March 30, 1979
Battelle Columbus Labs.

INDIVIDUAL WELL REPORT
FROM THE PROGRAM ON

CHARACTERIZATION AND ANALYSIS OF DEVONIAN SHALES AS RELATED TO RELEASE OF GASEOUS HYDROCARBONS

WELL C-2 LINCOLN COUNTY, WEST VIRGINIA

by

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DATA AND ANALYSIS SUMMARY REPORT

on

WELL C-2 LINCOLN COUNTY, WEST VIRGINIA

BATTELLE
Columbus Laboratories

DOE Contract No. EY-76-C-05-5205

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INDIVIDUAL WELL REPORT FROM THE PROGRAM ON

CHARACTERIZATION AND ANALYSIS OF DEVONIAN SHALES AS RELATED TO RELEASE OF GASEOUS HYDROCARBONS

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INTRODUCTION AND SUMMARY

This is the second of a number of individual well reports Battelle's Columbus Laboratories plans to submit during the next several months. In this second individual well report total characterization data on gas contents, release kinetics, physical and chemical properties, mineralogy, and lithology obtained on the C-2 well (Lincoln County, West Virginia) are reported.

C-2 shales were cored in January 1976 and the laboratory studies were completed in August 1977. Mean value of hydrocarbon gases in the free space surrounding the shale is 49.3 percent of total free volume. This translates to 0.3 ft^3 of gas per ft^3 of shale. Hydrogen values show a narrower distribution range, with amounts from 0.4 to 0.9 percent. Good correlations are found between the hydrocarbon gas values and total carbon and hydrogen contents. Increasing amounts of carbon and hydrogen are associated with higher values of hydrocarbon gas contents.

Among the physical characterization data obtained are densities (bulk and true), porosity (calculated from the density data and determined with Hg-intrusion technique), surface areas, and permeabilities. Bulk densities vary between 2.55 and 2.82 g/cc with an average value of 2.68 g/cc.

True density values range from 2.64 to 2.90 g/cc with an average value of 2.74 g/cc. Porosity values calculated from the density data and mercury intrusion technique are reasonably close. Mercury intrusion values vary between 2.7 to 6.1 percent. Very good correlations are observed between the bulk density and carbon and hydrogen contents. Higher carbon and hydrogen contents are associated with lower bulk density values indicating that major sources of carbon (and to some extent hydrogen) are organic in origin.

Several shale samples analyzed using X-ray diffraction revealed that the major clay mineral phase in these shales are kaolin minerals whereas illite has been the major clay mineral phase in the majority of wells thus far studied. The absence of feldspathic and mica minerals also differentiate C-2 shales from those of other wells.

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OBJECTIVE AND SCOPE

The objective of this program is to determine the relationships between shale characteristics, hydrocarbon gas content, and well location to provide a sound basis for defining the productive capacity of the Eastern Devonian Shale deposits and for guiding research, development, and demonstration projects to enhance the recovery of natural gas from the shale deposits. The program includes a number of elemental tasks as a part of the Resource Inventory and Shale Characterization subprojects of DOE's Eastern Gas Shales Project and is designed to provide a wide variety of support data for that project.

A large number of core samples of gas bearing Eastern Devonian Shale will have been examined by the end of the program. After the characterization data for individual wells have been compiled, attempts will be made to establish the interrelationships between the shale characteristics, the hydrocarbon gas content, and well locations from which the samples were obtained, employing the Automatic Interaction Detection (AID) Analysis.

The following tasks comprise the total efforts in this research program:

Task	Descriptive Title
1	Core Sampling
2	Gas Content and Gas Release Kinetics
3	Chemical Characterization of Shale
4	Physical Characterization of Shale
5	Lithology of Shale
6	Data interpretation and Correlation.

ANALYSIS AND DISCUSSION OF THE CHARACTERIZATION DATA

Detailed descriptions of the experimental procedures employed in the execution of the elemental tasks described were reported in the Appendix of the Fifth Quarterly Technical Progress Report (ORO-5205-5) submitted to U.S./DOE in January 1978.

Task 1. Core Sampling

C-2 Well (API Code #21636), Lincoln County, West Virginia, was sampled in January 1976. Coring was started at 2654 feet and stopped at 3978 feet, taking eleven barrels to complete. Samples were received at Battelle on August 1, 1976. The total number of samples received were 17. Table 1 summarizes the pertinent well data on the C-2 Well. Several types of well log data are reported in Table 2.

Task 2. Gas Contents and Release Rates

Quantitative and qualitative analyses of the gas accumulated in the free space surrounding the shale samples in sealed cannisters were made by gas chromatography as previously described.* Table 3 depicts the various species of hydrocarbon gases analyzed along with air (nitrogen and oxygen) and carbon dioxide. Methane is the major hydrocarbon gas species as is the case with all the wells analyzed. Considerable amounts of ethane and propane are also present.

An increase in the hydrocarbon gas contents with depth is quite apparent as illustrated in Figure 1, despite the large scatter in the data. This relationship is not as clear in some of the other wells thus far studied.

Some of the pertinent statistical parameters are presented in Table 4. Mean value of total hydrocarbons analyzed is 49.3 percent with a standard deviation of 30.9 and variance of 955.8. Mean value of hydrocarbon gas per unit volume of shale is 0.3 ft^3 of gas to 1.0 ft^3 of shale.

* R. S. Kalyoncu and M. J. Snyder, "Characterization and Analysis of Devonian Shales as Related to the Release of Gaseous Hydrocarbons", Fifth Quarterly Technical Progress Report, September-December, 1977.

As mentioned in the previous reports this reported value is probably well below the actual potential gas contents in the shales. The actual hydrocarbon gas contents may be as high as several times the value reported. A number of canisters from another well equipped with necessary pressure gauges and other accessories, were used to estimate total potential gas contents in the shales. These samples were monitored over a period of 2 months.

Table 5 summarizes the experimental findings and observed increases in the hydrocarbon gas contents 2 months after the initial gas analysis. As the data in Table 5 show, substantial amounts of hydrocarbon gases were released after the time of initial gas analysis. The amount released during the 2 months of monitoring range from 32 percent to as much as 154 percent over the initial gas contents. A substantial fraction of gas is probably still contained in the shales. This empirical experiment, coupled with the possibility that considerable amounts of hydrocarbon gas may readily escape from the shale at the well site before the shales are sealed in the canisters, points to the fact that the potential hydrocarbon gas contents in these shales may be as much as several times that of the reported values from the laboratory analyses. This also points to the importance, and perhaps necessity, of some gas analysis efforts at the well site during coring.

The gases contained in Devonian shale deposits may be trapped within the pore structure and adsorbed in the intermolecular layers of clay minerals. Either way, release of these gases is highly dependent on fine structure of the shale, with the kinetics of release being diffusion controlled. As a part of this program, Battelle-Columbus is attempting to define the release kinetics of the hydrocarbon gases in the shale in terms of diffusion processes. Two different approaches to measuring the diffusion coefficients have been employed. Initially, the release kinetics were measured by a microbalance procedure. Later, this approach was abandoned for reasons discussed below, and another procedure involving the dynamic measurement of the hydrocarbon release rates was adopted.

Microbalance procedure involves suspension of a small shale sample (5-10 g.) from the weighing arm of a continuous recording microbalance. The change in the weight of the sample can then be followed

as a function of time under controlled atmospheric and thermal conditions. These measurements on a shale specimen from the C-2 Well (C-2-3922) were made at temperatures of 25 C, 50 C, and 100 C. The weight loss results as a function of time as illustrated in Figure 2. Because of the very large weight losses observed in comparison with the amounts of gas present in the shale, it became evident that the observed weight losses included loss of other substances in addition to hydrocarbon gases. This was obvious when the microbalance data were compared with the data from the retort experiments, The latter work revealed hydrocarbon contents in the order of 0.5 to 1.0 mg. gas per gram of shale when the microbalance data showed losses of 4 to 13 mg. per gram of shale.

Because of the problem of masking of the hydrocarbon release by water in the microbalance system, gas release rates are now being determined with a continuous-flow system that determines hydrocarbon content of the gases released. The system employs a flame ionization detector for monitoring the hydrocarbons. In this approach, a suitable shale fragment is placed in a sealed container fitted with gas inlet and outlet. Pure nitrogen is passed through the container to transport the hydrocarbons to the detector. The flow rate of the carrier gas is high enough to insure against equilibrium effects on the kinetics of hydrocarbon release. Calibration of the system is performed using a standard hydrocarbon gas mixture. Reference of the signal obtained with the shale gas to that of the standard mixture yields a continuous profile of the concentration of the effusing gases. Integration of the area under the concentration curve and knowledge of the flow rate are used to determine the total amounts of hydrocarbons released.

With the low permeability of the shale samples, a typical kinetics run requires 30-60 days at room temperature. However, the apparatus can be heated to permit more rapid accumulation of data and determination of the temperature coefficient for the diffusion process.

Having been exposed to atmosphere for a long time, shale specimens from the C-2 Well were no longer appropriate for the kinetics studies employing the continuous flow system as no significant flow rates of hydrocarbon gases were observed. Shale samples from other wells, however, have been and will be studied with this method.

Task 3. Chemical Characterization Data

Total carbon, hydrogen, and nitrogen values for the C-2 Well are summarized in Table 6 (sulfur determination was not a part of the program at this stage). The total carbon contents range from 0.2 to 7.1 percent with an average value of 2.4 percent. Hydrogen values show a more narrow distribution range with values ranging between 0.4 and 0.9 percent. The carbon contents show a slight increase with sample depth as illustrated in Figure 3. Similar relationships between the hydrogen contents and sample depth is not as clear, as illustrated in Figure 4. The fact that considerable amounts of hydrogen orginates from inorganic sources (e.g., crystal water in clay minerals) which are not related to sample depth, and almost all of the carbon is organic in origin (very little carbonates in Devonian shales), may account for the more distinct relationship between the carbon contents and sample depth compared to the hydrogen contents as a function of sample depth.

H/C atomic ratios do not show a particular trend with sample depth (Figure 5). Figure 6 summarizes the relationship bewteen hydrocarbon gas and carbon contents. There is an obvious positive correlation between the two quantities. This observation further supports the conclusion that the source of carbon is mainly organic in origin.

Interestingly, the relationship between the hydrocarbon gas and hydrogen contents is quite clear; and a positive correlation exists between the two values. This is illustrated in Figure 7.

Task 4. Summary of Physical Characterization Data

Density, porosity (calculated from the density data) and surface area values are tabulated in Table 7. Bulk density values range from 2.55 to 2.82 g/cc with an average value of 2.68. True density values vary between 2.64 and 2.90 with an average value of 2.74. Some statistical parameters on density data and calculated porosity values are presented in Table 8.

Mercury intrusion porosity data are compiled in Appendix A. Tabulated forms of the data are interpreted by two figures as absoluate pressure vs. penetration volume and pore diameter vs. percent pores greater than diameter indicated. Table 9 is a list of total porosity values for

all C-2 shale samples. Hydrocarbon gas contents as a function of bulk density are plotted in Figure 8. Negative correlations (high hydrocarbon gas contents with decreasing density values) which has been observed for several wells is not apparent from the figure. A possible explanation for the lack of expected negative correlation may possibly be that the C-2 shales were stored for a long period of time (about 1 year) prior to characterization studies. The characterization values may have been altered by this inordinate length of shelf time. Another plausible explanation for it may be that the inorganic composition of the shales overshadows the organic components as the controlling parameter of the density values. This point can be verified by quantitative determination of the inorganic composition of the shales and studying the correlations between density and various inorganic components. Surface area values (Table 7) vary between 1.0 and 4.4 m^2/g. No recognizable correlations between surface areas and other characterization data exist. The surface area values seem to be determined by the clay mineral contents in the shales. Relationships between the bulk density and carbon and hydrogen contents are illustrated in Figures 9 and 10 respectively.

Task 5. Shale Lithology

Several shale samples were analyzed by X-ray diffraction. XRD findings are summarized in Table 10 in a semiquantitative way. Major single mineral phase is quartz. The C-2 shale compositions differ from the majority of the other wells in the composition of clay minerals. Kaolin minerals are the major caly minerals observed with detectable amounts of illite present in the shales. Minor to detectable quantities of pyrite and carbonate minerals (nahcolite, shortite, and siderite) are also found. The mineral composition of these shales also differ from most of the other shales by the absence of other minerals such as feldspar (albite, anorthite) and some micas which are quite frequently detected in shales from other locations.

Five C-2 shale samples were studied by SEM/EDAX technique. Four of the five smaples are quite similar in containing major quantities of kalonite and quartz and appreciable amounts of pyrite. The fifth sample appears (from microscopic studies) to be very high in illite and contains an abundance of pyrite. The same sample also contains significant amounts of carbonate minerals and relatively low contents of quartz.

Some of the quantitative EDAX results are summarized in Table 11. Figures 11 through 14 show SEM photomicrographs of four C-2 shales.

Task 6. Data Interpretation and Correlation

One-to-one correlations existing among the various data have been pointed out under appropriate subheadings throughout the report. Because of the small number of samples (17) an Automatic Interaction Detection (AID) analysis run was, statistically, not very meaningful. However, the data from the C-2 well were incorporated in the AID Analysis of the data from a number of wells in the Appalachian basin and the results were reported in the Seventh Quarterly Technical Progress Report.

TABLE I. WELL DATA FOR C- 2

LOCATION: LINCOLN COUNTY, WV

ALTITUDE: 1153 FEET

COORDINATES: 38.05 (DEGREES.MINUTES) LATITUDE
82.13 (DEGREES.MINUTES) LONGITUDE

CORING BEGAN AT 2659 FEET AND STOPPED AT 3978 FEET. IT TOOK 11 BARRELS TO COMPLETE.

SAMPLES WERE RETURNED TO BATTELLE ON 07 1776.

THERE WERE 17 SAMPLES COLLECTED FOR BATTELLE AND 0 SAMPLES COLLECTED FOR OTHERS.

RUN INFORMATION FROM WELL C- 2

RUN NO. 1 CORING BEGAN AT 2659 FEET AND CORING STOPPED AT 2713 FEET. THE AVERAGE CORING RATE IS 11.46 MINUTES PER FOOT. THE SAMPLES WERE ON THE SURFACE IN 0.00 HOURS

RUN NO. 2 CORING BEGAN AT 2713 FEET AND CORING STOPPED AT 2771 FEET. THE AVERAGE CORING RATE IS 14.16 MINUTES PER FOOT. THE SAMPLES WERE ON THE SURFACE IN 0.00 HOURS

RUN NO. 3 CORING BEGAN AT 3000 FEET AND CORING STOPPED AT 3059 FEET. THE AVERAGE CORING RATE IS 9.15 MINUTES PER FOOT. THE SAMPLES WERE ON THE SURFACE IN 0.00 HOURS

RUN NO. 4 CORING BEGAN AT 3059 FEET AND CORING STOPPED AT 3010 FEET. THE AVERAGE CORING RATE IS 16.06 MINUTES PER FOOT. THE SAMPLES WERE ON THE SURFACE IN 0.00 HOURS

RUN NO. 5 CORING BEGAN AT 3298 FEET AND CORING STOPPED AT 3357 FEET. THE AVERAGE CORING RATE IS 6.32 MINUTES PER FOOT. THE SAMPLES WERE ON THE SURFACE IN 0.00 HOURS

RUN NO. 6 CORING BEGAN AT 3357 FEET AND CORING STOPPED AT 3610 FEET. THE AVERAGE CORING RATE IS 9.20 MINUTES PER FOOT. THE SAMPLES WERE ON THE SURFACE IN 0.00 HOURS

TABLE 1. (Continued)

RUN INFORMATION FOR WELL CONTINUED 1- 2

RUN NO. 7	CORING BEGAN AT 3919 FEET AND CORING STOPPED AT 3972 FEET. THE AVERAGE CORING RATE IS 8.43 MINUTES PER FOOT. THE SAMPLES WERE ON THE SURFACE IN 0.00 HOURS
RUN NO. 8	CORING BEGAN AT 3972 FEET AND CORING STOPPED AT 3532 FEET. THE AVERAGE CORING RATE IS 9.42 MINUTES PER FOOT. THE SAMPLES WERE ON THE SURFACE IN 0.00 HOURS
RUN NO. 9	CORING BEGAN AT 3532 FEET AND CORING STOPPED AT 3551 FEET. THE AVERAGE CORING RATE IS 8.45 MINUTES PER FOOT. THE SAMPLES WERE ON THE SURFACE IN 0.00 HOURS
RUN NO. 10	CORING BEGAN AT 3892 FEET AND CORING STOPPED AT 3920 FEET. THE AVERAGE CORING RATE IS 0.00 MINUTES PER FOOT. THE SAMPLES WERE ON THE SURFACE IN 0.00 HOURS
RUN NO. 11	CORING BEGAN AT 3950 FEET AND CORING STOPPED AT 3978 FEET. THE AVERAGE CORING RATE IS 0.00 MINUTES PER FOOT. THE SAMPLES WERE ON THE SURFACE IN 0.00 HOURS

TABLE 2. WELL LOG DATA

SAMPLE ID.	COR. POR. PCT.	NEUT. POR. PCT.	SECND POR. PCT	BULK DNSTY. G/CC	GAMA-RAY. API	RESISTIVITY M /M	16 N M /M	64 N M /M	18 L M /M	CARD CODE	SEQ NO.
C 2-2655.	1.0	21.00	0.0		170.	55.	50.	45.	70.	1	1
C 2-2710.	.2	20.00	0.0		170.	70.	47.	47.	60.	1	2
C 2-2761.	2.0	20.00	0.0		160.	115.	50.	45.	80.	1	3
C 2-3000.	3.0	25.00	2.0	2.734	185.	190.	50.	45.	100.	1	4
C 2-3025.	2.0	26.30	0.0		180.	50.	43.	40.	70.	1	5
C 2-3050.	4.0	27.00	1.0	2.750	205.	45.	40.	40.	50.	1	6
C 2-3101.	2.5	28.50	1.0	2.730	190.	70.	37.	37.	60.	1	7
C 2-3303.	6.0	27.60	0.0	2.730	195.	28.	27.	27.	45.	1	8
C 2-3325.	0.0	26.00	0.0	2.730	185.	40.	27.	29.	50.	1	9
C 2-3378.	12.0	30.60	0.0	2.880	105.	70.	1800.	350.	1600.	1	10
C 2-3420.	13.0	29.00	2.0	2.830	60.	110.	250.	120.	400.	1	11
C 2-3470.	3.0	26.50	3.0	2.780	210.	100.	300.	100.	450.	1	12
C 2-3525.	10.0	28.00	0.0	2.820	240.	100.	100.	90.	140.	1	13
C 2-3695.	3.0	30.00	1.0	2.750	280.	100.	18.	18.	45.	1	14
C 2-3722.	7.0	30.00	0.0	2.800	240.	16.	25.	25.	30.	1	15
C 2-3761.	17.0	30.00	0.0	2.930	190.	2000.	1800.	500.	1600.	1	16
C 2-3771.	11.0	28.00	0.0	2.820	260.	450.	17.	500.	1200.	1	17

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TABLE 3. INITIAL GAS RELEASE DATA: WELL C- 2

SAMPLE ID	PRESSURE TORR	FREE VOLUME CC	CORE VOLUME CC	OPEN POROSITY PCT.	GAS COMPOSITION, VOLUME PERCENT: METHANE	ETHANE	PROPANE	BUTANE	PENTANE	TOTAL HYDROC.	NITROGEN	OXYGEN	CARBON DIOXIDE	GAS RELEASED/ UNIT VOLUME OF SHALE	SEQ NO.
C 2-2655.	7[illegible].	516.	334.	1.41	8.47	.81	.28	[illegible]	[illegible].00	9.56	85.33	1.95	3.16	.05	1
C 2-2710.	7[illegible].	440.	1016.	2.22	11.87	1.36	.63	.04	0.00	13.90	82.60	1.36	2.15	.06	2
C 2-2761.	7[illegible].	3[illegible].	1[illegible]87.	2.57	12.6[illegible]	1.81	.99	.10	0.00	15.59	81.15	1.37	1.88	.05	3
C 2-3[illegible].	[illegible].	523.	927.	.71	25.88	3.36	1.84	.53	.20	31.81	64.57	.83	2.78	.22	4
C 2-36[illegible].	[illegible].	346.	1164.	.68	23.03	4.31	3.81	.77	.17	32.14	63.72	.72	3.42	.12	5
C 2-3650.	890.	7[illegible]3.	747.	.64	22.63	3.15	1.56	.38	0.00	27.72	67.86	1.05	3.38	.31	6
C 2-3[illegible]1.	11[illegible].	561.	889.	.63	32.88	5.98	2.54	.66	.34	42.44	54.70	.73	2.16	.39	7
C 2-33[illegible]3.	7[illegible].	5[illegible].	915.	.54	19.58	4.09	2.92	.54	.21	27.34	68.50	.99	3.17	.16	8
C 2-3328.	7[illegible].	446.	1[illegible]94.	.50	23.98	5.88	3.42	.74	.16	34.18	58.95	2.60	4.31	.14	9
C 2-3371.	[illegible].	470.	972.	.30	54.13	15.16	13.[illegible]5	3.11	.76	86.12	12.67	.35	.89	.46	10
C 2-34[illegible]8.	7[illegible].	484.	96[illegible].	.23	47.29	1[illegible].47	6.31	2.07	.47	66.61	32.17	.67	.61	.34	11
C 2-3478.	8[illegible].	711.	735.	.95	16.34	2.87	1.56	.51	.12	21.4[illegible]	69.99	7.12	1.46	.23	12
C 2-3528.	7[illegible].	256.	1154.	.36	57.76	15.62	1[illegible].01	2.75	.78	87.12	11.05	.98	.85	.22	13
C 2-3896.	[illegible].	637.	813.	1.51	47.48	13.59	7.72	1.77	.48	71.64	26.98	.46	1.53	.72	14
C 2-3922.	7[illegible].	6[illegible]2.	828.	.66	46.33	21.46	13.27	3.96	.99	85.01	13.64	.69	.65	.63	15
C 2-3961.	[illegible].	[illegible].	1[illegible]26.	.32	65.13	18.39	9.79	2.65	.44	95.86	3.69	.13	.36	.50	16
C 2-3971.	77[illegible].	516.	934.	.34	59.08	17.99	11.27	2.1[illegible]	.33	90.77	7.38	1.54	.32	.51	17

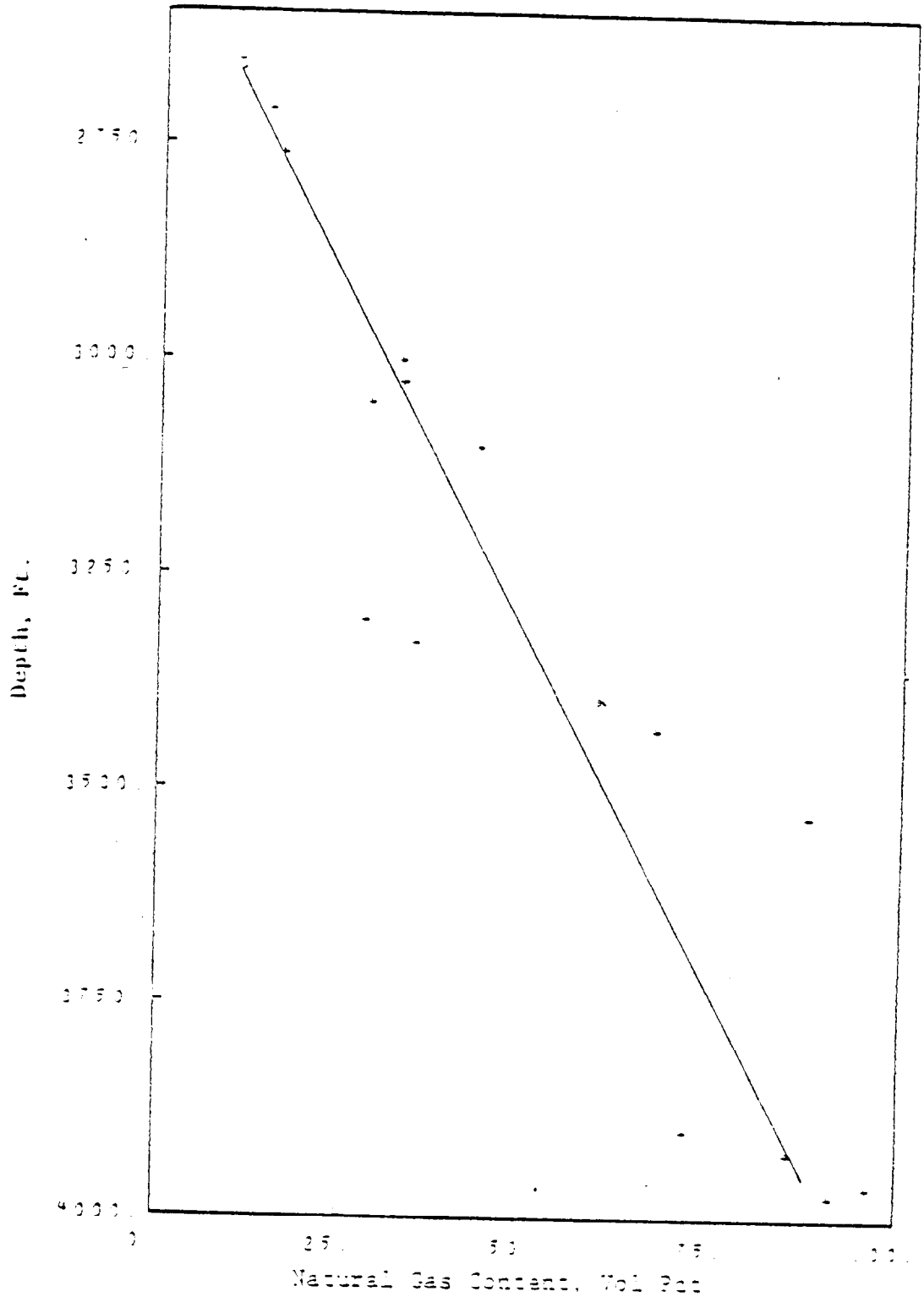


FIGURE 1. GAS CONTENT AS A FUNCTION OF SAMPLE DEPTH FOR WELL C-2

TABLE 4. STATISTICAL ANALYSES OF OFF GAS DATA

WELL G 2

	MEAN	STANDARD DEVIATION	VARIENCE	COEFFICIENT OF DEVIATION	95 PCT. CONFIDENCE INTERVAL LOWER LIMIT	UPPER LIMIT	NO OF SAMPLES
METHANE, PERCENT	33.802	18.73	350.73	.55	24.172	43.431	17
ETHANE, PERCENT	8.555	6.85	46.85	.80	5.036	12.075	17
PROPANE, PERCENT	5.351	4.56	20.81	.85	3.006	7.697	17
BUTANE, PERCENT	1.299	1.19	1.43	.92	.685	1.913	17
PENTANE, PERCENT	.321	.30	.09	.94	.166	.475	17
TOTAL HYDROCARBONS, PCT	49.324	30.92	955.80	.63	33.431	65.224	17
NITROGEN, PERCENT	47.350	29.33	860.44	.62	32.268	62.432	17
OXYGEN, PERCENT	1.383	1.60	2.56	1.16	.561	2.205	17
CARBON DIOXIDE, PERCENT	1.945	1.25	1.56	.64	1.303	2.587	17
GAS VOLUME/SOLE VOLUME	.301	.21	.04	.69	******	.407	17

TABLE 5. INCREASE IN GAS RELEASE AFTER TWO MONTHS WAIT FOR EQUILIBRIUM

Sample I.D.	P_o, torrs	ΔP_o, torrs	$\left(\frac{\text{H.C. Gas}}{\text{Shale Vol.}_o}\right)$	P_t, torrs	ΔP_t, torrs	$\left(\frac{\text{H.C. Gas}}{\text{Shale Vol.}_t}\right)$	%H.C. Gas in Free Space
1	780	44.5	0.040	840	104.5	0.094	5.70
2	825	41.2	0.050	860	76.2	0.093	5.00
3	810	40.9	0.060	855	85.9	0.126	5.05
4	875	106.0	0.110	1040	271.0	0.280	12.13
5	1125	391.5	0.560	1250	516.0	0.740	34.80

Column I - I.D. number

Column II - Can pressure at the time of initial gas analyses (usually 3 weeks after canning).

Column III - Hydrocarbon gas partial pressure at the time of gas analyses.

Column IV - Volume of hydrocarbon gas per unit volume of shale at the time of gas analyses.

Column V - Can pressure at 2 months after the gas analyses.

Column VI - Hydrocarbon partial pressure at 2 months after the initial gas analyses.

Column VII - Hydrocarbon gas volume per unit volume of shale at 2 months after the initial gas analyses.

Column VIII - Percent hydrocarbon gas in free space (inside the sealed can) at the time of initial gas analyses.

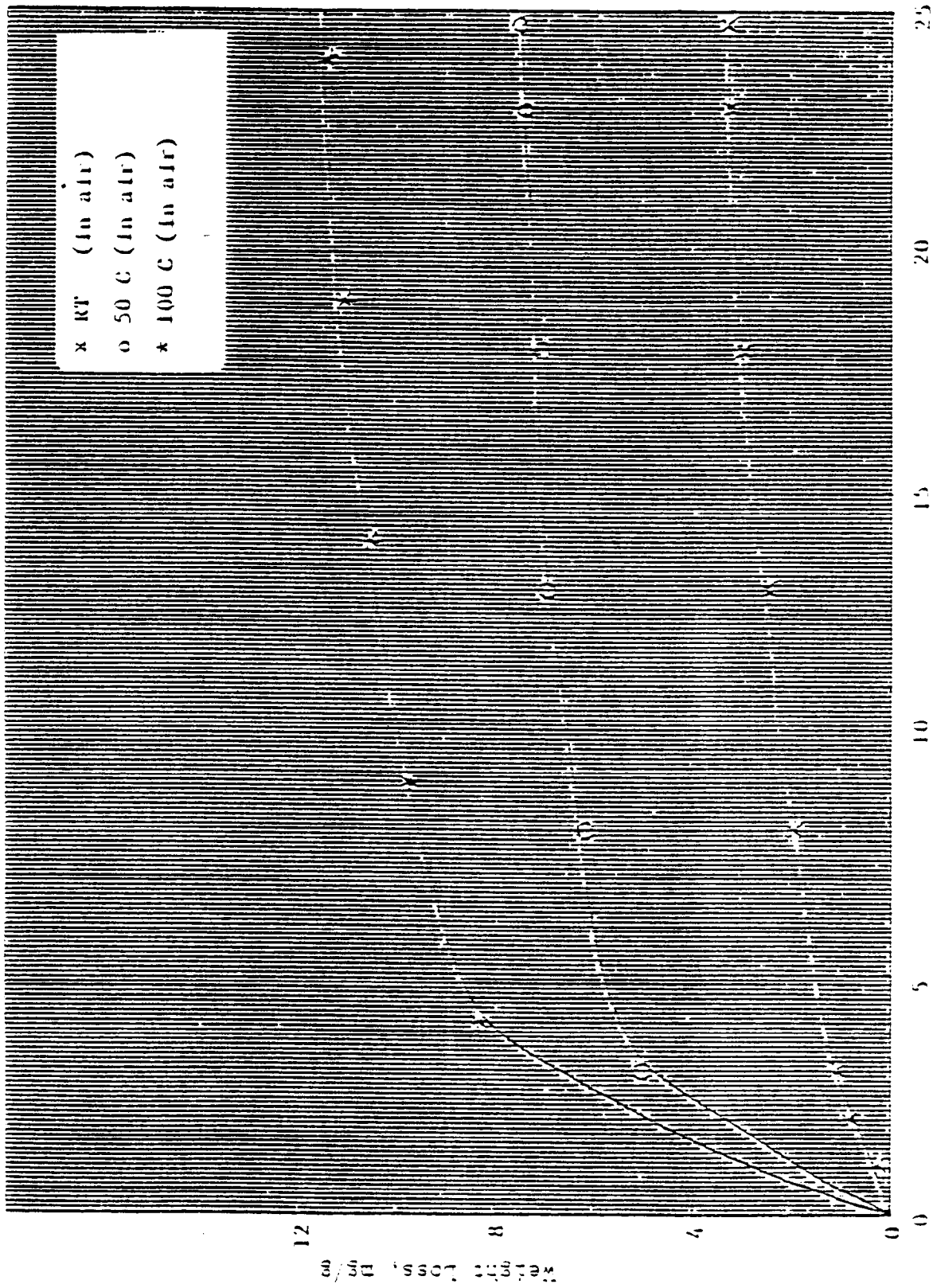


FIGURE 2. MICROBALANCE WEIGHT LOSS RATES FOR SHALE SAMPLE C-2-3922

TABLE 6. CHEMICAL CHARACTERIZATION DATA, 6/77

SAMPLE ID	CARBON	TOTAL, PERCENT HYDROGEN	NITROGEN	LOW TEMPERATURE ASH, % 200 C	100 C	CARD CODE	SEQ NO.
C 2-2655.	.2	.5	.1			5	1
C 2-2710.	.3	.4	.1			5	2
C 2-2761.	.7	.4	.1			5	3
C 2-3060.	1.0	.5	.1			5	4
C 2-3025.	.6	.6	.1			5	5
C 2-3050.	1.4	.6	.1			5	6
C 2-3101.	1.4	.6	.1			5	7
C 2-3103.	.7	.5	.1			5	8
C 2-3328.	1.4	.5	.1			5	9
C 2-3378.	4.8	.7	.2			5	10
C 2-3528.	3.1	.6	.1			5	11
C 2-3578.	.7	.5	.1			5	12
C 2-3528.	5.1	.8	.2	4.18		5	13
C 2-3896.	1.4	.5	.1			5	14
C 2-3922.	4.1	.7	.1			5	15
C 2-3961.	7.1	.9	.2			5	16
C 2-3971.	5.1	.7	.1			5	17

