

ANVIL POINTS OIL SHALE RESEARCH CENTER

Date Sampled 3-29-67

Run No. C-1024 START UP

Sample Time: RS 1815; SS _____

FISCHER ASSAY

RETORT SHALE MOISTURE

PNA
R

RAW SHALE SPENT SHALE

23.9 _____ Gal/Ton

.916 _____ S.G., g/ml

9.2 _____ Oil, wt %

1.7 _____ Water, wt %

87.1 _____ Sp. Shale, wt %

2.0 _____ Gas & Loss, wt %

Slight

_____ COKING TENDENCY

BMM

RAW SHALE FISCHER ASSAY MOISTURE

0.54 wt %

MINERAL CO₂

BMM
 17.3 _____ wt %

ASH (SHALE)

BMM
 69.6 _____ wt %

MOISTURE

BMM
 0.16 _____ wt %

SHALE RICHNESS DISTRIBUTION
(See attached graph)

CARBON

BMM
 14.9 _____ wt %

SCREEN ANALYSIS
(See back of this sheet)

HYDROGEN

BMM
 1.47 _____ wt %

BENZENE EXTRACTABLES

_____ _____ wt %

All results are "as received" unless noted. "Moisture" designates the moisture content of the -48 mesh material used for "Ash", "Mineral CO₂", "Carbon", and "Hydrogen". The "FA Moisture" is for the sample used for the Fischer Assay.

COMMENTS _____

DATE COMPLETED MAR 30 1967

CHECKED BY *REP*

LABORATORY ANALYSIS SHEET

ANVIL POINTS OIL SHALE RESEARCH CENTER

Date Sampled 3-28-67

Run No. C 1024
(2245 hrs)

LIQUID PRODUCTS

D3 PUMPOUT

T3 PUMPOUT

Pfl.

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>1</u>	<u>2</u>
<input checked="" type="radio"/> WATER, wt %	<u>38.9</u>	<u>/</u>	<u>/</u>	<u>/</u>		
<input checked="" type="radio"/> GRAVITY, °API	<u>19.8</u>	<u>/</u>	<u>/</u>	<u>/</u>		
<input type="radio"/> OIL ASH, wt %						

DISTILLATION (See attached sheet - OSRC-24)

VENT PURGE PRODUCT

Pfl.

OIL WT, g _____
 WATER VOL, ml _____
 GRAVITY OIL, °API 19.8

VENT GAS

MAJOR COMPONENTS

C₁ thru C₄, plus n-Pentane

CO₂ _____ vol %
 O₂ _____ "
 N₂ _____ "
 CH₄ _____ "
 CO _____ "
 H₂ _____ "
 Ar _____ "
 Others _____ "

CH₄ _____ vol %
 C₂H₄-C₂H₆ _____ "
 C₃H₈ _____ "
 C₃H₆ _____ "
 i C₄H₁₀ _____ "
 n C₄H₁₀ _____ "
 C₃H₆ _____ "
 n C₅H₁₂ _____ "

CARBON, _____ lbs/MSCFDG

HYDROGEN, _____ lbs/MSCFDG

COMMENTS _____

DATE COMPLETED MAR 30 1967

CHECKED BY _____

REP
OSRC-12B

SCREEN ANALYSIS DATA SHEET (TY-LAB)

#1

RUN NO. C 1024 SAMPLE NO. _____ DATE 3-28-67

UNIT Retort #3 DESCRIPTION Ty Lab

APPROX. SHALE SIZE 1/4"-1" SHAKING TIME 10 min ANALYSIS BY Schroffler & Sutterfield

TOTAL SAMPLE WT. GROSS 79.7 - TARE 0.2 = NET 79.5

SCREEN SIZE			WEIGHTS								
SCREENS REQD.	OPENING SIZE	MESH	GROSS LBS.	TARE LBS.	NET WT. RETAINED	SCREEN SIZE	Di *	1/2 Di	% RETAINED	CUM. % RETAINED	% PASSING
	4.25					4.25					
	3.00					3.00	(3.125)	(0.3200)			
	2.50					2.50	(2.625) 2.750	(0.3809) 0.3636			
	2.00					2.00	2.250	0.4444			
	1.50					1.50	1.750	0.5714			
	1.05		25.6	19.2	6.4	1.05	(1.087) 1.275	(0.9199) 0.7843	8.58		91.41
	0.742		47.9	20.5	27.4	0.742	0.896	1.116	36.73		54.68
	0.525		37.0	18.5	18.5	0.525	0.634	1.577	24.80		29.88
	0.371		25.5	19.2	6.3	0.371	0.448	2.232	8.45		21.43
	0.263	3	25.9	18.4	7.5	0.263	0.317	3.154	10.05		11.38
	0.185	4	22.7	19.4	3.3	0.185	0.224	4.464	4.42		6.96
	0.131	6	19.9	19.3	.6	0.131	0.158	6.329	0.80		6.16
	0.093	8	20.4	20.2	.2	0.093	0.112	8.928	0.27	94.10	5.89
	0.065	10	19.8	19.2	.6	0.065			0.80		5.09
	PAN		24.8	21.0	3.8	PAN			5.09		-
TOTAL ON SCREENS AND PAN					74.6	LOSS			-		-
LOSS (BY DIFFERENCE)					74.6	TOTAL			99.99		-
TOTAL SAMPLE WEIGHT					79.5						

* NUMBERS IN PARENTHESES SHOULD BE USED WHEN THESE SCREEN SIZES REPRESENT THE TOP OF THE SHALE SIZE RANGE.

