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STUDY OF HYDROCARBON - SHALE INTERACTION 34

No. 4
PROGRESS REPORT #10

July 1 - September 30, 1978

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Huntingdon, Pennsylvania 16652

Prepared for the U. S. Department of Energy

under Contract No. EY-76-S-05-5197

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QUARTERLY PROGRESS REPORT

July 1 - September 30, 1978

Contract No. EY-76-S-05-5197

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1. Executive Summary.

Work was directed at obtaining data at the maximum design equipment rate (1-2 samples/day). Procedures were streamlined so as to be able to approach the equipmental design rate during the academic year. Work on the high pressure apparatus was delayed because of delays in delivery of component parts. A report on estimating reservoir reserves from our data is included in Appendix D.

2. Technical Progress.

2.1 Task 1 - High Pressure

2.1.1 Current Status.

Orders of component parts have finally arrive. Breadboarding of new electronics design for valve/computer interface is complete (14 Oct. 1978). Layout of parts on board complete; some fittings installed.

2.1.2 Problem Areas. Problems of part delays resolved.

2.1.3 Plans.

- a) Construct valve/computer interface.
- b) Finish installation of heat exchanger, valves, and pressure transducer on copper plate.
- c) Mount plate on rack which has been constructed. Mount non-thermostatted components.
- d) Make vacuum, gas, thermostatted water connections.
- e) Install transducer power supply and valve/computer interface from a).
- f) Install insulation
- g) Initial checkout.
- h) Software adaptation.

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2.2 Task 2 - Low Pressure Data.

2.2.1 Current Status.

290 data points submitted in Appendix B and C of this report.
Approximate data breakdown as follows:

171 Isotherms including 57 BET's.
117 Diffusion constants.

2.2.2 Problem Areas.

A slight problem has developed in that an old G.C. program will not run on current versions of Data General supplied Basic. This will affect sample scheduling as noted.

2.2.3 Plans.

Continue data gathering at the rate of 1 sample/day (5 measurements/sample) according to the following priority scheme.

- a) IND#2 (3 samples) and NY#1 (33 samples) after G.C. analysis.
- b) Lincoln County #20403 well.
- c) Samples received from Columbia Gas.

We are also assessing the effect of long term storage on samples under a variety of atmospheres including vacuum, dry and moist air and water vapor.

2.3 Task 3 - Productivity Calculations

2.3.1 Current Status.

Report on Reservoir Potential submitted in Appendix D. A new approach has been initiated on the pseudo two step model.

2.3.2 Problem Areas.

Progress in this area is difficult to predict because it involves invention of new concepts.

2.3.3 Plans.

Continue work on 2 step model. Analyze available well productivity data from Ron Smith.

2.4 Task 4 - Interpretation in Terms of Other Laboratory Data.

2.4.1 Current Status.

- a) Several samples included in 2.1 are samples on which other measurements have been made by Columbia Gas. We plan to analyze correlations upon completion of the samples received.

b) Infrared work status report by William Russey included in Appendix E.

2.4.2 Problem Areas. None

2.4.3 Plans.

In-house laboratory work on this task will become dormant until summer 1979. Samples with work done by other laboratories will be run as available. We will send samples of our core to other laboratories upon request.

APPENDICES

A. WORK SCHEDULES	A1
B. DATA SUMMARY	B1-B285 B105R, B106R
C. SLAB DATA.	C1-C5
D. THE ESTIMATION OF RESERVES IN TIGHT SHALES	D1-D6
E. PROGRESS REPORT: INFRARED AND X-RAY STUDIES	E1

WORK SCHEDULES

Juniata College
Huntingdon, Pennsylvania 16652

WORK SCHEDULES

The data here is definitive up to September 30 and planned from September 30 to December 31, 1978.

Faculty

Paul Schettler

full time

June 30 - July 31

Thanksgiving Break (Nov. 19-26)

Xmas Break (Dec. 23-31)

1/2 time (academic year)

Sept. 1 - Dec. 31 except Thanksgiving and Xmas breaks

Dale Wampler

full time

July 17 - Sept. 1

on sabbatical leave

Sept. 1 - Dec. 31

William Russey

full time

Aug. 1 - Aug. 31

Students

Jay Nelson

full time

July 10-14

Aug. 1 - Sept. 8

1/2 time

July 1-9

Bill Beard

full time

July 1 - Aug. 5

Sue Stapleton

July 1-15

Aug. 1-31

Scott Klinger, Dean Roth, Brian Winship, and Evelyn Forsaert.

Sample prep and similar tasks on an on-call basis--Sept. 1 - Dec. 31

DATA SUMMARY

Juniata College

Huntingdon, Pennsylvania 16652

Data Tables Explanation

Sample ID

This is ordinarily the identification on the can as received.

Gas

The gas used in the sorption experiment (methane, helium, or nitrogen).

Initials, Book, Page

Location of original data and sample description at Juniata.

Weight

Weighings are made on a Mettler H20 balance (sensitivity .01 mg) whose calibration is checked biennially.

Density

Determined by displacement of toluene using a pycnometer and the balance mentioned above.

Sample Temperature

0°C is regulated by an ice bath. The temperature for BET's is calculated from the variation of the boiling point of N₂ with barometric pressure.

Particle Size

Mean diameter as determined by sieving, e.g., .06 means 500-700 μ mesh.

Slope of Isotherm

This is determined by a least squares fit of a straight line through the data for several different units.

% Slope Uncertainty

Relative standard error associated with the slope as calculated from least squares.

Detailed Data (Isotherm and BET)

Pressure: Determined by Datametrix Barocel.

Adsorbed Gas: Method of obtaining described in ORO-1 and ORO-8.

Uncertainty %: Approximate percentage uncertainty to be associated with each point.

Flag: This parameter expresses the criteria for determining equilibrium.

0 - assumed value (after degassing).

1 - Final equilibrium reading constant. Uncertainty in reading less than .02 torr and drift observed less than uncertainty in drift (nominally 1 minute readings).

2 - Equilibrium reading shows drift in pressure of opposite sign to previous reading. This change in slope (pressure vs. time) is usually due to (minor) temperature fluctuation ($\sim \pm 0.001^\circ\text{C}$).

3 - point took more than 4 hours to obtain.

Flag Parameter: 0 if flag = 0 or 1. Pressure drift in torr/hr if flag = 2 or 3.

