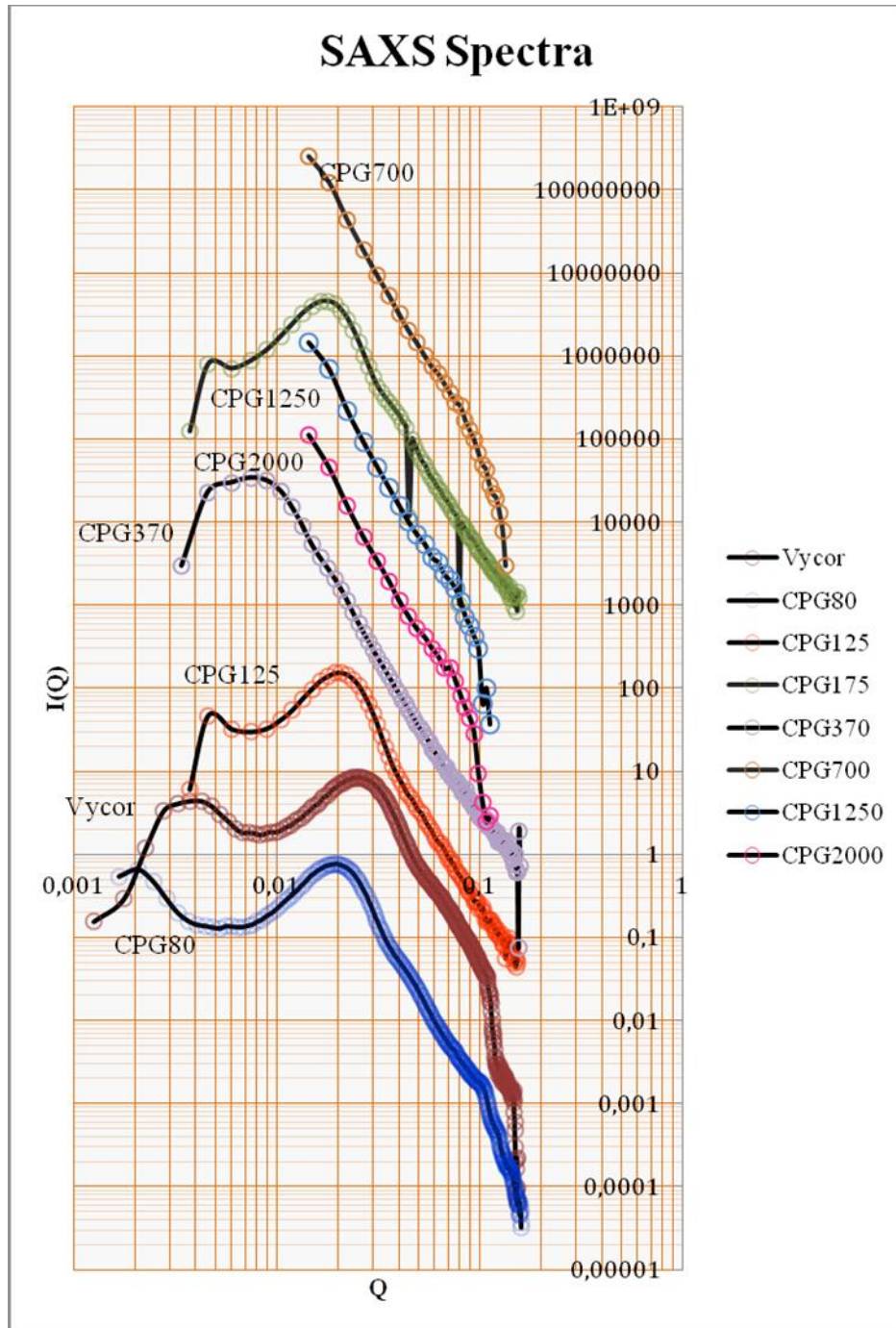
.14. μ μ μ μ .

μ 15 pore size distribution,
 μ SAXS



.15. μ CPG μ SAXS

. 16 μ – CPG μ



Pressure	Pore Radius	Volume Intruded	Delta Volume	% Volume Intruded	Dv(r)	dV/d(log r)
[PSI]	[μ]	[cc/g]	[cc/g]	%	[cc/(μ -g)]	[cc/g]
81,057	13158.84	0.0071	0.0071	0.84	2.64E-05	2.66E+00
164,017	6503.03	0.0075	0.0004	0.89	6.21E-05	3.09E+00
238,568	4470.89	0.0079	0.0004	0.93	1.73E-04	3.57E+00
308,728	3454.86	0.0082	0.0004	0.97	3.26E-04	4.04E+00
377,744	2823.63	0.0086	0.0004	1.02	5.22E-04	4.49E+00
445,688	2393.18	0.0089	0.0004	1.06	7.71E-04	5.04E+00
515,658	2068.45	0.0093	0.0004	1.10	1.17E-03	6.05E+00
584,070	1826.17	0.0097	0.0004	1.15	1.55E-03	7.10E+00
651,488	1637.19	0.0101	0.0004	1.19	2.03E-03	8.28E+00
718,809	1483.86	0.0104	0.0004	1.23	2.55E-03	9.37E+00
786,515	1356.12	0.0108	0.0004	1.28	3.13E-03	1.05E+01
854,852	1247.71	0.0112	0.0004	1.33	3.79E-03	1.16E+01
923,553	1154.90	0.0117	0.0004	1.38	4.55E-03	1.28E+01
993,020	1074.11	0.0121	0.0005	1.44	5.33E-03	1.38E+01
1,063,155	1003.25	0.0126	0.0004	1.49	6.16E-03	1.48E+01
1,134,395	940.25	0.0130	0.0004	1.54	7.07E-03	1.58E+01
1,206,584	883.99	0.0135	0.0005	1.60	7.89E-03	1.65E+01
1,279,935	833.33	0.0140	0.0005	1.66	8.75E-03	1.71E+01
1,354,367	787.53	0.0145	0.0004	1.71	9.51E-03	1.74E+01
1,430,020	745.87	0.0149	0.0004	1.76	1.01E-02	1.74E+01
1,506,621	707.95	0.0153	0.0004	1.81	1.08E-02	1.75E+01
1,584,426	673.18	0.0157	0.0004	1.86	1.14E-02	1.76E+01
1,663,254	641.28	0.0161	0.0004	1.90	1.19E-02	1.75E+01
1,743,270	611.85	0.0164	0.0003	1.94	1.23E-02	1.73E+01
1,824,266	584.68	0.0167	0.0003	1.98	1.30E-02	1.75E+01
1,906,484	559.47	0.0170	0.0003	2.02	1.38E-02	1.79E+01
1,989,641	536.08	0.0174	0.0003	2.05	1.46E-02	1.84E+01