REMARKS: _____

$\sum_{+8m}^m Di$	0.66078	$\sum_{+8m}^m Xi$	
$1/\sum_{+8m}^m Di$	1.65756	$\sum_{+8m}^m Xi / Di$	
Da	0.56770	$\sum_{+8m}^m Xi Di$	
Dv	0.70220		

SCREEN ANALYSIS DATA SHEET (TY-LAB)

#2

RUN NO. C-1024 SAMPLE NO. _____ DATE 3-28-67
 UNIT Retort 3 DESCRIPTION Ty Lab
 APPROX. SHALE SIZE 1/4"-1" SHAKING TIME 10 min. ANALYSIS BY Satterfield & Schaeffer
 TOTAL SAMPLE WT. GROSS 81.6 - TARE 5.2 = NET 76.4

SCREEN SIZE			WEIGHTS								
SCREENS REQD.	OPENING SIZE	MESH	GROSS LBS.	TARE LBS.	NET WT. RETAINED	SCREEN SIZE	Di *	1/Di	% RETAINED	CUM. % RETAINED	% PASSING
	4.25					4.25					
	3.00					3.00	(3.125)	(0.3200)			
	2.50					2.50	(2.625) 2.750	(0.3809) 0.3636			
	2.00					2.00	2.250	0.4444			
	1.50					1.50	1.750	0.5714			
	1.05		24.2	19.2	5.0	1.05	(1.087) 1.275	(0.9199) 0.7843	6.31		93.69
	0.742		53.3	20.5	32.8	0.742	0.896	1.116	41.36		52.33
	0.525		39.9	18.5	21.4	0.525	0.634	1.577	26.99		25.34
	0.371		27.7	19.2	8.5	0.371	0.448	2.232	10.72		14.62
	0.263	3	25.5	18.4	7.1	0.263	0.317	3.154	8.95		5.67
	0.185	4	21.9	19.4	2.5	0.185	0.224	4.464	3.15		2.52
	0.131	6	19.6	19.3	13	0.131	0.158	6.329	0.38		2.14
	0.093	8	20.7	20.0	1.5	0.093	0.112	8.928	0.63	98.49	1.51
	0.065	10	19.3	19.2	1.0	0.065			-		-
	PAN		22.0	21.0	1.2	PAN			1.51	-	0.00
TOTAL ON SCREENS AND PAN					79.3	LOSS			-	-	-
LOSS (BY DIFFERENCE)					1	TOTAL			100.00	-	-
TOTAL SAMPLE WEIGHT					79.4						

* NUMBERS IN PARENTHESES SHOULD BE USED WHEN THESE SCREEN SIZES REPRESENT THE TOP OF THE SHALE SIZE RANGE.

REMARKS: _____

$\sum_{+8m}^m D_i$	0.69505	$\sum_{+8m}^m X_i$	
$1/\sum_{+8m}^m D_i$	1.68772	$\sum_{+8m}^m X_i / D_i$	
D_a	0.58356	$\sum_{+8m}^m X_i D_i$	
D_v	0.70570		

SCREEN ANALYSIS DATA SHEET (TY-LAB)

#3

RUN NO. C-1024 SAMPLE NO. _____ DATE 3-28-67

UNIT Retort 3 DESCRIPTION Ty Lab

APPROX. SHALE SIZE 1/4" - 1" SHAKING TIME 10 Min. ANALYSIS BY Satterfield & Schaeffer

TOTAL SAMPLE WT. GROSS 40.2 - TARE 2.6 = NET 37.6

SCREEN SIZE			WEIGHTS								
SCREENS REQD.	OPENING SIZE	MESH	GROSS LBS.	TARE LBS.	NET WT. RETAINED	SCREEN SIZE	Di *	1/2 Di	% RETAINED	CUM. % RETAINED	% PASSING
	4.25					4.25					
	3.00					3.00	(3.125)	(0.3200)			
	2.50					2.50	(2.625) 2.750	(0.3809) 0.3636			
	2.00					2.00	2.250	0.4444			
	1.50					1.50	1.750	0.5714			
	1.05		21.4	19.2	2.2	1.05	(1.087) 1.275	(0.9199) 0.7843	5.88		94.12
	0.742		32.8	20.5	12.3	0.742	0.896	1.116	32.89		61.23
	0.525		31.9	18.5	13.4	0.525	0.634	1.577	35.83		25.40
	0.371		24.1	19.2	4.9	0.371	0.448	2.232	13.10		12.30
	0.263	3	21.7	18.4	3.3	0.263	0.317	3.154	8.82		3.48
	0.185	4	20.4	19.4	1.0	0.185	0.224	4.464	2.67		0.81
	0.131	6	19.4	19.3	.1	0.131	0.158	6.329	0.27		0.54
	0.093	8	20.3	20.2	.1	0.093	0.112	8.928	0.27	99.73	0.27
	0.065	10	19.2	19.2	.0	0.065			0.00		0.27
	PAN		21.1	21.0	.1	PAN			0.27	-	0.00
TOTAL ON SCREENS AND PAN					37.4	LOSS			-	-	-
LOSS (BY DIFFERENCE)					.2	TOTAL			100.00	-	-
TOTAL SAMPLE WEIGHT					37.6						

* NUMBERS IN PARENTHESES SHOULD BE USED WHEN THESE SCREEN SIZES REPRESENT THE TOP OF THE SHALE SIZE RANGE.

REMARKS: _____

$\sum_{+8m}^m D_i$	0.67913	$\sum_{+8m}^m X_i$	
$1/\sum_{+8m}^m D_i$	1.71714	$\sum_{+8m}^m X_i / D_i$	
Da	0.58079	$\sum_{+8m}^m X_i D_i$	
Dv	068096		