P_{initial}

Initial equilibrium pressure before the step change in pressure expressed in torr.

P_{equilibrium}

Final equilibrium pressure after the step change in pressure and after equilibrium has been reestablished (torr).

P₀

Pressure after the pressure jump but before diffusion occurs (torr).

Specific Degasibility

Amount of gas (volume STP) degassed from the sample per area of rock per torr of pressure per $(\text{sec})^{1/2}$. $\text{cm}^3 \text{ gas/cm}^2 \text{ rock area/torr}/(\text{sec})^{1/2}$.

Uncertainty in Specific Degasibility

Least squares estimate of error.

System d moles/dP

An apparatus parameter. The number of moles of gas necessary to change the system pressure by one torr.

Notes

- I. It is intended that the data format here be supplemented by a summary format. We have to find the time to write a computer program to do this however.
- II. All data obtained on diskette file through the reporting period is included here.
- III. Data for T1-3106 has been repeated. The old values in Report #9 should be discarded.
- IV. Explanation of Well ID's.

<u>Printout</u>		<u>EGSP</u>
<u>Designation</u>	<u>Location or Company Name/depth</u>	<u>Designation</u>
20403		WV#3
N1-RAR-1		IL#2
N2-MAK-1		IL#3
T1	TRI STAR #1-D	IL#1
COLGAS:		
:MK1	20336/2873'	KY#3
:MK2	20336/2539'	"
:MK3	20336/3129'	"
:MK4	20336/3139'	"
:B019	Brown Well, Belmont, Ohio/5586	
:B020	" " /5541	
:B021	" " /5561	
:R013	Dawson Well, Richland, Ohio/686	
:R014	" " /676	
:R015	Egner Well, Richland, Ohio/345	
:R016	" " /520	
:R017	" " /340	
:R018	" " /510	
:R027	Romig Well, Richland, Ohio/1684	
:R028	" " /1704	
:R029	" " /1570	

- V. Correction: On page B110 of Progress Report #9 (T-1:3081), the Specific Degasibility should be 1.745×10^{-7} instead of $1.03305E-06$ as reported.
- VI. Deletion: On page B34 of Progress Report #9 (20403:3006), delete table after "Detailed Data 5 Points Taken." Values for Internal Area and C are O.K.
- VII. Correction. B105R and B106R (at end of this appendix) are replacements for pages B105 and B106 of Progress Report #9.

Date 7/ 1/1978

Sample ID : 20403:2906

Gas : Helium

Initials : PDS

Book : 1

Page : 16

SAMPLE DATA

Weight : 5.73099 (grams)

Density : 2.708 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

3.77403E-05 Vol Gas/Vol Rock/Torr
1.95173E-03 Vol Gas/Vol rock/PSI
2.86826E-02 Vol Gas/Vol Rock/ATM
6.21769E-10 Moles Gas/Gram Rock/Torr

UNCERTAINTY : 4.84721 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
240.107	1.59053E-07	14.9582	1	0
534.024	3.21438E-07	10.4791	1	0
824.775	5.3363E-07	7.73923	1	0
891.193	5.30624E-07	8.99258	1	0

Date 7/ 1/1978

Sample ID : 20403:2906

Gas : Methane

Initials : PDS

Book : 1

Page : 16

SAMPLE DATA

Weight : 5.73099 (grams)

Density : 2.708 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

2.68113E-04 Vol Gas/Vol Rock/Torr

1.38654E-02 Vol Gas/Vol rock/PSI

203766 Vol Gas/Vol Rock/ATM

4.41715E-09 Moles Gas/Gram Rock/Torr

UNCERTAINTY : .691554 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
237.538	1.13893E-06	2.0922	1	0
524.351	2.36922E-06	1.42516	1	0
818.157	3.58192E-06	1.15679	1	0
884.839	3.78741E-06	1.26467	1	0

Date 7/ 1/1978

Sample ID : 20403:2906

Gas : Methane

Initials : PDS

Book : 1

Page : 16

SAMPLE DATA

Weight : 5.73099 (grams)

Density : 2.708 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 884.509

P equilibrium : 199.648

P o : 196.371

SPECIFIC DEGASIBILITY 1.35976E-07

UNCERTAINTY .366771 %

System d Moles/ dP 2.00154E-06

Date 7/ 1/1978

Sample ID : 20403:2906

Gas : Nitrogen

Initials : PDS

Book : 1

Page : 16

SAMPLE DATA

Weight : 5.73099 (grams)

Density : 2.708 (gm/cc)

Sample Temp : -196 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

INTERNAL AREA

4.56521E-05	Moles/Gram
1.68582E-05	Moles/ml
2.76922	ml. gas/ml. rock
4.3438	Specific Area (sq.meters/gram)

UNCERTAINTY : .198679 %

C : 207.44

UNCERTAINTY IN C : .547943 %

BAROMETRIC PRESSURE 739.302 mm Hg

DETAILED DATA 5 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
12.7565	3.64496E-05	.302967	1	0
83.9397	4.93244E-05	.316657	1	0
141.019	5.60428E-05	.341365	1	0
192.12	6.12827E-05	.360504	1	0
243.962	6.63838E-05	.372117	1	0

Date 7/ 1/1978

Sample ID : 20403:2906

Gas : Nitrogen

Initials : PDS

Book : 1

Page : 16

SAMPLE DATA

Weight : 5.73099 (grams)

Density : 2.708 (gm/cc)

Sample Temp : -196 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 242.808

P equilibrium : 41.4138

P o : 35.1663

SPECIFIC DEGASIBILITY 2.86244E-06

UNCERTAINTY .153447 %

System d Moles/ dP 8.2757E-06

Date 7/ 3/1978

Sample ID : 20403:2896

Gas : Helium

Initials : WRB

Book : 1

Page : 20

SAMPLE DATA

Weight : 4.59674 (grams)

Density : 2.6834 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

3.64511E-05 Vol Gas/Vol Rock/Torr
1.88506E-03 Vol Gas/Vol rock/PSI
2.77028E-02 Vol Gas/Vol Rock/ATM
6.06035E-10 Moles Gas/Gram Rock/Torr

UNCERTAINTY : 6.29959 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
236.507	1.42178E-07	20.9528	1	0
522.61	2.95601E-07	14.2676	1	0
815.453	5.34776E-07	9.66931	1	0
887.806	5.14465E-07	11.613	1	0