2,074,069	514.26	0.0177	0.0003	2.09	1.60E-02	1.95E+01
2,159,454	493.93	0.0180	0.0003	2.12	1.76E-02	2.08E+01
2,245,918	474.91	0.0183	0.0004	2.17	1.96E-02	2.23E+01
2,333,158	457.15	0.0187	0.0004	2.21	2.20E-02	2.41E+01
2,421,388	440.50	0.0191	0.0004	2.26	2.46E-02	2.60E+01
2,510,261	424.90	0.0195	0.0005	2.31	2.74E-02	2.78E+01
2,599,918	410.25	0.0200	0.0005	2.37	3.05E-02	2.97E+01
2,690,053	396.50	0.0205	0.0005	2.43	3.38E-02	3.17E+01
2,780,897	383.55	0.0210	0.0005	2.49	3.67E-02	3.31E+01
2,872,178	371.36	0.0216	0.0005	2.55	3.92E-02	3.41E+01
2,964,111	359.84	0.0221	0.0005	2.61	4.17E-02	3.49E+01
3,056,300	348.99	0.0226	0.0005	2.67	4.35E-02	3.52E+01
3,149,065	338.71	0.0231	0.0005	2.73	4.48E-02	3.51E+01
3,242,128	328.98	0.0235	0.0005	2.78	4.60E-02	3.49E+01
3,335,809	319.75	0.0239	0.0004	2.83	4.69E-02	3.45E+01
3,429,845	310.98	0.0243	0.0004	2.88	4.75E-02	3.40E+01
3,524,516	302.63	0.0247	0.0004	2.93	4.81E-02	3.35E+01
3,619,599	294.68	0.0251	0.0004	2.97	4.82E-02	3.27E+01
3,715,384	287.08	0.0254	0.0004	3.01	4.86E-02	3.22E+01
3,811,531	279.84	0.0258	0.0003	3.05	4.95E-02	3.21E+01
3,908,247	272.91	0.0261	0.0003	3.09	5.09E-02	3.23E+01
4,005,269	266.30	0.0265	0.0003	3.13	5.24E-02	3.25E+01
4,102,867	259.97	0.0268	0.0003	3.17	5.45E-02	3.30E+01
4,200,713	253.91	0.0271	0.0003	3.21	5.70E-02	3.38E+01
4,299,104	248.10	0.0275	0.0004	3.25	5.99E-02	3.47E+01
4,397,700	242.54	0.0278	0.0004	3.29	6.35E-02	3.60E+01
4,496,709	237.20	0.0282	0.0003	3.33	6.74E-02	3.74E+01
4,595,842	232.08	0.0285	0.0004	3.37	7.23E-02	3.93E+01
4,695,387	227.16	0.0289	0.0004	3.42	7.81E-02	4.16E+01
4,794,964	222.44	0.0293	0.0004	3.46	8.37E-02	4.36E+01
4,894,947	217.90	0.0297	0.0004	3.51	8.96E-02	4.57E+01
4,995,078	213.53	0.0301	0.0004	3.56	9.58E-02	4.79E+01
5,095,645	209.32	0.0305	0.0004	3.61	1.02E-01	5.02E+01
5,196,386	205.26	0.0310	0.0005	3.67	1.10E-01	5.26E+01
5,297,622	201.34	0.0315	0.0005	3.72	1.17E-01	5.49E+01
5,398,990	197.56	0.0319	0.0005	3.78	1.24E-01	5.70E+01
5,500,778	193.90	0.0324	0.0005	3.84	1.30E-01	5.88E+01
5,602,830	190.37	0.0329	0.0005	3.89	1.37E-01	6.05E+01
5,705,410	186.95	0.0334	0.0005	3.95	1.42E-01	6.19E+01
5,808,180	183.64	0.0339	0.0005	4.01	1.48E-01	6.33E+01
5,911,511	180.43	0.0344	0.0005	4.07	1.55E-01	6.50E+01
6,015,023	177.32	0.0349	0.0005	4.13	1.61E-01	6.63E+01