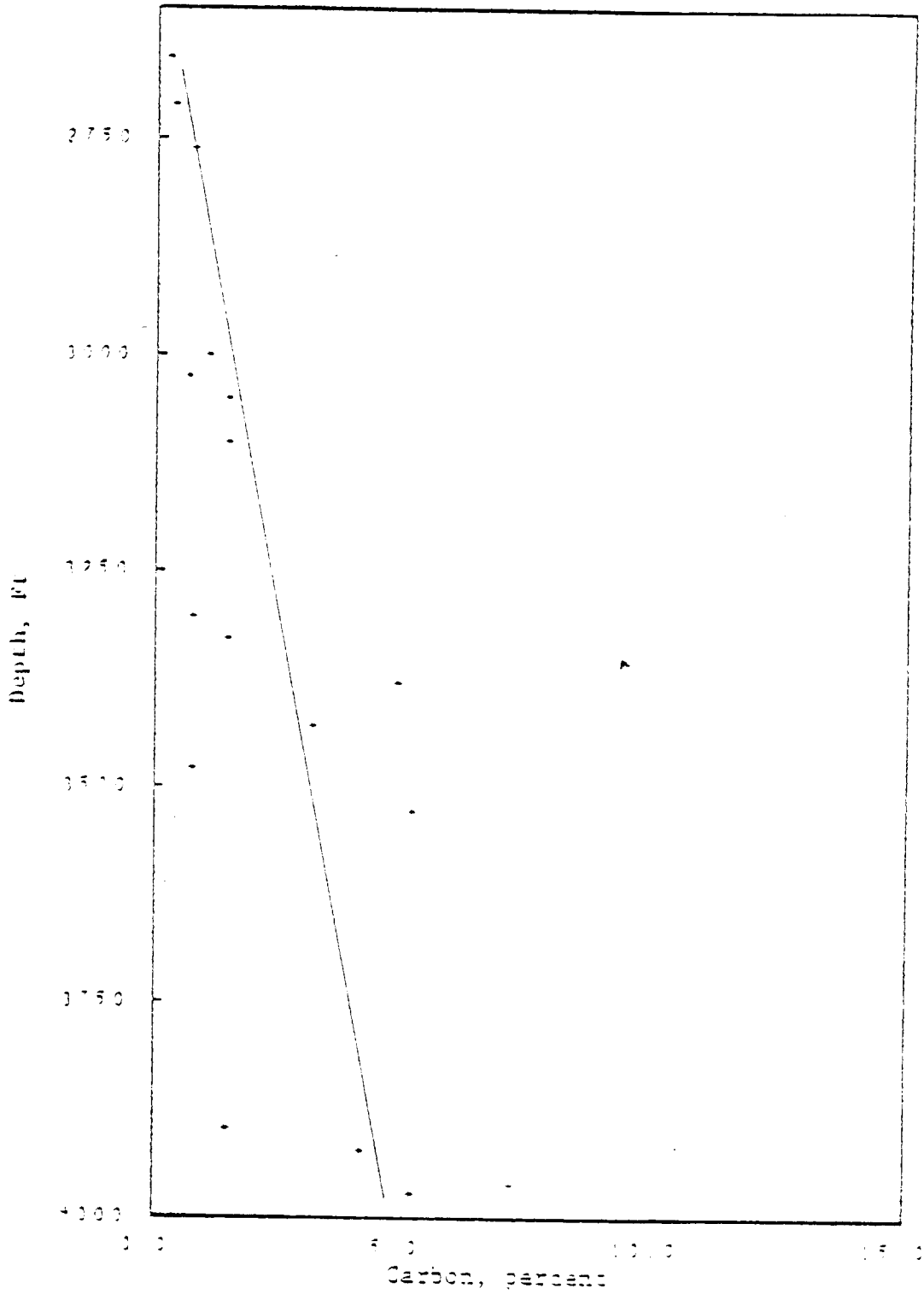


FIGURE 3. CARBON CONTENT AS A FUNCTION OF SAMPLE DEPTH FOR WELL C-2

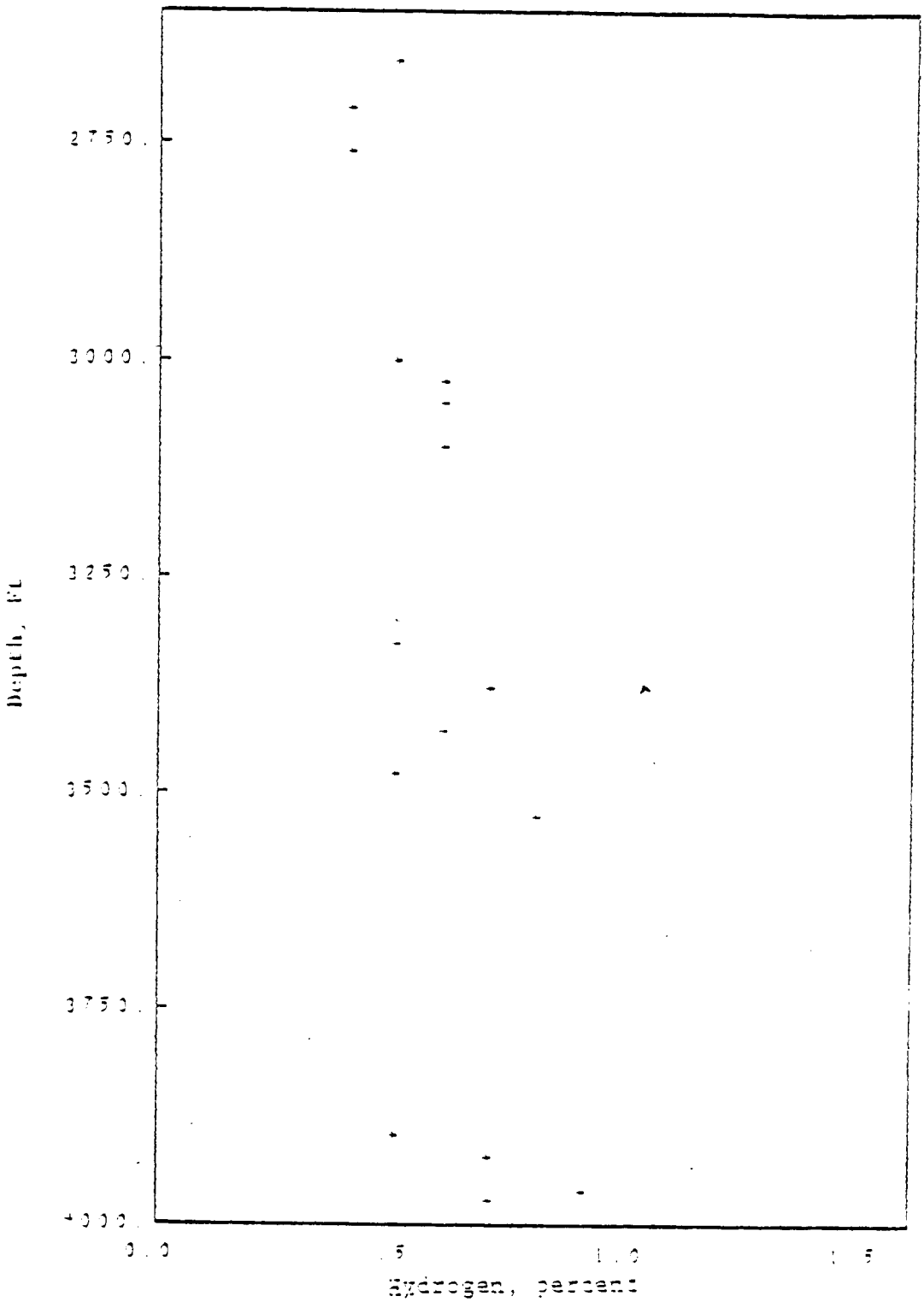


FIGURE 4. HYDROGEN CONTENT AS A FUNCTION OF SAMPLE DEPTH FOR WELL C-1

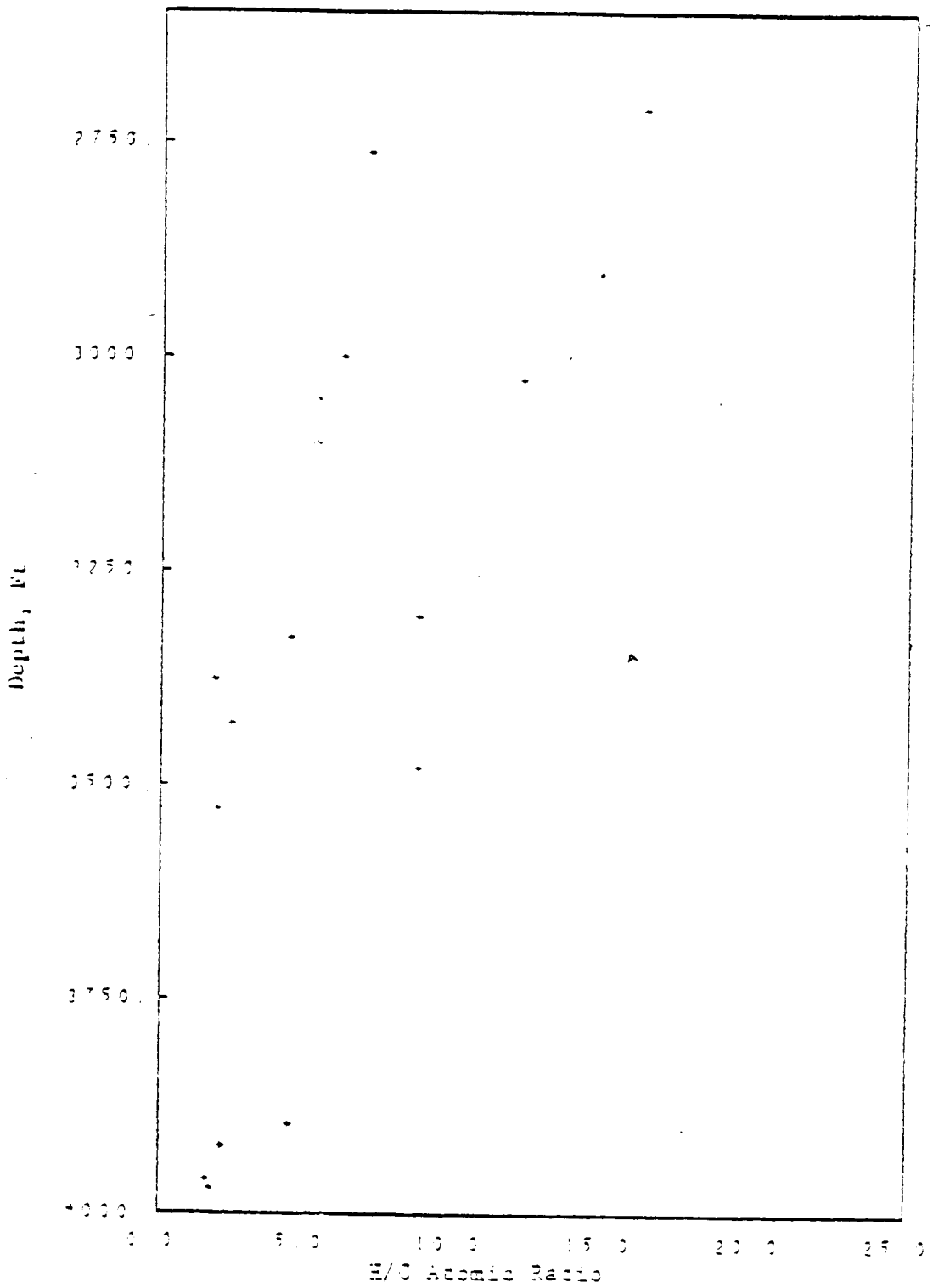


FIGURE 5. H/C ATOMIC RATIO AS A FUNCTION OF SAMPLE DEPTH FOR WELL C-2

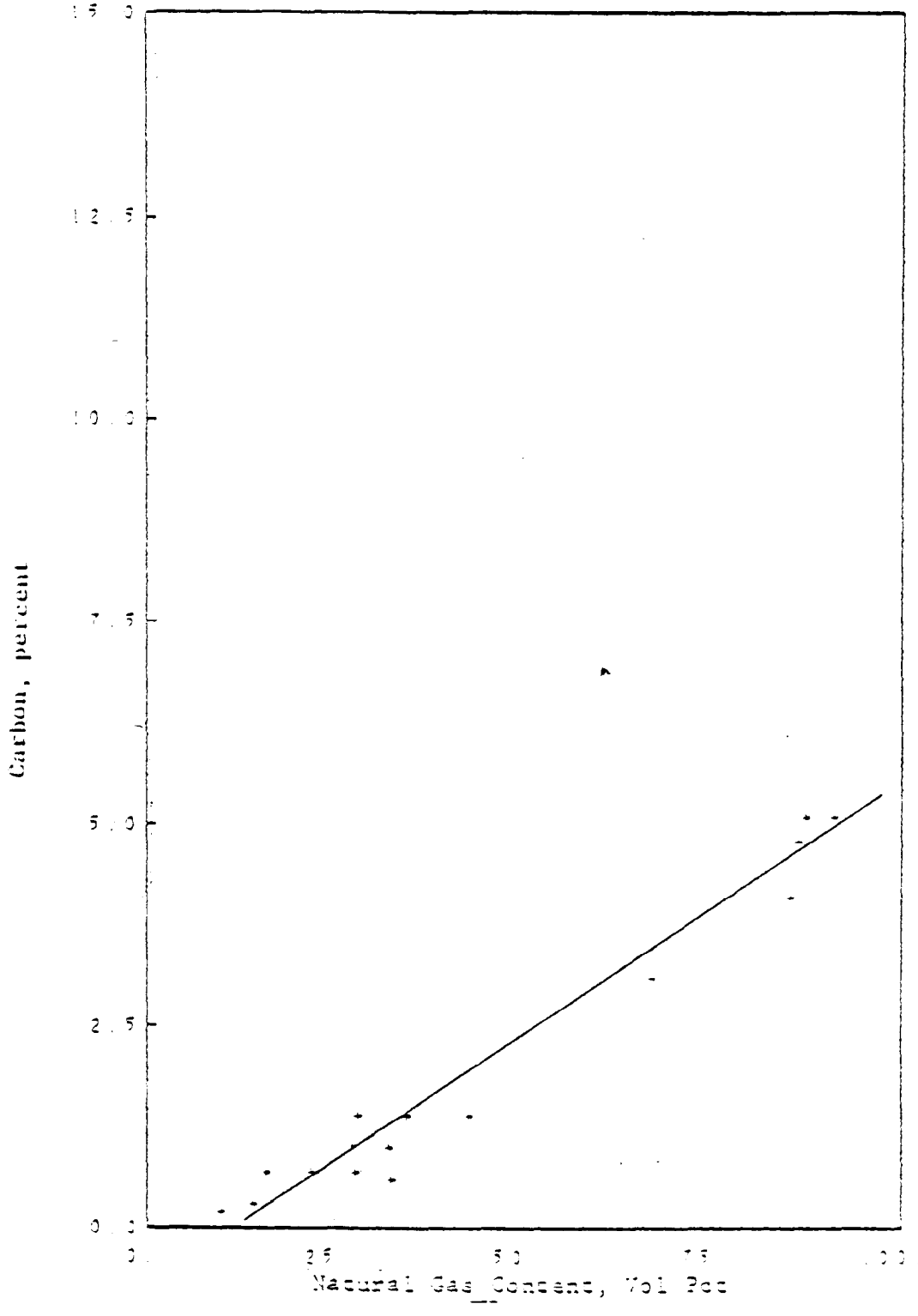


FIGURE 6. GAS CONTENT AS A FUNCTION OF CARBON CONTENT FOR WELL C-2

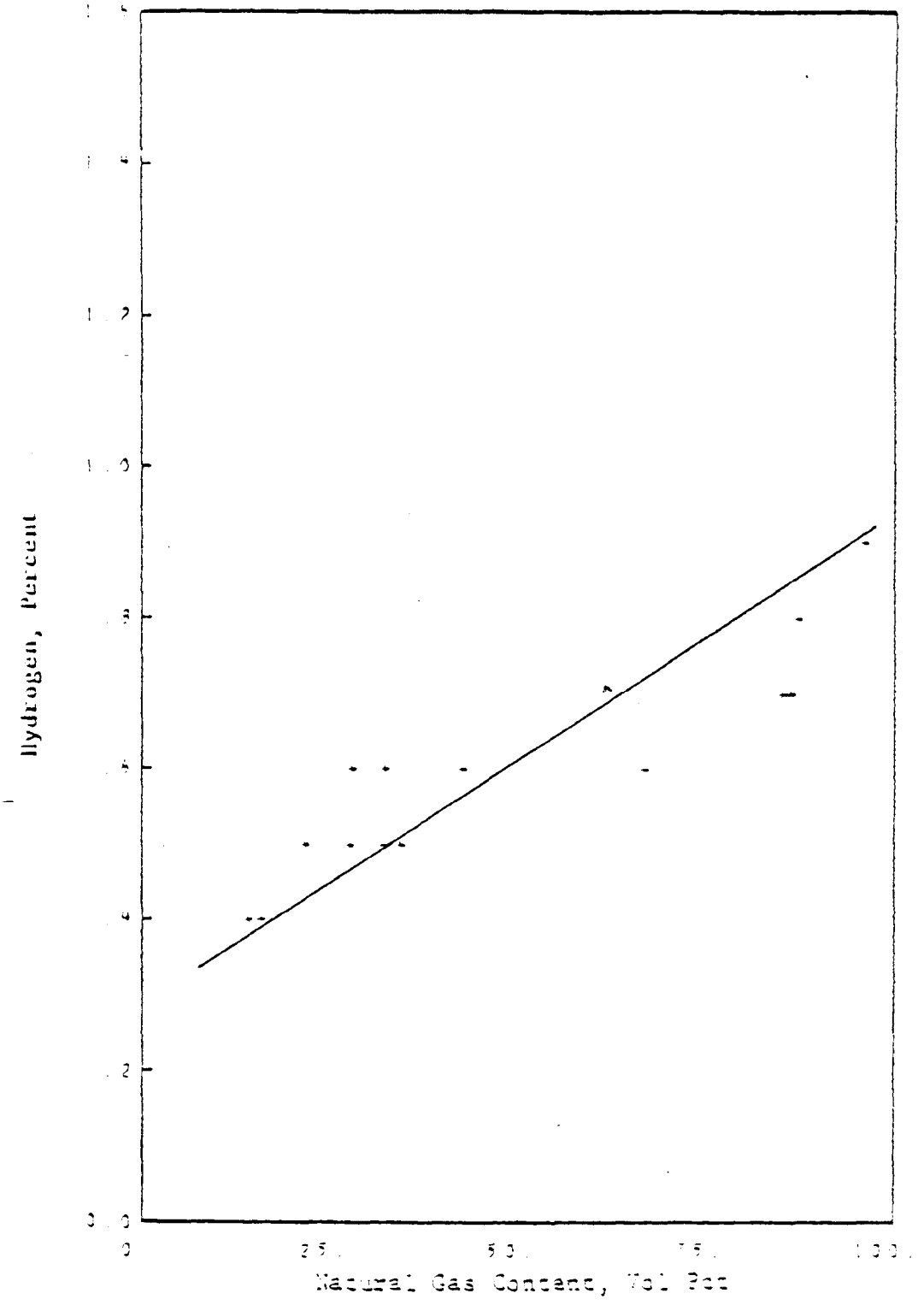


FIGURE [illegible]. GAS CONTENT AS A FUNCTION OF HYDROGEN CONTENT FOR WELL C-2

TABLE 7. SUMMARY OF PHYSICAL CHARACTERIZATION DATA

	BULK DENSITY G/CC	OPEN POROSITY PCT	CLOSED POROSITY PCT	TOTAL POROSITY PCT	DEGREE OF SATURATION PCT	SURFACE AREA M2/G	SPD
1 2-2651.	2.731	1.414	.664	2.077	36.399	1.970	1
1 2-2710.	2.708	2.220	1.406	3.626	19.433	1.550	2
1 2-2761.	2.705	2.565	3.604	6.169	5.816	2.420	3
1 2-3000.	2.737	.714	2.799	3.513	18.036	.950	4
1 2-3025.	2.708	.679	0.000	.679	100.000	3.610	5
1 2-3050.	2.716	.643	3.566	4.209	21.020	.400	6
1 2-3101.	2.737	.659	0.000	.659	100.000	3.910	7
1 2-3303.	2.810	.559	1.024	1.583	40.307	2.380	8
1 2-3378.	2.821	.496	1.069	2.566	19.306	3.200	9
1 2-3378.	2.581	.299	2.766	3.064	15.114	1.890	10
1 2-3428.	2.630	.290	1.756	2.046	45.767	4.220	11
1 2-3478.	2.757	.346	5.124	6.069	18.286	2.160	12
1 2-3528.	2.616	.363	0.000	.363	100.000	4.070	13
1 2-3806.	2.642	1.510	2.245	3.755	23.459	4.180	14
1 2-3922.	2.575	.664	.082	.747	100.000	4.390	15
1 2-3961.	2.558	.317	.383	.700	83.029	4.600	16
1 2-3971.	2.559	.335	4.926	5.261	6.997		17

TABLE 8. STATISTICAL ANALYSES OF PHYSICAL CHARACTERIZATION DATA

WELL C- 2

	MEAN	STANDARD DEVIATION	VARIENCE	COEFFICIENT OF DEVIATION	95 PCT. CONFIDENCE INTERVAL LOWER LIMIT	UPPER LIMIT	NO OF SAMPLES
[illegible]	2.681	.09	.01	.03	2.638	2.725	17
[illegible]	2.795	.09	.01	.03	2.658	2.752	17
[illegible]	2.743	.12	.01	.04	2.682	2.804	17
[illegible]	.960	.58	.56	.79	.511	1.210	17
[illegible]	1.895	1.69	2.87	.89	1.025	2.766	17
[illegible]	2.755	1.92	3.67	.70	1.770	3.741	17
[illegible]	7.129	3.13	9.78	.44	5.521	8.737	17
[illegible]	.932	.75	.56	23.17	0.000	.910	17
[illegible]	7.161	3.06	9.35	.43	5.582	8.731	17

TABLE 9. MERCURY INTRUSION POROSITY VALUES OF C-2 SHALES

Sequence No.	Shale I. D. No.	Porosity, Percent
1	C-2-2655	2.92
2	2710	4.77
3	2761	6.10
4	3000	4.24
5	3025	4.51
6	3050	7.15
7	3101	2.97
8	3303	4.77
9	3328	3.98
10	3378	2.65
11	3428	4.51
12	3478	4.24
13	3528	3.71
14	3896	1.10
15	3922	5.10
16	3961	2.68
17	3971	3.18

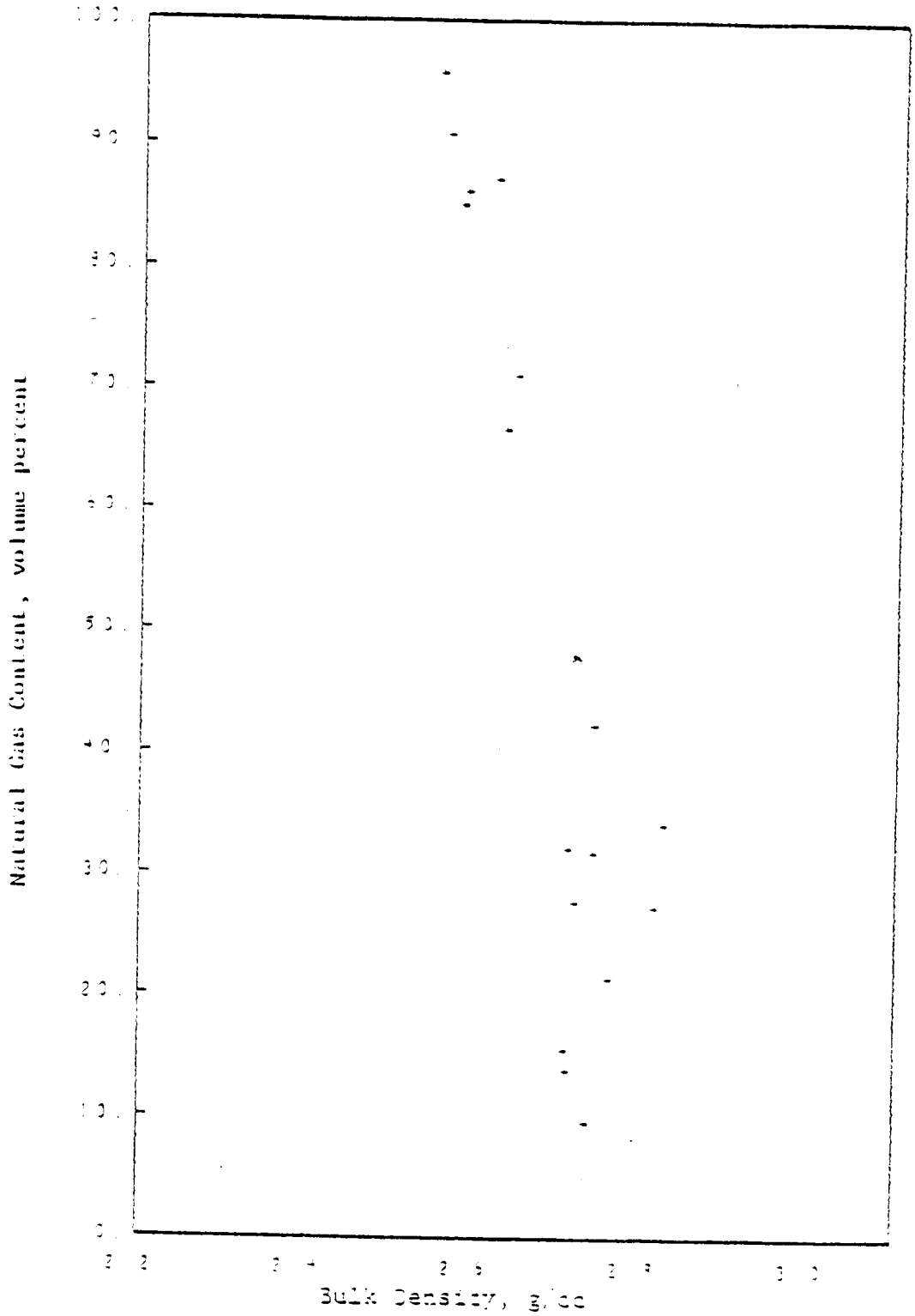


FIGURE 3. GAS CONTENT AS A FUNCTION OF BULK DENSITY FOR WELL C-1

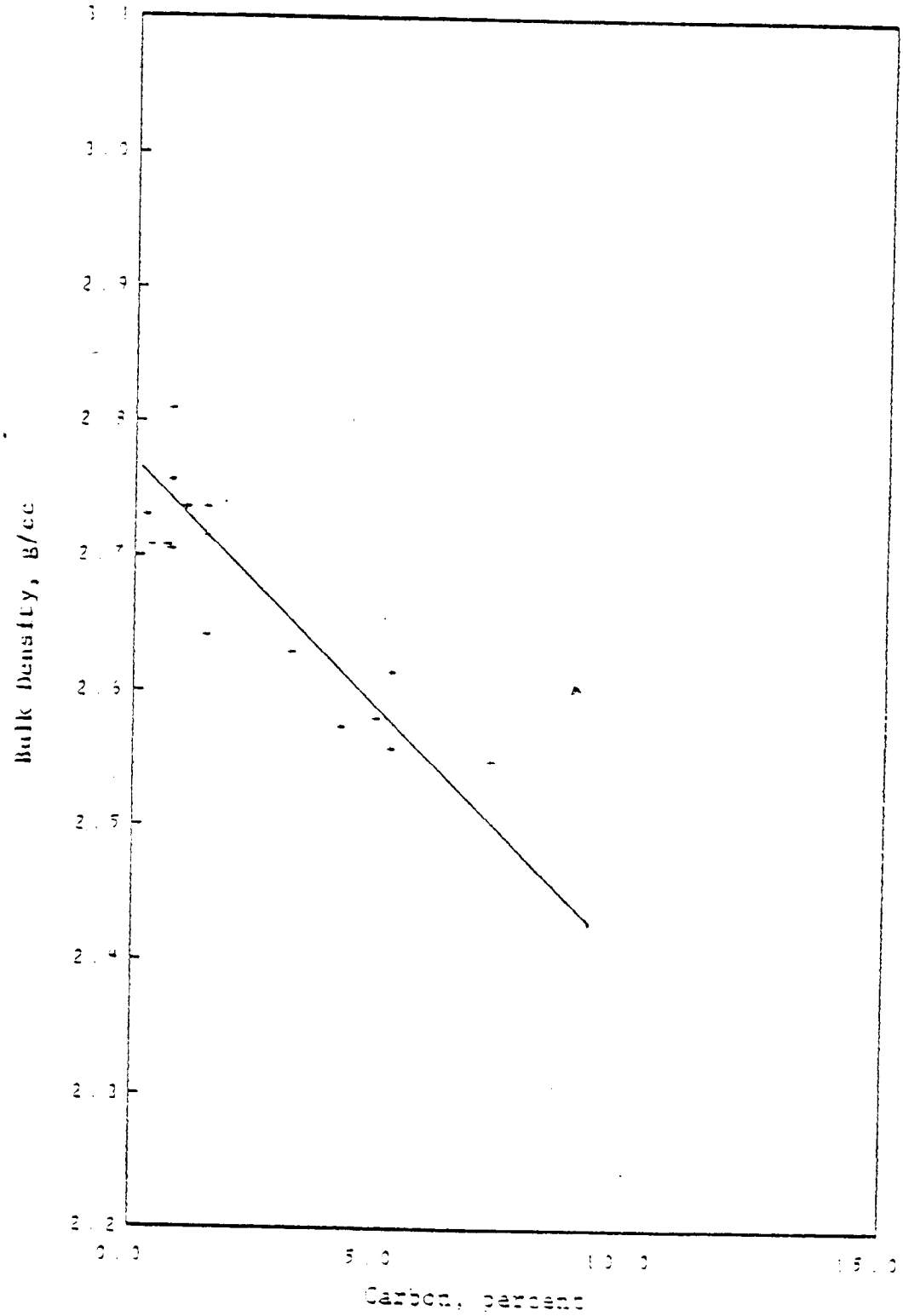


FIGURE 9. CARBON CONTENT AS A FUNCTION OF BULK DENSITY FOR WELL C-2

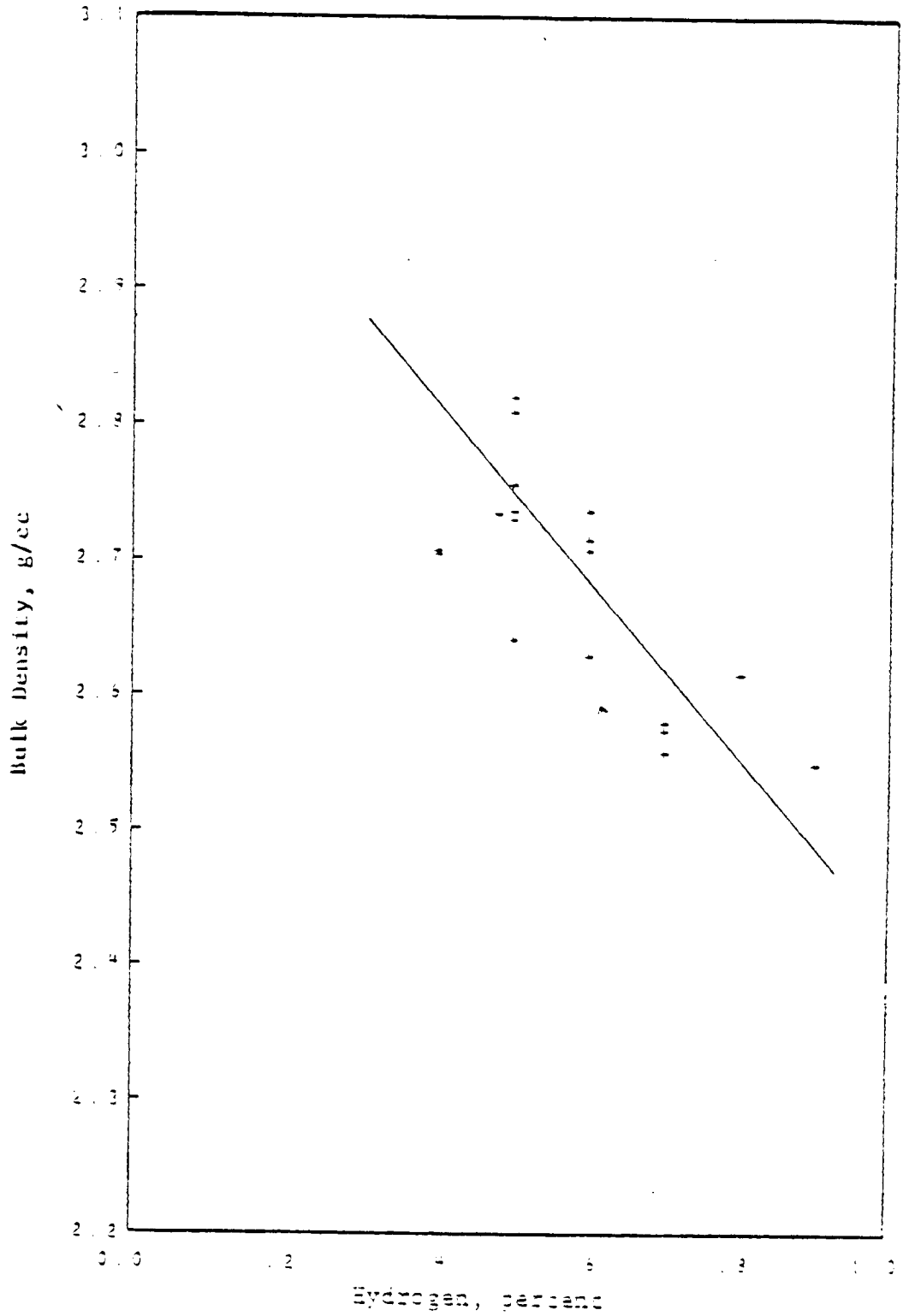


FIGURE 10. HYDROGEN CONTENT AS A FUNCTION OF BULK DENSITY FOR WELL C-1

TABLE 10. MINERALS OBSERVED BY XRD ANALYSIS ON RANDOM SHALE SAMPLES

Sample No.	Quartz	Illite	Kaolin	Pyrite	Nahcolite	Shortite	Siderite	Calcite	Mica	Others
C-2-3050	M	d	m	d	m	d	d	d	–	–
C-2-3378	M	d	m	d	m	m	–	d	–	–
C-2-3528	M	m	m	m	d	m	–	d	–	–
C-2-3922	M	–	m	m	m	m	d	m	–	–