Date 7/ 3/1978

Sample ID : 20403:2896

Gas : Methane

Initials : WRB

Book : 1

Page : 20

SAMPLE DATA

Weight : 4.59674 (grams)

Density : 2.6834 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

9.73507E-05 Vol Gas/Vol Rock/Torr
5.03448E-03 Vol Gas/Vol rock/PSI
7.39865E-02 Vol Gas/Vol Rock/ATM
1.61855E-09 Moles Gas/Gram Rock/Torr

UNCERTAINTY : 2.38353 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
231.255	2.0843E-07	14.3149	1	0
519.232	7.82714E-07	5.4016	1	0
811.896	1.42968E-06	3.62899	1	0
881.703	1.52901E-06	3.92249	1	0

Date 7/ 3/1978

Sample ID : 20403:2896

Gas : Methane

Initials : WRB

Book : 1

Page : 20

SAMPLE DATA

Weight : 4.59674 (grams)

Density : 2.6834 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 881.927

P equilibrium : 210.85

P o : 209.464

SPECIFIC DEGASIBILITY : 5.71625E-08

UNCERTAINTY : 562258 %

System d Moles/ dP : 2.0485E-06

Date 7/ 3/1978

Sample ID : 20403:2896

Gas : Nitrogen

Initials : WRB

Book : 1

Page : 20

SAMPLE DATA

Weight : 4.59674 (grams)

Density : 2.6834 (gm/cc)

Sample Temp : -196 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

INTERNAL AREA

3.8266E-05	Moles/Gram
1.42603E-05	Moles/ml.
2.3001	ml. gas/ml. rock
3.64101	Specific Area (sq. meters/gram)

UNCERTAINTY : 1.19714 %

C : 11.2582

UNCERTAINTY IN C : 9.69143 %

BAROMETRIC PRESSURE 738.341 mm Hg

DETAILED DATA 5 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
34.3056	1.49853E-05	.916304	1	0
94.1146	2.52616E-05	.768761	1	0
145.23	3.36904E-05	.706025	1	0
198.026	4.24138E-05	.647615	1	0
247.23	5.06251E-05	.606653	1	0

Date 7/ 3/1978

Sample ID : 20403:2896

Gas : Nitrogen

Initials : WRB

Book : 1

Page : 20

SAMPLE DATA

Weight : 4.59674 (grams)

Density : 2.6834 (gm/cc)

Sample Temp : -196 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 246.24

P equilibrium : 37.3565

P o : 36.4873

SPECIFIC DEGASIBILITY 5.18911E-07

UNCERTAINTY .933804 %

System d Moles/ dP 8.42917E-06

Date 7/ 4/1978

Sample ID : 20403:2886

Gas : Helium

Initials : WRB

Book : 1

Page : 19

SAMPLE DATA

Weight : 4.2022 (grams)

Density : 2.66818 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

6.28792E-05 Vol Gas/Vol Rock/Torr
3.25179E-03 Vol Gas/Vol rock/PSI
4.77882E-02 Vol Gas/Vol Rock/ATM
1.05139E-09 Moles Gas/Gram Rock/Torr

UNCERTAINTY : 3.91283 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
241.079	2.50938E-07	12.9448	1	0
532.972	5.43541E-07	8.46102	1	0
823.664	8.98311E-07	6.27686	1	0
893.494	9.22524E-07	7.06196	1	0

Date 7/ 4/1978

Sample ID : 20403-2886

Gas : Methane

Initials : WRB

Book : 1

Page : 19

SAMPLE DATA

Weight : 4.2022 (grams)

Density : 2.66818 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

3.30137E-04 Vol Gas/Vol Rock/Torr

.017073 Vol Gas/Vol rock/PSI

.250904 Vol Gas/Vol Rock/ATM

5.52017E-09 Moles Gas/Gram Rock/Torr

UNCERTAINTY : .75882 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
236.776	1.40456E-06	2.31642	1	0
520.264	2.91817E-06	1.57982	1	0
814.125	4.46252E-06	1.26776	1	0
883.535	4.75579E-06	1.37513	1	0

Date 7/ 4/1978

Sample ID : 20403:2886

Gas : Methane

Initials : WRB

Book : 1

Page : 19

SAMPLE DATA

Weight : 4.2022 (grams)

Density : 2.66818 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 882.884

P equilibrium : 203.177

P o : 198.467

SPECIFIC DEGASIBILITY 1.75027E-07

UNCERTAINTY .139382 %

System d Moles/ dP 2.01588E-06

Date 7/ 4/1978

Sample ID : 20403:2886

Gas : Nitrogen

Initials : WRB

Book : 1

Page : 19

SAMPLE DATA

Weight : 4.2022 (grams)

Density : 2.66818 (gm/cc)

Sample Temp : -196 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

INTERNAL AREA

5.94111E-05	Moles/Gram
2.22666E-05	Moles/ml.
3.55084	ml. gas/ml. rock
5.65297	Specific Area (sq meters/gram)

UNCERTAINTY : 5.74148 %

C : 3.53233

UNCERTAINTY IN C : 14.0629 %

BAROMETRIC PRESSURE 744.622 mm Hg

DETAILED DATA 5 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
32.8594	1.01987E-05	1.47244	1	0
91.3261	2.092E-05	1.01524	1	0
142.669	3.06214E-05	.849531	1	0
191.732	4.10912E-05	.731058	1	0
238.671	5.79826E-05	.579276	1	0

Date 7/6/1978

Sample ID : 20403-2876

Gas : Helium

Initials : WRB

Book : 1

Page : 21

SAMPLE DATA

Weight : 5.11053 (grams)

Density : 2.69822 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

3.3713E-05 Vol Gas/Vol Rock/Torr
1.74346E-03 Vol Gas/Vol rock/PSI
2.56218E-02 Vol Gas/Vol Rock/ATM
5.57432E-10 Moles Gas/Gram Rock/Torr

UNCERTAINTY : 6.18261 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
234.434	1.41871E-07	18.9347	1	0
525.662	2.80461E-07	13.5602	1	0
812.381	4.72082E-07	9.87701	1	0
887.129	4.74041E-07	11.3647	1	0

Date 7/ 6/1978

Sample ID : 20403-2876

Gas : Methane

Initials : WRB

Book : 1

Page : 21

SAMPLE DATA

Weight : 5.11053 (grams)