6,119,045	174.31	0.0354	0.0005	4.19	1.68E-01	6.80E+01
6,223,242	171.39	0.0359	0.0005	4.25	1.76E-01	7.00E+01
6,327,884	168.56	0.0364	0.0005	4.31	1.83E-01	7.16E+01
6,432,667	165.81	0.0369	0.0005	4.37	1.91E-01	7.37E+01
6,537,961	163.14	0.0374	0.0005	4.43	2.01E-01	7.64E+01
6,643,477	160.55	0.0380	0.0005	4.49	2.13E-01	7.98E+01
6,749,388	158.03	0.0385	0.0006	4.56	2.32E-01	8.58E+01
6,855,457	155.59	0.0391	0.0006	4.63	2.65E-01	9.67E+01
6,961,987	153.20	0.0397	0.0006	4.70	3.21E-01	1.16E+02
7,068,691	150.89	0.0403	0.0006	4.77	4.19E-01	1.51E+02
7,175,906	148.64	0.0410	0.0007	4.85	5.75E-01	2.05E+02
7,283,236	146.45	0.0418	0.0008	4.95	8.04E-01	2.84E+02
7,390,947	144.31	0.0430	0.0012	5.09	1.14E+00	3.98E+02
7,498,575	142.24	0.0448	0.0018	5.30	1.63E+00	5.58E+02
7,606,070	140.23	0.0476	0.0028	5.63	2.29E+00	7.75E+02
7,712,716	138.29	0.0517	0.0040	6.11	3.18E+00	1.06E+03
7,818,356	136.42	0.0572	0.0056	6.77	4.35E+00	1.42E+03
7,922,593	134.63	0.0649	0.0077	7.68	5.82E+00	1.87E+03
8,025,272	132.91	0.0753	0.0103	8.91	7.64E+00	2.42E+03
8,125,716	131.26	0.0886	0.0133	10.48	9.80E+00	3.06E+03
8,223,702	129.70	0.1054	0.0168	12.47	1.23E+01	3.78E+03
8,318,472	128.22	0.1258	0.0204	14.89	1.52E+01	4.58E+03
8,409,812	126.83	0.1500	0.0242	17.75	1.83E+01	5.46E+03
8,497,125	125.53	0.1777	0.0277	21.03	2.17E+01	6.38E+03
8,580,514	124.31	0.2086	0.0309	24.69	2.52E+01	7.31E+03
8,659,878	123.17	0.2422	0.0336	28.66	2.87E+01	8.24E+03
8,735,712	122.10	0.2782	0.0360	32.92	3.21E+01	9.11E+03
8,808,230	121.09	0.3161	0.0379	37.41	3.52E+01	9.89E+03
8,877,408	120.15	0.3550	0.0389	42.01	3.79E+01	1.05E+04
8,943,396	119.26	0.3941	0.0391	46.64	4.00E+01	1.11E+04
9,006,694	118.42	0.4328	0.0386	51.21	4.16E+01	1.14E+04
9,067,544	117.63	0.4702	0.0374	55.64	4.26E+01	1.16E+04
9,126,595	116.87	0.5060	0.0358	59.87	4.29E+01	1.16E+04
9,184,375	116.13	0.5397	0.0338	63.86	4.25E+01	1.14E+04
9,241,421	115.42	0.5713	0.0316	67.60	4.15E+01	1.10E+04
9,298,088	114.71	0.6007	0.0294	71.08	3.99E+01	1.05E+04
9,354,780	114.02	0.6278	0.0271	74.29	3.79E+01	9.93E+03
9,411,611	113.33	0.6526	0.0248	77.22	3.55E+01	9.24E+03
9,468,642	112.65	0.6749	0.0223	79.86	3.29E+01	8.50E+03
9,526,200	111.97	0.6950	0.0201	82.24	3.01E+01	7.74E+03
9,584,509	111.28	0.7129	0.0179	84.36	2.73E+01	6.97E+03
9,643,725	110.60	0.7289	0.0159	86.25	2.45E+01	6.22E+03