LEGEND

M – Major

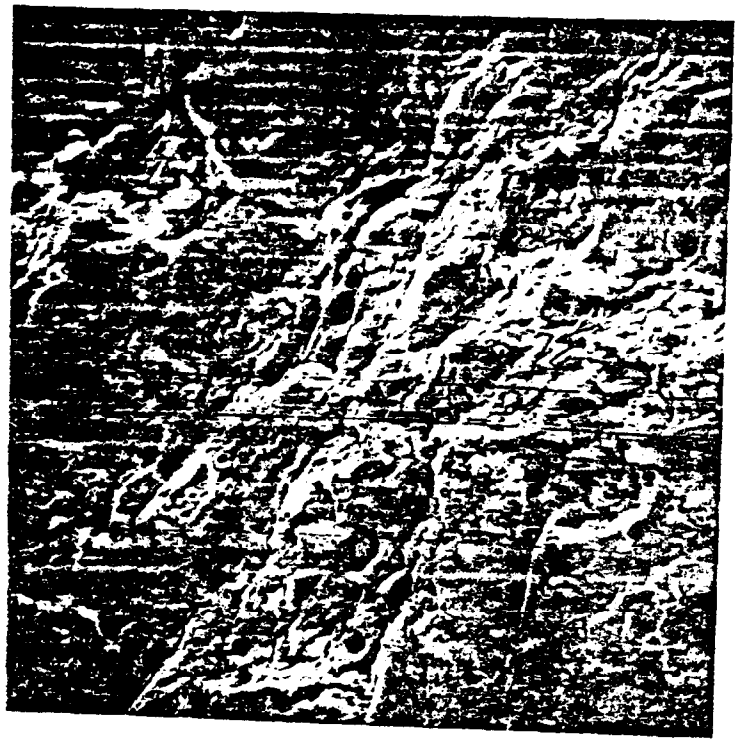
m – minor

d – detectable

D – Major Detectable

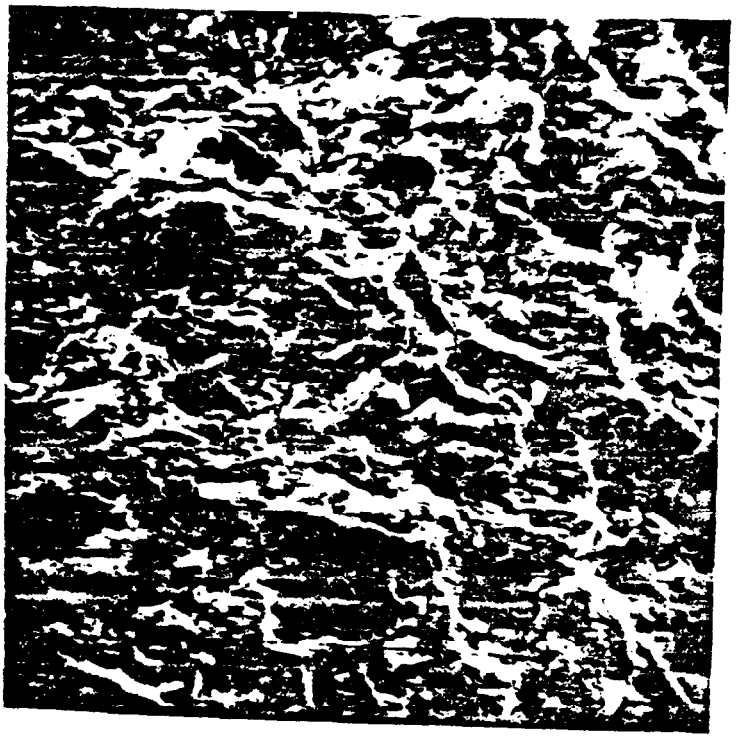
TABLE 11. ENERGY-DISPERSIVE ANALYSIS OF SHALES

	Element Count Per 100 Counts													
Shale Sample	Na	K	Ca	Mg	Al	Si	Fe	S	Ti	P	Fe/S	K/Al	K/Si	Al/Si
C-2-3000	Tr	8.4	-	Tr	21.5	61.7	5.6	1.4	1.4	-	4.0	0.39	0.14	0.35
C-2-3101	-	9.5	-	-	20.3	54.2	10.1	4.5	1.4	-	2.2	0.47	0.18	0.37
C-2-3428	-	8.3	-	Tr	18.9	63.0	6.5	2.7	0.6	-	2.7	0.44	0.13	0.30
C-2-3478	-	8.8	-	1.1	17.6	59.0	7.9	4.8	0.8	-	1.7	0.50	0.15	0.30
C-2-3961	-	7.7	5.5	Tr	19.1	63.4	2.9	1.4	Tr	-	2.0	0.40	0.12	0.30



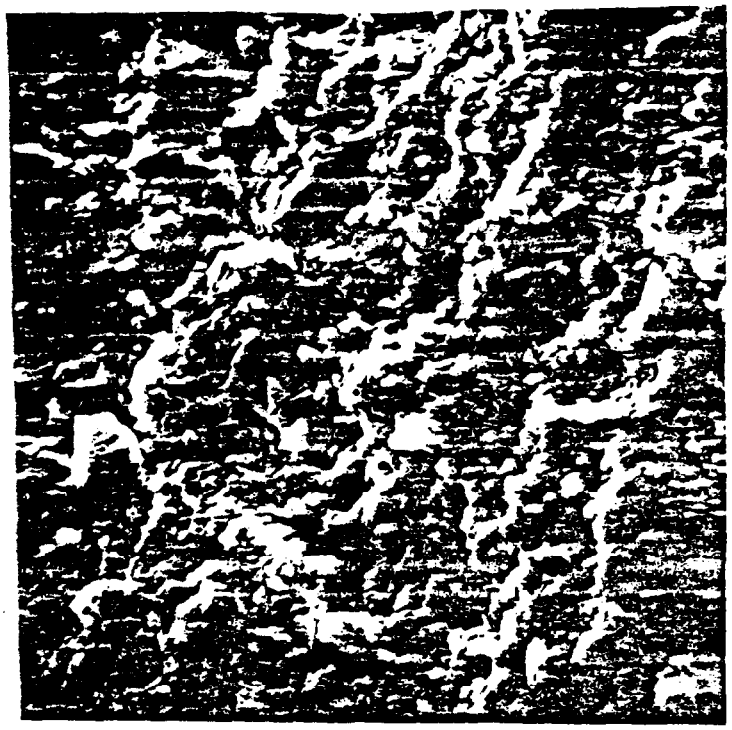
570 X

FIGURE 11. SEM MICROGRAPH OF SAMPLE C-2-3000



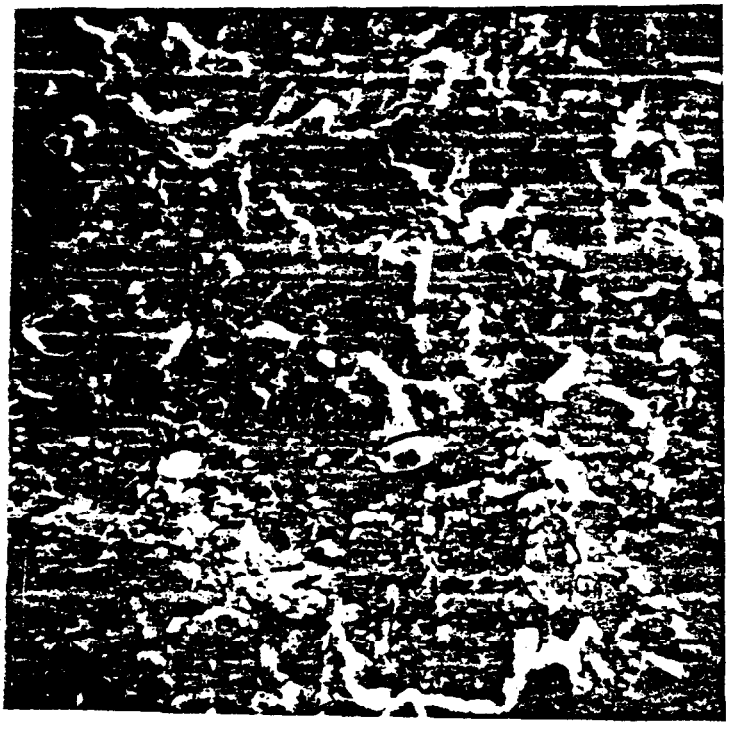
670 X

FIGURE 12. SEM MICROGRAPH OF SAMPLE C-2-3101



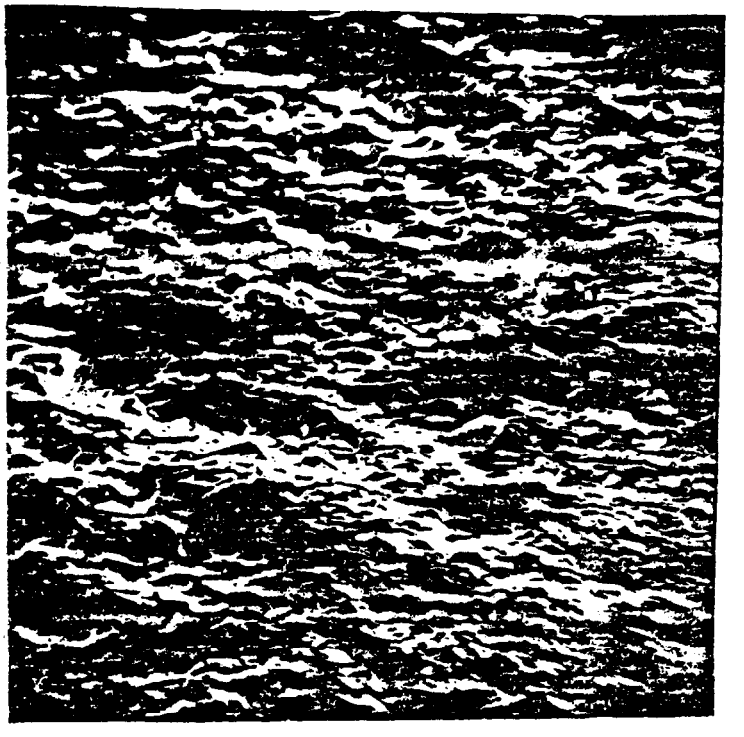
670 X

FIGURE 13. SEM MICROGRAPH OF SAMPLE C-2-3428



670 X

FIGURE 14. SEM MICROGRAPH OF SAMPLE C-2-3479



670 X

FIGURE 15. SEM MICROGRAPH OF SAMPLE C-2-3961

APPENDIX A

MERCURY INTRUSION POROSITY DATA

POROSITY DATA FOR SAMPLE C 2-2655.

SEQUENCE NUMBER 1
PORE VOLUME .011 CC/G

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
1.	14.696	15.000	.0000	.0108	.0
2.	29.392	7.500	.0000	.0108	.0
3.	44.088	5.000	.0003	.0105	2.5
4.	58.784	3.700	.0003	.0105	2.5
5.	73.480	3.000	.0003	.0105	2.5
6.	88.176	2.500	.0003	.0105	2.5
7.	102.872	2.100	.0003	.0105	2.5
8.	117.568	1.800	.0003	.0105	2.5
9.	132.264	1.600	.0003	.0105	2.5
10.	146.960	1.500	.0003	.0105	2.5
11.	161.656	1.400	.0003	.0105	2.5
12.	176.352	1.300	.0003	.0105	2.5
13.	191.048	1.200	.0003	.0105	2.5
14.	205.744	1.100	.0003	.0105	2.5
15.	220.440	1.000	.0003	.0105	2.5
16.	235.136	.930	.0003	.0105	2.5
17.	249.832	.880	.0003	.0105	2.5
18.	264.528	.830	.0003	.0105	2.5
19.	279.224	.790	.0003	.0105	2.5
20.	293.920	.750	.0003	.0105	2.5
25.	367.400	.600	.0003	.0105	2.5
30.	440.880	.500	.0003	.0105	2.5
35.	514.360	.430	.0003	.0105	2.5
40.	587.840	.370	.0013	.0095	12.3
45.	661.320	.330	.0013	.0094	12.3
50.	734.800	.300	.0016	.0092	14.8
55.	808.280	.270	.0020	.0088	18.5
60.	881.760	.250	.0025	.0082	23.5
65.	955.240	.230	.0027	.0081	25.7
70.	1028.720	.210	.0028	.0080	25.9
75.	1102.200	.200	.0029	.0078	27.2
80.	1175.680	.180	.0033	.0074	30.9
85.	1249.160	.170	.0036	.0072	33.3

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POROSITY DATA FOR SAMPLE C 2-2655.

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
90.	1322.640	.160	.0039	.0069	35.8
100.	1469.600	.150	.0039	.0069	35.8
110.	1616.560	.140	.0040	.0068	37.0
120.	1763.520	.130	.0041	.0067	38.3
130.	1910.480	.120	.0048	.0060	44.4
140.	2057.440	.110	.0048	.0060	44.4
150.	2204.400	.100	.0048	.0060	44.4
170.	2498.320	.088	.0053	.0055	49.4
180.	2645.280	.083	.0055	.0053	50.6
190.	2792.240	.079	.0055	.0053	50.6
200.	2939.200	.075	.0057	.0051	53.1
220.	3233.120	.068	.0057	.0051	53.1
240.	3527.040	.062	.0064	.0044	59.3
260.	3820.960	.057	.0064	.0044	59.3
280.	4114.880	.053	.0068	.0040	63.0
300.	4408.800	.050	.0068	.0040	63.0
330.	4849.680	.045	.0072	.0036	66.7
360.	5290.560	.041	.0072	.0036	66.7
390.	5731.440	.038	.0074	.0033	69.1
420.	6172.320	.035	.0077	.0031	71.6
450.	6613.200	.033	.0077	.0031	71.6
490.	7201.040	.030	.0081	.0027	75.3
510.	7494.960	.029	.0081	.0027	75.3
540.	7935.840	.027	.0081	.0027	75.3
590.	8670.640	.025	.0081	.0027	75.3
610.	8964.560	.025	.0081	.0027	75.3
660.	9685.440	.023	.0092	.0016	85.2
700.	10287.200	.021	.0094	.0013	87.7
750.	10875.040	.020	.0096	.0012	88.9
770.	11315.920	.019	.0096	.0012	88.9
800.	11756.800	.019	.0096	.0012	88.9
830.	12197.680	.018	.0096	.0012	88.9
860.	12638.560	.017	.0096	.0012	88.9
900.	13226.400	.017	.0105	.0003	97.5
930.	13667.280	.016	.0105	.0003	97.5
960.	13961.200	.016	.0108	.0000	100.0
1000.	14696.000	.015	.0108	.0000	100.0

March 30, 1979
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POROSITY DATA FOR SAMPLE C 2-2710.

SPECIMEN NUMBER 2
PORE VOLUME .018 CC/G

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
1.	14.696	15.000	.0000	.0182	.0
2.	29.392	7.500	.0013	.0169	7.0
3.	44.088	5.000	.0022	.0160	12.1
4.	58.784	3.700	.0024	.0158	13.4
5.	73.480	3.000	.0034	.0148	18.5
6.	88.176	2.500	.0034	.0148	18.5
7.	102.872	2.100	.0035	.0147	19.1
8.	117.568	1.800	.0041	.0141	22.3
9.	132.264	1.600	.0044	.0138	24.2
10.	146.960	1.500	.0044	.0138	24.2
11.	161.656	1.400	.0049	.0135	26.1
12.	176.352	1.300	.0050	.0132	27.4
13.	191.048	1.200	.0050	.0132	27.4
14.	205.744	1.100	.0050	.0132	27.4
15.	220.440	1.000	.0056	.0126	30.6
16.	235.136	.930	.0056	.0126	30.6
17.	249.832	.880	.0059	.0123	32.5
18.	264.528	.830	.0059	.0123	32.5
19.	279.224	.790	.0059	.0123	32.5
20.	293.920	.750	.0061	.0121	33.8
25.	367.400	.600	.0072	.0110	39.5
30.	440.880	.500	.0081	.0101	44.6
35.	514.360	.430	.0087	.0095	47.8
40.	587.840	.370	.0092	.0090	50.3
45.	661.320	.330	.0093	.0089	51.0
50.	734.800	.300	.0093	.0089	51.0
55.	808.280	.270	.0094	.0088	51.6
60.	881.760	.250	.0096	.0086	52.9
65.	955.240	.230	.0097	.0085	53.5
70.	1028.720	.210	.0104	.0078	57.3
75.	1102.200	.200	.0106	.0077	58.0
80.	1175.680	.180	.0107	.0075	58.6
85.	1249.160	.170	.0108	.0074	59.2

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POROSITY DATA FOR SAMPLE C 2-2710.

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
90.	1322.640	.160	.0109	.0073	59.9
100.	1469.600	.150	.0115	.0067	63.1
110.	1616.560	.140	.0115	.0067	63.1
120.	1763.520	.130	.0117	.0065	64.3
130.	1910.480	.120	.0117	.0065	64.3
140.	2057.440	.110	.0118	.0064	65.0
150.	2204.400	.100	.0124	.0058	68.2
170.	2498.320	.088	.0128	.0055	70.1
180.	2645.280	.083	.0128	.0055	70.1
190.	2792.240	.079	.0130	.0052	71.3
200.	2939.200	.075	.0130	.0052	71.3
220.	3233.120	.068	.0131	.0051	72.0
240.	3527.040	.062	.0137	.0045	75.2
260.	3820.960	.057	.0137	.0045	75.2
280.	4114.880	.053	.0138	.0044	75.8
300.	4408.800	.050	.0140	.0042	77.1
330.	4849.680	.045	.0145	.0037	79.6
360.	5290.560	.041	.0145	.0037	79.6
390.	5731.440	.038	.0147	.0035	80.9
420.	6172.320	.035	.0152	.0030	83.4
450.	6613.200	.033	.0153	.0029	84.1
480.	7201.040	.030	.0157	.0026	86.0
510.	7494.960	.029	.0157	.0026	86.0
540.	7935.840	.027	.0159	.0023	87.3
580.	8670.640	.025	.0161	.0021	88.5
610.	8964.560	.024	.0161	.0021	88.5
640.	9405.440	.023	.0166	.0016	91.1
700.	10287.200	.021	.0168	.0014	92.4
740.	10875.040	.020	.0170	.0012	93.6
770.	11315.920	.019	.0172	.0010	94.3
800.	11756.800	.019	.0172	.0010	94.3
830.	12197.680	.018	.0176	.0006	96.8
860.	12638.560	.017	.0179	.0003	98.1
900.	13226.400	.017	.0179	.0003	98.1
930.	13667.280	.016	.0180	.0002	98.7
960.	13961.200	.016	.0180	.0002	98.7
1000.	14696.000	.014	.0182	.0000	100.0

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March 30, 1975
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POROSITY DATA FOR SAMPLE C 2-2761.

SEQUENCE NUMBER 1
PORE VOLUME .023 CC/G

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
1.	14.696	15.000	.0010	.0220	4.4
2.	29.392	7.500	.0019	.0210	8.4
3.	44.088	5.000	.0020	.0209	8.9
4.	58.784	3.700	.0037	.0193	16.0
5.	73.480	3.000	.0037	.0193	16.0
6.	88.176	2.500	.0045	.0185	19.6
7.	102.872	2.100	.0060	.0170	26.2
8.	117.568	1.800	.0060	.0170	26.2
9.	132.264	1.600	.0060	.0170	26.2
10.	146.960	1.500	.0060	.0170	26.2
11.	161.656	1.400	.0063	.0167	27.6
12.	176.352	1.300	.0075	.0155	32.4
13.	191.048	1.200	.0075	.0155	32.4
14.	205.744	1.100	.0075	.0155	32.4
15.	220.440	1.000	.0075	.0155	32.4
16.	235.136	.930	.0079	.0151	34.2
17.	249.832	.880	.0080	.0150	34.7
18.	264.528	.830	.0084	.0146	36.4
19.	279.224	.790	.0085	.0145	36.9
20.	293.920	.750	.0085	.0145	36.9
25.	367.400	.600	.0103	.0127	44.9
30.	440.880	.500	.0112	.0118	48.9
35.	514.360	.430	.0118	.0112	51.1
40.	587.840	.370	.0123	.0107	53.3
45.	661.320	.330	.0125	.0105	54.2
50.	734.800	.300	.0128	.0102	55.6
55.	808.280	.270	.0128	.0102	55.6
60.	881.760	.250	.0133	.0097	57.8
65.	955.240	.230	.0135	.0095	58.7
70.	1028.720	.210	.0138	.0092	60.0
75.	1102.200	.200	.0143	.0087	62.2
80.	1175.680	.180	.0143	.0087	62.2
85.	1249.160	.170	.0143	.0087	62.2

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POROSITY DATA FOR SAMPLE G 2-2761.

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
90.	1322.640	.160	.0145	.0089	63.1
100.	1469.600	.150	.0140	.0082	64.4
110.	1616.560	.140	.0140	.0082	64.4
120.	1763.520	.130	.0153	.0077	66.7
130.	1910.480	.120	.0156	.0074	68.0
140.	2057.440	.110	.0156	.0074	68.0
150.	2204.400	.100	.0161	.0068	70.2
170.	2490.320	.088	.0161	.0066	71.1
190.	2645.280	.083	.0166	.0064	72.0
198.	2792.240	.079	.0166	.0064	72.0
200.	2939.200	.075	.0171	.0059	74.2
220.	3233.120	.068	.0171	.0059	74.2
240.	3527.040	.062	.0172	.0058	74.7
260.	3820.960	.057	.0176	.0054	76.4
280.	4114.880	.053	.0180	.0050	78.2
300.	4408.800	.050	.0182	.0048	79.1
330.	4849.680	.045	.0183	.0047	79.6
360.	5290.560	.041	.0185	.0045	80.4
390.	5731.440	.038	.0189	.0041	82.2
420.	6172.320	.035	.0193	.0037	84.0
450.	6613.200	.033	.0195	.0035	84.9
480.	7201.040	.030	.0198	.0032	86.2
510.	7494.960	.029	.0198	.0032	86.2
540.	7935.840	.027	.0200	.0030	87.1
570.	8670.640	.025	.0205	.0025	89.3
610.	8964.560	.024	.0205	.0025	89.3
650.	9405.440	.023	.0208	.0021	90.7
700.	10287.200	.021	.0215	.0015	93.5
740.	10875.040	.020	.0216	.0014	93.8
770.	11315.920	.019	.0218	.0012	94.7
800.	11756.800	.019	.0220	.0010	95.6
830.	12197.680	.018	.0222	.0008	96.4
860.	12638.560	.017	.0223	.0007	96.9
900.	13226.400	.017	.0226	.0004	98.2
930.	13667.280	.016	.0227	.0003	98.7
960.	13961.200	.016	.0229	.0001	99.6
1000.	14696.000	.014	.0230	.0000	100.0

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POROSITY DATA FOR SAMPLE C 2-3000.

SEQUENCE NUMBER 4
PORE VOLUME .016 CC/G

PRESSURE ATM.	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
1.	14.696	15.000	.0000	.0160	.0
2.	29.392	7.500	.0000	.0160	.0
3.	44.088	5.000	.0007	.0153	4.3
4.	58.784	3.700	.0007	.0153	4.3
5.	73.480	3.000	.0008	.0152	5.1
6.	88.176	2.500	.0008	.0152	5.1
7.	102.872	2.100	.0008	.0152	5.1
8.	117.568	1.800	.0030	.0130	18.8
9.	132.264	1.600	.0031	.0129	19.7
10.	146.960	1.500	.0033	.0127	20.5
11.	161.656	1.400	.0033	.0127	20.5
12.	176.352	1.300	.0033	.0127	20.5
13.	191.048	1.200	.0033	.0127	20.5
14.	205.744	1.100	.0033	.0127	20.5
15.	220.440	1.000	.0033	.0127	20.5
16.	235.136	.930	.0033	.0127	20.5
17.	249.832	.880	.0033	.0127	20.5
18.	264.528	.830	.0033	.0127	20.5
19.	279.224	.790	.0033	.0127	20.5
20.	293.920	.750	.0033	.0127	20.5
25.	367.400	.600	.0060	.0100	37.6
30.	440.880	.500	.0068	.0092	42.7
35.	514.360	.430	.0068	.0092	42.7
40.	587.840	.370	.0075	.0085	47.0
45.	661.320	.330	.0075	.0085	47.0
50.	734.800	.300	.0085	.0075	53.0
55.	808.280	.270	.0086	.0074	53.8
60.	881.760	.250	.0086	.0074	53.8
65.	955.240	.230	.0086	.0074	53.8
70.	1028.720	.210	.0086	.0074	53.8
75.	1102.200	.200	.0086	.0074	53.8
80.	1175.680	.180	.0086	.0074	53.8
85.	1249.160	.170	.0086	.0074	53.8

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POROSITY DATA FOR SAMPLE C 2-3000.

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
90.	1322.640	.160	.0086	.0074	53.0
100.	1469.600	.150	.0104	.0056	65.0
110.	1616.560	.140	.0104	.0056	65.0
120.	1763.520	.130	.0104	.0056	65.0
130.	1910.480	.120	.0104	.0056	65.0
140.	2057.440	.110	.0104	.0056	65.0
150.	2204.400	.100	.0104	.0056	65.0
170.	2498.320	.088	.0104	.0056	65.0
180.	2645.280	.083	.0104	.0056	65.0
190.	2792.240	.079	.0104	.0056	65.0
200.	2939.200	.075	.0104	.0056	65.0
220.	3233.120	.068	.0125	.0036	77.8
240.	3527.040	.062	.0125	.0036	77.8
260.	3820.960	.057	.0125	.0036	77.8
280.	4114.880	.053	.0125	.0036	77.8
300.	4408.800	.050	.0125	.0036	77.8
330.	4849.680	.045	.0125	.0036	77.8
360.	5290.560	.041	.0125	.0036	77.8
390.	5731.440	.038	.0125	.0036	77.8
420.	6172.320	.035	.0125	.0036	77.8
450.	6613.200	.033	.0125	.0036	77.8
490.	7201.040	.030	.0125	.0036	77.8
510.	7494.960	.029	.0146	.0014	91.5
540.	7935.840	.027	.0146	.0014	91.5
590.	8670.640	.025	.0146	.0014	91.5
610.	8964.560	.024	.0146	.0014	91.5
640.	9405.440	.023	.0146	.0014	91.5
700.	10287.200	.021	.0146	.0014	91.5
740.	10875.040	.020	.0146	.0014	91.5
770.	11315.920	.019	.0146	.0014	91.5
800.	11756.800	.019	.0151	.0010	94.0
830.	12197.680	.018	.0151	.0010	94.0
860.	12638.560	.017	.0155	.0005	96.6
900.	13226.400	.017	.0155	.0005	96.6
930.	13667.280	.016	.0155	.0005	96.6
960.	13961.200	.016	.0155	.0005	96.6
1000.	14696.000	.014	.0160	.0000	100.0

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POROSITY DATA FOR SAMPLE C 2-1025.

SEQUENCE NUMBER 5
PORE VOLUME .017 CC/G

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
1.	14.696	15.000	.0000	.0169	.0
2.	29.392	7.500	.0000	.0169	.0
3.	44.088	5.000	.0003	.0166	1.7
4.	58.784	3.700	.0009	.0160	5.5
5.	73.480	3.000	.0019	.0150	11.0
6.	88.176	2.500	.0021	.0148	12.7
7.	102.872	2.100	.0029	.0140	17.1
8.	117.568	1.800	.0032	.0137	18.8
9.	132.264	1.600	.0036	.0133	21.5
10.	146.960	1.500	.0037	.0132	22.1
11.	161.656	1.400	.0042	.0127	24.9
12.	176.352	1.300	.0047	.0122	27.6
13.	191.048	1.200	.0049	.0120	28.7
14.	205.744	1.100	.0051	.0118	30.4
15.	220.440	1.000	.0052	.0117	30.9
16.	235.136	.930	.0052	.0117	30.9
17.	249.832	.880	.0052	.0117	30.9
18.	264.528	.830	.0052	.0117	30.9
19.	279.224	.790	.0052	.0117	30.9
20.	293.920	.750	.0052	.0117	30.9
25.	367.400	.600	.0061	.0108	35.9
30.	440.880	.500	.0061	.0108	35.9
35.	514.360	.430	.0074	.0095	43.6
40.	587.840	.370	.0078	.0092	45.9
45.	661.320	.330	.0082	.0087	48.6
50.	734.800	.300	.0082	.0087	48.6
55.	808.280	.270	.0083	.0086	49.2
60.	881.760	.250	.0089	.0080	52.5
65.	955.240	.230	.0093	.0076	55.2
70.	1028.720	.210	.0096	.0073	56.9
75.	1102.200	.200	.0099	.0070	58.6
80.	1175.680	.180	.0101	.0068	59.7
85.	1249.160	.170	.0101	.0068	59.7

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POROSITY DATA FOR SAMPLE C 2-3025.

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
90.	1322.640	.160	.0103	.0066	60.8
100.	1469.600	.150	.0105	.0064	61.9
110.	1616.560	.140	.0107	.0062	63.5
120.	1763.520	.130	.0107	.0062	63.5
130.	1910.480	.120	.0111	.0058	65.7
140.	2057.440	.110	.0114	.0055	67.4
150.	2204.400	.100	.0114	.0055	67.4
170.	2498.320	.088	.0118	.0051	69.6
180.	2645.280	.083	.0118	.0051	69.6
190.	2792.240	.079	.0122	.0047	72.4
200.	2939.200	.075	.0122	.0047	72.4
220.	3233.120	.068	.0123	.0046	72.9
240.	3527.040	.062	.0128	.0041	75.7
260.	3820.960	.057	.0128	.0041	75.7
280.	4114.880	.053	.0131	.0038	77.3
300.	4408.800	.050	.0131	.0038	77.3
330.	4849.680	.045	.0134	.0035	79.6
360.	5290.560	.041	.0134	.0035	79.6
390.	5731.440	.038	.0138	.0031	81.8
420.	6172.320	.035	.0138	.0031	81.8
450.	6613.200	.033	.0142	.0027	84.0
490.	7201.040	.030	.0142	.0027	84.0
510.	7494.960	.029	.0146	.0023	86.2
540.	7935.840	.027	.0146	.0023	86.2
590.	8670.640	.025	.0149	.0020	88.4
610.	8964.560	.024	.0149	.0020	88.4
660.	9605.440	.023	.0151	.0018	89.5
700.	10287.200	.021	.0155	.0014	91.7
750.	10875.040	.020	.0155	.0014	91.7
770.	11315.920	.019	.0155	.0014	91.7
800.	11756.800	.019	.0158	.0011	93.4
830.	12197.680	.018	.0158	.0011	93.4
860.	12638.560	.017	.0162	.0007	96.1
900.	13226.400	.017	.0162	.0007	96.1
930.	13667.280	.016	.0162	.0007	96.1
960.	13961.200	.016	.0169	.0000	100.0
1000.	14696.000	.014	.0169	.0000	100.0

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POROSITY DATA FOR SAMPLE C 2-3050.

SEQUENCE NUMBER 6
PORE VOLUME .027 CC/G

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
1.	14.696	15.000	.0005	.0267	1.8
2.	29.392	7.500	.0014	.0258	5.0
3.	44.088	5.000	.0032	.0240	11.9
4.	58.784	3.700	.0044	.0228	16.1
5.	73.480	3.000	.0052	.0220	19.3
6.	88.176	2.500	.0062	.0210	22.9
7.	102.872	2.100	.0070	.0202	25.7
8.	117.568	1.800	.0070	.0202	25.7
9.	132.264	1.600	.0077	.0195	28.4
10.	146.960	1.500	.0085	.0187	31.2
11.	161.656	1.400	.0090	.0182	33.0
12.	176.352	1.300	.0090	.0182	33.0
13.	191.048	1.200	.0096	.0176	35.3
14.	205.744	1.100	.0102	.0170	37.6
15.	220.440	1.000	.0102	.0170	37.6
16.	235.136	.930	.0102	.0170	37.6
17.	249.832	.880	.0109	.0163	39.9
18.	264.528	.830	.0109	.0163	39.9
19.	279.224	.790	.0109	.0163	39.9
20.	293.920	.750	.0116	.0156	42.7
25.	367.400	.600	.0126	.0146	46.3
30.	440.880	.500	.0144	.0129	52.8
35.	514.360	.430	.0157	.0115	57.8
40.	587.840	.370	.0157	.0115	57.8
45.	661.320	.330	.0160	.0112	58.7
50.	734.800	.300	.0163	.0109	60.1
55.	808.280	.270	.0163	.0109	60.1
60.	881.760	.250	.0170	.0102	62.4
65.	955.240	.230	.0170	.0102	62.4
70.	1028.720	.210	.0176	.0096	64.7
75.	1102.200	.200	.0176	.0096	64.7
80.	1175.680	.180	.0183	.0089	67.4
85.	1249.160	.170	.0183	.0089	67.4

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POROSITY DATA FOR SAMPLE C 2-3050.

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
90.	1322.640	.160	.0183	.0089	67.4
100.	1469.600	.150	.0188	.0084	69.3
110.	1616.560	.140	.0188	.0084	69.3
120.	1763.520	.130	.0197	.0075	72.5
130.	1910.480	.120	.0197	.0075	72.5
140.	2057.440	.110	.0203	.0069	74.8
150.	2204.400	.100	.0203	.0069	74.8
160.	2498.320	.088	.0208	.0064	76.6
180.	2645.280	.083	.0208	.0064	76.6
190.	2792.240	.079	.0215	.0057	78.9
200.	2939.200	.075	.0215	.0057	78.9
220.	3233.120	.068	.0220	.0052	80.7
240.	3527.040	.062	.0220	.0052	80.7
260.	3820.960	.057	.0220	.0052	80.7
280.	4114.880	.053	.0225	.0047	82.6
300.	4408.800	.050	.0228	.0044	83.9
330.	4849.680	.045	.0235	.0037	86.2
360.	5290.560	.041	.0236	.0036	86.7
390.	5731.440	.038	.0236	.0036	86.7
420.	6172.320	.035	.0240	.0032	88.1
450.	6613.200	.033	.0240	.0032	88.1
480.	7201.040	.030	.0247	.0025	90.8
510.	7494.960	.029	.0247	.0025	90.8
540.	7935.840	.027	.0250	.0022	91.7
590.	8670.640	.025	.0253	.0019	93.1
610.	8964.560	.024	.0253	.0019	93.1
640.	9405.440	.023	.0253	.0019	93.1
700.	10287.200	.021	.0260	.0012	95.4
750.	10875.040	.020	.0261	.0011	95.9
770.	11315.920	.019	.0263	.0009	96.8
800.	11756.800	.019	.0263	.0009	96.8
850.	12197.680	.018	.0263	.0009	96.8
860.	12638.560	.017	.0268	.0004	98.6
900.	13226.400	.017	.0268	.0004	98.6
950.	13667.280	.016	.0272	.0000	100.0
960.	13961.200	.016	.0272	.0000	100.0
1000.	14696.000	.015	.0272	.0000	100.0

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POROSITY DATA FOR SAMPLE C 2-3101.