Density : 2.69822 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

3.30266E-04 Vol Gas/Vol Rock/Torr
1.70797E-02 Vol Gas/Vol rock/PSI
251002 Vol Gas/Vol Rock/ATM
5.46084E-09 Moles Gas/Gram Rock/Torr

UNCERTAINTY : .643475 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
228.801	1.36053E-06	1.97754	1	0
509.627	2.84607E-06	1.33949	1	0
803.501	4.32838E-06	1.08082	1	0
878.436	4.67909E-06	1.15576	1	0

Date 7/ 6/1978

Sample ID : 20403-2876

Gas : Methane

Initials : WRB

Book : 1

Page : 21

SAMPLE DATA

Weight : 5.11053 (grams)

Density : 2.69822 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 900.387

P equilibrium : 229.393

P o : 224.275

SPECIFIC DEGASIBILITY 4.01686E-07

UNCERTAINTY 1.44113 %

System d Moles/ dP 2.0788E-06

Date 7/ 7/1978

Sample ID : 20403:2926

Gas : Methane

Initials : JCN

Book : 1

Page : 22

SAMPLE DATA

Weight : 5.5165 (grams)

Density : 2.7367 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .06 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

2.9408E-04 Vol Gas/Vol Rock/Torr

1.52083E-02 Vol Gas/Vol rock/PSI

.223501 Vol Gas/Vol Rock/ATM

4.79414E-09 Moles Gas/Gram Rock/Torr

UNCERTAINTY : .68563 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
225.66	1.17063E-06	2.13685	1	0
507.5	2.41968E-06	1.46484	1	0
797.75	3.80346E-06	1.14355	1	0
874.829	4.14279E-06	1.21363	1	0

Date 7/ 6/1978

Sample ID : 20403-2876

Gas : Nitrogen

Initials : WRB

Book : 1

Page : 21

SAMPLE DATA

Weight : 5.11053 (grams)

Density : 2.69822 (gm/cc)

Sample Temp : -196 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 238.557

P equilibrium : 51.298

P o : 37.7885

SPECIFIC DEGASIBILITY 6.40448E-06

UNCERTAINTY 5.08901E-02 %

System d Moles/ dP 8.56627E-06

Date 7/ 7/1978

Sample ID : 20403:2926

Gas : Helium

Initials : JCN

Book : 1

Page : 22

SAMPLE DATA

Weight : 5.5165 (grams)

Density : 2.7367 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .06 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

3.24906E-05 Vol Gas/Vol Rock/Torr
1.68025E-03 Vol Gas/Vol rock/PSI
2.46929E-02 Vol Gas/Vol Rock/ATM
5.29668E-10 Moles Gas/Gram Rock/Torr

UNCERTAINTY : 6.09047 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
231.248	1.36875E-07	18.2471	1	0
519.782	2.50874E-07	14.0943	1	0
807.14	4.46753E-07	9.70356	1	0
885.353	4.59203E-07	10.9074	1	0

Date 7/ 7/1978

Sample ID : 20403:2926

Gas : Methane

Initials : JCN

Book : 1

Page : 22

SAMPLE DATA

Weight : 5.5165 (grams)

Density : 2.7367 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .06 (cm)

DATA COLLECTED

P initial : 874.552

P equilibrium : 233.265

P o : 228.136

SPECIFIC DEGASIBILITY 1.99578E-07

UNCERTAINTY .515167 %

System d Moles/ dP 2.11586E-06

Date 7/ 7/1978

Sample ID : 20403-2926

Gas : Nitrogen

Initials : JCN

Book : 1

Page : 22

SAMPLE DATA

Weight : 5.5165 (grams)

Density : 2.7367 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .06 (cm)

DATA COLLECTED

INTERNAL AREA

1.4417E-04	Moles/Gram
5.268E-05	Moles/ml.
8.83789	ml. gas/ml. rock
13.7177	Specific Area (sq.meters/gram)

UNCERTAINTY : .055692 %

C : 275.065

UNCERTAINTY IN C : 5.59033E-02 %

BAROMETRIC PRESSURE 743.708 mm Hg

DETAILED DATA 5 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
2.22573	6.53366E-05	.175152	1	0
65.36	1.51989E-04	.106491	1	0
169.593	1.9053E-04	.104053	1	0
242.473	2.1335E-04	.107309	1	0
299.857	2.29899E-04	.111348	1	0

Date 7/ 7/1978

Sample ID : 20403:2926

Gas : Nitrogen

Initials : JCN

Book : 1

Page : 22

SAMPLE DATA

Weight : 5.5165 (grams)

Density : 2.7367 (gm/cc)

Sample Temp : -196 (cent)

Particle Size : .06 (cm)

DATA COLLECTED

P initial : 87.5715

P equilibrium : 20.6609

P o : 16.0763

SPECIFIC DEGASIBILITY 3.72501E-06

UNCERTAINTY 6.87079E-02 %

System d Moles/ dP 8.71022E-06

Date 7/19/1978

Sample ID : COL GAS R027

Gas : Helium

Initials : PDS

Book : 1

Page : 30

SAMPLE DATA

Weight : 4.6504 (grams)

Density : 2.4 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

9.58896E-05 Vol Gas/Vol Rock/Torr
4.95892E-03 Vol Gas/Vol rock/PSI
7.28761E-02 Vol Gas/Vol Rock/ATM
1.78252E-09 Moles Gas/Gram Rock/Torr

UNCERTAINTY : 2.10004 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
237.005	4.35231E-07	6.75336	1	0
531.685	9.19777E-07	4.52434	1	0
819.609	1.47306E-06	3.4636	1	0
888.793	1.58927E-06	3.70923	1	0

Date 7/19/1978

Sample ID : COL GAS R027

Gas : Methane

Initials : PDS

Book : 1

Page : 30

SAMPLE DATA

Weight : 4.6504 (grams)

Density : 2.4 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

1.01108E-03 Vol Gas/Vol Rock/Torr

.052288 Vol Gas/Vol rock/PSI

.768422 Vol Gas/Vol Rock/ATM

1.87952E-08 Moles Gas/Gram Rock/Torr

UNCERTAINTY : .204368 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
227.296	5.00613E-06	.588056	1	0
510.93	1.00727E-05	.41413	1	0
804.686	1.46894E-05	.348481	1	0
879.736	1.57512E-05	.375682	1	0