9,703,971	109.91	0.7430	0.0141	87.92	2.18E+01	5.49E+03
9,765,116	109.23	0.7555	0.0124	89.39	1.92E+01	4.80E+03
9,827,037	108.54	0.7662	0.0108	90.66	1.68E+01	4.16E+03
9,889,774	107.85	0.7754	0.0092	91.75	1.45E+01	3.58E+03
9,953,262	107.16	0.7832	0.0078	92.67	1.24E+01	3.04E+03
10,017,484	106.47	0.7896	0.0064	93.43	1.06E+01	2.57E+03
10,082,556	105.79	0.7948	0.0052	94.04	8.86E+00	2.14E+03
10,148,832	105.10	0.7990	0.0042	94.54	7.35E+00	1.76E+03
10,216,608	104.40	0.8023	0.0033	94.94	6.04E+00	1.44E+03
10,286,034	103.70	0.8050	0.0027	95.25	4.90E+00	1.16E+03
10,357,241	102.98	0.8071	0.0021	95.50	3.94E+00	9.25E+02
10,430,649	102.26	0.8088	0.0017	95.70	3.15E+00	7.33E+02
10,506,871	101.52	0.8101	0.0013	95.86	2.51E+00	5.80E+02
10,586,384	100.75	0.8112	0.0011	95.98	2.00E+00	4.59E+02
10,668,998	99.97	0.8121	0.0009	96.09	1.61E+00	3.66E+02
10,754,580	99.18	0.8129	0.0008	96.18	1.30E+00	2.93E+02
10,842,859	98.37	0.8135	0.0007	96.26	1.06E+00	2.37E+02
10,933,447	97.55	0.8141	0.0006	96.33	8.79E-01	1.96E+02
11,025,768	96.74	0.8146	0.0005	96.39	7.50E-01	1.66E+02
11,119,284	95.92	0.8151	0.0005	96.45	6.50E-01	1.43E+02
11,213,437	95.12	0.8155	0.0004	96.50	5.71E-01	1.24E+02
11,307,669	94.33	0.8159	0.0003	96.54	5.07E-01	1.09E+02
11,401,193	93.55	0.8162	0.0003	96.58	4.57E-01	9.79E+01
11,493,118	92.80	0.8165	0.0003	96.61	4.11E-01	8.74E+01
11,582,553	92.09	0.8167	0.0003	96.64	3.70E-01	7.80E+01
11,669,843	91.40	0.8169	0.0002	96.67	3.35E-01	7.01E+01
11,755,054	90.74	0.8171	0.0002	96.69	3.13E-01	6.51E+01
11,838,523	90.10	0.8173	0.0002	96.71	3.02E-01	6.25E+01
11,920,510	89.48	0.8175	0.0001	96.73	2.92E-01	6.02E+01
12,001,491	88.87	0.8176	0.0001	96.74	2.82E-01	5.79E+01
12,081,713	88.28	0.8177	0.0001	96.76	2.79E-01	5.68E+01
12,161,662	87.70	0.8179	0.0002	96.77	2.80E-01	5.68E+01
12,241,750	87.13	0.8180	0.0002	96.80	2.88E-01	5.80E+01
12,322,551	86.56	0.8182	0.0002	96.82	2.95E-01	5.92E+01
12,404,487	85.99	0.8184	0.0002	96.84	3.08E-01	6.14E+01
12,488,206	85.41	0.8186	0.0002	96.86	3.28E-01	6.48E+01
12,573,500	84.83	0.8188	0.0002	96.88	3.50E-01	6.87E+01
12,660,649	84.25	0.8190	0.0002	96.91	3.66E-01	7.15E+01
12,749,563	83.66	0.8192	0.0002	96.94	3.76E-01	7.29E+01
12,840,434	83.07	0.8194	0.0002	96.96	3.87E-01	7.46E+01
12,933,108	82.47	0.8197	0.0003	96.99	4.03E-01	7.70E+01
13,027,788	81.87	0.8200	0.0003	97.02	4.16E-01	7.89E+01

13,124,422	81.27	0.8202	0.0003	97.06	4.28E-01	8.04E+01
13,223,084	80.66	0.8205	0.0003	97.09	4.33E-01	8.09E+01
13,323,628	80.05	0.8208	0.0003	97.12	4.37E-01	8.08E+01
13,426,191	79.44	0.8211	0.0003	97.15	4.39E-01	8.06E+01
13,530,659	78.83	0.8213	0.0003	97.19	4.32E-01	7.85E+01
13,637,215	78.21	0.8216	0.0003	97.22	4.16E-01	7.49E+01
13,745,642	77.60	0.8219	0.0003	97.25	3.96E-01	7.07E+01
13,856,031	76.98	0.8221	0.0002	97.28	3.75E-01	6.63E+01
13,968,172	76.36	0.8224	0.0002	97.31	3.49E-01	6.10E+01
14,082,132	75.74	0.8226	0.0002	97.33	3.16E-01	5.48E+01
14,197,693	75.13	0.8227	0.0002	97.35	2.86E-01	4.91E+01
14,314,879	74.51	0.8229	0.0001	97.37	2.53E-01	4.31E+01
14,433,435	73.90	0.8230	0.0001	97.38	2.21E-01	3.73E+01
14,553,457	73.29	0.8231	0.0001	97.39	1.95E-01	3.26E+01
14,674,676	72.68	0.8232	0.0001	97.40	1.66E-01	2.75E+01
14,797,082	72.08	0.8232	0.0001	97.41	1.44E-01	2.37E+01
14,920,446	71.49	0.8233	0.0001	97.42	1.29E-01	2.12E+01
15,044,782	70.90	0.8233	0.0000	97.42	1.22E-01	2.00E+01
15,169,860	70.31	0.8234	0.0001	97.43	1.20E-01	1.95E+01
15,295,731	69.73	0.8235	0.0000	97.44	1.24E-01	2.00E+01
15,422,179	69.16	0.8235	0.0001	97.44	1.30E-01	2.08E+01
15,549,287	68.60	0.8236	0.0001	97.45	1.33E-01	2.12E+01
15,676,822	68.04	0.8237	0.0001	97.46	1.41E-01	2.22E+01
15,804,994	67.49	0.8238	0.0001	97.47	1.52E-01	2.38E+01
15,933,512	66.94	0.8239	0.0001	97.49	1.59E-01	2.47E+01
16,062,559	66.40	0.8240	0.0001	97.50	1.73E-01	2.66E+01
16,191,975	65.87	0.8241	0.0001	97.51	1.87E-01	2.85E+01
16,321,838	65.35	0.8242	0.0001	97.52	2.01E-01	3.05E+01
16,452,039	64.83	0.8243	0.0001	97.53	2.12E-01	3.19E+01
16,582,717	64.32	0.8244	0.0001	97.54	2.22E-01	3.31E+01
16,713,701	63.82	0.8245	0.0001	97.56	2.30E-01	3.40E+01
16,845,186	63.32	0.8246	0.0001	97.57	2.43E-01	3.57E+01
16,976,996	62.83	0.8247	0.0001	97.59	2.59E-01	3.77E+01
17,109,291	62.34	0.8249	0.0001	97.61	2.73E-01	3.95E+01
17,241,801	61.86	0.8250	0.0001	97.62	2.90E-01	4.16E+01
17,374,771	61.39	0.8252	0.0001	97.64	3.10E-01	4.42E+01
17,507,992	60.92	0.8253	0.0002	97.66	3.28E-01	4.63E+01
17,641,572	60.46	0.8255	0.0002	97.67	3.45E-01	4.84E+01
17,775,426	60.00	0.8256	0.0002	97.69	3.61E-01	5.02E+01
17,909,670	59.56	0.8258	0.0002	97.71	3.78E-01	5.21E+01
18,044,107	59.11	0.8260	0.0002	97.74	3.99E-01	5.46E+01
18,178,959	58.67	0.8262	0.0002	97.76	4.22E-01	5.74E+01