SEQUENCE NUMBER 7
PORE VOLUME .012 CC/G

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
1.	14.696	15.000	.0001	.0122	1.1
2.	29.392	7.500	.0001	.0122	1.1
3.	44.088	5.000	.0001	.0122	1.1
4.	58.784	3.700	.0001	.0122	1.1
5.	73.480	3.000	.0001	.0122	1.1
6.	88.176	2.500	.0025	.0098	20.2
7.	102.872	2.100	.0026	.0097	21.3
8.	117.568	1.800	.0029	.0095	23.4
9.	132.264	1.600	.0029	.0095	23.4
10.	146.960	1.500	.0032	.0092	25.5
11.	161.656	1.400	.0032	.0092	25.5
12.	176.352	1.300	.0032	.0092	25.5
13.	191.048	1.200	.0032	.0092	25.5
14.	205.744	1.100	.0032	.0092	25.5
15.	220.440	1.000	.0032	.0092	25.5
16.	235.136	.930	.0032	.0092	25.5
17.	249.832	.880	.0032	.0092	25.5
18.	264.528	.830	.0032	.0092	25.5
19.	279.224	.790	.0032	.0092	25.5
20.	293.920	.750	.0032	.0092	25.5
25.	367.400	.600	.0032	.0092	25.5
30.	440.880	.500	.0046	.0077	37.2
35.	514.360	.430	.0047	.0076	38.3
40.	587.840	.370	.0050	.0074	40.4
45.	661.320	.330	.0050	.0074	40.4
50.	734.800	.300	.0050	.0074	40.4
55.	808.280	.270	.0051	.0072	41.5
60.	881.760	.250	.0053	.0071	42.6
65.	955.240	.230	.0054	.0070	43.6
70.	1028.720	.210	.0056	.0067	45.7
75.	1102.200	.200	.0058	.0066	46.8
80.	1175.680	.180	.0059	.0064	47.9
85.	1249.160	.170	.0060	.0063	48.9

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POROSITY DATA FOR SAMPLE C 2-3101.

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
90.	1322.640	.160	.0063	.0060	51.1
100.	1469.600	.150	.0063	.0060	51.1
110.	1616.560	.140	.0072	.0051	58.5
120.	1763.520	.130	.0075	.0049	60.6
130.	1910.480	.120	.0076	.0047	61.7
140.	2057.440	.110	.0077	.0046	62.8
150.	2204.400	.100	.0079	.0045	63.8
170.	2490.120	.088	.0080	.0043	64.9
180.	2645.280	.083	.0080	.0043	64.9
190.	2792.240	.079	.0081	.0042	66.0
200.	2939.200	.075	.0081	.0042	66.0
220.	3233.120	.068	.0081	.0042	66.0
240.	3527.040	.062	.0081	.0042	66.0
260.	3820.960	.057	.0081	.0042	66.0
280.	4114.880	.053	.0081	.0042	66.0
300.	4408.800	.050	.0081	.0042	66.0
330.	4849.680	.045	.0081	.0042	66.0
360.	5290.560	.041	.0081	.0042	66.0
390.	5731.440	.038	.0102	.0021	83.0
420.	6172.320	.035	.0102	.0021	83.0
450.	6613.200	.033	.0102	.0021	83.0
490.	7201.040	.030	.0102	.0021	83.0
510.	7494.960	.029	.0102	.0021	83.0
540.	7935.840	.027	.0102	.0021	83.0
590.	8670.640	.025	.0102	.0021	83.0
610.	8964.560	.024	.0102	.0021	83.0
640.	9405.440	.023	.0108	.0016	87.2
700.	10287.200	.021	.0108	.0016	87.2
740.	10875.040	.020	.0123	.0000	100.0
770.	11315.920	.019	.0123	.0000	100.0
800.	11756.800	.019	.0123	.0000	100.0
830.	12197.680	.018	.0123	.0000	100.0
860.	12638.560	.017	.0123	.0000	100.0
900.	13226.400	.017	.0123	.0000	100.0
930.	13667.280	.016	.0123	.0000	100.0
960.	13961.200	.016	.0123	.0000	100.0
1000.	14696.000	.014	.0123	.0000	100.0

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POROSITY DATA FOR SAMPLE C 2-3303.

SEQUENCE NUMBER 8
PORE VOLUME .018 CC/G

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
1.	14.696	15.000	.0006	.0178	3.2
2.	29.392	7.500	.0018	.0167	9.6
3.	44.088	5.000	.0026	.0158	14.0
4.	58.784	3.700	.0035	.0149	19.1
5.	73.480	3.000	.0040	.0144	21.7
6.	88.176	2.500	.0046	.0138	24.8
7.	102.872	2.100	.0049	.0135	26.8
8.	117.568	1.800	.0056	.0128	30.6
9.	132.264	1.600	.0059	.0125	31.8
10.	146.960	1.500	.0059	.0125	31.8
11.	161.656	1.400	.0062	.0122	33.8
12.	176.352	1.300	.0062	.0122	33.8
13.	191.048	1.200	.0062	.0122	33.8
14.	205.744	1.100	.0062	.0122	33.8
15.	220.440	1.000	.0084	.0100	45.9
16.	235.136	.930	.0084	.0100	45.9
17.	249.832	.880	.0084	.0100	45.9
18.	264.528	.830	.0086	.0098	46.5
19.	279.224	.790	.0087	.0097	47.1
20.	293.920	.750	.0088	.0096	47.8
25.	367.400	.600	>.0101	.0083	54.8
30.	440.880	.500	.0108	.0076	58.6
35.	514.360	.430	.0111	.0073	60.5
40.	587.840	.370	.0116	.0068	63.1
45.	661.320	.330	.0116	.0068	63.1
50.	734.800	.300	.0117	.0067	63.7
55.	808.280	.270	.0117	.0067	63.7
60.	881.760	.250	.0118	.0066	64.3
65.	955.240	.230	.0118	.0066	64.3
70.	1028.720	.210	.0118	.0066	64.3
75.	1102.200	.200	.0122	.0062	66.2
80.	1175.680	.180	.0122	.0062	66.2
85.	1249.160	.170	.0122	.0062	66.2

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POROSITY DATA FOR SAMPLE C 2-3301.

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
90.	1322.640	.160	.0122	.0062	66.2
100.	1469.600	.150	.0122	.0062	66.2
110.	1616.560	.140	.0122	.0062	66.2
120.	1763.520	.130	.0133	.0052	72.0
130.	1910.480	.120	.0133	.0052	72.0
140.	2057.440	.110	.0136	.0048	73.9
150.	2204.400	.100	.0136	.0048	73.9
170.	2498.320	.080	.0136	.0048	73.9
180.	2645.280	.083	.0141	.0043	76.4
190.	2792.240	.079	.0141	.0043	76.4
200.	2939.200	.075	.0141	.0043	76.4
220.	3233.120	.068	.0141	.0043	76.4
240.	3527.040	.062	.0148	.0036	80.3
260.	3820.960	.057	.0148	.0036	80.3
280.	4114.880	.053	.0151	.0033	82.2
300.	4408.800	.050	.0151	.0033	82.2
330.	4849.680	.045	.0151	.0033	82.2
360.	5290.560	.041	.0155	.0029	84.1
390.	5731.440	.038	.0155	.0029	84.1
420.	6172.320	.035	.0161	.0023	87.3
450.	6613.200	.033	.0161	.0023	87.3
490.	7201.040	.030	.0165	.0019	89.8
510.	7496.960	.029	.0165	.0019	89.8
540.	7935.840	.027	.0165	.0019	89.8
590.	8670.640	.025	.0168	.0016	91.1
610.	8964.560	.024	.0168	.0016	91.1
660.	9685.440	.023	.0174	.0011	94.3
700.	10287.200	.021	.0174	.0011	94.3
750.	10875.040	.020	.0174	.0011	94.3
770.	11315.920	.019	.0177	.0007	96.2
800.	11756.800	.019	.0177	.0007	96.2
850.	12197.680	.018	.0177	.0007	96.2
860.	12638.560	.017	.0182	.0002	98.7
900.	13226.400	.017	.0182	.0002	98.7
950.	13667.280	.016	.0182	.0002	98.7
960.	13961.200	.016	.0184	.0000	100.0
1000.	14696.000	.014	.0184	.0000	100.0

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POROSITY DATA FOR SAMPLE C 2-3328.

SEQUENCE NUMBER 9
PORE VOLUME .015 CC/G

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
1.	14.696	15.000	.0001	.0146	.9
2.	29.392	7.500	.0001	.0146	.9
3.	44.088	5.000	.0001	.0146	.9
4.	58.784	3.700	.0003	.0145	1.8
5.	73.480	3.000	.0004	.0143	2.7
6.	88.176	2.500	.0011	.0137	7.3
7.	102.872	2.100	.0011	.0137	7.3
8.	117.568	1.800	.0013	.0134	9.1
9.	132.264	1.600	.0015	.0133	10.0
10.	146.960	1.500	.0021	.0126	14.5
11.	161.656	1.400	.0021	.0126	14.5
12.	176.352	1.300	.0025	.0122	17.3
13.	191.048	1.200	.0025	.0122	17.3
14.	205.744	1.100	.0029	.0118	20.0
15.	220.440	1.000	.0029	.0118	20.0
16.	235.136	.930	.0029	.0118	20.0
17.	249.832	.880	.0029	.0118	20.0
18.	264.528	.830	.0031	.0117	20.9
19.	279.224	.790	.0031	.0117	20.9
20.	293.920	.750	.0031	.0117	20.9
25.	367.400	.600	.0044	.0103	30.0
30.	440.880	.500	.0055	.0092	37.3
35.	514.360	.430	.0056	.0091	38.2
40.	587.840	.370	.0064	.0084	42.7
45.	661.320	.330	.0063	.0084	42.7
50.	734.800	.300	.0063	.0084	42.7
55.	808.280	.270	.0063	.0084	42.7
60.	881.760	.250	.0063	.0084	42.7
65.	955.240	.230	.0063	.0084	42.7
70.	1028.720	.210	.0072	.0075	49.1
75.	1102.200	.200	.0072	.0075	49.1
80.	1175.680	.180	.0078	.0070	52.7
85.	1249.160	.170	.0078	.0070	52.7

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POROSITY DATA FOR SAMPLE C 2-3328.

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
90.	1322.640	.160	.0078	.0070	52.7
100.	1469.600	.150	.0078	.0070	52.7
110.	1616.560	.140	.0078	.0070	52.7
120.	1763.520	.130	.0082	.0066	55.5
130.	1910.480	.120	.0082	.0066	55.5
140.	2057.440	.110	.0087	.0060	59.1
150.	2204.400	.100	.0087	.0060	59.1
170.	2498.320	.088	.0087	.0060	59.1
180.	2645.280	.083	.0091	.0056	61.8
190.	2792.240	.079	.0091	.0056	61.8
200.	2939.200	.075	.0091	.0056	61.8
220.	3233.120	.068	.0091	.0056	61.8
240.	3527.040	.062	.0096	.0051	65.5
260.	3820.960	.057	.0096	.0051	65.5
280.	4114.880	.053	.0102	.0046	69.1
300.	4408.800	.050	.0102	.0046	69.1
330.	4849.680	.045	.0107	.0040	72.7
360.	5290.560	.041	.0107	.0040	72.7
390.	5731.440	.038	.0107	.0040	72.7
420.	6172.320	.035	.0111	.0036	75.5
450.	6613.200	.033	.0118	.0029	80.0
490.	7201.040	.030	.0118	.0029	80.0
510.	7494.960	.029	.0123	.0024	83.6
540.	7935.840	.027	.0123	.0024	83.6
590.	8670.640	.025	.0123	.0024	83.6
610.	8964.560	.024	.0123	.0024	83.6
640.	9405.440	.023	.0123	.0024	83.6
700.	10287.200	.021	.0129	.0019	87.3
740.	10875.040	.020	.0133	.0015	90.0
770.	11315.920	.019	.0133	.0015	90.0
800.	11756.800	.019	.0137	.0011	92.7
830.	12197.680	.018	.0137	.0011	92.7
860.	12638.560	.017	.0137	.0011	92.7
900.	13226.400	.017	.0139	.0008	94.5
930.	13667.280	.016	.0139	.0008	94.5
960.	13961.200	.016	.0139	.0008	94.5
1000.	14696.000	.014	.0147	.0000	100.0

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POROSITY DATA FOR SAMPLE C 2-3378.

SEQUENCE NUMBER 10
PORE VOLUME .010 CC/G

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
1.	14.696	15.000	.0000	.0097	.0
2.	29.392	7.500	.0000	.0097	.0
3.	44.088	5.000	.0002	.0096	1.7
4.	58.784	3.700	.0002	.0096	1.7
5.	73.480	3.000	.0003	.0094	3.4
6.	88.176	2.500	.0003	.0094	3.4
7.	102.872	2.100	.0003	.0094	3.4
8.	117.568	1.800	.0003	.0094	3.4
9.	132.264	1.600	.0003	.0094	3.4
10.	146.960	1.500	.0007	.0091	6.9
11.	161.656	1.400	.0007	.0091	6.9
12.	176.352	1.300	.0008	.0089	8.6
13.	191.048	1.200	.0008	.0089	8.6
14.	205.744	1.100	.0008	.0089	8.6
15.	220.440	1.000	.0008	.0089	8.6
16.	235.136	.930	.0008	.0089	8.6
17.	249.832	.880	.0015	.0082	15.5
18.	264.528	.830	.0015	.0082	15.5
19.	279.224	.790	.0015	.0082	15.5
20.	293.920	.750	.0015	.0082	15.5
25.	367.400	.600	.0015	.0082	15.5
30.	440.880	.500	.0017	.0081	17.2
35.	514.360	.430	.0017	.0081	17.2
40.	587.840	.370	.0017	.0081	17.2
45.	661.320	.330	.0017	.0081	17.2
50.	734.800	.300	.0017	.0081	17.2
55.	808.280	.270	.0017	.0081	17.2
60.	881.760	.250	.0017	.0081	17.2
65.	955.240	.230	.0017	.0081	17.2
70.	1028.720	.210	.0017	.0081	17.2
75.	1102.200	.200	.0017	.0081	17.2
80.	1175.680	.180	.0017	.0081	17.2
85.	1249.160	.170	.0017	.0081	17.2

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POROSITY DATA FOR SAMPLE C 2-3378.

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
90.	1322.640	.160	.0017	.0081	17.2
100.	1469.600	.150	.0017	.0081	17.2
110.	1616.560	.140	.0017	.0081	17.2
120.	1763.520	.130	.0050	.0047	51.7
130.	1910.480	.120	.0050	.0047	51.7
140.	2057.440	.110	.0050	.0047	51.7
150.	2204.400	.100	.0050	.0047	51.7
170.	2450.320	.088	.0052	.0045	53.4
180.	2645.280	.083	.0052	.0045	53.4
190.	2792.240	.079	.0052	.0045	53.4
200.	2939.200	.075	.0055	.0042	56.9
220.	3233.120	.068	.0055	.0042	56.9
240.	3527.040	.062	.0055	.0042	56.9
260.	3820.960	.057	.0055	.0042	56.9
280.	4114.880	.053	.0059	.0039	60.3
300.	4408.800	.050	.0059	.0039	60.3
330.	4849.680	.045	.0059	.0039	60.3
360.	5290.560	.041	.0060	.0037	62.1
390.	5731.440	.038	.0060	.0037	62.1
420.	6172.320	.035	.0060	.0037	62.1
450.	6613.200	.033	.0065	.0032	67.2
490.	7201.040	.030	.0065	.0032	67.2
510.	7494.960	.029	.0065	.0032	67.2
540.	7935.840	.027	.0065	.0032	67.2
590.	8670.640	.025	.0065	.0032	67.2
610.	8964.560	.024	.0065	.0032	67.2
640.	9405.440	.023	.0065	.0032	67.2
700.	10287.200	.021	.0065	.0032	67.2
740.	10875.040	.020	.0065	.0032	67.2
770.	11315.920	.019	.0065	.0032	67.2
800.	11756.800	.019	.0065	.0032	67.2
830.	12197.680	.018	.0065	.0032	67.2
860.	12638.560	.017	.0091	.0007	93.1
900.	13226.400	.017	.0097	.0000	100.0
930.	13667.280	.016	.0097	.0000	100.0
960.	13961.200	.016	.0097	.0000	100.0
1000.	14696.000	.014	.0097	.0000	100.0

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POROSITY DATA FOR SAMPLE C 2-3428.

SEQUENCE NUMBER 11
PORE VOLUME .017 CC/G

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
1.	14.696	15.000	.0008	.0167	4.7
2.	29.392	7.500	.0014	.0161	7.8
3.	44.088	5.000	.0026	.0149	14.7
4.	58.784	3.700	.0026	.0149	14.7
5.	73.480	3.000	.0030	.0145	17.1
6.	88.176	2.500	.0035	.0140	20.2
7.	102.872	2.100	.0035	.0140	20.2
8.	117.568	1.800	.0042	.0133	24.0
9.	132.264	1.600	.0042	.0133	24.0
10.	146.960	1.500	.0042	.0133	24.0
11.	161.656	1.400	.0049	.0126	27.9
12.	176.352	1.300	.0049	.0126	27.9
13.	191.048	1.200	.0049	.0126	27.9
14.	205.744	1.100	.0049	.0126	27.9
15.	220.440	1.000	.0057	.0118	32.6
16.	235.136	.930	.0057	.0118	32.6
17.	249.832	.880	.0057	.0118	32.6
18.	264.528	.830	.0061	.0114	34.9
19.	279.224	.790	.0061	.0114	34.9
20.	293.920	.750	.0061	.0114	34.9
25.	367.400	.600	.0073	.0102	41.9
30.	440.880	.500	.0088	.0087	50.4
35.	514.360	.430	.0088	.0087	50.4
40.	587.840	.370	.0092	.0083	52.7
45.	661.320	.330	.0092	.0083	52.7
50.	734.800	.300	.0092	.0083	52.7
55.	808.280	.270	.0092	.0083	52.7
60.	881.760	.250	.0100	.0074	57.4
65.	955.240	.230	.0100	.0074	57.4
70.	1028.720	.210	.0100	.0074	57.4
75.	1102.200	.200	.0100	.0074	57.4
80.	1175.680	.180	.0100	.0074	57.4
85.	1249.160	.170	.0107	.0068	61.2

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POROSITY DATA FOR SAMPLE C 2-3428.

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
90.	1322.640	.160	.0107	.0068	61.2
100.	1469.600	.150	.0107	.0068	61.2
110.	1616.560	.140	.0111	.0064	63.6
120.	1763.520	.130	.0111	.0064	63.6
130.	1910.480	.120	.0111	.0064	63.6
140.	2057.440	.110	.0111	.0064	63.6
150.	2204.400	.100	.0111	.0064	63.6
160.	2351.360	.090	.0111	.0064	63.6
170.	2498.320	.088	.0111	.0064	63.6
180.	2645.280	.083	.0121	.0054	69.0
190.	2792.240	.079	.0121	.0054	69.0
200.	2939.200	.075	.0121	.0054	69.0
220.	3233.120	.068	.0125	.0050	71.3
240.	3527.040	.062	.0125	.0050	71.3
260.	3820.960	.057	.0131	.0043	75.2
280.	4114.880	.053	.0131	.0043	75.2
300.	4408.800	.050	.0131	.0043	75.2
330.	4849.680	.045	.0131	.0043	75.2
360.	5290.560	.041	.0133	.0042	76.0
390.	5731.440	.038	.0133	.0042	76.0
420.	6172.320	.035	.0138	.0037	79.1
450.	6613.200	.033	.0142	.0033	81.4
480.	7201.040	.030	.0148	.0027	84.5
510.	7494.960	.029	.0148	.0027	84.5
540.	7935.840	.027	.0150	.0024	86.0
590.	8670.640	.025	.0154	.0020	88.4
610.	8964.560	.024	.0154	.0020	88.4
640.	9405.440	.023	.0154	.0020	88.4
700.	10287.200	.021	.0160	.0015	91.5
740.	10875.040	.020	.0160	.0015	91.5
770.	11315.920	.019	.0165	.0009	94.6
800.	11756.800	.019	.0165	.0009	94.6
830.	12197.680	.018	.0167	.0008	95.3
860.	12638.560	.017	.0167	.0008	95.3
900.	13226.400	.017	.0173	.0001	99.2
930.	13667.280	.016	.0173	.0001	99.2
960.	13961.200	.016	.0173	.0001	99.2
1000.	14696.000	.015	.0175	.0000	100.0

March 30, 1975
Battelle Columbus Labs.

DEC 21 1975
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POROSITY DATA FOR SAMPLE C 2-3478.

SEQUENCE NUMBER 12
PORE VOLUME .016 CC/G

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
1.	14.696	15.000	.0000	.0159	.0
2.	29.392	7.500	.0000	.0159	.0
3.	44.088	5.000	.0003	.0156	1.7
4.	58.784	3.700	.0011	.0148	7.0
5.	73.480	3.000	.0017	.0143	10.4
6.	88.176	2.500	.0019	.0140	12.2
7.	102.872	2.100	.0022	.0137	13.9
8.	117.568	1.800	.0022	.0137	13.9
9.	132.264	1.600	.0030	.0129	19.1
10.	146.960	1.500	.0030	.0129	19.1
11.	161.656	1.400	.0033	.0126	20.9
12.	176.352	1.300	.0033	.0126	20.9
13.	191.048	1.200	.0033	.0126	20.9
14.	205.744	1.100	.0040	.0119	25.2
15.	220.440	1.000	.0040	.0119	25.2
16.	235.136	.930	.0040	.0119	25.2
17.	249.832	.880	.0044	.0115	27.8
18.	264.528	.830	.0044	.0115	27.8
19.	279.224	.790	.0044	.0115	27.8
20.	293.920	.750	.0048	.0111	30.4
25.	367.400	.600	.0060	.0100	37.4
30.	440.880	.500	.0069	.0090	43.5
35.	514.360	.430	.0071	.0089	44.1
40.	587.840	.370	.0076	.0083	47.8
45.	661.320	.330	.0076	.0083	47.8
50.	734.800	.300	.0078	.0082	48.7
55.	808.280	.270	.0080	.0079	50.4
60.	881.760	.250	.0083	.0076	52.2
65.	955.240	.230	.0084	.0075	53.0
70.	1028.720	.210	.0086	.0073	53.9
75.	1102.200	.200	.0086	.0073	53.9
80.	1175.680	.180	.0086	.0073	53.9
85.	1249.160	.170	.0086	.0073	53.9

Battelle Columbus Labs.

DEC 21 1977
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POROSITY DATA FOR SAMPLE C 2-1478.

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
90.	1322.640	.160	.0086	.0073	53.9
100.	1469.600	.150	.0091	.0068	57.4
110.	1616.560	.140	.0091	.0068	57.4
120.	1763.520	.130	.0096	.0064	60.0
130.	1910.480	.120	.0101	.0058	63.5
140.	2057.440	.110	.0101	.0058	63.5
150.	2204.400	.100	.0101	.0058	63.5
160.	2498.320	.088	.0105	.0054	66.1
170.	2645.280	.083	.0105	.0054	66.1
180.	2792.240	.079	.0105	.0054	66.1
200.	2939.200	.075	.0111	.0048	69.6
220.	3233.120	.068	.0111	.0048	69.6
240.	3527.040	.062	.0115	.0044	72.2
260.	3820.960	.057	.0115	.0044	72.2
280.	4114.880	.053	.0115	.0044	72.2
300.	4408.800	.050	.0122	.0037	76.5
330.	4849.680	.045	.0122	.0037	76.5
360.	5290.560	.041	.0126	.0033	79.1
390.	5731.440	.038	.0126	.0033	79.1
420.	6172.320	.035	.0129	.0030	80.9
450.	6613.200	.033	.0129	.0030	80.9
490.	7201.040	.030	.0136	.0024	85.2
510.	7494.960	.029	.0136	.0024	85.2
540.	7935.840	.027	.0136	.0024	85.2
590.	8670.640	.025	.0141	.0018	88.7
610.	8966.560	.024	.0141	.0018	88.7
640.	9405.440	.023	.0141	.0018	88.7
700.	10287.200	.021	.0147	.0012	92.2
740.	10875.040	.020	.0150	.0010	93.9
770.	11315.920	.019	.0150	.0010	93.9
800.	11756.800	.019	.0155	.0004	97.4
830.	12197.680	.018	.0155	.0004	97.4
860.	12638.560	.017	.0155	.0004	97.4
900.	13226.400	.017	.0155	.0004	97.4
930.	13667.280	.016	.0159	.0000	100.0
960.	13961.200	.016	.0159	.0000	100.0
1000.	14696.000	.014	.0159	.0000	100.0

March 30, 197
Battelle Columbus Labs.

DEC 21 197

POROSITY DATA FOR SAMPLE C 2-3528.

SEQUENCE NUMBER 13
PORE VOLUME .014 CC/G

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
1.	14.696	15.000	.0000	.0139	.0
2.	29.392	7.500	.0003	.0135	2.3
3.	44.088	5.000	.0010	.0129	7.0
4.	58.784	3.700	.0019	.0119	14.1
5.	73.480	3.000	.0019	.0119	14.1
6.	88.176	2.500	.0024	.0115	17.2
7.	102.872	2.100	.0027	.0112	19.5
8.	117.568	1.800	.0034	.0105	24.2
9.	132.264	1.600	.0034	.0105	24.2
10.	146.960	1.500	.0034	.0105	24.2
11.	161.656	1.400	.0041	.0097	29.7
12.	176.352	1.300	.0041	.0097	29.7
13.	191.048	1.200	.0041	.0097	29.7
14.	205.744	1.100	.0045	.0093	32.8
15.	220.440	1.000	.0047	.0092	33.6
16.	235.136	.930	.0047	.0092	33.6
17.	249.832	.880	.0047	.0092	33.6
18.	264.528	.830	.0047	.0092	33.6
19.	279.224	.790	.0050	.0089	35.9
20.	293.920	.750	.0050	.0089	35.9
25.	367.400	.600	.0060	.0079	43.0
30.	440.880	.500	.0070	.0068	50.8
35.	514.360	.430	.0071	.0067	51.6
40.	587.840	.370	.0075	.0064	53.9
45.	661.320	.330	.0075	.0064	53.9
50.	734.800	.300	.0075	.0064	53.9
55.	808.280	.270	.0079	.0060	57.0
60.	881.760	.250	.0079	.0060	57.0
65.	955.240	.230	.0079	.0060	57.0
70.	1028.720	.210	.0084	.0054	60.9
75.	1102.200	.200	.0084	.0054	60.9
80.	1175.680	.180	.0084	.0054	60.9
85.	1249.160	.170	.0084	.0054	60.9

March 30, 1979
Battelle Columbus Labs.

DEC 21 19

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POROSITY DATA FOR SAMPLE C 2-3528.

PRESSURE ATM	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
90.	1322.640	.160	.0089	.0050	64.1
100.	1469.600	.150	.0089	.0050	64.1
110.	1616.560	.140	.0089	.0050	64.1
120.	1763.520	.130	.0093	.0045	67.2
130.	1910.480	.120	.0093	.0045	67.2
140.	2057.440	.110	.0097	.0041	70.3
150.	2204.400	.100	.0097	.0041	70.3
170.	2498.320	.088	.0101	.0038	72.7
180.	2645.280	.083	.0101	.0038	72.7
190.	2792.240	.079	.0101	.0038	72.7
200.	2939.200	.075	.0101	.0038	72.7
220.	3233.120	.068	.0101	.0038	72.7
240.	3527.040	.062	.0101	.0038	72.7
260.	3820.960	.057	.0101	.0038	72.7
280.	4114.880	.053	.0101	.0038	72.7
300.	4408.800	.050	.0101	.0038	72.7
330.	4849.680	.045	.0101	.0038	72.7
360.	5290.560	.041	.0110	.0028	79.7
390.	5731.440	.038	.0110	.0028	79.7
420.	6172.320	.035	.0110	.0028	79.7
450.	6613.200	.033	.0114	.0025	82.0
480.	7201.040	.030	.0116	.0023	83.6
510.	7494.960	.029	.0116	.0023	83.6
540.	7935.840	.027	.0116	.0023	83.6
570.	8670.640	.025	.0116	.0023	83.6
610.	8964.560	.024	.0127	.0012	91.4
640.	9405.440	.023	.0127	.0012	91.4
700.	10287.200	.021	.0127	.0012	91.4
740.	10875.040	.020	.0139	.0000	100.0
770.	11315.920	.019	.0139	.0000	100.0
800.	11756.800	.019	.0139	.0000	100.0
830.	12197.680	.018	.0139	.0000	100.0
860.	12638.560	.017	.0139	.0000	100.0
900.	13226.400	.017	.0139	.0000	100.0
930.	13667.280	.016	.0139	.0000	100.0
960.	13961.200	.016	.0139	.0000	100.0
1000.	14696.000	.014	.0139	.0000	100.0

Battelle Columbus Labs.

DEC 21 1978

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POROSITY DATA FOR SAMPLE C Z-3896.

SEQUENCE NUMBER 14
PORE VOLUME .004 CC/G

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
1.	14.696	15.000	.0000	.0037	.0
2.	29.392	7.500	.0000	.0037	.0
3.	44.088	5.000	.0000	.0037	.0
4.	58.784	3.700	.0000	.0037	.0
5.	73.480	3.000	.0000	.0037	.0
6.	88.176	2.500	.0000	.0037	.0
7.	102.872	2.100	.0000	.0037	.0
8.	117.568	1.800	.0000	.0037	.0
9.	132.264	1.600	.0000	.0037	.0
10.	146.960	1.500	.0000	.0037	.0
11.	161.656	1.400	.0000	.0037	.0
12.	176.352	1.300	.0000	.0037	.0
13.	191.048	1.200	.0000	.0037	.0
14.	205.744	1.100	.0000	.0037	.0
15.	220.440	1.000	.0000	.0037	.0
16.	235.136	.930	.0000	.0037	.0
17.	249.832	.880	.0000	.0037	.0
18.	264.528	.830	.0000	.0037	.0
19.	279.224	.790	.0000	.0037	.0
20.	293.920	.750	.0000	.0037	.0
25.	367.400	.600	.0000	.0037	.0
30.	440.880	.500	.0000	.0037	.0
35.	514.360	.430	.0000	.0037	.0
40.	587.840	.370	.0000	.0037	.0
45.	661.320	.330	.0000	.0037	.0
50.	734.800	.300	.0000	.0037	.0
55.	808.280	.270	.0000	.0037	.0
60.	881.760	.250	.0000	.0037	.0
65.	955.240	.230	.0000	.0037	.0
70.	1028.720	.210	.0000	.0037	.0
75.	1102.200	.200	.0000	.0037	.0
80.	1175.680	.180	.0000	.0037	.0
85.	1249.160	.170	.0000	.0037	.0

March 30, 1978
Battelle Columbus Labs.

DEC 21

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POROSITY DATA FOR SAMPLE C 2-3896.

PRESSURE ATMS.	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
90.	1322.640	.160	.0000	.0037	.0
100.	1469.600	.150	.0000	.0037	.0
110.	1616.560	.140	.0000	.0037	.0
120.	1763.520	.130	.0000	.0037	.0
130.	1910.480	.120	.0000	.0037	.0
140.	2057.440	.110	.0000	.0037	.0
150.	2204.400	.100	.0001	.0036	2.6
170.	2498.320	.088	.0001	.0036	2.6
180.	2645.280	.083	.0001	.0036	2.6
190.	2792.240	.079	.0003	.0034	7.9
200.	2939.200	.075	.0003	.0034	7.9
220.	3233.120	.068	.0006	.0031	15.8
240.	3527.040	.062	.0008	.0029	21.1
260.	3820.960	.057	.0009	.0028	23.7
280.	4114.880	.053	.0010	.0027	26.3
300.	4408.800	.050	.0012	.0025	31.6
330.	4849.680	.045	.0012	.0025	31.6
360.	5290.560	.041	.0015	.0021	42.1
390.	5731.440	.038	.0015	.0021	42.1
420.	6172.320	.035	.0015	.0021	42.1
450.	6613.200	.033	.0022	.0014	60.5
480.	7201.040	.030	.0022	.0014	60.5
510.	7494.960	.029	.0022	.0014	60.5
540.	7935.840	.027	.0022	.0014	60.5
580.	8670.640	.025	.0032	.0005	86.8
610.	8964.560	.024	.0032	.0005	86.8
660.	9605.440	.023	.0032	.0005	86.8
700.	10287.200	.021	.0032	.0005	86.8
740.	10875.040	.020	.0032	.0005	86.8
770.	11315.920	.019	.0032	.0005	86.8
800.	11756.800	.019	.0032	.0005	86.8
840.	12197.680	.018	.0037	.0000	100.0
860.	12638.560	.017	.0037	.0000	100.0
900.	13226.400	.017	.0037	.0000	100.0
930.	13667.280	.016	.0037	.0000	100.0
960.	13961.200	.016	.0037	.0000	100.0
1000.	14696.080	.014	.0037	.0000	100.0

Battelle Columbus Labs.

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POROSITY DATA FOR SAMPLE C 2-3922.