Date 7/19/1978

Sample ID : COL GAS R027

Gas : Methane

Initials : PDS

Book : 1

Page : 30

SAMPLE DATA

Weight : 4.6504 (grams)

Density : 2.4 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 878.476

P equilibrium : 223.829

P o : 205.913

SPECIFIC DEGASIBILITY 1.00241E-05

UNCERTAINTY .411574 %

System d Moles/ dP 2.02952E-06

Date 7/19/1978

Sample ID : COL GAS R027

Gas : Nitrogen

Initials : PDS

Book : 1

Page : 30

SAMPLE DATA

Weight : 4.6504 (grams)

Density : 2.4 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

INTERNAL AREA

4.92845E-04	Moles/Gram
2.05352E-04	Moles/ml.
26.4954	ml. gas/ml. rock
46.8942	Specific Area (sq. meters/gram)

UNCERTAINTY : 2.76886E-02 %

C : 1210.73

UNCERTAINTY IN C : 2.76887E-02 %
BAROMETRIC PRESSURE 747.38 mm Hg

DETAILED DATA 5 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
6.91004E-02	6.59364E-05	.205869	1	0
1.68245	2.24599E-04	8.54753E-02	1	0
31.9059	4.12581E-04	5.69908E-02	1	0
100.029	5.68576E-04	4.77552E-02	2	5.72065
164.726	7.00668E-04	4.33292E-02	2	4.20172

Date 7/19/1978

Sample ID : COL GAS-R027

Gas : Nitrogen

Initials : PDS

Book : 1

Page : 30

SAMPLE DATA

Weight : 4.6504 (grams)

Density : 2.4 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 163.33

P equilibrium : 92.5846

P o : 72.614

SPECIFIC DEGASIBILITY 2.38386E-04

UNCERTAINTY .123314 %

System d Moles/ dP 7.88376E-06

Date 7/19/1978

Sample ID : N1-RAR-1:465.65

Gas : Helium

Initials : PDS

Book : 1

Page : 27

SAMPLE DATA

Weight : 4.61398 (grams)

Density : 2.483 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

1.17468E-04 Vol Gas/Vol Rock/Torr
6.07486E-03 Vol Gas/Vol rock/PSI
8.92759E-02 Vol Gas/Vol Rock/ATM
2.11065E-09 Moles Gas/Gram Rock/Torr

UNCERTAINTY : 1.77561 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
240.684	5.24502E-07	5.63982	1	0
534.184	1.11491E-06	3.75639	1	0
823.956	1.75714E-06	2.92226	1	0
891.112	1.85574E-06	3.19697	1	0

Date 7/19/1978

Sample ID : N1-RAR-1:465.65

Gas : Methane

Initials : PDS

Book : 1

Page : 27

SAMPLE DATA

Weight : 4.61398 (grams)

Density : 2.483 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

5.83764E-04 Vol Gas/Vol Rock/Torr

3.01893E-02 Vol Gas/Vol rock/PSI

.443661 Vol Gas/Vol Rock/ATM

1.0489E-08 Moles Gas/Gram Rock/Torr

UNCERTAINTY : .36424 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
234.561	2.60424E-06	1.13769	1	0
522.206	5.51085E-06	.761835	1	0
812.464	8.47771E-06	.607711	1	0
881.399	9.1048E-06	.65411	2	156754

Date 7/19/1978

Sample ID : N1-RAR-1:465.65

Gas : Methane

Initials : PDS

Book : 1

Page : 27

SAMPLE DATA

Weight : 4.61398 (grams)

Density : 2.483 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 817.306

P equilibrium : 172.509

P o : 172.496

SPECIFIC DEGASIBILITY 2.42708E-08

UNCERTAINTY .305435 %

System d Moles/ dP 2.01125E-06

Date 7/19/1978

Sample ID : N1-RAR-1:465.65

Gas : Nitrogen

Initials : PDS

Book : 1

Page : 27

SAMPLE DATA

Weight : 4.61398 (grams)

Density : 2.483 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

INTERNAL AREA

2.08587E-04	Moles/Gram
8.40059E-05	Moles/ml
11.6014	ml. gas/ml. rock
19.847	Specific Area (sq. meters/gram)

UNCERTAINTY : 5.00445E-02 %

C : 1228.51

UNCERTAINTY IN C : 5.00503E-02 %
BAROMETRIC PRESSURE 746.982 mm Hg

DETAILED DATA 5 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
.276868	6.60859E-05	.207011	1	0
25.2453	1.86711E-04	.103626	1	0
110.295	2.44304E-04	9.70033E-02	1	0
174.639	2.81205E-04	9.73185E-02	1	0
229.024	3.13839E-04	9.74982E-02	1	0

Date 7/19/1978

Sample ID : N1-RAR-1:465.65

Gas : Nitrogen

Initials : PDS

Book : 1

Page : 27

SAMPLE DATA

Weight : 4.61398 (grams)

Density : 2.483 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 228.7

P equilibrium : 67.8574

P o : 57.9423

SPECIFIC DEGASIBILITY 5.88517E-05

UNCERTAINTY .350083 %

System d Moles/ dP 7.86626E-06

Date 7/20/1978

Sample ID : N1-RAR-1:418.33

Gas : Helium

Initials : JCN

Book : 1

Page : 24

SAMPLE DATA

Weight : 4.12934 (grams)

Density : 2.56 (gm/cc)

Sample Temp : 273.16 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

1.4321E-04 Vol Gas/Vol Rock/Torr

7.40607E-03 Vol Gas/Vol rock/PSI

.108839 Vol Gas/Vol Rock/ATM

2.49577E-09 Moles Gas/Gram Rock/Torr

UNCERTAINTY : .899744 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
231.374	5.88181E-07	2.95011	1	0
515.238	1.29853E-06	1.89198	1	0
811.36	2.02736E-06	1.48593	2	3.14961
880.68	2.16888E-06	1.6049	1	0

Date 7/20/1978

Sample ID : N1-RAR-1:418.33

Gas : Methane

Initials : JCN

Book : 1

Page : 24

SAMPLE DATA

Weight : 4.12934 (grams)