18,313,969	58.24	0.8264	0.0002	97.78	4.42E-01	5.97E+01
18,449,332	57.81	0.8266	0.0002	97.80	4.66E-01	6.25E+01
18,584,852	57.39	0.8267	0.0002	97.83	4.95E-01	6.59E+01
18,720,750	56.97	0.8270	0.0002	97.85	5.17E-01	6.82E+01
18,856,820	56.56	0.8272	0.0002	97.88	5.36E-01	7.02E+01
18,993,240	56.16	0.8274	0.0002	97.91	5.54E-01	7.20E+01
19,129,891	55.76	0.8277	0.0002	97.93	5.65E-01	7.29E+01
19,266,861	55.36	0.8279	0.0003	97.97	5.75E-01	7.36E+01
19,403,939	54.97	0.8282	0.0002	97.99	5.82E-01	7.39E+01
19,541,373	54.58	0.8284	0.0002	98.02	5.80E-01	7.30E+01
19,678,908	54.20	0.8286	0.0002	98.05	5.73E-01	7.16E+01
19,816,768	53.82	0.8289	0.0002	98.08	5.64E-01	6.99E+01
19,954,713	53.45	0.8291	0.0002	98.10	5.43E-01	6.67E+01
20,092,994	53.08	0.8293	0.0002	98.12	5.11E-01	6.23E+01
20,231,393	52.72	0.8294	0.0002	98.14	4.83E-01	5.85E+01
20,370,053	52.36	0.8296	0.0002	98.16	4.52E-01	5.43E+01
20,508,797	52.01	0.8297	0.0002	98.18	4.27E-01	5.10E+01
20,647,781	51.66	0.8299	0.0001	98.20	4.07E-01	4.83E+01
20,786,857	51.31	0.8300	0.0001	98.21	3.91E-01	4.62E+01
20,926,264	50.97	0.8301	0.0001	98.22	3.80E-01	4.47E+01
21,065,732	50.63	0.8302	0.0001	98.23	3.77E-01	4.41E+01
21,205,508	50.30	0.8303	0.0001	98.25	3.79E-01	4.41E+01
21,345,334	49.97	0.8304	0.0001	98.26	3.89E-01	4.51E+01
21,485,480	49.64	0.8305	0.0001	98.28	4.13E-01	4.76E+01
21,625,676	49.32	0.8307	0.0001	98.29	4.45E-01	5.10E+01
21,766,168	49.00	0.8308	0.0001	98.31	4.84E-01	5.50E+01
21,906,760	48.69	0.8310	0.0002	98.33	5.26E-01	5.94E+01
22,047,639	48.38	0.8312	0.0002	98.35	5.55E-01	6.22E+01
22,188,594	48.07	0.8314	0.0002	98.37	5.81E-01	6.47E+01
22,329,877	47.77	0.8316	0.0002	98.40	6.00E-01	6.63E+01
22,471,254	47.47	0.8318	0.0002	98.42	6.12E-01	6.72E+01
22,612,938	47.17	0.8320	0.0002	98.45	6.16E-01	6.71E+01
22,754,750	46.87	0.8322	0.0002	98.47	6.11E-01	6.60E+01
22,896,908	46.58	0.8324	0.0002	98.49	5.91E-01	6.33E+01
23,039,174	46.30	0.8326	0.0002	98.51	5.60E-01	5.95E+01
23,181,814	46.01	0.8327	0.0002	98.53	5.23E-01	5.52E+01
23,324,564	45.73	0.8328	0.0001	98.55	4.75E-01	4.98E+01
23,467,656	45.45	0.8330	0.0001	98.56	4.29E-01	4.47E+01
23,610,912	45.17	0.8330	0.0001	98.57	3.95E-01	4.10E+01
23,754,555	44.90	0.8331	0.0001	98.58	3.70E-01	3.82E+01
23,898,264	44.63	0.8332	0.0001	98.59	3.54E-01	3.64E+01
24,042,262	44.36	0.8333	0.0001	98.60	3.38E-01	3.46E+01