SEQUENCE NUMBER 15
PORE VOLUME .019 CC/G

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
1.	14.696	15.000	.0000	.0193	.0
2.	29.392	7.500	.0029	.0164	15.1
3.	44.088	5.000	.0032	.0161	16.4
4.	58.784	3.700	.0039	.0154	20.4
5.	73.480	3.000	.0042	.0151	21.7
6.	88.176	2.500	.0048	.0145	25.0
7.	102.872	2.100	.0051	.0142	26.3
8.	117.568	1.800	.0053	.0140	27.6
9.	132.264	1.600	.0055	.0139	28.3
10.	146.960	1.500	.0055	.0139	28.3
11.	161.656	1.400	.0064	.0130	32.9
12.	176.352	1.300	.0066	.0127	34.2
13.	191.048	1.200	.0066	.0127	34.2
14.	205.744	1.100	.0070	.0123	36.2
15.	220.440	1.000	.0070	.0123	36.2
16.	235.136	.930	.0070	.0123	36.2
17.	249.832	.880	.0075	.0118	38.8
18.	264.528	.830	.0075	.0118	38.8
19.	279.224	.790	.0076	.0117	39.5
20.	293.920	.750	.0078	.0116	40.1
25.	367.400	.600	.0079	.0114	40.8
30.	440.880	.500	.0089	.0104	46.1
35.	514.360	.430	.0092	.0102	47.4
40.	587.840	.370	.0095	.0098	49.3
45.	661.320	.330	.0095	.0098	49.3
50.	734.800	.300	.0095	.0098	49.3
55.	808.280	.270	.0102	.0092	52.6
60.	881.760	.250	.0102	.0092	52.6
65.	955.240	.230	.0102	.0092	52.6
70.	1028.720	.210	.0105	.0088	54.6
75.	1102.200	.200	.0105	.0088	54.6
80.	1175.680	.180	.0107	.0086	55.3
85.	1249.160	.170	.0107	.0086	55.3

March 30, 1978
Battelle Columbus Labs.

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POROSITY DATA FOR SAMPLE G 2-3922.

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
90.	1322.640	.160	.0109	.0084	56.6
100.	1469.600	.150	.0112	.0081	57.9
110.	1616.560	.140	.0114	.0079	59.2
120.	1763.520	.130	.0116	.0078	59.9
130.	1910.480	.120	.0118	.0075	61.2
140.	2057.440	.110	.0118	.0075	61.2
150.	2204.400	.100	.0125	.0069	64.5
160.	2498.320	.088	.0125	.0069	64.5
180.	2645.280	.083	.0127	.0066	65.8
190.	2792.240	.079	.0127	.0066	65.8
200.	2939.200	.075	.0131	.0062	67.8
220.	3233.120	.068	.0132	.0061	68.4
240.	3527.040	.062	.0136	.0057	70.4
260.	3820.960	.057	.0139	.0055	71.7
280.	4114.880	.053	.0141	.0052	73.0
300.	4408.800	.050	.0142	.0051	73.7
330.	4849.680	.045	.0144	.0050	74.3
360.	5290.560	.041	.0147	.0046	76.3
390.	5731.440	.038	.0153	.0041	78.9
420.	6172.320	.035	.0155	.0038	80.3
450.	6613.200	.033	.0158	.0036	81.6
480.	7201.040	.030	.0163	.0031	84.2
510.	7494.960	.029	.0163	.0031	84.2
540.	7935.840	.027	.0164	.0029	84.9
570.	8670.640	.025	.0169	.0024	87.5
610.	8964.560	.024	.0173	.0020	89.5
650.	9405.440	.023	.0175	.0018	90.8
700.	10287.200	.021	.0177	.0017	91.4
750.	10875.040	.020	.0179	.0014	92.8
770.	11315.920	.019	.0182	.0011	94.1
800.	11756.800	.019	.0183	.0010	94.7
850.	12197.680	.018	.0183	.0010	94.7
860.	12638.560	.017	.0187	.0006	96.7
900.	13226.400	.017	.0188	.0005	97.4
950.	13667.280	.016	.0191	.0003	98.7
960.	13961.200	.016	.0193	.0000	100.0
1000.	14696.000	.014	.0193	.0000	100.0

March 30, 1978
Battelle Columbus Labs.

DEC 21 1977

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POROSITY DATA FOR SAMPLE C 2-3961.

SEQUENCE NUMBER 16
PORE VOLUME .010 CC/G

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
1.	14.696	15.000	.0000	.0097	.0
2.	29.392	7.500	.0000	.0097	.0
3.	44.088	5.000	.0000	.0097	.0
4.	58.784	3.700	.0001	.0096	1.5
5.	73.480	3.000	.0006	.0091	6.1
6.	88.176	2.500	.0007	.0090	7.6
7.	102.872	2.100	.0010	.0087	10.6
8.	117.568	1.800	.0012	.0085	12.1
9.	132.264	1.600	.0015	.0082	15.2
10.	146.960	1.500	.0015	.0082	15.2
11.	161.656	1.400	.0016	.0081	16.7
12.	176.352	1.300	.0018	.0079	18.2
13.	191.048	1.200	.0021	.0076	21.2
14.	205.744	1.100	.0022	.0075	22.7
15.	220.440	1.000	.0022	.0075	22.7
16.	235.136	.930	.0024	.0073	24.2
17.	249.832	.880	.0025	.0072	25.8
18.	264.528	.830	.0025	.0072	25.8
19.	279.224	.790	.0025	.0072	25.8
20.	293.920	.750	.0025	.0072	25.8
25.	367.400	.600	.0029	.0068	30.3
30.	440.880	.500	.0029	.0068	30.3
35.	514.360	.430	.0031	.0066	31.8
40.	587.840	.370	.0032	.0065	33.3
45.	661.320	.330	.0032	.0065	33.3
50.	734.800	.300	.0034	.0063	34.8
55.	808.280	.270	.0034	.0063	34.8
60.	881.760	.250	.0034	.0063	34.8
65.	955.240	.230	.0037	.0060	37.9
70.	1028.720	.210	.0037	.0060	37.9
75.	1102.200	.200	.0037	.0060	37.9
80.	1175.680	.180	.0037	.0060	37.9
85.	1249.160	.170	.0037	.0060	37.9

March 30, 1979
Battelle Columbus Labs.

DEC. 117

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POROSITY DATA FOR SAMPLE C 2-3961.

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
90.	1322.640	.160	.0037	.0060	37.9
100.	1469.600	.150	.0038	.0059	39.4
110.	1616.560	.140	.0038	.0059	39.4
120.	1763.520	.130	.0041	.0056	42.4
130.	1910.480	.120	.0041	.0056	42.4
140.	2057.440	.110	.0041	.0056	42.4
150.	2204.400	.100	.0044	.0053	45.5
160.	2498.320	.088	.0044	.0053	45.5
180.	2645.280	.083	.0044	.0053	45.5
190.	2792.240	.079	.0049	.0049	50.0
200.	2939.200	.075	.0049	.0049	50.0
220.	3233.120	.068	.0049	.0049	50.0
240.	3527.040	.062	.0049	.0049	50.0
260.	3820.960	.057	.0059	.0038	60.6
280.	4114.880	.053	.0059	.0038	60.6
300.	4408.800	.050	.0059	.0038	60.6
330.	4849.680	.045	.0062	.0035	63.6
360.	5290.560	.041	.0062	.0035	63.6
390.	5731.440	.038	.0065	.0032	66.7
420.	6172.320	.035	.0066	.0031	68.2
450.	6613.200	.033	.0066	.0031	68.2
480.	7201.040	.030	.0072	.0025	74.2
510.	7494.960	.029	.0072	.0025	74.2
540.	7935.840	.027	.0075	.0022	77.3
590.	8670.640	.025	.0076	.0021	78.8
610.	8964.560	.024	.0076	.0021	78.8
640.	9405.440	.023	.0076	.0021	78.8
700.	10287.200	.021	.0085	.0012	87.9
750.	10875.040	.020	.0085	.0012	87.9
770.	11315.920	.019	.0085	.0012	87.9
800.	11756.800	.019	.0088	.0009	90.9
850.	12197.680	.018	.0088	.0009	90.9
860.	12638.560	.017	.0094	.0003	97.0
900.	13226.400	.017	.0094	.0003	97.0
950.	13667.280	.016	.0097	.0000	100.0
960.	13961.200	.016	.0097	.0000	100.0
1000.	14696.000	.015	.0097	.0000	100.0

March 30, 1978
Battelle Columbus Labs.

DLC

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POROSITY DATA FOR SAMPLE G 2-3971.

SEQUENCE NUMBER 17
PORE VOLUME .012 CC/G

PRESSURE ATM.	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
1.	14.696	15.000	.0000	.0124	.0
2.	29.392	7.500	.0013	.0110	10.9
3.	44.088	5.000	.0017	.0106	14.1
4.	58.784	3.700	.0020	.0104	16.1
5.	73.480	3.000	.0022	.0102	17.4
6.	88.176	2.500	.0027	.0097	21.7
7.	102.872	2.100	.0027	.0097	21.7
8.	117.568	1.800	.0027	.0097	21.7
9.	132.264	1.600	.0027	.0097	21.7
10.	146.960	1.500	.0028	.0096	22.8
11.	161.656	1.400	.0028	.0096	22.8
12.	176.352	1.300	.0028	.0096	22.8
13.	191.048	1.200	.0030	.0094	23.9
14.	205.744	1.100	.0030	.0094	23.9
15.	220.440	1.000	.0030	.0094	23.9
16.	235.136	.930	.0030	.0094	23.9
17.	249.832	.880	.0038	.0086	30.4
18.	264.528	.830	.0038	.0086	30.4
19.	279.224	.790	.0038	.0086	30.4
20.	293.920	.750	.0038	.0086	30.4
25.	367.400	.600	.0048	.0075	39.1
30.	440.880	.500	.0055	.0069	44.6
35.	514.360	.430	.0055	.0069	44.6
40.	587.840	.370	.0077	.0047	62.0
45.	661.320	.330	.0077	.0047	62.0
50.	734.800	.300	.0077	.0047	62.0
55.	808.280	.270	.0077	.0047	62.0
60.	881.760	.250	.0077	.0047	62.0
65.	955.240	.230	.0077	.0047	62.0
70.	1029.720	.210	.0077	.0047	62.0
75.	1102.200	.200	.0077	.0047	62.0
80.	1175.680	.180	.0077	.0047	62.0
85.	1249.160	.170	.0077	.0047	62.0

00

POROSITY DATA FOR SAMPLE C 2-4971.

PRESSURE ATMS	PRESSURE PSI	PORE DIAMETER MICRON	PORE VOLUME CC/G	CHANGE IN PORE VOLUME CC/G	PCT. PORES GREATER THAN DIA INDICATED
90.	1322.640	.160	.0077	.0047	62.0
100.	1469.600	.150	.0077	.0047	62.0
110.	1616.560	.140	.0077	.0047	62.0
120.	1763.520	.130	.0077	.0047	62.0
130.	1910.480	.120	.0079	.0044	64.1
140.	2057.440	.110	.0079	.0044	64.1
150.	2204.400	.100	.0083	.0040	67.4
160.	2498.320	.088	.0083	.0040	67.4
180.	2645.280	.083	.0092	.0032	73.9
190.	2792.240	.079	.0092	.0032	73.9
200.	2939.200	.075	.0092	.0032	73.9
220.	3233.120	.068	.0092	.0032	73.9
240.	3527.040	.062	.0097	.0027	78.3
260.	3820.960	.057	.0097	.0027	78.3
290.	4115.880	.053	.0097	.0027	78.3
300.	4408.800	.050	.0102	.0022	82.6
330.	4849.680	.045	.0102	.0022	82.6
360.	5290.560	.041	.0102	.0022	82.6
390.	5731.440	.038	.0102	.0022	82.6
420.	6172.320	.035	.0102	.0022	82.6
450.	6613.200	.033	.0102	.0022	82.6
490.	7201.040	.030	.0102	.0022	82.6
510.	7496.960	.029	.0102	.0022	82.6
540.	7935.840	.027	.0110	.0013	89.1
590.	8670.640	.025	.0116	.0008	93.5
610.	8963.560	.024	.0116	.0008	93.5
650.	9505.440	.023	.0116	.0008	93.5
700.	10287.200	.021	.0118	.0005	95.7
750.	10975.040	.020	.0118	.0005	95.7
770.	11315.920	.019	.0118	.0005	95.7
800.	11756.800	.019	.0118	.0005	95.7
830.	12197.680	.018	.0118	.0005	95.7
860.	12638.560	.017	.0118	.0005	95.7
900.	13226.400	.017	.0118	.0005	95.7
930.	13667.280	.016	.0123	.0000	100.0
960.	14061.200	.016	.0123	.0000	100.0
1000.	14696.000	.015	.0123	.0000	100.0

March 30, 1979
Battelle Columbus Labs.

DEC 2

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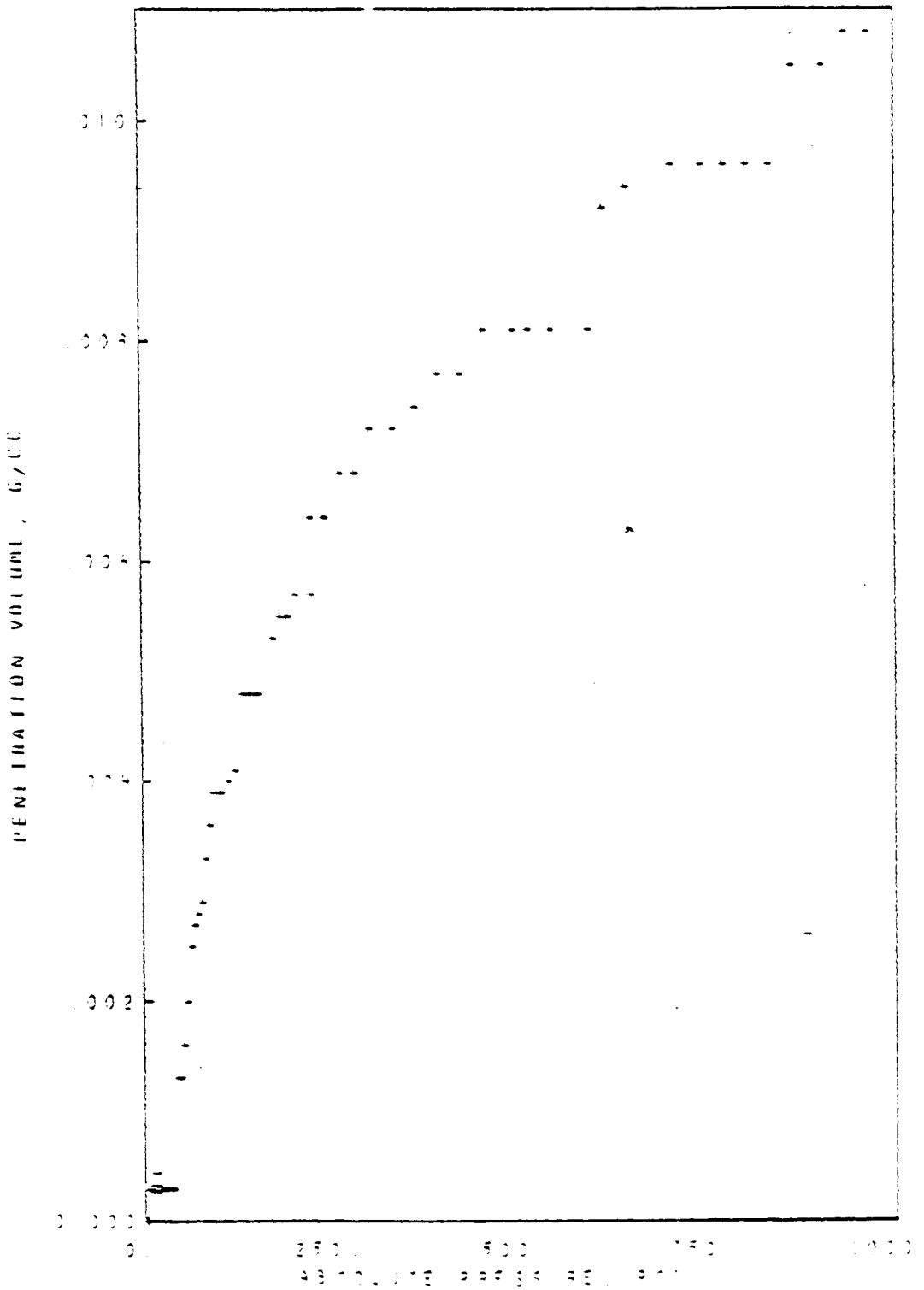
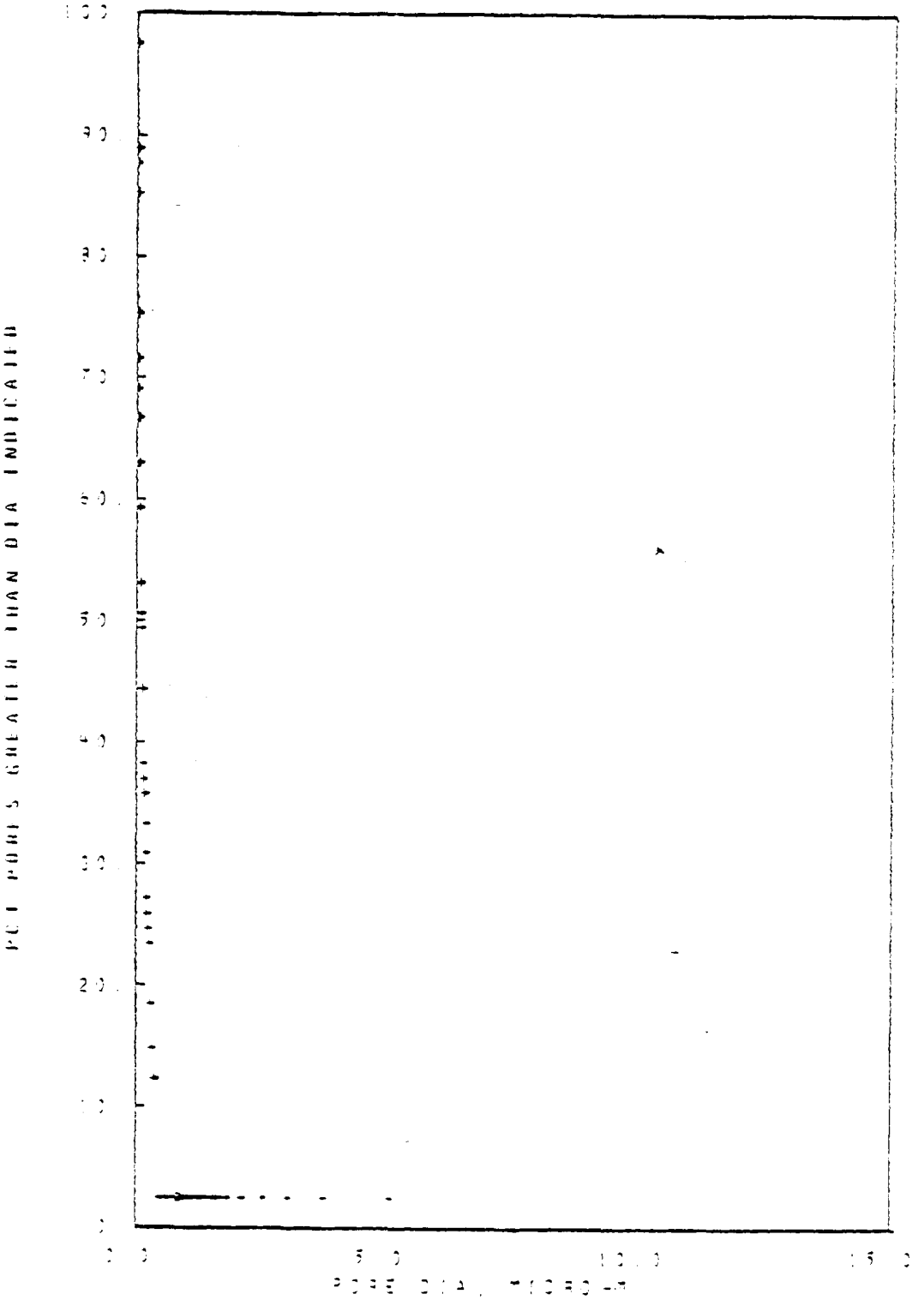
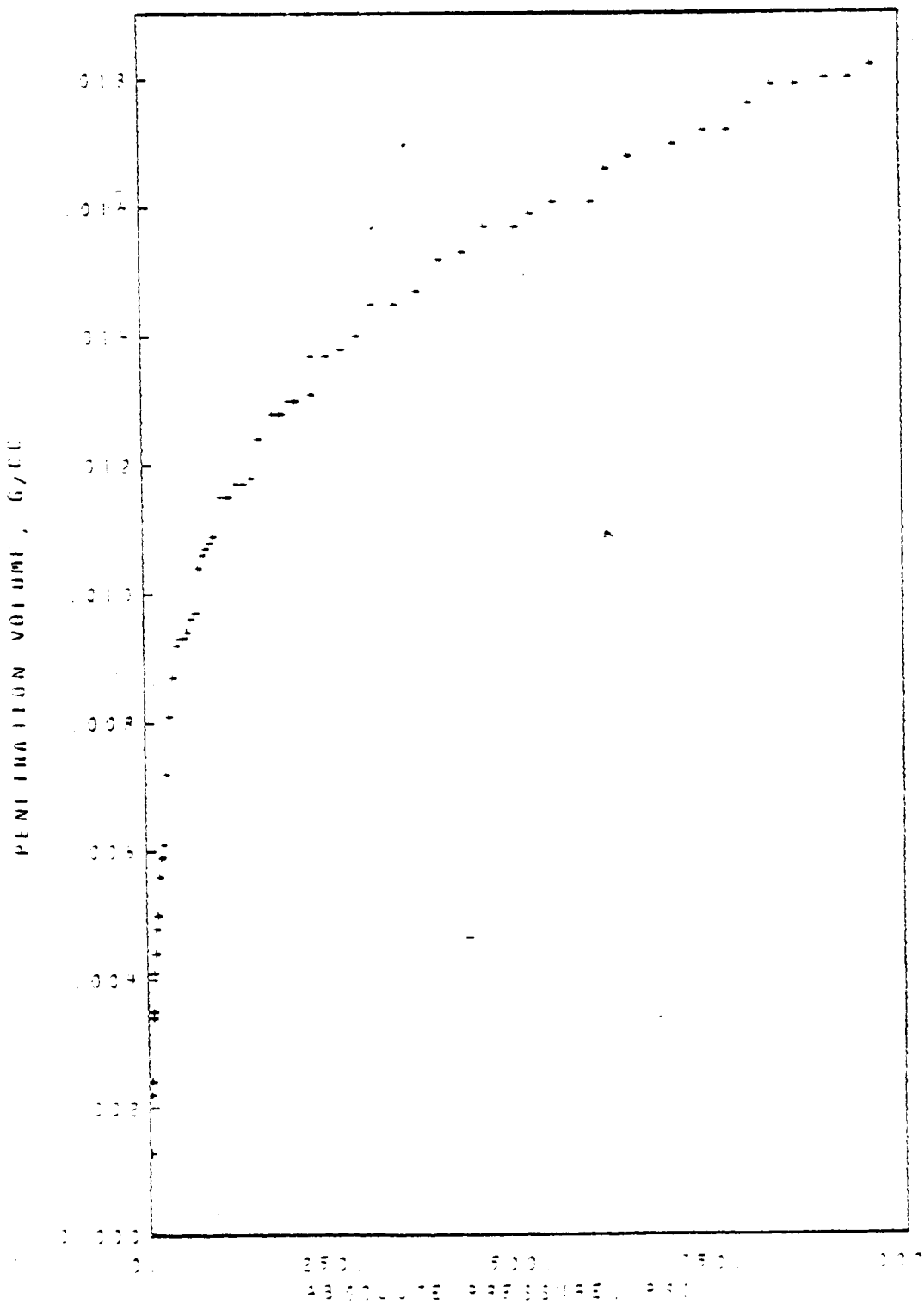
March 30, 1979
Battelle Columbus Labs.



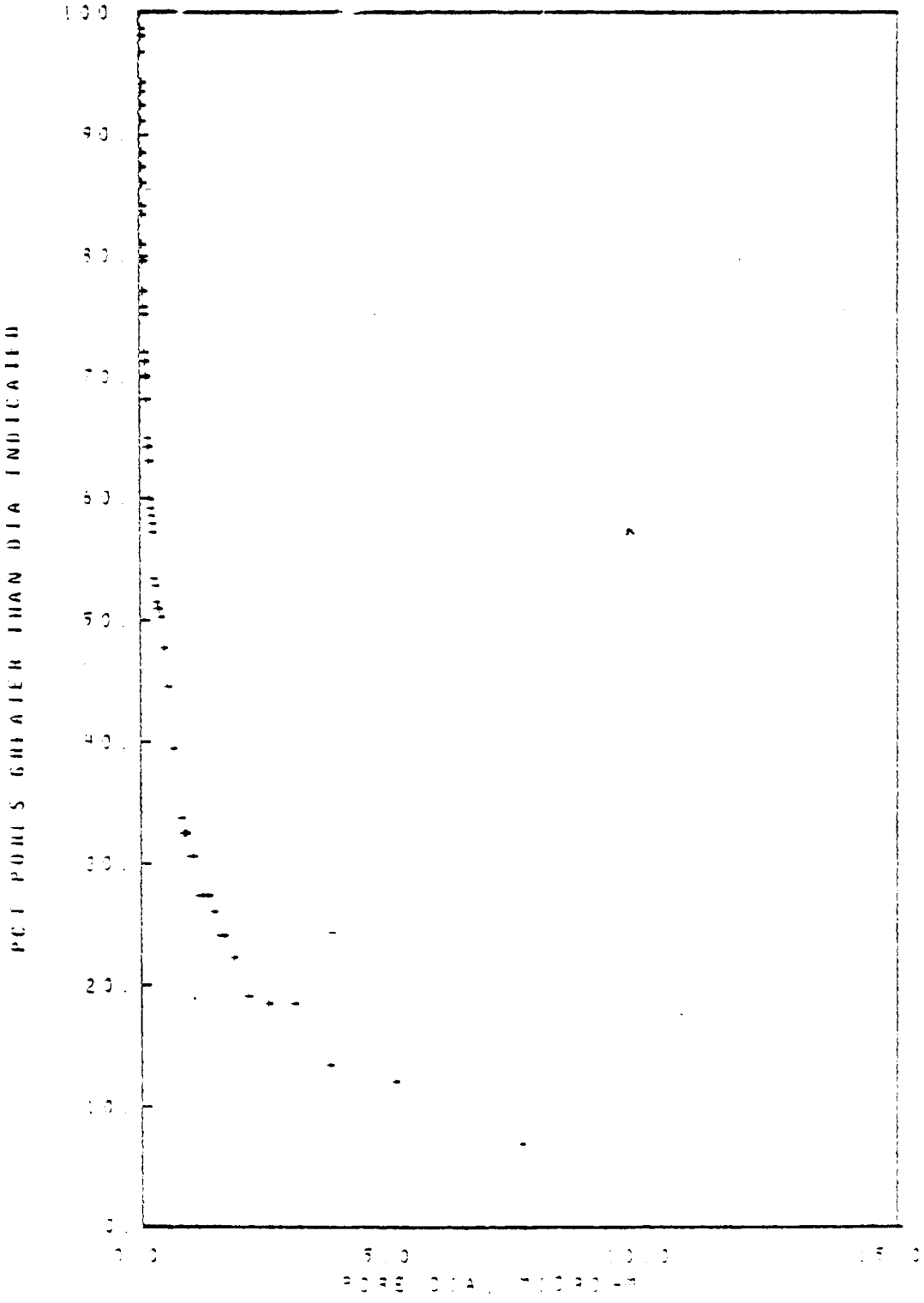
C 2-2655


PCT PORES GREATER THAN DIA INDICATED
100
90
80
70
60
50
40
30
20
10
0
0.0
5.0
10.0
15.0
PORE DIA, MICRON

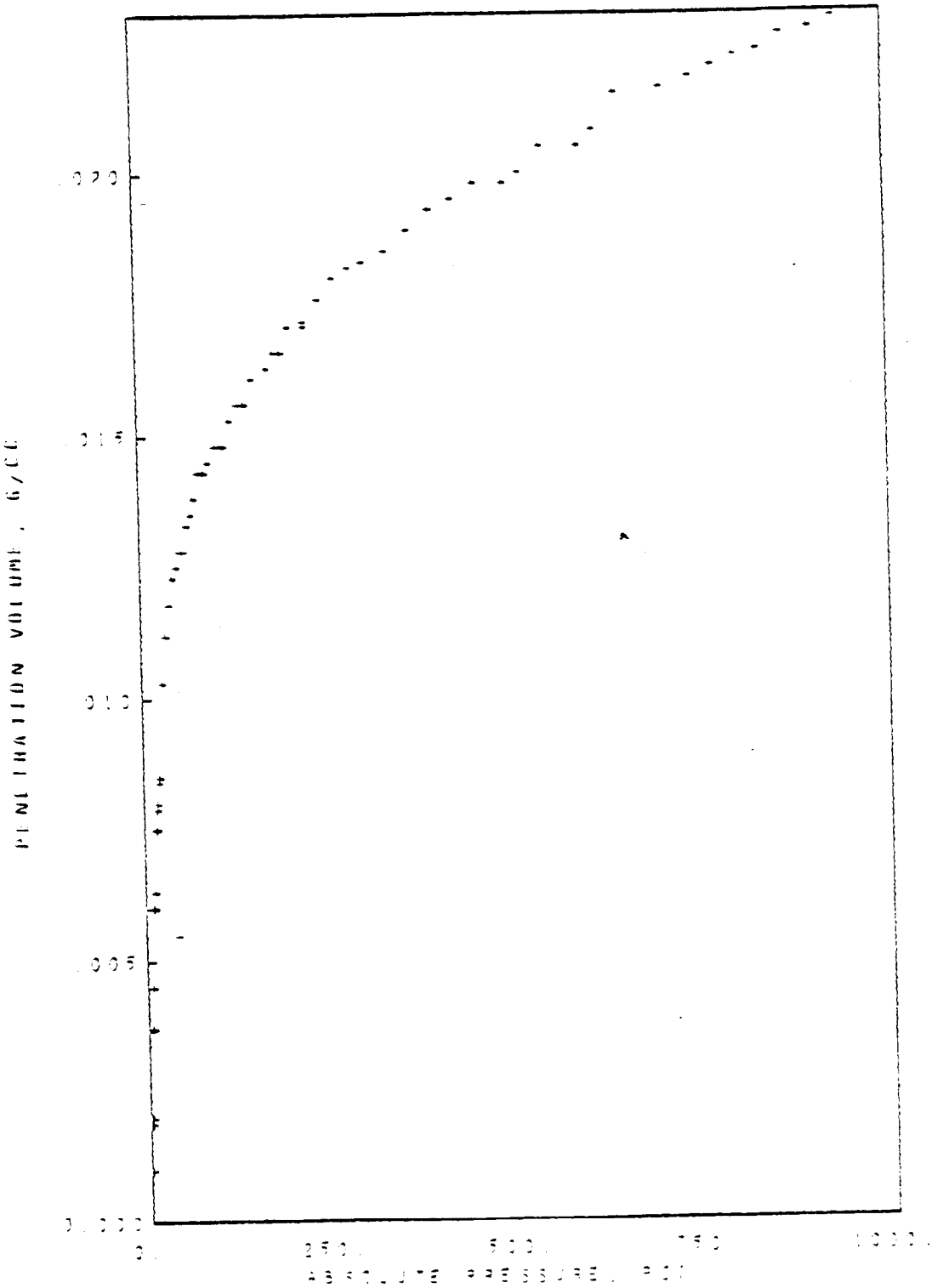
C 2-2655



C 2-27[illegible]

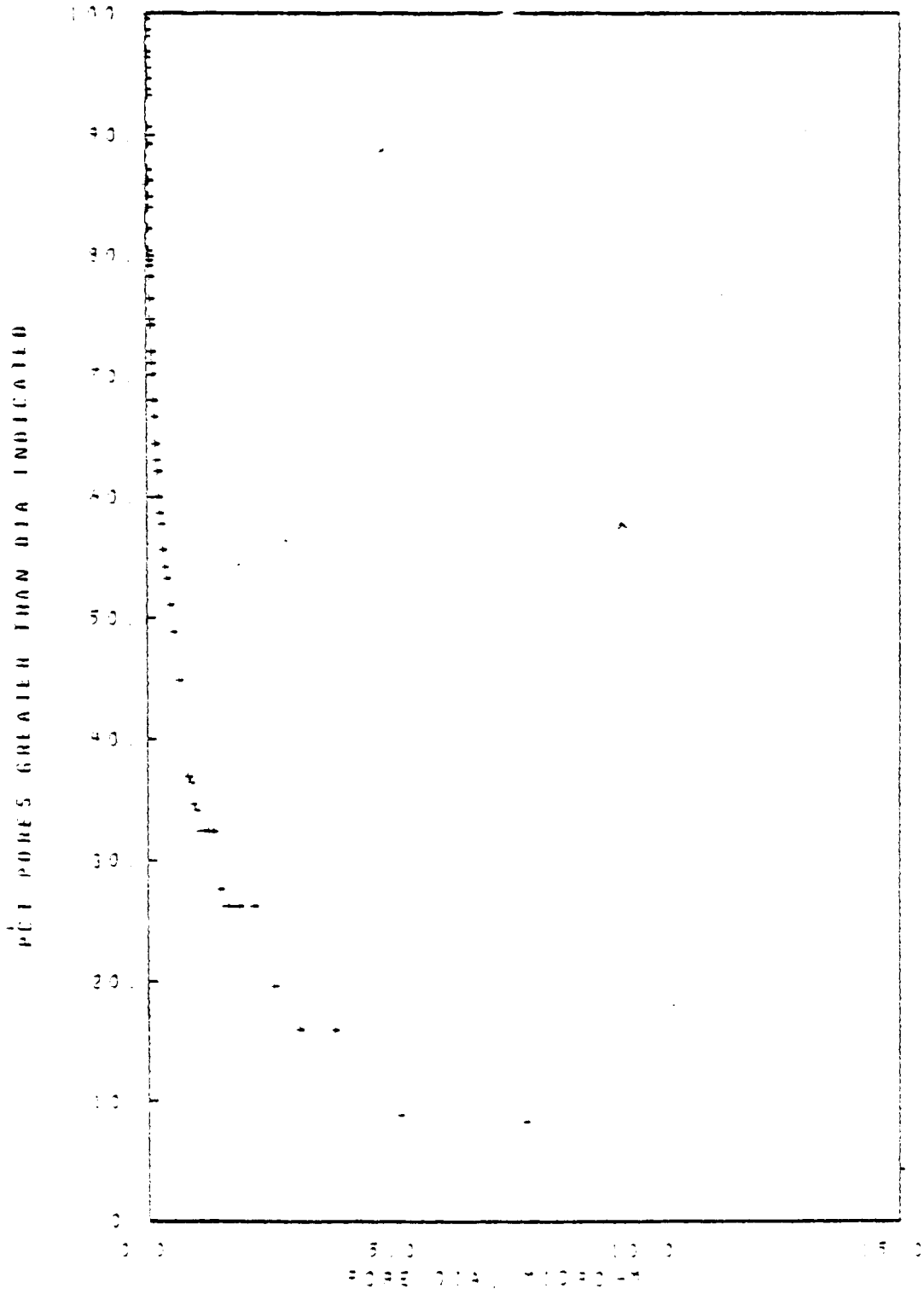

PCT PORES GREATER THAN DIA INDICATED
100.
90.
80.
70.
60.
50.
40.
30.
20.
10.
0.
0.0
5.0
10.0
15.0
PORE DIA, MICRONS

March 30, 197[illegible]
Battelle Columbus Labs.