Density : 2.56 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

4.71506E-04 Vol Gas/Vol Rock/Torr

2.43839E-02 Vol Gas/Vol rock/PSI

358344 Vol Gas/Vol Rock/ATM

8.21712E-09 Moles Gas/Gram Rock/Torr

UNCERTAINTY : .527351 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
228.726	1.731E-06	1.91898	1	0
511.585	4.0228E-06	1.17004	1	0
805.087	6.76461E-06	.853857	1	0
877.506	7.3964E-06	.902727	1	0

Date 7/20/1978

Sample ID : N1-RAR-1:418.33

Gas : Methane

Initials : JCN

Book : 1

Page : 24

SAMPLE DATA

Weight : 4.12934 (grams)

Density : 2.56 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 877.213

P equilibrium : 216.513

P o : 216.043

SPECIFIC DEGASIBILITY 1.17585E-08

UNCERTAINTY .837127 %

System d Moles/ dP 2.04952E-06

Date 7/20/1978

Sample ID : N1-RAR-1:418.33

Gas : Nitrogen

Initials : JCN

Book : 1

Page : 24

SAMPLE DATA

Weight : 4.12934 (grams)

Density : 2.56 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

INTERNAL AREA

3.2352E-04	Moles/Gram
1.26375E-04	Moles/ml.
18.5519	ml. gas/ml. rock
30.7829	Specific Area (sq. meters/gram)

UNCERTAINTY : 4.18771E-02 %

C : 327.608

UNCERTAINTY IN C : 4.18921E-02 %

BAROMETRIC PRESSURE 745.215 mm Hg

DETAILED DATA 5 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
60.152	7.34946E-05	.208036	1	0
8.63135	2.41109E-04	8.96838E-02	1	0
85.3733	3.52868E-04	7.50569E-02	1	0
161.051	4.16758E-04	7.33869E-02	1	0
220.908	4.66513E-04	7.33036E-02	1	0

Date 7/20/1978

Sample ID : N1-RAR-1:418.33

Gas : Nitrogen

Initials : JCN

Book : 1

Page : 24

SAMPLE DATA

Weight : 4.12934 (grams)

Density : 2.56 (gm/cc)

Sample Temp : -196 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 219.969

P equilibrium : 74.3109

P o : 58.0401

SPECIFIC DEGASIBILITY 1.85777E-05

UNCERTAINTY .297341 %

System d Moles/ dP 8.44844E-06

Date 7/22/1978

Sample ID : 20403-2996

Gas : Helium

Initials : PDS

Book : 1

Page : 25

SAMPLE DATA

Weight : 5.84655 (grams)

Density : 2.62437 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

1.37856E-05 Vol Gas/Vol Rock/Torr

7.12921E-04 Vol Gas/Vol rock/PSI

1.04771E-02 Vol Gas/Vol Rock/ATM

2.34355E-10 Moles Gas/Gram Rock/Torr

UNCERTAINTY : 12.4252 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
248.262	5.85805E-08	39.7186	1	0
541.228	1.13139E-07	29.1161	1	0
832.277	2.09631E-07	19.2667	1	0
898.768	2.08715E-07	22.3586	1	0

Date 7/22/1978

Sample ID : 20403:2996

Gas : Methane

Initials : PDS

Book : 1

Page : 25

SAMPLE DATA

Weight : 5.84655 (grams)

Density : 2.62437 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

1.72743E-04 Vol Gas/Vol Rock/Torr

8.93339E-03 Vol Gas/Vol rock/PSI

.131285 Vol Gas/Vol Rock/ATM

2.93663E-09 Moles Gas/Gram Rock/Torr

UNCERTAINTY : 1.00822 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
243.601	6.59797E-07	3.53217	1	0
533.35	1.50601E-06	2.19282	1	0
823.372	2.46078E-06	1.64686	1	0
886.212	2.68395E-06	1.74541	1	0

Date 7/22/1978

Sample ID : 20403:2996

Gas : Methane

Initials : PDS

Book : 1

Page : 25

SAMPLE DATA

Weight : 5.84655 (grams)

Density : 2.62437 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 882.947

P equilibrium : 187.112

P o : 182.133

SPECIFIC DEGASIBILITY 6.84403E-08

UNCERTAINTY 3.92576E-02 %

System d Moles/ dP 1.97461E-06

Date 7/22/1978

Sample ID : 20403:2996

Gas : Nitrogen

Initials : PDS

Book : 1

Page : 25

SAMPLE DATA

Weight : 5.84655 (grams)

Density : 2.62437 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

INTERNAL AREA

2.37764E-05 Moles/Gram

9.05986E-06 Moles/ml.

1.39772 ml. gas/ml. rock

2.26233 Specific Area (sq. meters/gram)

UNCERTAINTY : 1.04439 %

C : 17.8909

UNCERTAINTY IN C : 12.8948 %

BAROMETRIC PRESSURE 743.565 mm Hg

DETAILED DATA 5 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
31.8015	1.14629E-05	.941505	1	0
93.7169	1.81502E-05	.840978	1	0
145.393	2.32704E-05	.803411	1	0
195.303	2.81805E-05	.766107	1	0
245.592	3.31871E-05	.727365	1	0

Date 7/22/1978

Sample ID : 20403:2996

Gas : Nitrogen

Initials : PDS

Book : 1

Page : 25

SAMPLE DATA

Weight : 5.84655 (grams)

Density : 2.62437 (gm/cc)

Sample Temp : -196 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 244.643

P equilibrium : 29.5584

P o : 27.684

SPECIFIC DEGASIBILITY 3.30213E-07

UNCERTAINTY 3.24036E-02 %

System d Moles/ dP 8.22845E-06

Date 7/24/1978

Sample ID : N1-RAR-1:320.3

Gas : Helium

Initials : PDS

Book : 1

Page : 23

SAMPLE DATA

Weight : 4.7024 (grams)

Density : 2.52 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

1.68397E-04 Vol Gas/Vol Rock/Torr

8.70862E-03 Vol Gas/Vol rock/PSI

.127981 Vol Gas/Vol Rock/ATM

2.9813E-09 Moles Gas/Gram Rock/Torr

UNCERTAINTY : 1.24564 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
238.877	7.15316E-07	4.06176	1	0
524.702	1.53679E-06	2.67658	1	0
816.427	2.46556E-06	2.04546	1	0
888.918	2.64063E-06	2.20664	1	0

Date 7/24/1978

Sample ID : N1-RAR-1:320.3

Gas : Methane

Initials : PDS

Book : 1

Page : 23

SAMPLE DATA

Weight : 4.7024 (grams)