24,186,367	44.10	0.8333	0.0001	98.60	3.35E-01	3.42E+01
24,330,713	43.84	0.8334	0.0001	98.61	3.42E-01	3.48E+01
24,475,156	43.58	0.8335	0.0001	98.63	3.60E-01	3.63E+01
24,619,895	43.32	0.8336	0.0001	98.64	3.85E-01	3.87E+01
24,764,658	43.07	0.8337	0.0001	98.65	4.13E-01	4.12E+01
24,909,680	42.82	0.8338	0.0001	98.66	4.38E-01	4.35E+01
25,054,781	42.57	0.8339	0.0001	98.68	4.54E-01	4.47E+01
25,200,100	42.33	0.8341	0.0001	98.69	4.62E-01	4.52E+01
25,345,443	42.08	0.8342	0.0001	98.71	4.56E-01	4.43E+01
25,491,082	41.84	0.8343	0.0001	98.73	4.43E-01	4.27E+01
25,636,855	41.60	0.8345	0.0001	98.74	4.36E-01	4.18E+01
25,782,914	41.37	0.8346	0.0001	98.75	4.14E-01	3.94E+01
25,929,080	41.14	0.8346	0.0001	98.76	3.92E-01	3.70E+01
26,075,520	40.90	0.8347	0.0001	98.77	3.76E-01	3.53E+01
26,222,033	40.68	0.8348	0.0001	98.78	3.48E-01	3.25E+01
26,368,852	40.45	0.8348	0.0001	98.78	3.20E-01	2.98E+01
26,515,781	40.23	0.8349	0.0000	98.79	3.06E-01	2.84E+01
26,663,002	40.00	0.8349	0.0001	98.80	3.06E-01	2.83E+01
26,811,645	39.78	0.8350	0.0001	98.81	3.20E-01	2.95E+01
26,961,812	39.56	0.8351	0.0001	98.81	3.53E-01	3.24E+01
27,113,381	39.34	0.8351	0.0001	98.82	3.99E-01	3.65E+01
27,267,719	39.12	0.8352	0.0001	98.83	4.46E-01	4.06E+01
27,425,977	38.89	0.8353	0.0001	98.84	5.08E-01	4.60E+01
27,588,318	38.66	0.8354	0.0001	98.86	5.67E-01	5.10E+01
27,754,682	38.43	0.8356	0.0002	98.87	6.16E-01	5.51E+01
27,926,506	38.19	0.8358	0.0002	98.90	6.80E-01	6.04E+01
28,104,971	37.95	0.8360	0.0002	98.92	7.48E-01	6.59E+01
28,290,256	37.70	0.8362	0.0002	98.95	8.04E-01	7.03E+01
28,482,275	37.45	0.8364	0.0002	98.97	8.53E-01	7.40E+01
28,679,980	37.19	0.8367	0.0002	99.00	8.86E-01	7.63E+01
28,884,711	36.93	0.8369	0.0003	99.03	9.03E-01	7.71E+01
29,097,904	36.66	0.8372	0.0003	99.06	9.09E-01	7.70E+01
29,318,043	36.38	0.8375	0.0003	99.10	9.03E-01	7.59E+01
29,544,068	36.10	0.8377	0.0003	99.13	8.93E-01	7.44E+01
29,777,393	35.82	0.8380	0.0003	99.16	8.75E-01	7.23E+01
30,019,387	35.53	0.8382	0.0002	99.19	8.59E-01	7.04E+01
30,268,898	35.24	0.8385	0.0002	99.21	8.40E-01	6.82E+01
30,524,855	34.94	0.8387	0.0002	99.24	8.13E-01	6.55E+01
30,788,645	34.64	0.8389	0.0002	99.27	7.93E-01	6.34E+01
31,061,662	34.34	0.8391	0.0002	99.29	7.73E-01	6.13E+01
31,344,029	34.03	0.8394	0.0002	99.32	7.55E-01	5.93E+01
31,634,600	33.72	0.8396	0.0002	99.35	7.45E-01	5.81E+01

31,932,020	33.40	0.8398	0.0002	99.37	7.32E-01	5.65E+01
32,236,674	33.09	0.8401	0.0002	99.40	7.28E-01	5.56E+01
32,548,600	32.77	0.8403	0.0002	99.43	7.19E-01	5.45E+01
32,866,508	32.45	0.8405	0.0002	99.46	7.20E-01	5.40E+01
33,189,141	32.14	0.8408	0.0002	99.48	7.11E-01	5.28E+01
33,516,520	31.82	0.8410	0.0002	99.51	6.92E-01	5.08E+01
33,848,598	31.51	0.8412	0.0002	99.54	6.71E-01	4.87E+01
34,184,016	31.20	0.8414	0.0002	99.56	6.45E-01	4.63E+01
34,521,566	30.90	0.8416	0.0002	99.59	6.16E-01	4.37E+01
34,861,152	30.60	0.8418	0.0002	99.61	5.90E-01	4.15E+01
35,202,707	30.30	0.8420	0.0002	99.63	5.52E-01	3.84E+01
35,546,336	30.01	0.8421	0.0001	99.64	5.19E-01	3.57E+01
35,892,406	29.72	0.8422	0.0001	99.66	4.80E-01	3.27E+01
36,240,922	29.43	0.8423	0.0001	99.67	4.37E-01	2.94E+01
36,591,809	29.15	0.8425	0.0001	99.69	3.92E-01	2.62E+01
36,945,117	28.87	0.8425	0.0001	99.70	3.58E-01	2.37E+01
37,300,797	28.59	0.8426	0.0001	99.71	3.40E-01	2.23E+01
37,658,840	28.32	0.8427	0.0001	99.72	3.34E-01	2.18E+01
38,019,375	28.05	0.8428	0.0001	99.72	3.34E-01	2.17E+01
38,382,305	27.79	0.8428	0.0001	99.73	3.38E-01	2.18E+01
38,747,672	27.53	0.8429	0.0001	99.74	3.44E-01	2.20E+01
39,115,496	27.27	0.8430	0.0001	99.75	3.65E-01	2.32E+01
39,485,762	27.01	0.8431	0.0001	99.76	3.90E-01	2.46E+01
39,858,090	26.76	0.8432	0.0001	99.77	4.20E-01	2.62E+01
40,232,438	26.51	0.8433	0.0001	99.79	4.68E-01	2.89E+01
40,608,832	26.27	0.8434	0.0001	99.80	5.14E-01	3.14E+01
40,987,207	26.02	0.8436	0.0001	99.82	5.57E-01	3.37E+01
41,367,566	25.78	0.8437	0.0001	99.84	5.88E-01	3.52E+01
41,749,930	25.55	0.8439	0.0001	99.85	6.04E-01	3.58E+01
42,134,137	25.31	0.8441	0.0002	99.87	6.09E-01	3.56E+01
42,520,176	25.08	0.8442	0.0002	99.89	6.09E-01	3.53E+01
42,908,016	24.86	0.8444	0.0002	99.91	5.99E-01	3.43E+01
43,297,602	24.63	0.8445	0.0001	99.93	5.80E-01	3.28E+01
43,688,914	24.41	0.8447	0.0001	99.95	5.49E-01	3.07E+01
44,081,922	24.20	0.8448	0.0001	99.96	5.13E-01	2.83E+01
44,476,629	23.98	0.8449	0.0001	99.97	4.50E-01	2.46E+01
44,873,031	23.77	0.8449	0.0001	99.98	3.89E-01	2.10E+01
45,271,102	23.56	0.8450	0.0001	99.99	3.22E-01	1.72E+01
45,670,785	23.35	0.8451	0.0000	99.99	2.61E-01	1.38E+01
46,072,078	23.15	0.8451	0.0000	100.00	2.08E-01	1.08E+01
46,474,766	22.95	0.8451	0.0000	100.00	1.61E-01	8.33E+00
46,878,910	22.75	0.8451	0.0000	100.00	1.18E-01	6.04E+00