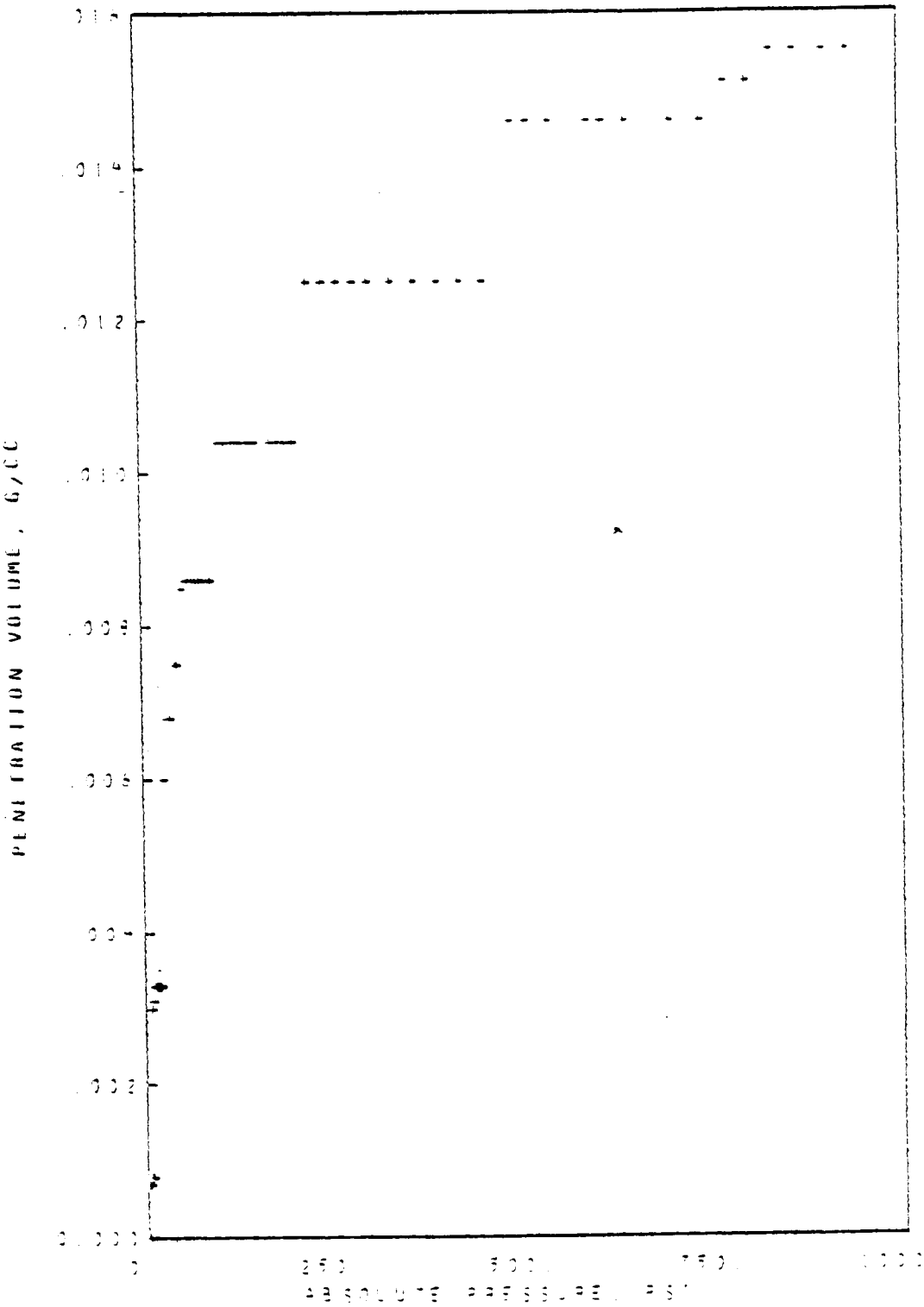


C 2-2761

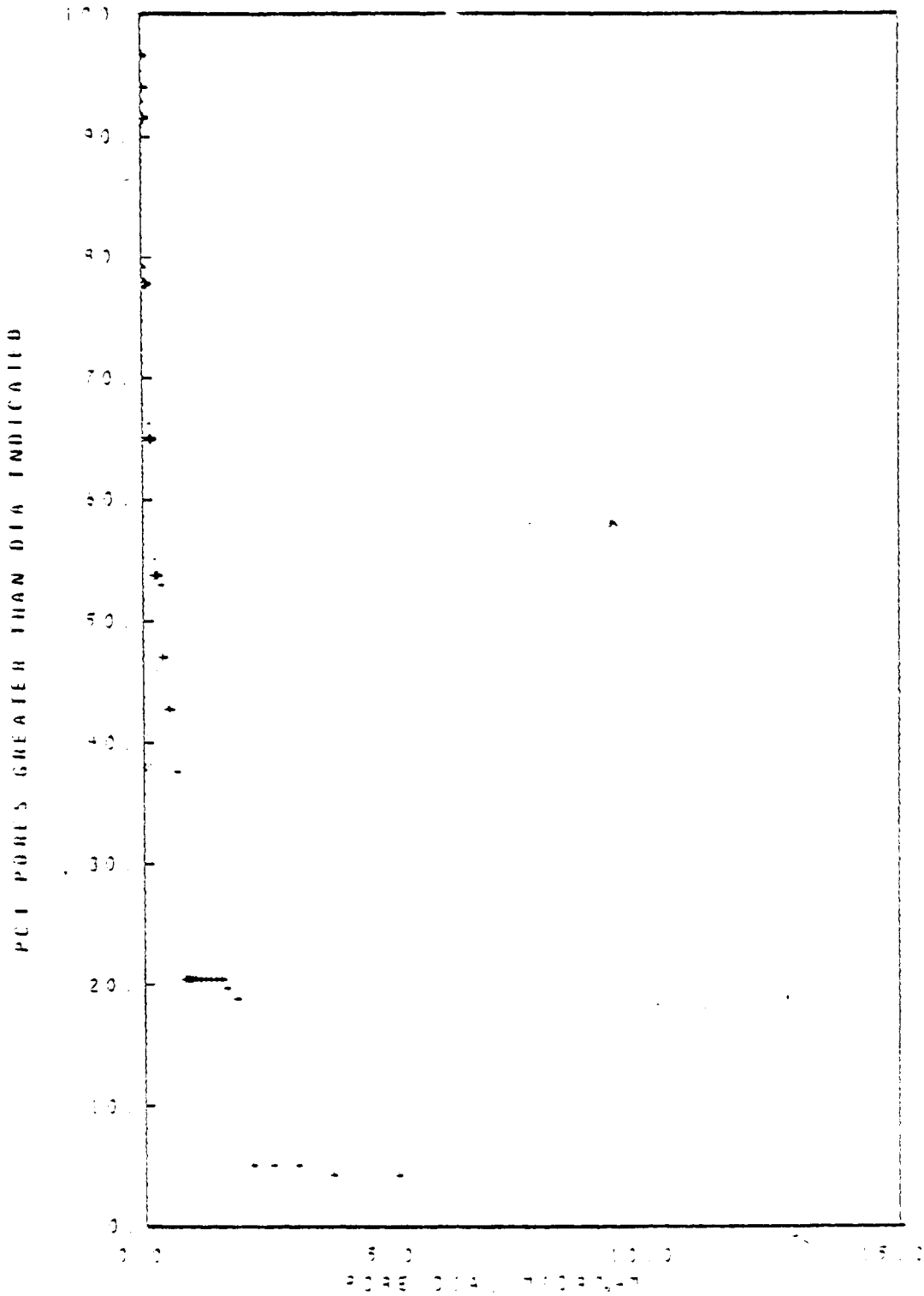
March 30, 1979
Battelle Columbus Labs.



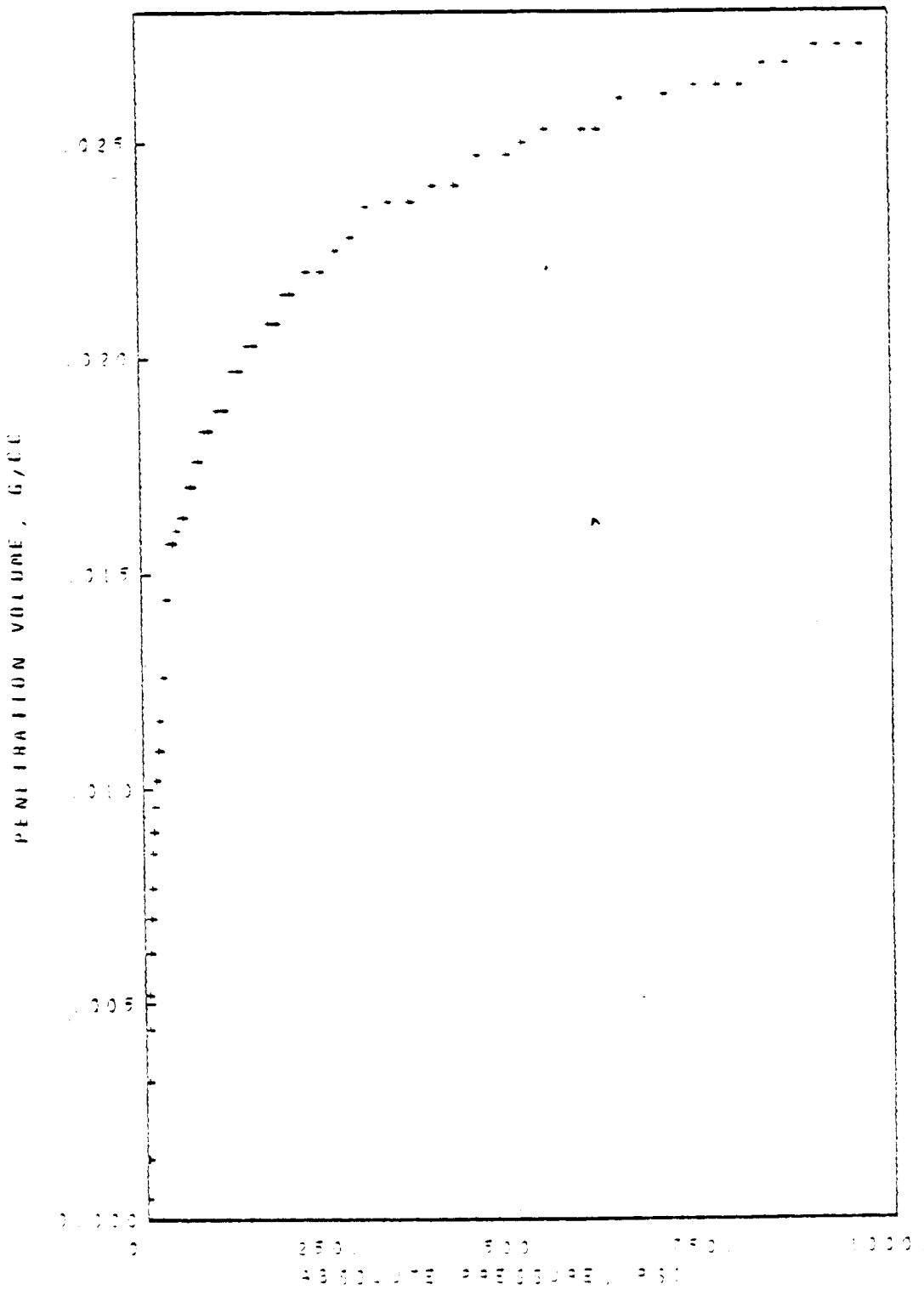
C 2-2761


PENETRATION VOLUME, G/CC
.016
.014
.012
.010
.008
.006
.004
.002
0.000
0
250
500
750
1000
ABSOLUTE PRESSURE, PSI

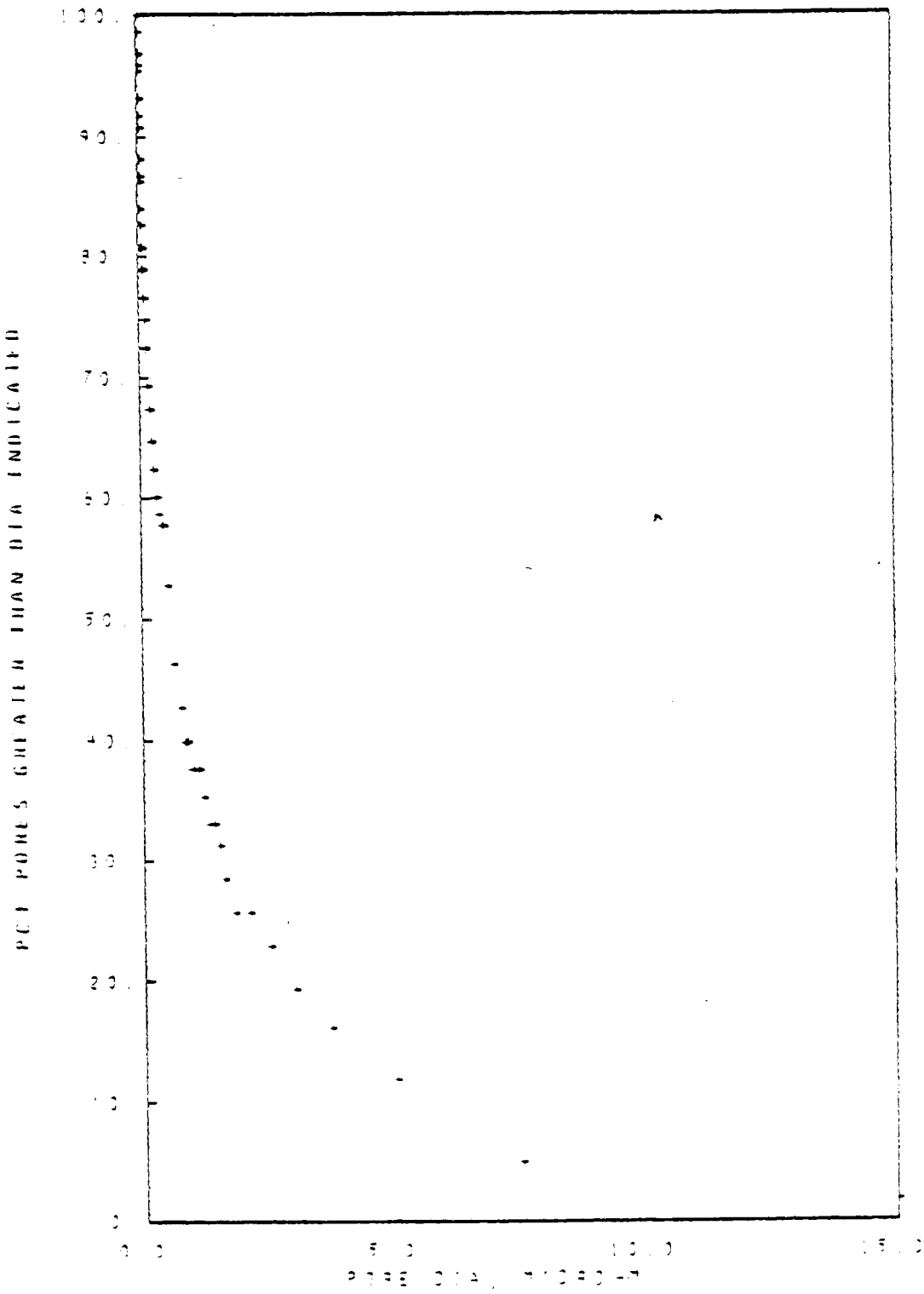
C 2-3000


PCT PORES GREATER THAN DIA INDICATED
100
90
80
70
60
50
40
30
20
10
0
0.0
5.0
10.0
15.0

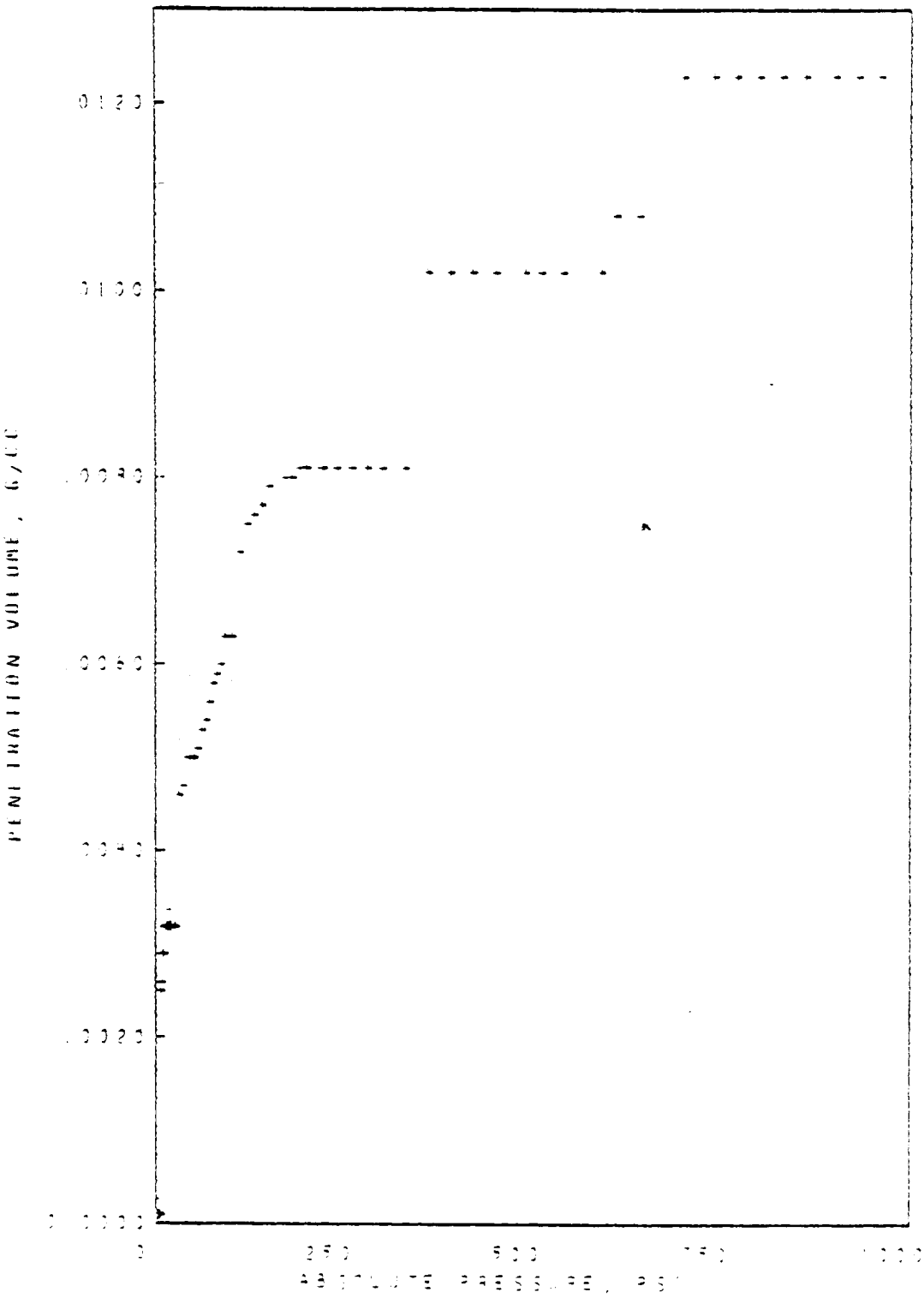
March 30, 1979
Battelle Columbus Labs.



C 2-3050

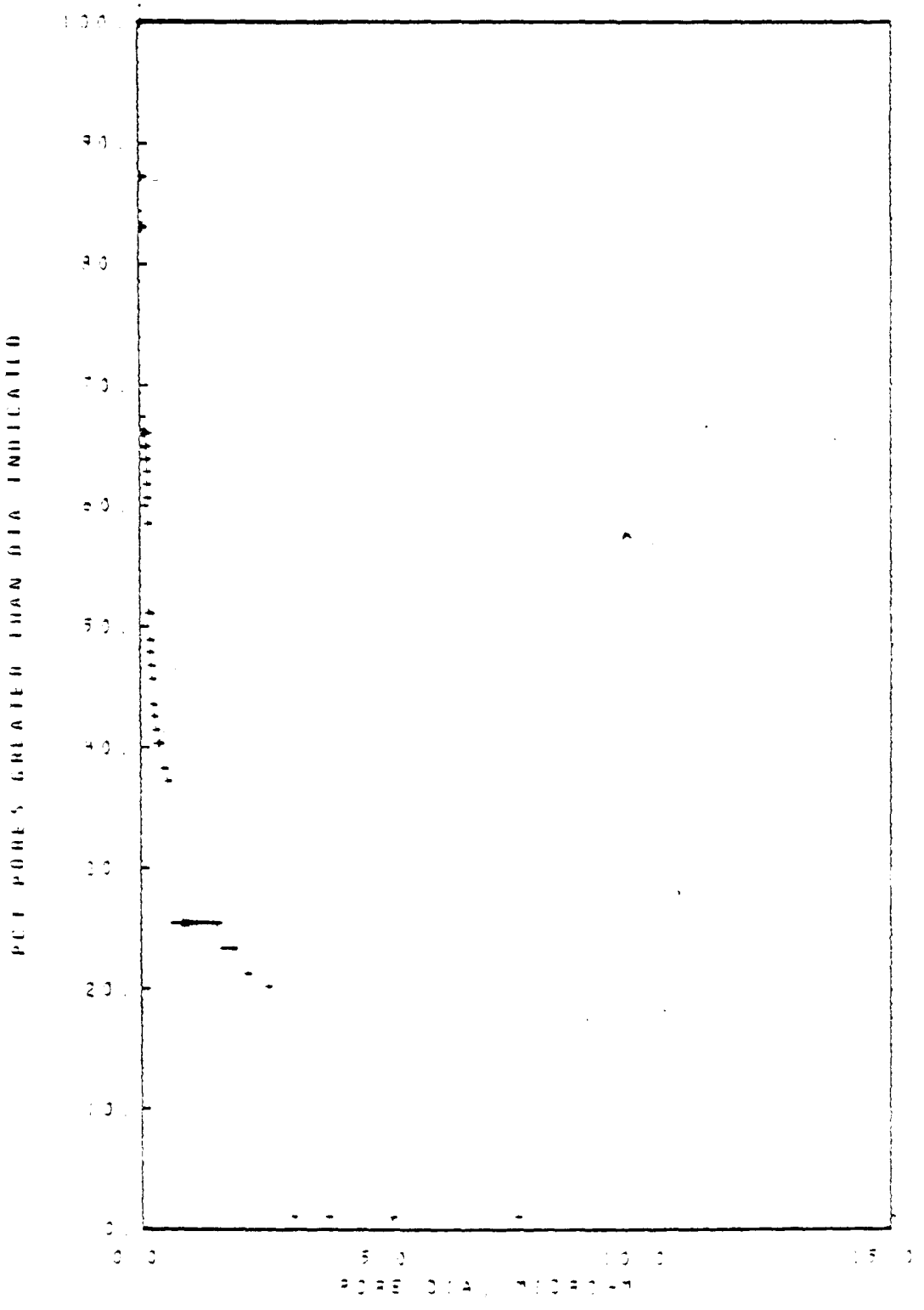

PCT POWER GREATER THAN DIA INDICATED
100.
90.
80.
70.
60.
50.
40.
30.
20.
10.
0.
0.0
5.0
10.0
15.0
PORE DIA, MICRON

March 30, 1979
Battelle Columbus Labs.



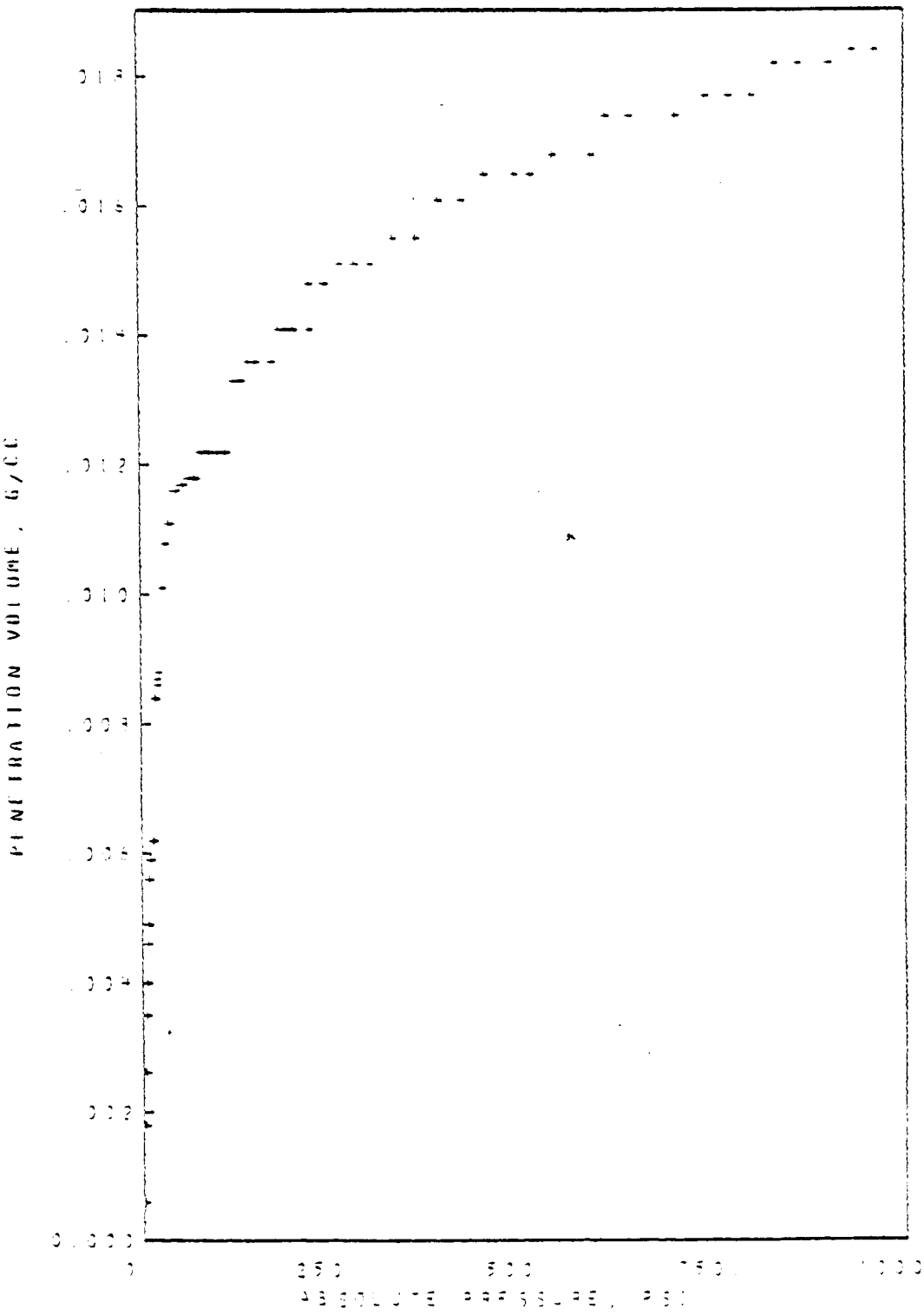
C 2-3101

March 30, 1979
Battelle Columbus Labs.

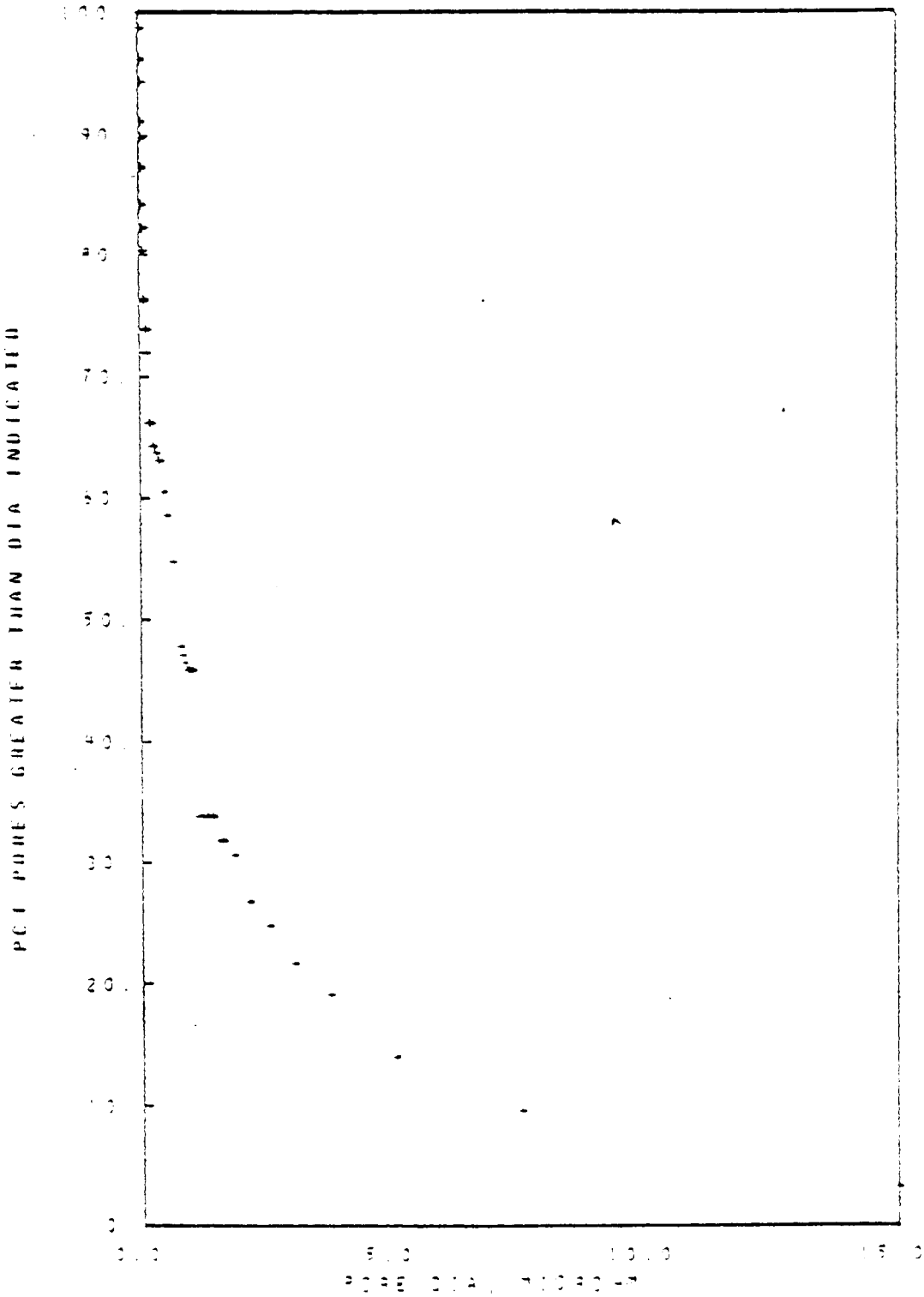


C 2-3101

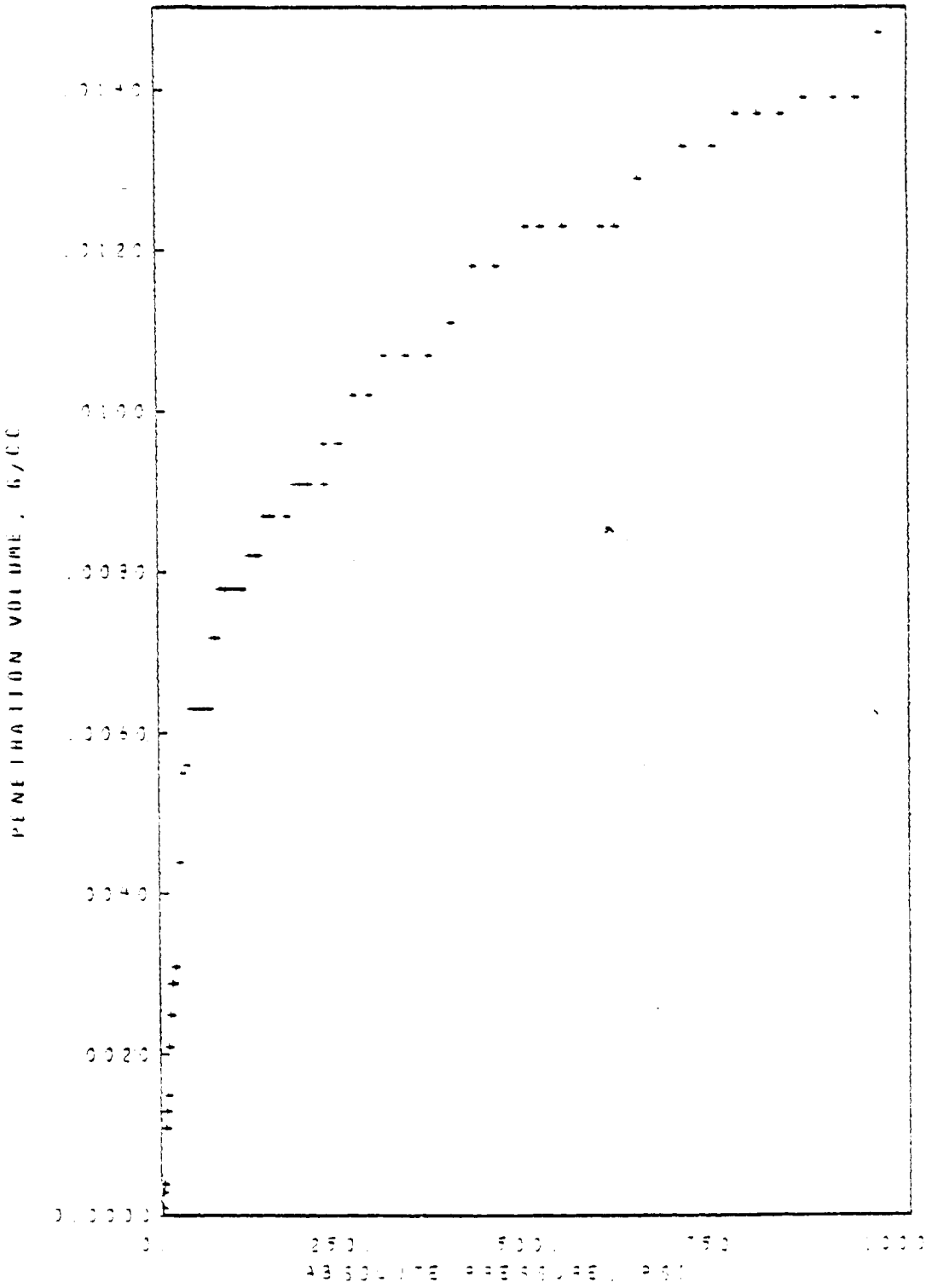
March 30, 1979
Battelle Columbus Labs.