Density : 2.52 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

7.67823E-04 Vol Gas/Vol Rock/Torr

3.97079E-02 Vol Gas/Vol rock/PSI

.583545 Vol Gas/Vol Rock/ATM

1.35936E-08 Moles Gas/Gram Rock/Torr

UNCERTAINTY : .278735 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
230.423	3.30129E-06	.881472	1	0
512.775	7.04349E-06	.585413	2	6.58257
805.807	1.08769E-05	.465203	2	22.5877
878.525	1.17716E-05	.496891	2	6.1233

Date 7/24/1978

Sample ID : N1-RAR-1:320.3

Gas : Methane

Initials : PDS

Book : 1

Page : 23

SAMPLE DATA

Weight : 4.7021 (grams)

Density : 2.52 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 878.437

P equilibrium : 219.301

P o : 219.062

SPECIFIC DEGASIBILITY 8.11248E-09

UNCERTAINTY 2.50141 %

System d Moles/ dP 2.0275E-06

Date 7/24/1978

Sample ID : N1-RAR-1-320.3

Gas : Nitrogen

Initials : PDS

Book : 1

Page : 23

SAMPLE DATA

Weight : 4.7024 (grams)

Density : 2.52 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

INTERNAL AREA

2.95965E-04	Moles/Gram
1.17446E-04	Moles/ml.
16.7066	ml. gas/ml. rock
28.161	Specific Area (sq. meters/gram)

UNCERTAINTY : 3.64632E-02 %

C : 4732.86

UNCERTAINTY IN C : 3.64633E-02 %

BAROMETRIC PRESSURE 744.597 mm Hg

DETAILED DATA 5 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
4.36915E-02	6.68667E-05	.200667	1	0
4.49805	2.20694E-04	8.59858E-02	1	0
77.8882	3.33467E-04	.069701	1	0
159.651	3.9457E-04	.068025	1	0
220.988	4.39507E-04	6.82831E-02	1	0

Date 7/24/1978

Sample ID : N1-RAR-1:320.3

Gas : Nitrogen

Initials : PDS

Book : 1

Page : 23

SAMPLE DATA

Weight : 4.7024 (grams)

Density : 2.52 (gm/cc)

Sample Temp : -196 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 221.287

P equilibrium : 76.5805

P o : 63.7422

SPECIFIC DEGASIBILITY 1.11742E-05

UNCERTAINTY .256488 %

System d Moles/ dP 8.34085E-06

Date 7/25/1978

Sample ID : 20403-2946

Gas : Helium

Initials : DLW

Book : 1

Page : 31

SAMPLE DATA

Weight : 5.5995 (grams)

Density : 2.744 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

4.12085E-05 Vol Gas/Vol Rock/Torr

2.13109E-03 Vol Gas/Vol rock/PSI

3.13185E-02 Vol Gas/Vol Rock/ATM

6.70001E-10 Moles Gas/Gram Rock/Torr

UNCERTAINTY : 4.65389 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
240.781	1.64285E-07	14.8638	1	0
525.079	3.29693E-07	10.4857	1	0
816.917	5.72773E-07	7.40002	1	0
888.451	5.87035E-07	8.34227	1	0

Date 7/25/1978

Sample ID : 20403:2946

Gas : Methane

Initials : DLW

Book : 1

Page : 31

SAMPLE DATA

Weight : 5.5995 (grams)

Density : 2.744 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

2.64928E-04 Vol Gas/Vol Rock/Torr

1.37007E-02 Vol Gas/Vol rock/PSI

201345 Vol Gas/Vol Rock/ATM

4.30741E-09 Moles Gas/Gram Rock/Torr

UNCERTAINTY : .734666 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
233.177	1.06405E-06	2.29849	1	0
517.83	2.24523E-06	1.5435	1	0
810.169	3.46317E-06	1.22798	1	0
881.446	3.7482E-06	1.31157	1	0

Date 7/25/1978

Sample ID : 20403-2946

Gas : Methane

Initials : DLW

Book : 1

Page : 31

SAMPLE DATA

Weight : 5.5995 (grams)

Density : 2.744 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 867.927

P equilibrium : 207.086

P o : 202.146

SPECIFIC DEGASIBILITY 2.2546E-07

UNCERTAINTY .32502 %

System d Moles/ dP 2.03564E-06

Date 7/25/1978

Sample ID : 20403-2946

Gas : Nitrogen

Initials : DLW

Book : 1

Page : 31

SAMPLE DATA

Weight : 5.5995 (grams)

Density : 2.744 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

INTERNAL AREA

4.80536E-05	Moles/Gram
1.75122E-05	Moles/ml.
2.95364	ml. gas/ml. rock
4.5723	Specific Area (sq. meters/gram)

UNCERTAINTY : .232799 %

C : 56.8033

UNCERTAINTY IN C : .747308 %

BAROMETRIC PRESSURE 741.135 mm Hg

DETAILED DATA 5 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
19.01	3.00593E-05	.374889	2	461343
87.7725	4.46239E-05	.357161	2	1.16132
142	5.45327E-05	.357973	2	204353
193.799	6.33011E-05	.356119	2	1.08159
242.866	7.18707E-05	.350701	2	.631722

Date 7/25/1978

Sample ID : 20403-2946

Gas : Nitrogen

Initials : DLW

Book : 1

Page : 31

SAMPLE DATA

Weight : 5.5995 (grams)

Density : 2.744 (gm/cc)

Sample Temp : -196 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 242.609

P equilibrium : 249.811

P o : 250.071

SPECIFIC DEGASIBILITY 2.36481E-06

UNCERTAINTY - .56348 %

System d Moles/ dP 8.37118E-06

Date 7/26/1978

Sample ID : 20403-2976

Gas : Helium

Initials : DLW

Book : 1

Page : 32

SAMPLE DATA

Weight : 5.63774 (grams)

Density : 2.67307 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

8.14118E-05 Vol Gas/Vol Rock/Torr

4.21021E-03 Vol Gas/Vol rock/PSI

.061873 Vol Gas/Vol Rock/ATM

1.35574E-09 Moles Gas/Gram Rock/Torr

UNCERTAINTY : 2.2716 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
243.342	3.29315E-07	7.36269	1	0
529.783	6.95179E-07	4.9378	1	0
819.727	1.13885E-06	3.6955	1	0
891.405	1.2029E-06	4.04241	1	0