47,284,578	22.56	0.8451	0.0000	100.00	8.33E-02	4.20E+00
47,729,875	22.35	0.8451	0.0000	100.00	5.18E-02	2.58E+00
48,144,734	22.15	0.8451	0.0000	100.00	3.16E-02	1.56E+00
48,566,309	21.96	0.8451	0.0000	100.00	1.17E-02	5.74E-01
49,000,129	21.77	0.8451	0.0000	100.00	6.80E-03	3.28E-01
49,467,355	21.56	0.8451	0.0000	100.00	1.61E-04	7.94E-03
50,160,918	21.26	0.8451	0.0000	100.00	1.92E-04	9.27E-03

	μ	μ						
p/p0	Vads(cc/g)	rk	nas eq	drp	dv	rpave	dv/drps	
0.99130	177.4882	1.07E+	1490.909					
8	474	03	514					
0.96918	176.4131	2.98E+	420.9616	1069.947	1.0750515	955.9355	0.0010047	
	959	02	504	864	46	825	7	
0.94490	176.4832	1.65E+	235.7742	185.1874	0.0701030	328.3679	0.0003785	
8	99	02	2	305	93	352	52	
0.91017	174.6863	9.91E+	144.8237	90.95043	1.7969072	190.2990	0.0197569	
6	918	01	837	63	16	018	94	
0.87638	173.9340	7.07E+	105.3678	39.45594	0.7523711	125.0958	0.0190686	
9	206	01	42	166	34	129	4	
0.85933	172.5723	6.15E+	92.63986	12.72797	1.3616494	99.00385	0.1069808	
1	711	01	703	5	85	453	42	
0.83553	172.5845	5.19E+	79.28777	13.35209	0.0121649	85.96382	0.0009110	
7	361	01	344	359	48	024	89	
0.8188	171.3762	4.66E+	71.99128	7.296486	1.2082474	75.63953	0.1655930	
	887	01	744	001	23	044	57	
0.77695	170.6391	3.70E+	58.52449	13.46678	0.7371134	65.25789	0.0547356	
7	753	01	918	826	02	331	49	
0.76360	169.5857	3.46E+	55.22578	3.298711	1.0534020	56.87514	0.3193374	
5	732	01	782	36	62	35	46	
0.74550	169.8463	3.18E+	51.30325	3.922531	0.2606185	53.26452	0.0664414	
6	918	01	62	618	57	201	16	
0.71940	168.1383	2.83E+	46.53010	4.773154	1.7080412	48.91667	0.3578432	
2	505	01	172	481	37	896	76	
0.69859	165.6111	2.60E+	43.31121	3.218885	2.5272164	44.92065	0.7851216	
	34	01	648	242	95	91	51	
0.67972	114.5938	2.42E+	40.75008	2.561130	51.017319	42.03065	19.919847	
1	144	01	639	087	59	144	04	
0.65983	93.35030	2.24E+	38.35416	2.395924	21.243505	39.55212	8.8665175	
6	928	01	206	336	15	423	42	
0.63927	85.11484	2.08E+	36.15029	2.203863	8.2354639	37.25223	3.7368310	
9	536	01	902	033	18	054	97	
0.61786	79.56639	1.94E+	34.10171	2.048588	5.5484536	35.12600	2.7084271	