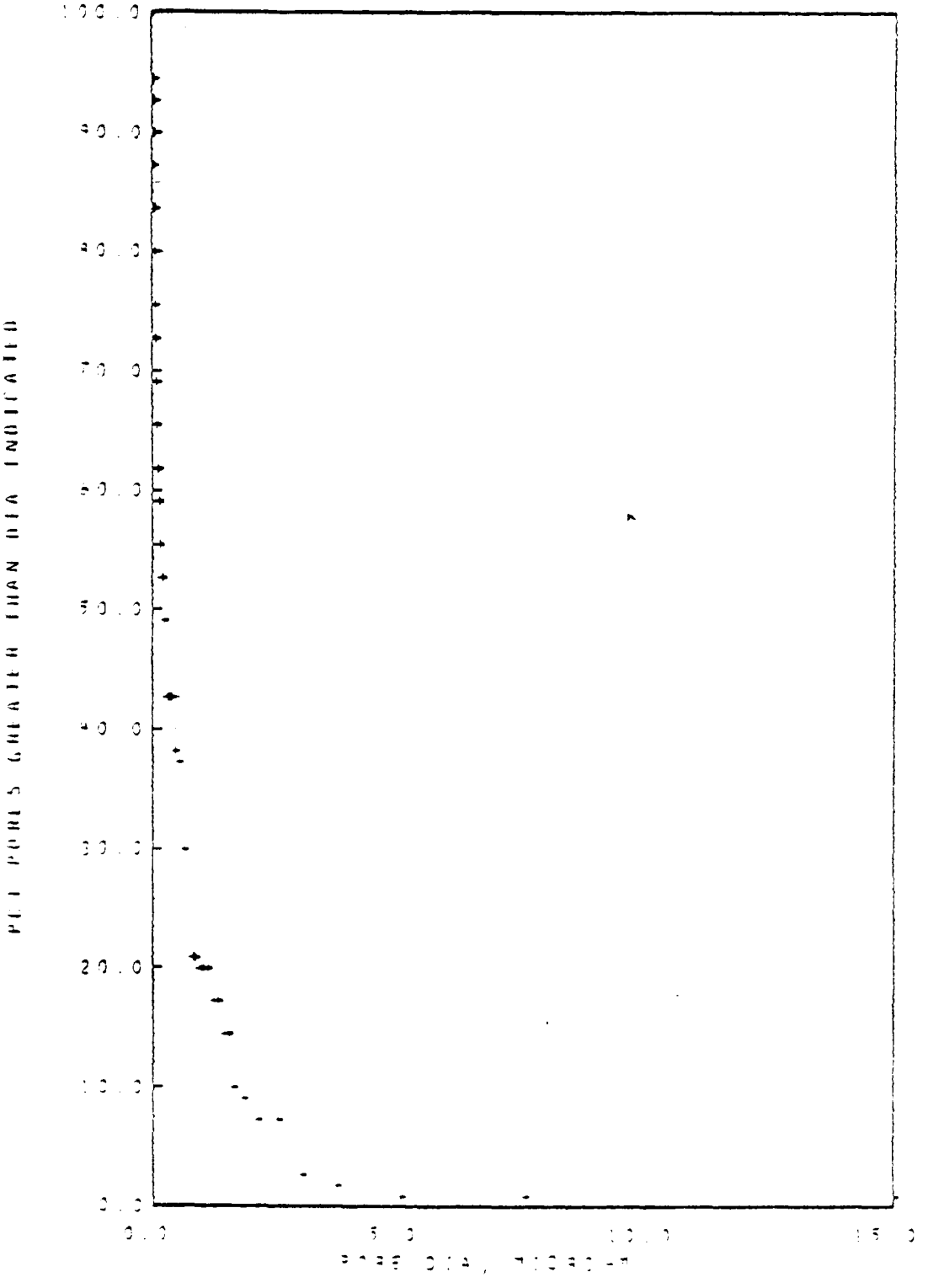
C 2-3303


PCT PORES GREATER THAN DIA INDICATED
100
90
80
70
60
50
40
30
20
10
0
0.0
5.0
10.0
15.0
PORE DIA, MICRON

March 30, 1979
Battelle Columbus Labs.

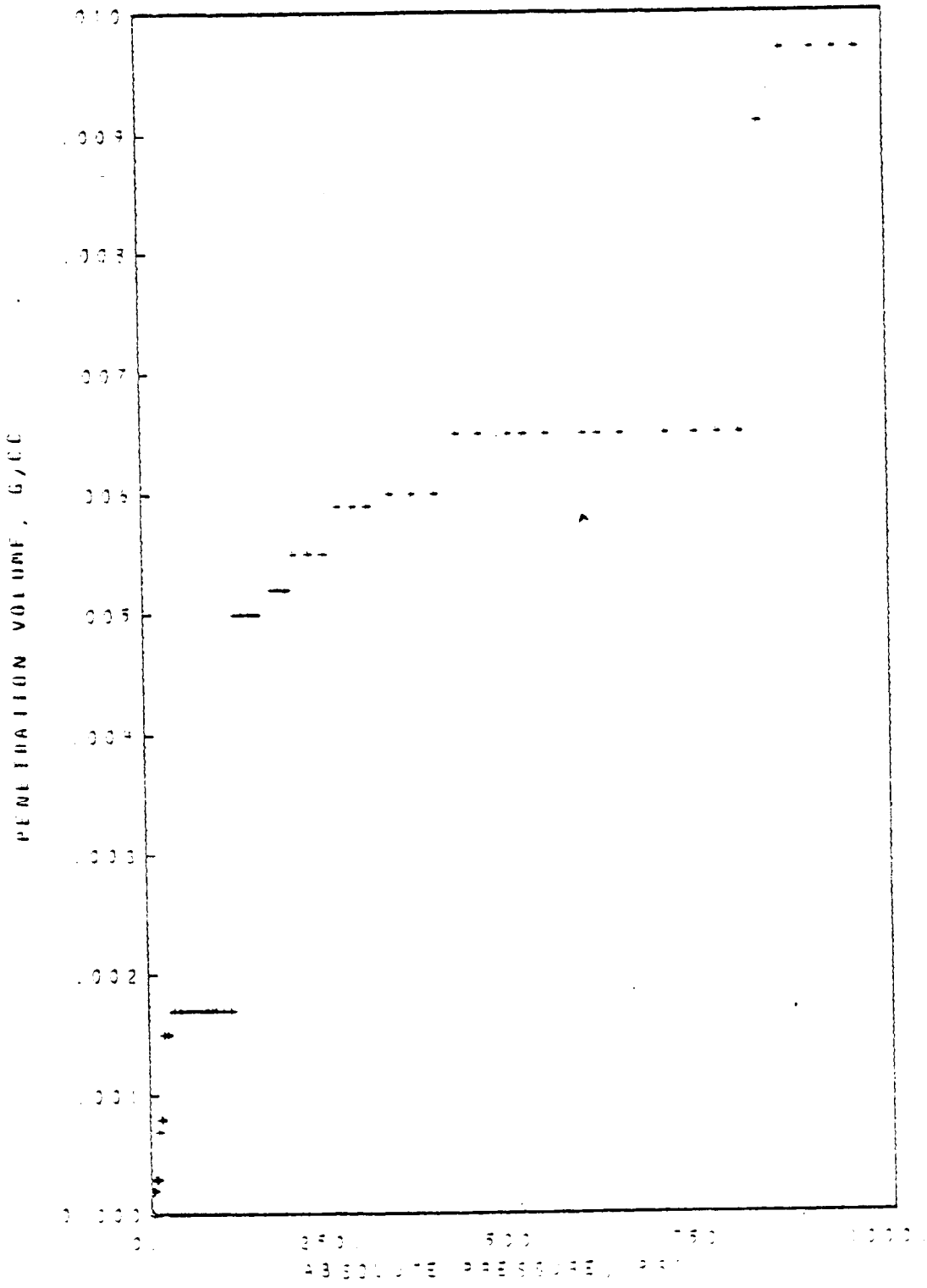


C 2-3328

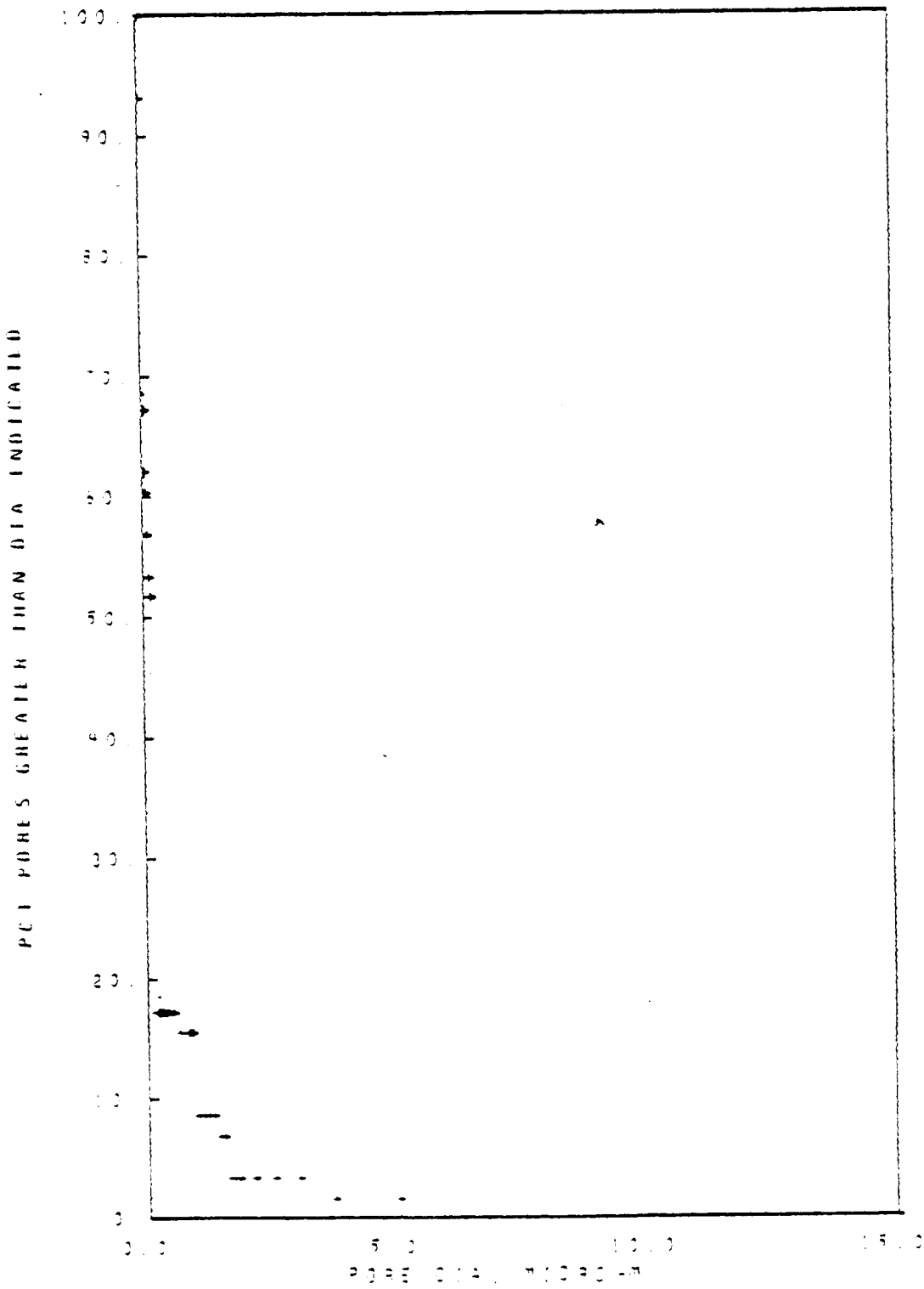

PERCENT GREATER THAN DIA INDICATED
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
0.0
5.0
10.0
15.0

C 2-3323

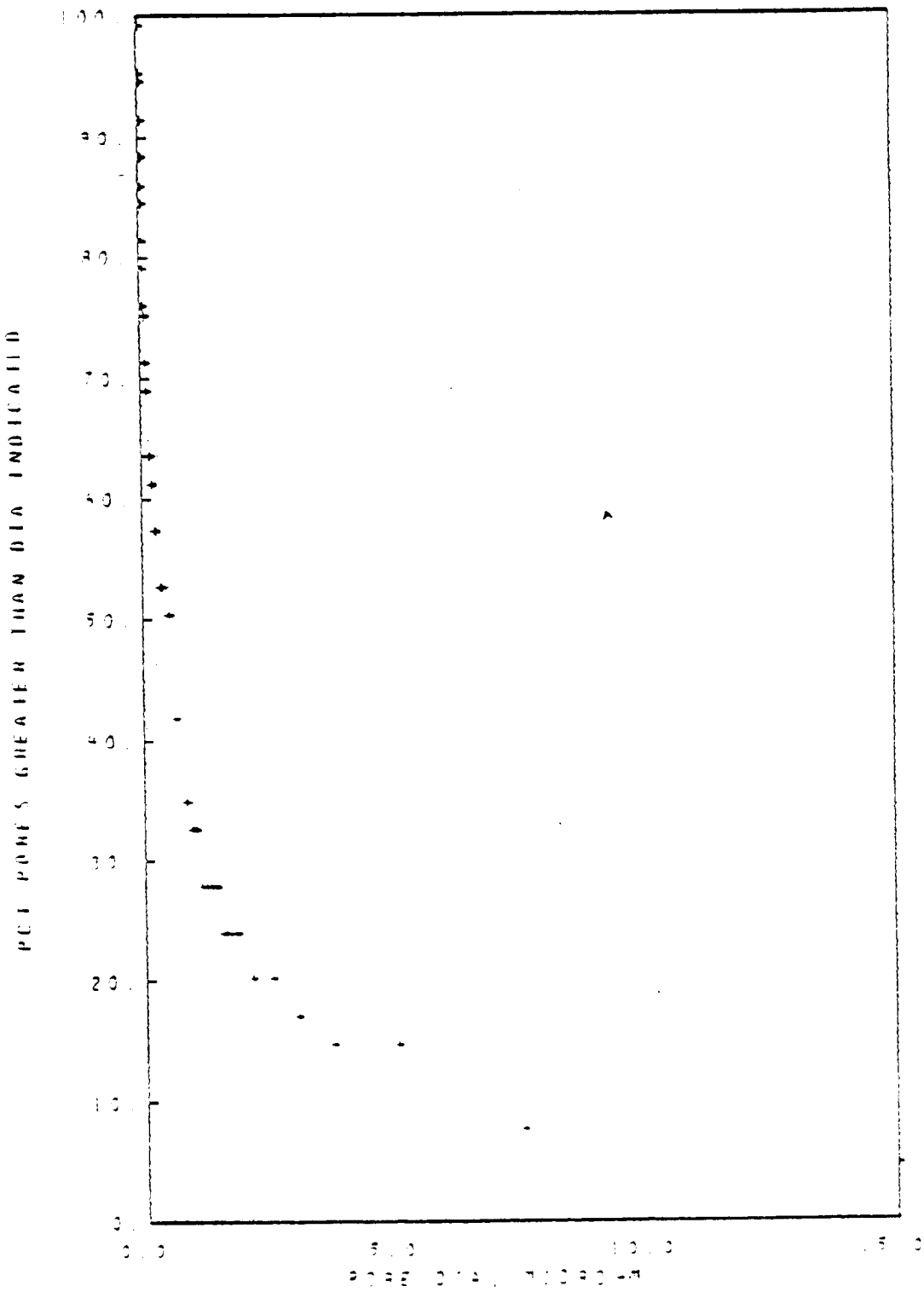
March 30, 1979
Battelle Columbus Labs.

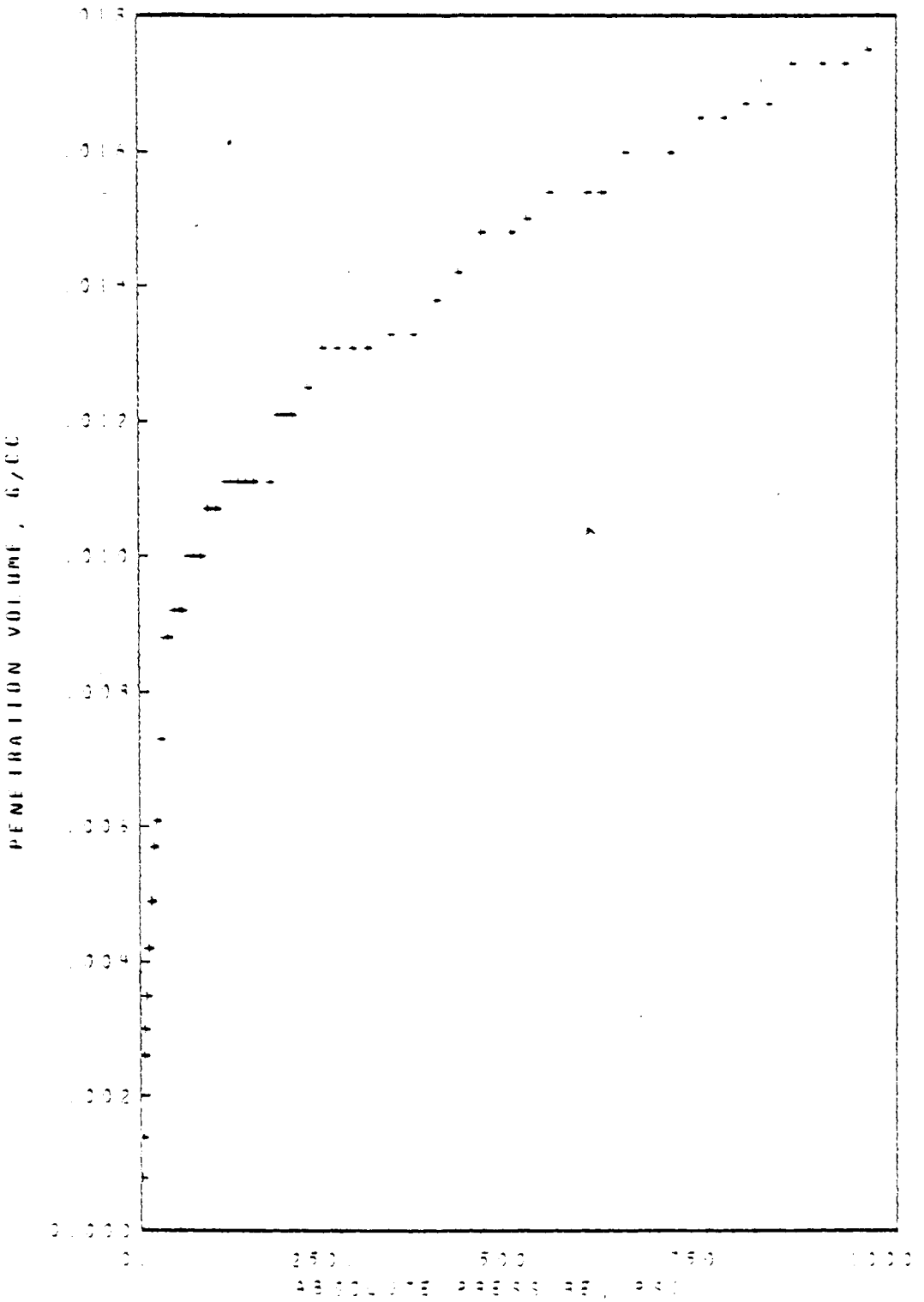


C 2-3373


PCT PORES GREATER THAN DIA INDICATED
100.
90.
80.
70.
60.
50.
40.
30.
20.
10.
0
0.0
5.0
10.0
15.0
PORE DIA, MICRON

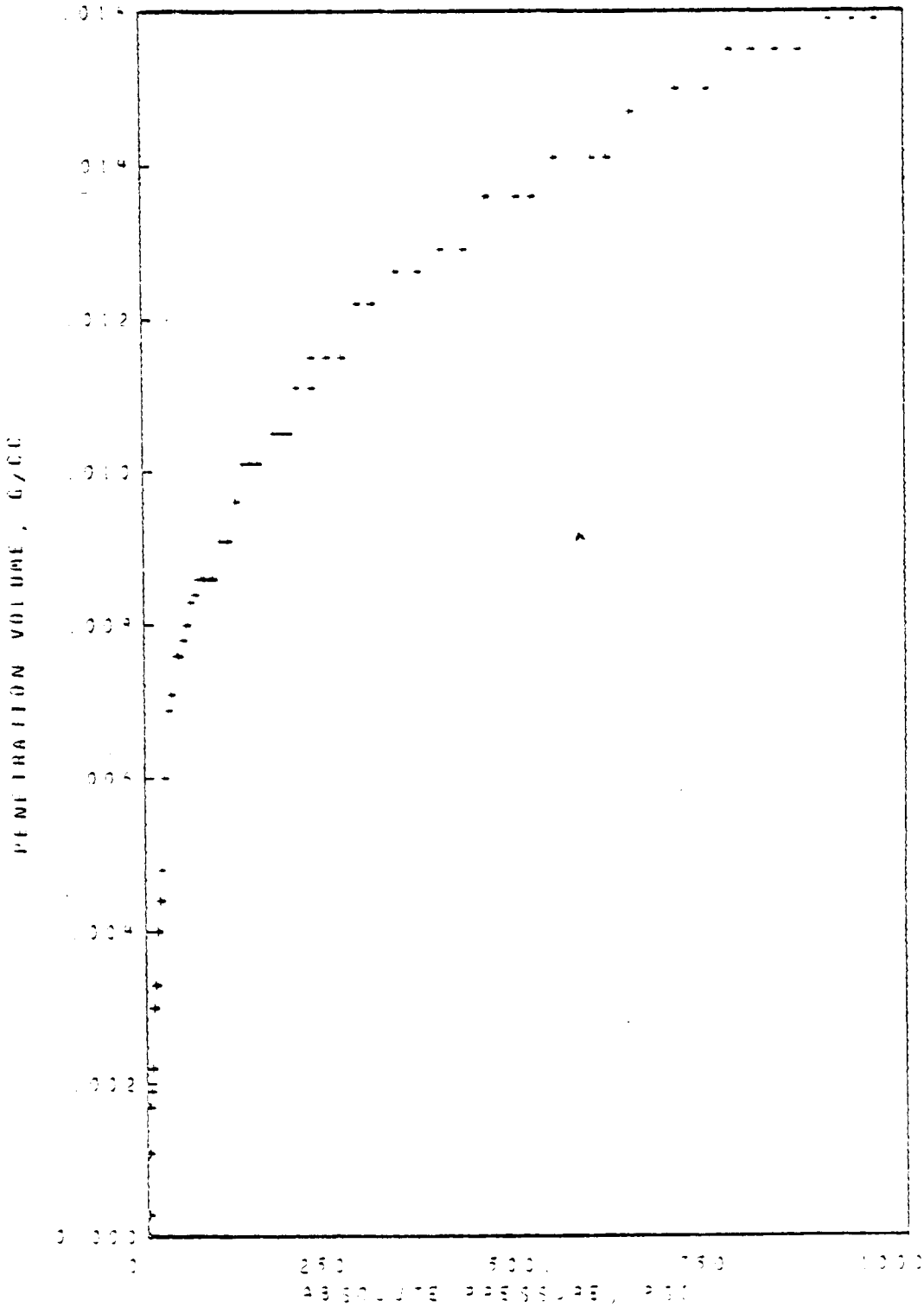
C 2-3373


PCT PORES GREATER THAN DIA INDICATED
100.
90.
80.
70.
60.
50.
40.
30.
20.
10.
0.
0.0
5.0
10.0
15.0

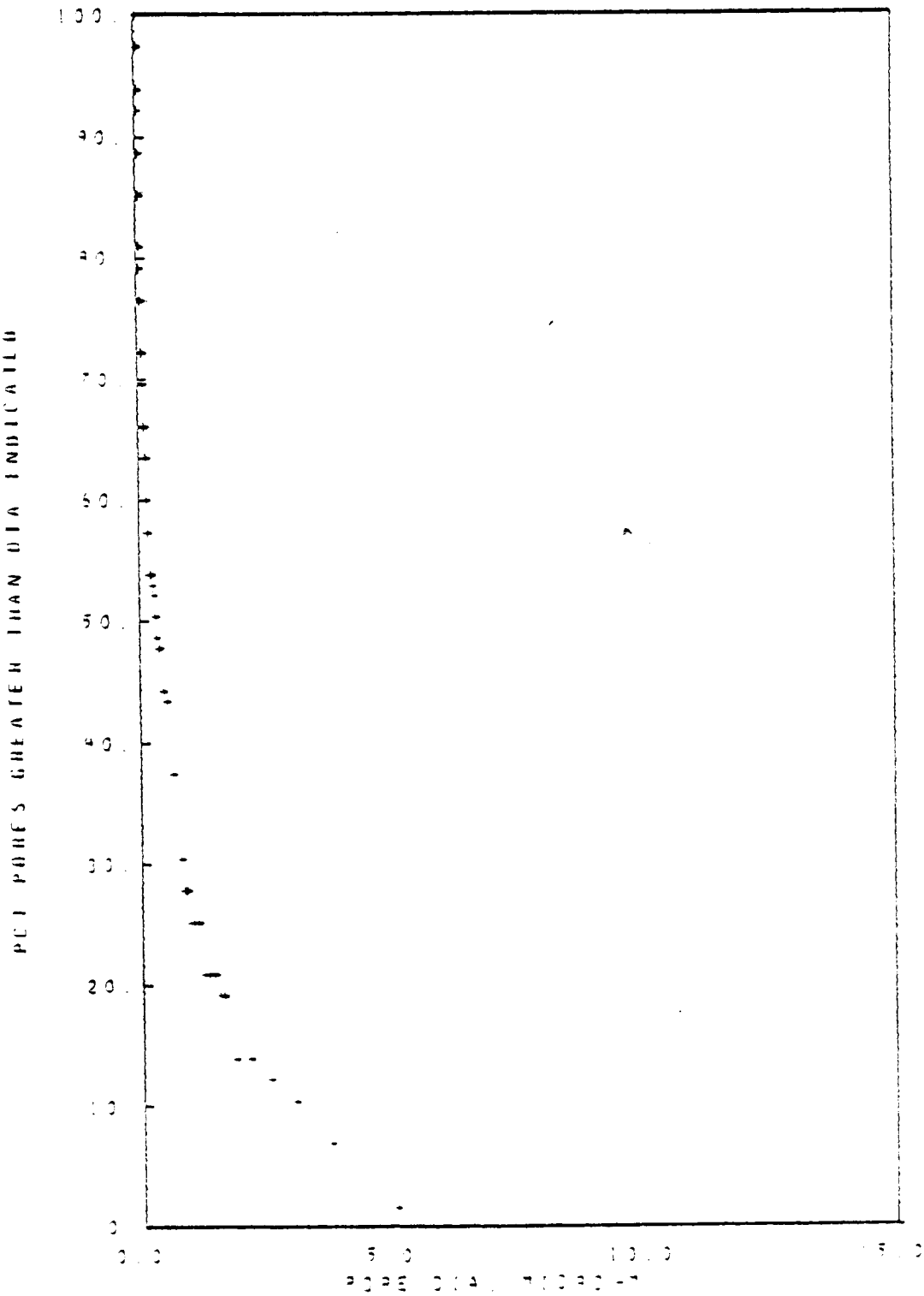


C 2-3423

March 30, 1979
Battelle Columbus Labs.

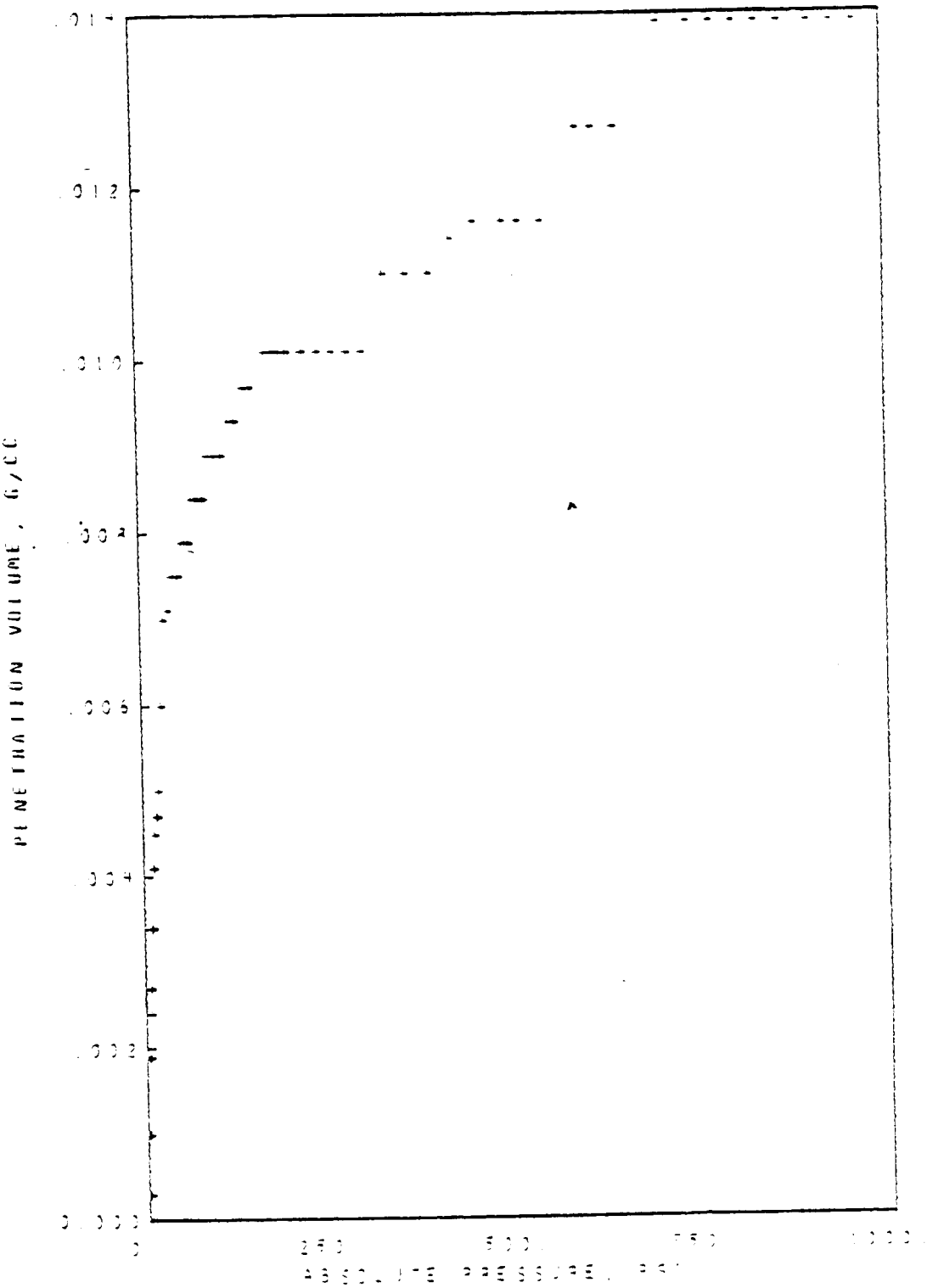


C 2-3478

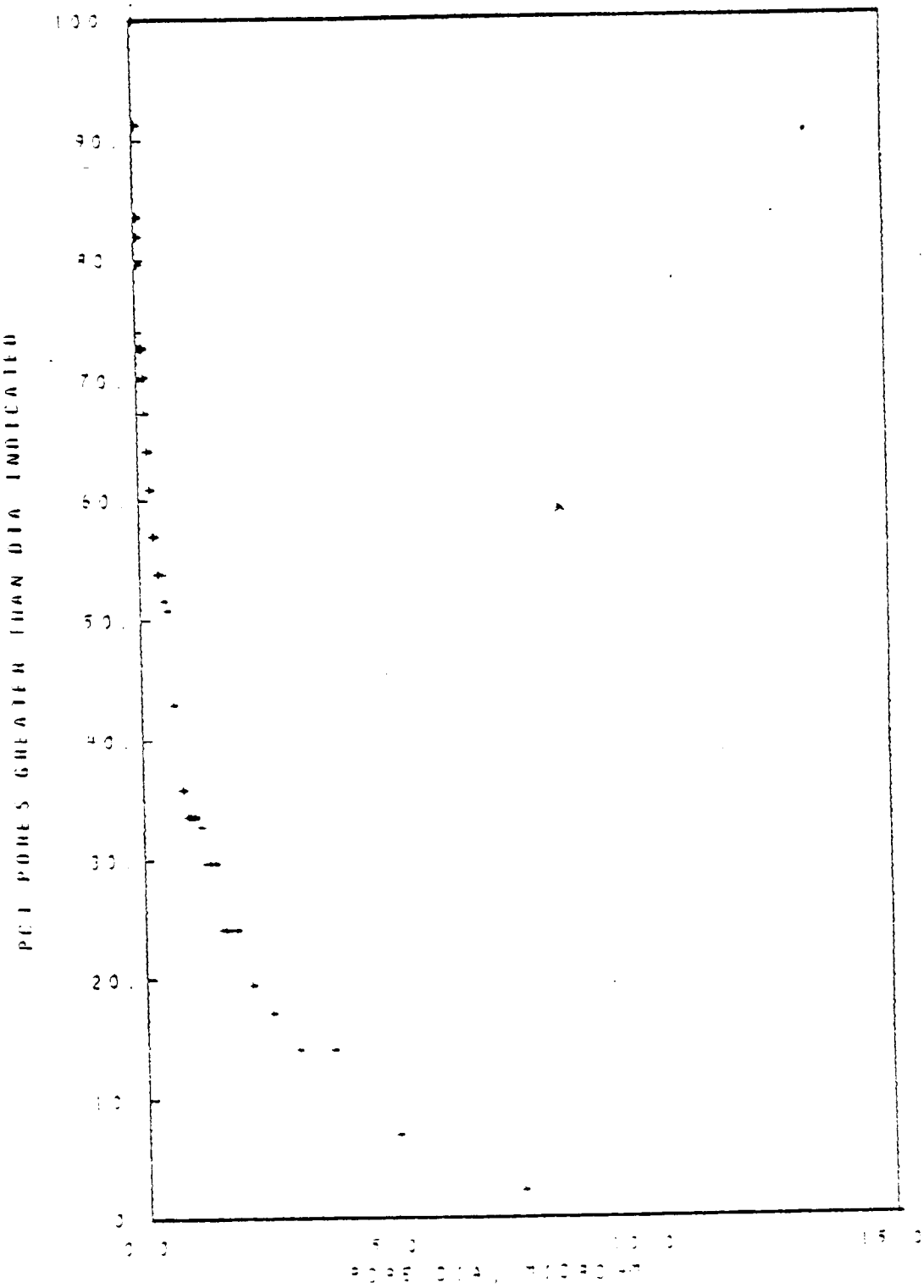

PCT PORES GREATER THAN DIA INDICATED
100.
90.
80.
70.
60.
50.
40.
30.
20.
10.
0.
0.0
5.0
10.0
15.0
PORE DIA. MICRON

C 2-3478

UGR File # [illegible]
March 30, 1979
Battelle Columbus Labs.