Date 7/26/1978

Sample ID : 20403:2976

Gas : Methane

Initials : DLW

Book : 1

Page : 32

SAMPLE DATA

Weight : 5.63774 (grams)

Density : 2.67907 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

3.65625E-04 Vol Gas/Vol Rock/Torr
1.89083E-02 Vol Gas/Vol rock/PSI
277875 Vol Gas/Vol Rock/ATM
6.08871E-09 Moles Gas/Gram Rock/Torr

UNCERTAINTY : .516196 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
231.835	1.48894E-06	1.63093	1	0
518.817	3.16116E-06	1.08852	1	0
810.6	4.91754E-06	.858682	1	0
880.424	5.29778E-06	.921367	1	0

Date 7/26/1978

Sample ID : 20403-2976

Gas : Methane

Initials : DLW

Book : 1

Page : 32

SAMPLE DATA

Weight : 5.63774 (grams)

Density : 2.67307 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 878.514

P equilibrium : 212.317

P o : 205.452

SPECIFIC DEGASIBILITY 3.27252E-07

UNCERTAINTY .299109 %

System d Moles/ dP 2.0326E-06

Date 7/26/1978

Sample ID : 20403-2976

Gas : Nitrogen

Initials : DLW

Book : 1

Page : 32

SAMPLE DATA

Weight : 5.63774 (grams)

Density : 2.67907 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

INTERNAL AREA

3.42016E-04	Moles/Gram
1.27662E-04	Moles/ml.
20.5248	ml. gas/ml. rock
32.5428	Specific Area (sq. meters/gram)

UNCERTAINTY : 3.04836E-02 %

C : 915.591

UNCERTAINTY IN C : 3.04842E-02 %

BAROMETRIC PRESSURE 737.824 mm Hg

DETAILED DATA 5 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
123374	5.54766E-05	.201744	1	0
3.74014	1.8724E-04	8.45362E-02	1	0
51.5055	3.16621E-04	6.12309E-02	1	0
122.84	4.19268E-04	.053397	1	0
187.382	5.02611E-04	4.98037E-02	1	0

Date 7/26/1978

Sample ID : 20403-2976

Gas : Nitrogen

Initials : DLW

Book : 1

Page : 32

SAMPLE DATA

Weight : 5.63774 (grams)

Density : 2.67907 (gm/cc)

Sample Temp : -196 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 215.067

P equilibrium : 109.435

P o : 93.3505

SPECIFIC DEGASIBILITY 9.44323E-06

UNCERTAINTY .039716 %

System d Moles/ dP 8.34443E-06

Date 7/27/1978

Sample ID : N2-MAK-1:1076.0

Gas : Helium

Initials : PDS

Book : 1

Page : 33

SAMPLE DATA

Weight : 4.88682 (grams)

Density : 2.5241 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

1.40041E-04 Vol Gas/Vol Rock/Torr

7.24221E-03 Vol Gas/Vol rock/PSI

106431 Vol Gas/Vol Rock/ATM

2.47527E-09 Moles Gas/Gram Rock/Torr

UNCERTAINTY : 1.4328 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
238.807	6.0866E-07	4.58648	1	0
532.909	1.35763E-06	2.91119	1	0
821.424	2.01827E-06	2.40097	1	0
890.027	2.15625E-06	2.59656	2	161076

Date 7/27/1978

Sample ID : N2-MAK-1:1076.0

Gas : Methane

Initials : PDS

Book : 1

Page : 33

SAMPLE DATA

Weight : 4.88632 (grams)

Density : 2.5241 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

SLOPE OF ISOTHERM

7.18895E-04 Vol Gas/Vol Rock/Torr

3.71776E-02 Vol Gas/Vol rock/PSI

54636 Vol Gas/Vol Rock/ATM

1.27067E-08 Moles Gas/Gram Rock/Torr

UNCERTAINTY : .285329 %

DETAILED DATA 4 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
230.106	3.17794E-06	.879796	1	0
517.151	6.80637E-06	.582087	1	0
809.344	1.00851E-05	.482085	2	3.39934
880.641	1.08883E-05	.516168	2	1.13905

Date 7/27/1978

Sample ID : N2-MAK-1:1076.0

Gas : Methane

Initials : PDS

Book : 1

Page : 33

SAMPLE DATA

Weight : 4.88682 (grams)

Density : 2.5241 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 885.951

P equilibrium : 214.994

P o : 214.513

SPECIFIC DEGASIBILITY 1.71556E-08

UNCERTAINTY 1.57087 %

System d Moles/ dP 2.01024E-06

Date 7/27/1978

Sample ID : N2-MAK-1:1076.0

Gas : Nitrogen

Initials : PDS

Book : 1

Page : 33

SAMPLE DATA

Weight : 4.88682 (grams)

Density : 2.5241 (gm/cc)

Sample Temp : 0 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

INTERNAL AREA

2.44342E-04	Moles/Gram
9.68035E-05	Moles/ml.
13.815	ml. gas/ml. rock
23.2491	Specific Area (sq. meters/gram)

UNCERTAINTY : 4.09185E-02 %

C : 3033.71

UNCERTAINTY IN C : .040919 %

BAROMETRIC PRESSURE 740.713 mm Hg

DETAILED DATA 5 POINTS TAKEN

PRESSURE Torr	ADS GAS Moles/Gram	UNCERTAINTY %	FLAG	FLAG Parameter
0	0	0	0	0
8.61459E-02	6.49595E-05	.19875	1	0
9.93948	2.05127E-04	8.90147E-02	1	0
94.7978	2.84706E-04	7.85529E-02	1	0
168.78	3.29574E-04	7.83625E-02	1	0
227.358	3.64042E-04	7.93224E-02	1	0

Date 7/27/1978

Sample ID : N2-MAK-1:1076.0

Gas : Nitrogen

Initials : PDS

Book : 1

Page : 33

SAMPLE DATA

Weight : 4.88682 (grams)

Density : 2.5241 (gm/cc)

Sample Temp : -196 (cent)

Particle Size : .085 (cm)

DATA COLLECTED

P initial : 227.155

P equilibrium : 71.3238

P o : 54.569

SPECIFIC DEGASIBILITY 1.64369E-05

UNCERTAINTY .356499 %

System d Moles/ dP 8.26845E-06