5	175	01	017	851	08	46	23
0.59870	75.40494	1.82E+	32.44991	1.651791	4.1614432	33.27581	2.5193515
7	845	01	874	438	99	445	37
0.57869	72.66556	1.70E+	30.88054	1.569373	2.7393814	31.66523	1.7455254
5	701	01	524	499	43	199	89
0.55021	68.80412	1.56E+	28.88011	2.000434	3.8614432	29.88032	1.9303021
3	371	01	055	685	99	789	13
0.51855	65.15216	1.42E+	26.92399	1.956113	3.6519587	27.90205	1.8669461
9	495	01	699	562	63	377	91
0.49831	63.15876	1.34E+	25.79644	1.127547	1.9934020	26.36022	1.7679096
7	289	01	951	484	62	325	37
0.45085	58.15876	1.17E+	23.45970	2.336746		24.62807	2.1397267
1	289	01	257	931	5	604	86
0.41773	55.49360	1.07E+	22.03856	1.421132	2.6651546	22.74913	1.8753736
3	825	01	999	581	39	628	81
0.29801	45.42288	7.70E+	17.89930	4.139261	10.070721	19.96893	2.4329757
3	66	00	892	073	65	946	1
0.19914	37.78597	5.78E+	15.22659	2.672711	7.6369072	16.56295	2.8573629
3	938	00	724	679	16	308	08
0.16344	35.01443	5.15E+	14.35115	0.875442	2.7715463	14.78887	3.1658795
4	299	00	446	777	92	585	59
0.13031	32.32247	4.58E+	13.55634	0.794805	2.6919587	13.95375	3.3869415
9	423	00	927	194	63	187	83
0.09758	29.45608	4.01E+	12.76624	0.790105	2.8663917	13.16129	3.6278573
58	247	00	33	974	53	628	35
0.07960	27.79793	3.69E+	12.31833	0.447910	1.6581443	12.54228	3.7019572
62	814	00	312	179	3	821	43
0.06023	25.72948	3.32E+	11.81028	0.508043	2.0684536	12.06431	4.0714119
29	454	00	98	314	08	146	3
0.03763	22.92536	2.84E+	11.14933	0.660950	2.8041237	11.47981	4.2425600
83	082	00	894	86	11	437	46

SAXS

r	p(r)
	0.00E+00
	3.07E+00
	6.14E+00
	9.21E+00
	1.23E+01
	1.54E+01
	1.84E+01
	0.00E+00
	2.60E-04
	2.08E-03
	7.03E-03
	1.67E-02
	3.17E-02
	4.99E-02

2.15E+01	6.79E-02
2.46E+01	8.26E-02
2.76E+01	9.15E-02
3.07E+01	9.54E-02
3.38E+01	9.57E-02
3.68E+01	9.39E-02
3.99E+01	9.11E-02
4.30E+01	8.77E-02
4.61E+01	8.37E-02
4.91E+01	7.91E-02
5.22E+01	7.41E-02
5.53E+01	6.89E-02
5.83E+01	6.36E-02
6.14E+01	5.87E-02
6.45E+01	5.42E-02
6.75E+01	5.03E-02
7.06E+01	4.69E-02
7.37E+01	4.42E-02
7.68E+01	4.20E-02
7.98E+01	4.01E-02
8.29E+01	3.85E-02
8.60E+01	3.67E-02
8.90E+01	3.47E-02
9.21E+01	3.25E-02
9.52E+01	3.01E-02
9.82E+01	2.77E-02
1.01E+02	2.52E-02
1.04E+02	2.28E-02
1.07E+02	2.07E-02
1.11E+02	1.89E-02
1.14E+02	1.76E-02
1.17E+02	1.66E-02
1.20E+02	1.57E-02
1.23E+02	1.47E-02
1.26E+02	1.35E-02
1.29E+02	1.20E-02
1.32E+02	1.01E-02
1.35E+02	7.99E-03
1.38E+02	5.56E-03

1.41E+02	3.06E-03
1.44E+02	7.41E-04
1.47E+02	-1.15E-03
1.50E+02	-2.42E-03
1.54E+02	-3.11E-03
1.57E+02	-3.33E-03
1.60E+02	-3.18E-03
1.63E+02	-2.78E-03
1.66E+02	-2.30E-03
1.69E+02	-1.90E-03
1.72E+02	-1.76E-03
1.75E+02	-1.99E-03
1.78E+02	-2.47E-03
1.81E+02	-3.01E-03
1.84E+02	-3.43E-03
1.87E+02	-3.59E-03
1.90E+02	-3.46E-03
1.93E+02	-3.05E-03
1.96E+02	-2.35E-03
2.00E+02	-1.42E-03
2.03E+02	-4.25E-04
2.06E+02	4.26E-04
2.09E+02	9.26E-04
2.12E+02	9.33E-04
2.15E+02	5.61E-04
2.18E+02	-1.15E-05
2.21E+02	-6.05E-04
2.24E+02	-1.06E-03
2.27E+02	-1.27E-03
2.30E+02	-1.17E-03
2.33E+02	-6.80E-04
2.36E+02	2.16E-04
2.39E+02	1.23E-03
2.43E+02	2.01E-03
2.46E+02	2.19E-03
2.49E+02	1.55E-03
2.52E+02	4.41E-04
2.55E+02	-6.84E-04
2.58E+02	-1.35E-03

2.61E+02	-1.23E-03
2.64E+02	-5.60E-04
2.67E+02	2.77E-04
2.70E+02	9.01E-04
2.73E+02	1.03E-03
2.76E+02	7.74E-04
2.79E+02	3.43E-04
2.82E+02	-5.42E-05
2.86E+02	-2.55E-04
2.89E+02	-2.85E-04
2.92E+02	-2.15E-04
2.95E+02	-1.17E-04
2.98E+02	-4.93E-05
3.01E+02	-1.46E-05
3.04E+02	-1.83E-06
3.07E+02	0.00E+00

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