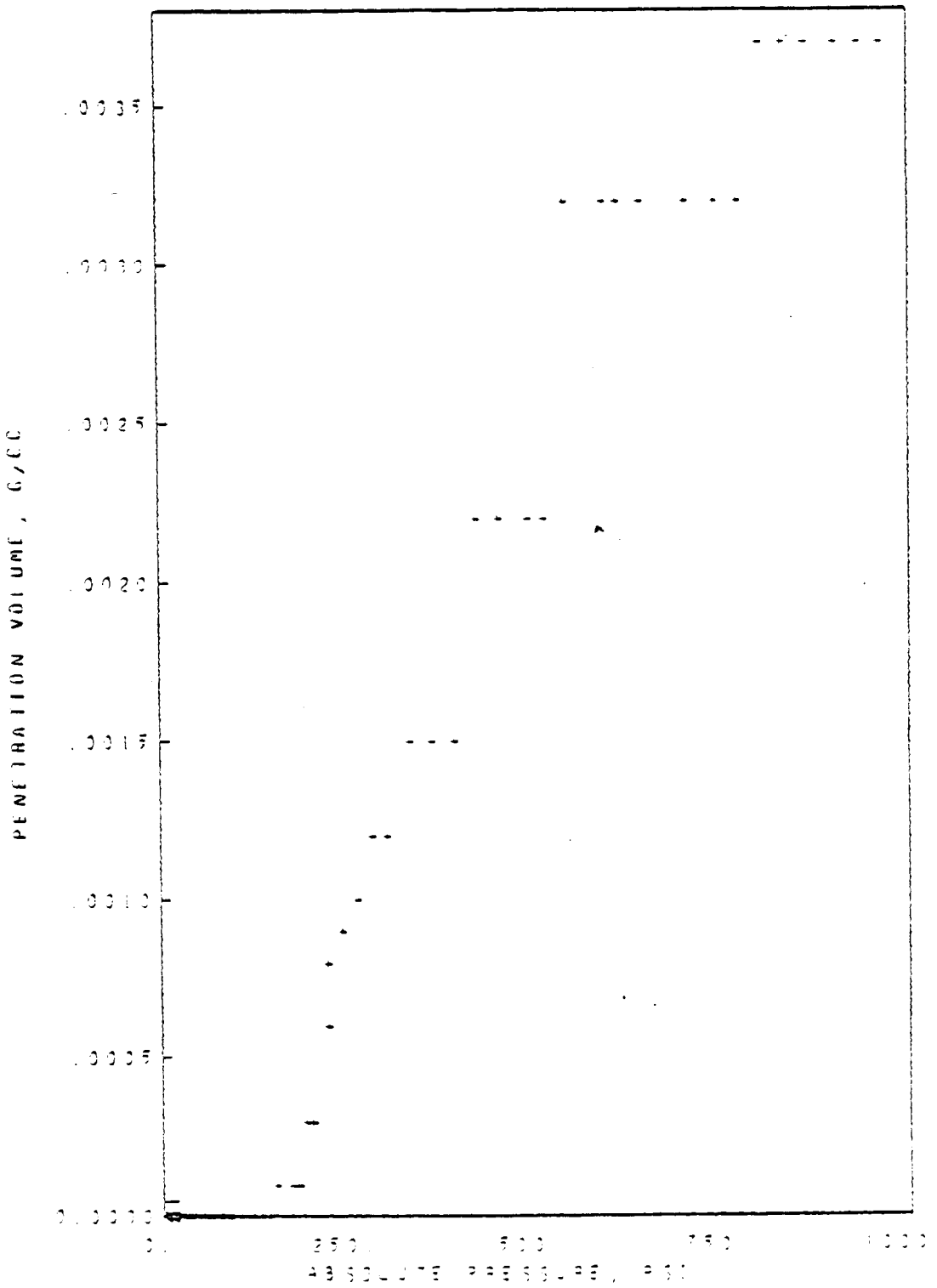
C 2-3523


PCT PORES GREATER THAN DIA INDICATED
100
90
80
70
60
50
40
30
20
10
0
0.0
5.0
10.0
15.0
PORE DIA, MICRONS

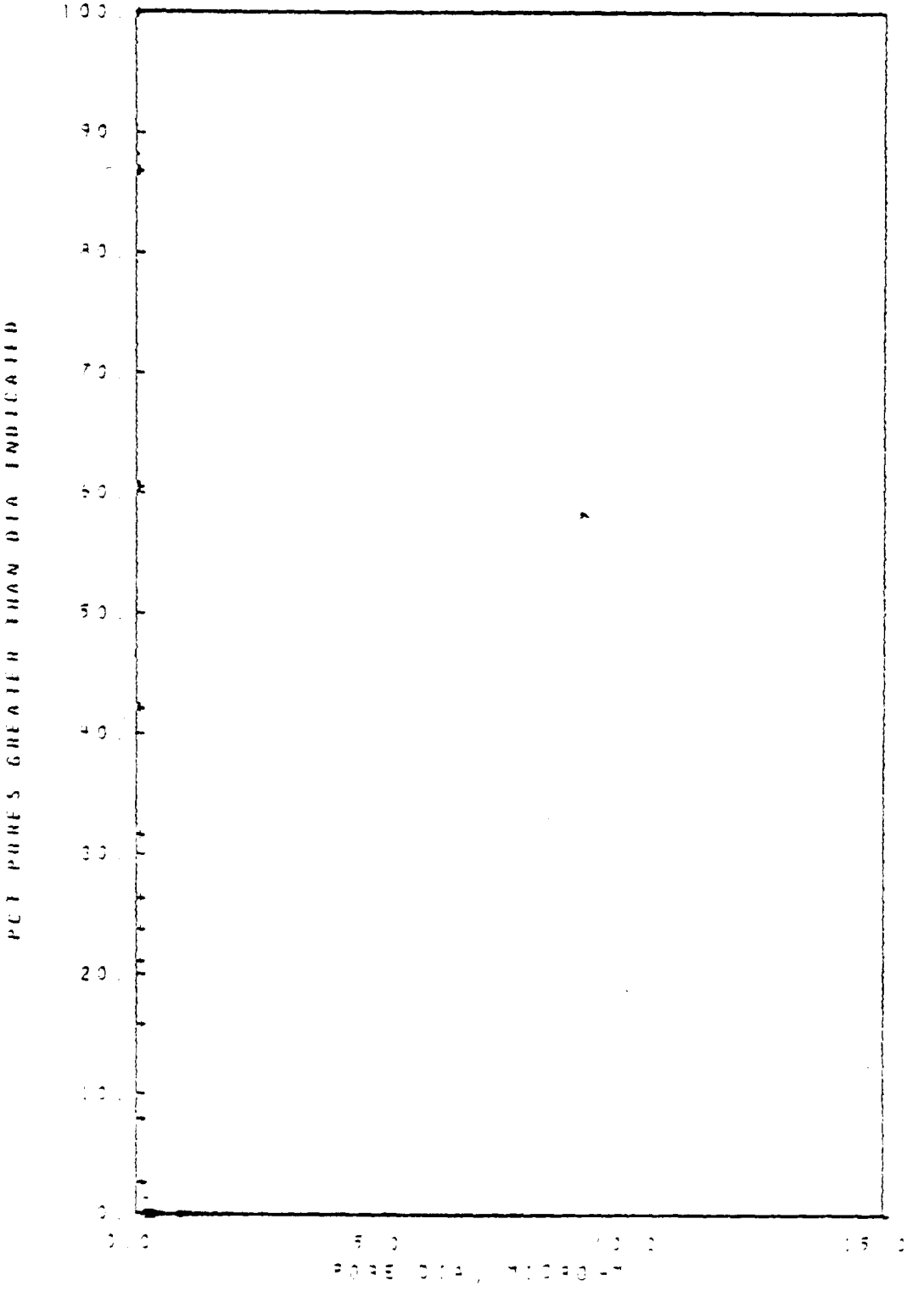
C 2-3523

16

JGR File # [illegible]
March 30, 1979
Battelle Columbus Labs.

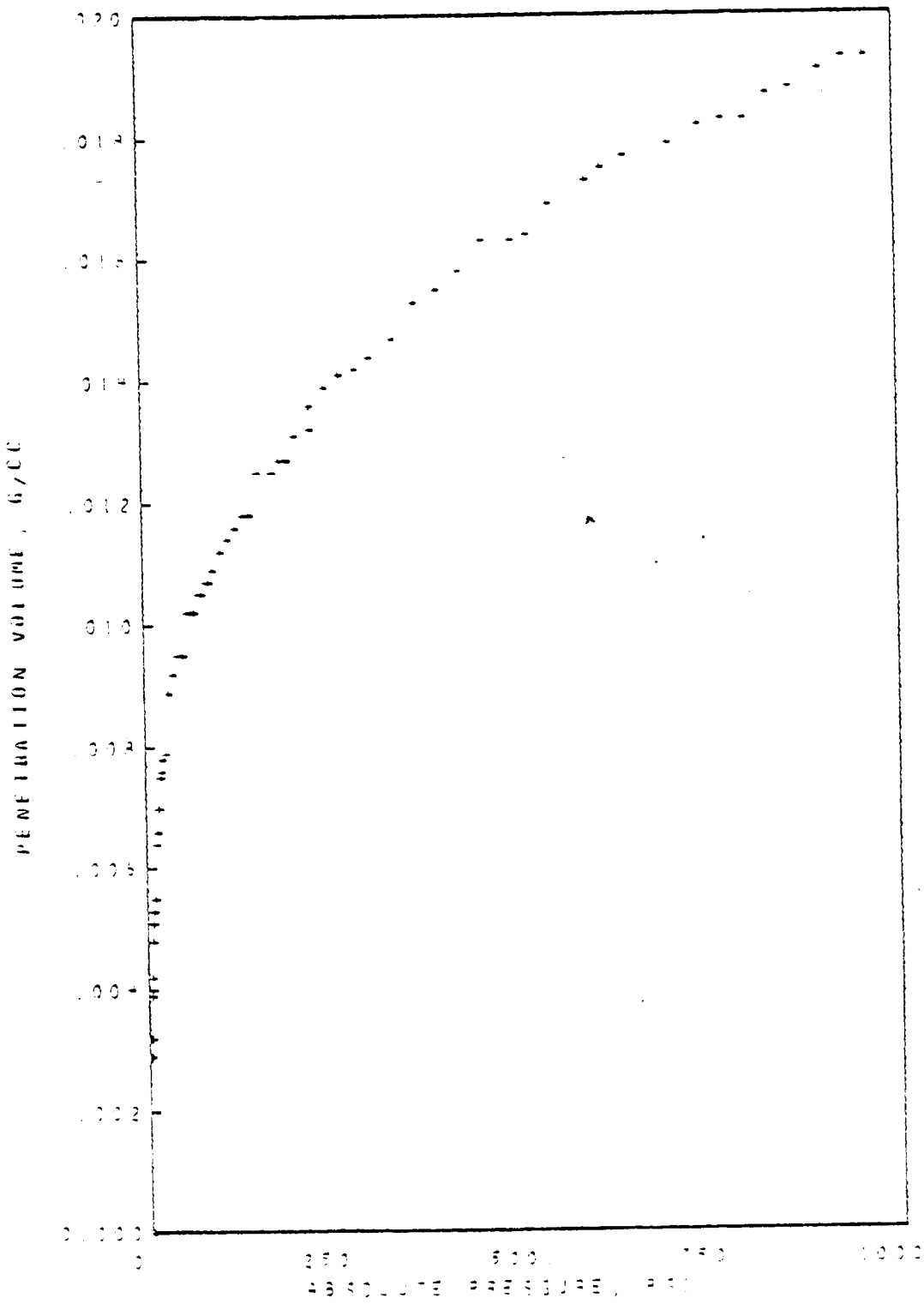


C 2-3896

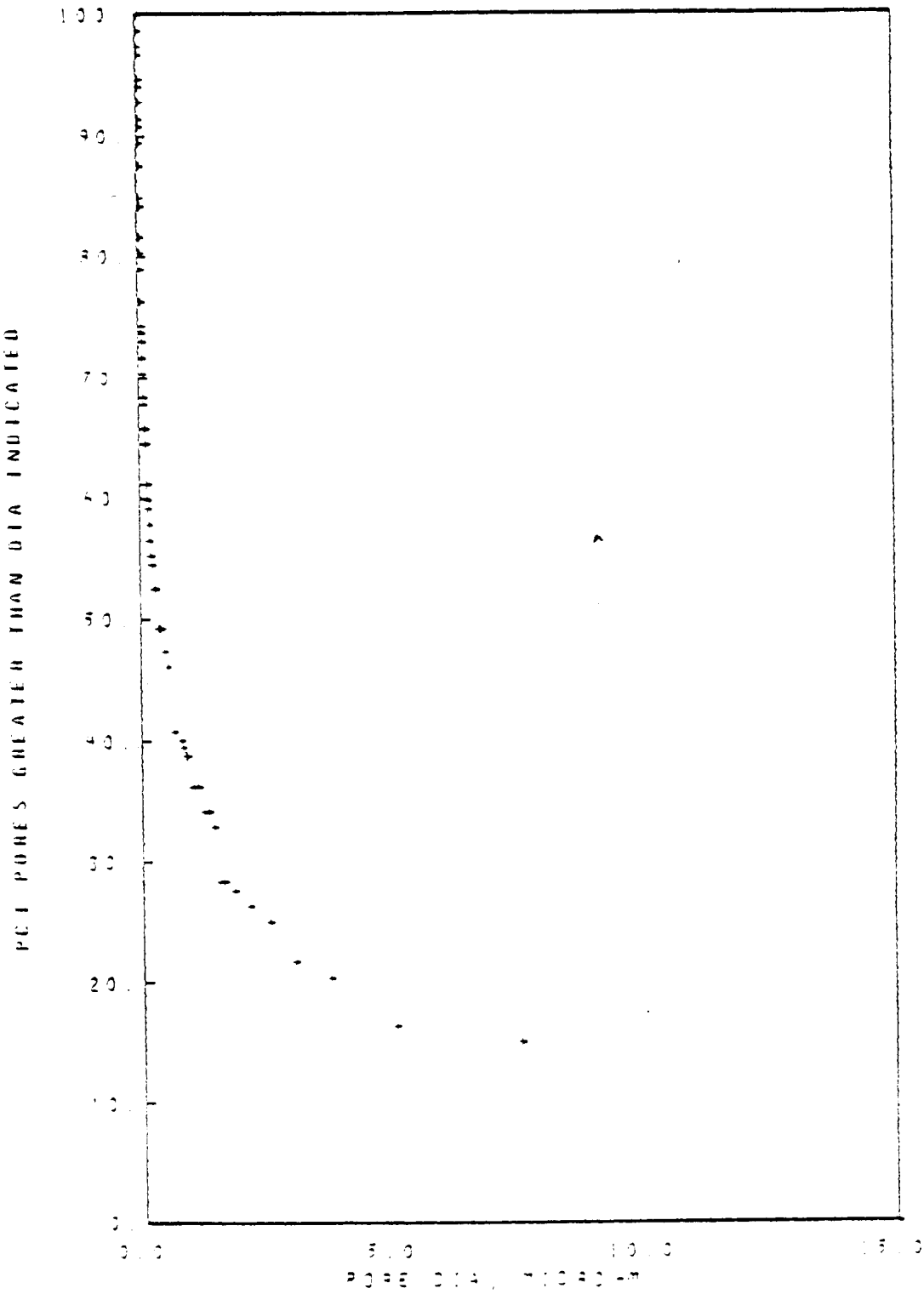

PCT PORES GREATER THAN DIA INDICATED
100.
90
80
70
60
50
40
30
20
10
0.
0.0
5.0
10.0
15.0
PORE DIA, MICRON

C 2-3896

March 30, 1979
Battelle Columbus Labs.



C 2-3922


PCT PORES GREATER THAN DIA INDICATED
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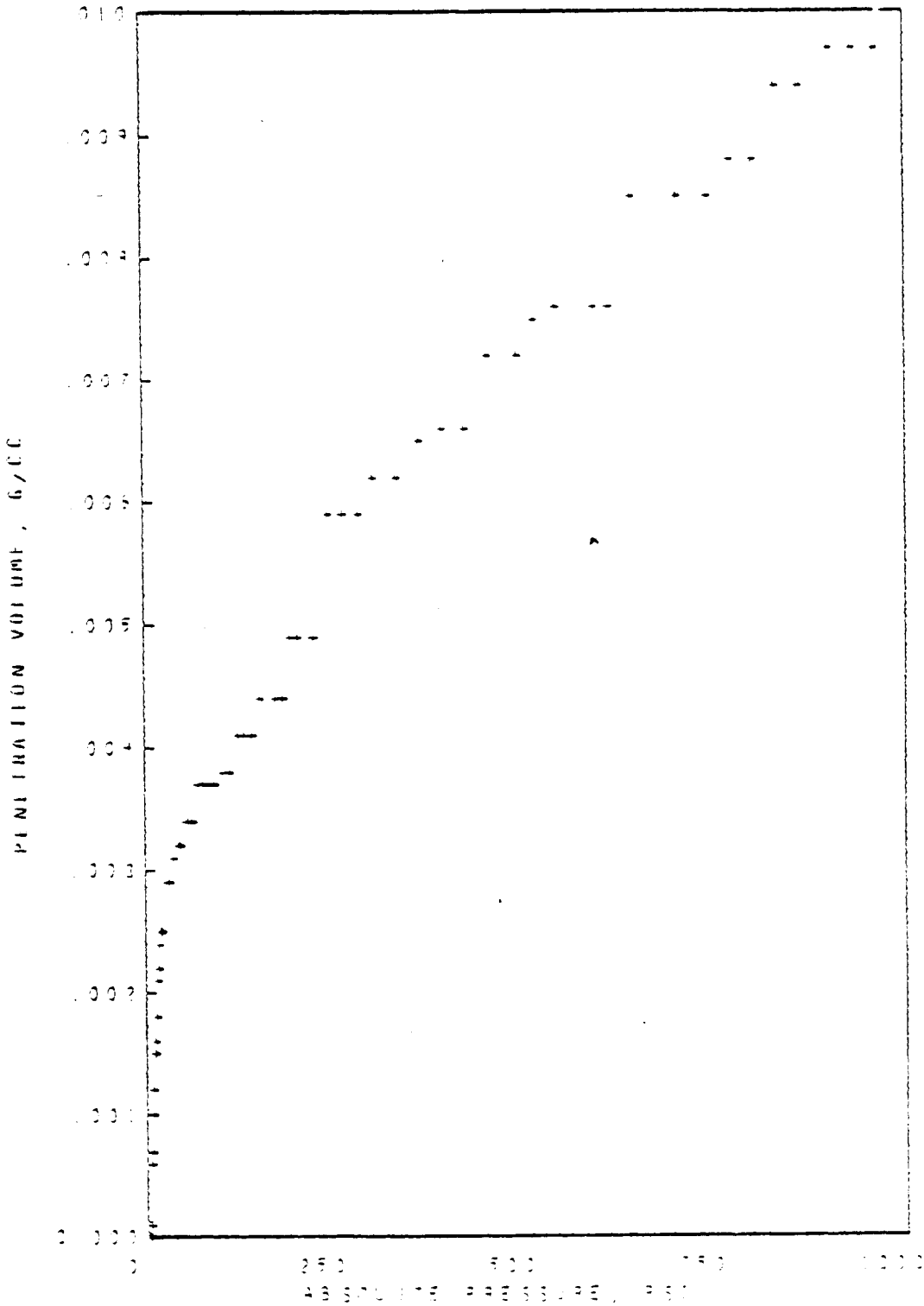
40
30
20
10
0
0.0
5.0
10.0
15.0
PORE DIA, MICRON

C 2-3922


PENETRATION VOLUME, G/CC
ABSOLUTE PRESSURE, PSI
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500
750
1000
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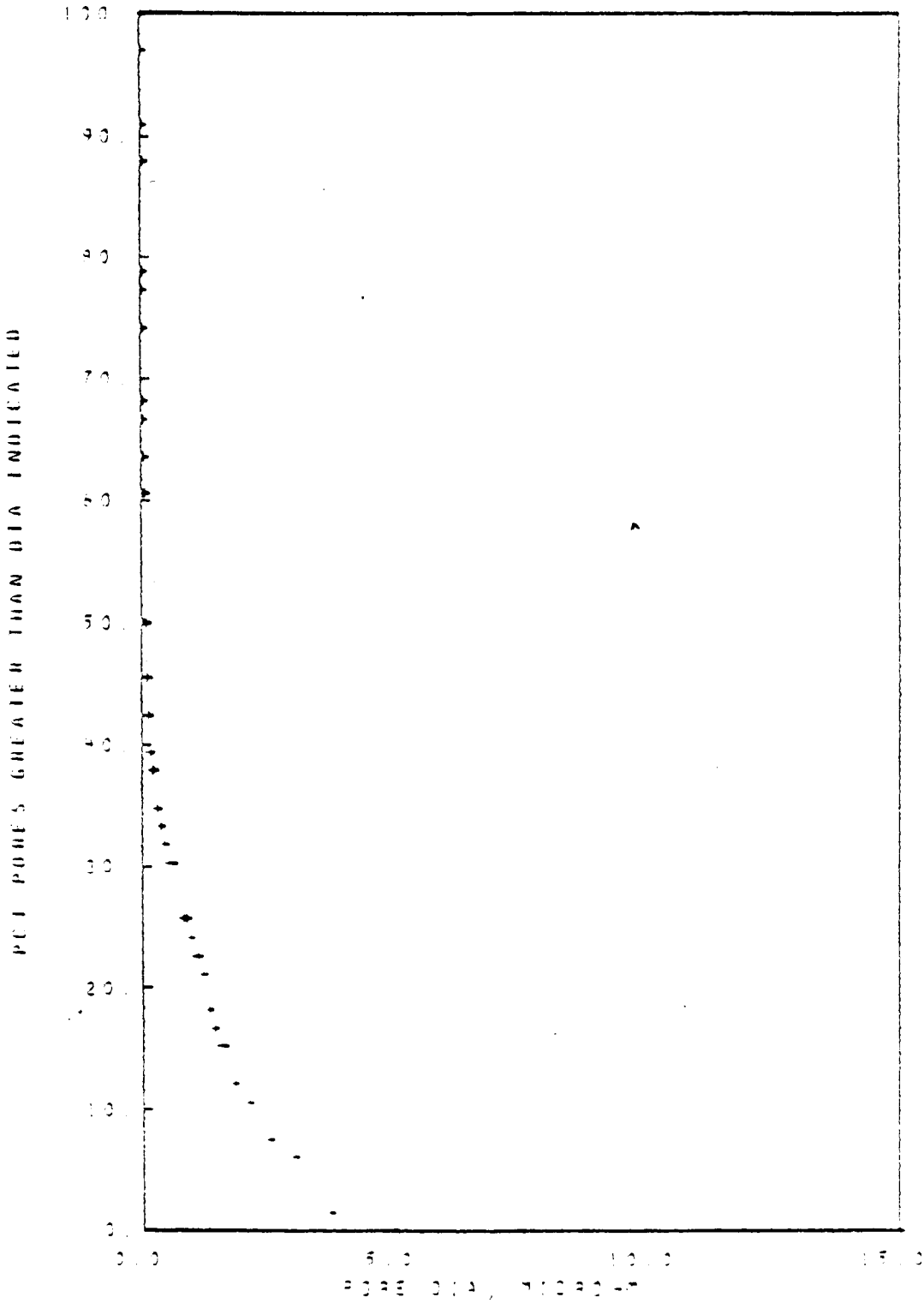
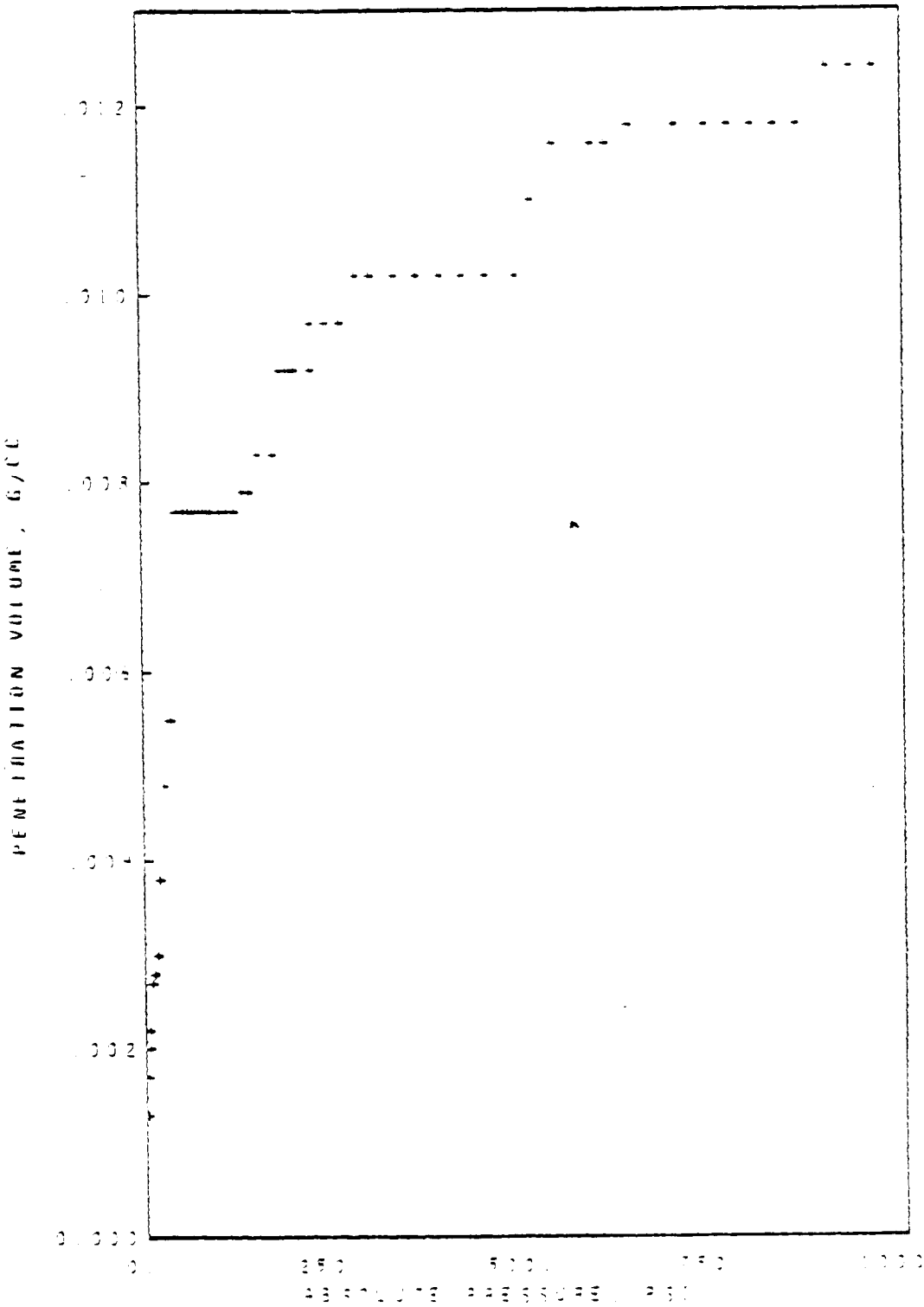
.009
.008
.007
.006
.005
.004
.003
.002
.001
0.000

C 2-3961

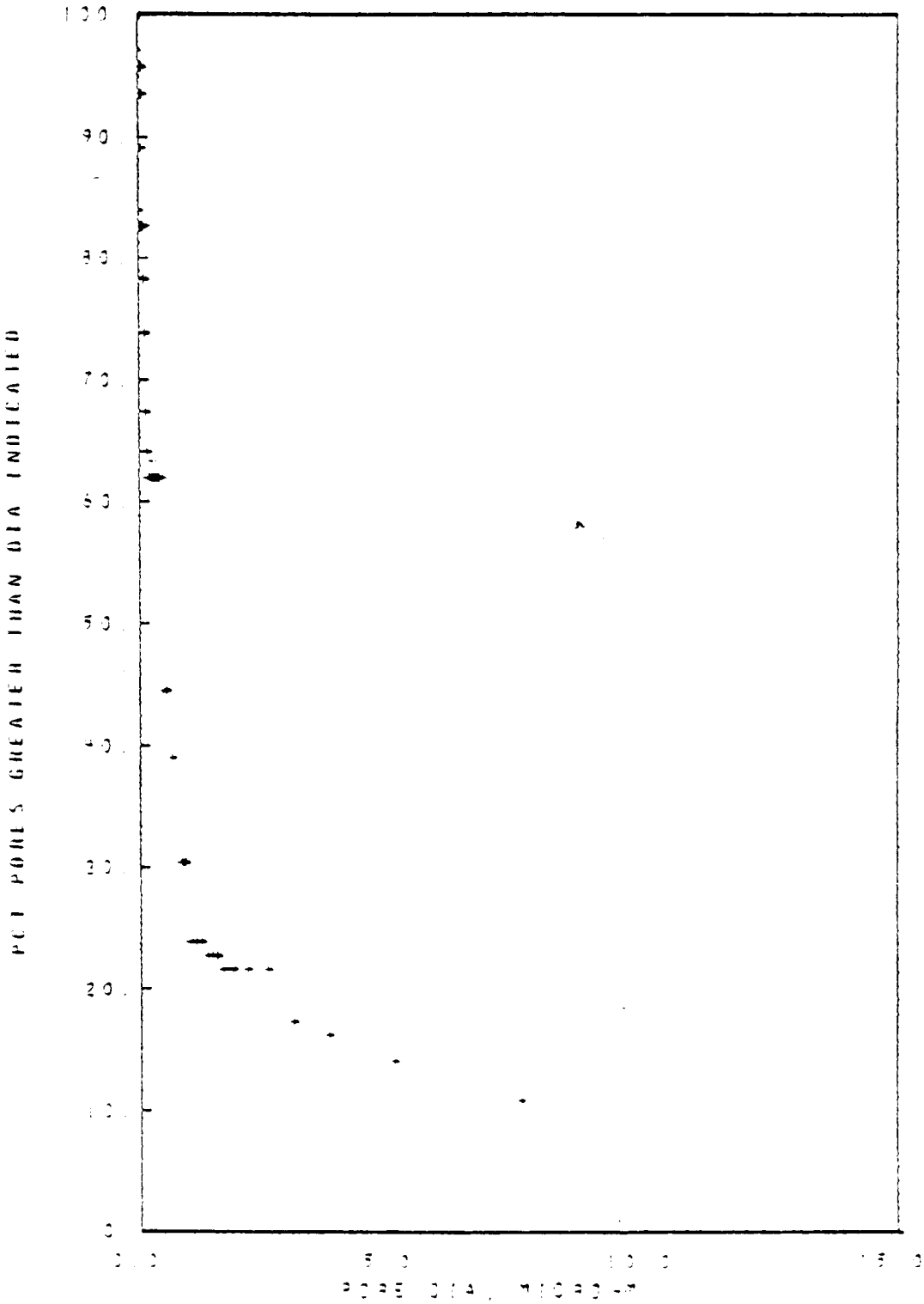

PCT POWER GREATER THAN DIA INDICATED
100
90
80
70
60
50
40
30
20
10
0
0.0
5.0
10.0
15.0

C 2-3961

March 30, 1979
Battelle Columbus Labs.



C 2-3971


PCT PORES GREATER THAN DIA INDICATED
100
90
80
70
60
50
40
30
20
10
0
0.0
5.0
10.0
15.0
PORE DIA, MICRON

C 2-3971