Total organic carbon and Rock Eval pyrolysis data and analysis for the Consolidated Oil Iniskin Unit Zappa No. 1 well (See GMC Data Report No. 83), and for the Consolidated Oil Iniskin Unit Beal No. 1 well.

Received 9 February 1989 Total of 22 pages in report

Geologic Materials Center Data Report No. 115

Iniskin Well" (930' to 11200', samples 6436-001 to -014)

Organic Richness

From 930' to 5090' TOC values of 0.30 to 0.66 wt.% generally reflect poor source rock organic carbon quantity. A sample at 6240-6270' with TOC 0.87 wt.% has fair quantity, and from 6500' to 9080' three samples with values of 1.01 to 1.41 wt.% marginally qualify as good source quantities. The deepest sample, at 11170-11200', has poor quantity (0.28 wt.%).

Thermal Maturity

Based on T_{max} values for samples from 1430' to 4980' (T_{max} 435-438°C), maturation varies from immature to marginally mature (early oil window). Marginally detectable S_1 values (0.10) improve slightly for samples at 5060'. A shoulder on the S_2 peak of the sample at 6500-6550' accounts for the break in the downhole increasing trend of T_{max}. The shoulder could reflect either early generated bitumen or contamination, which can reduce T_{max}.

Quantity of Organic Matter

At this early stage of maturity the low Hydrogen Indices (28-149) suggest a marginally gas prone source rock to non source rock quality (Type III-Type IV kerogen).

Iniskin Beal #1 (480' to 8760', samples 6438-023 to -041)

Organic Richness

Poor to fair TOC from 480' to 5120' (0.46-0.55 wt.%), good from 6510' to 8040' (0.99-1.55 wt.%), fair from 8520' to 8760' (0.55-0.90 wt.%).

Thermal Maturity

Clear unimodal S_2 peaks have yielded apparently reliable T_{max} values throughout the well. They vary fairly consistently with depth from marginally mature at the surface (435-440°C) to well within the oil window for the deepest samples (up to 448°C). This is supported by increasing S_1 values and Production Indices up to 0.29.

Quality of Organic Matter

No oil prone sample was apparent as the HI never significantly exceeded the HI=150 required to characterize a mixed oil and gas prone source. Several samples, however, had values near 150 and considering their having been in the oil window these values could have been reduced by early generation and expulsion.

These data correlate well with the "Iniskin well".

TABLE II

Results of Total Organic Carbon Analysis and Rock-Eval Pyrolysis

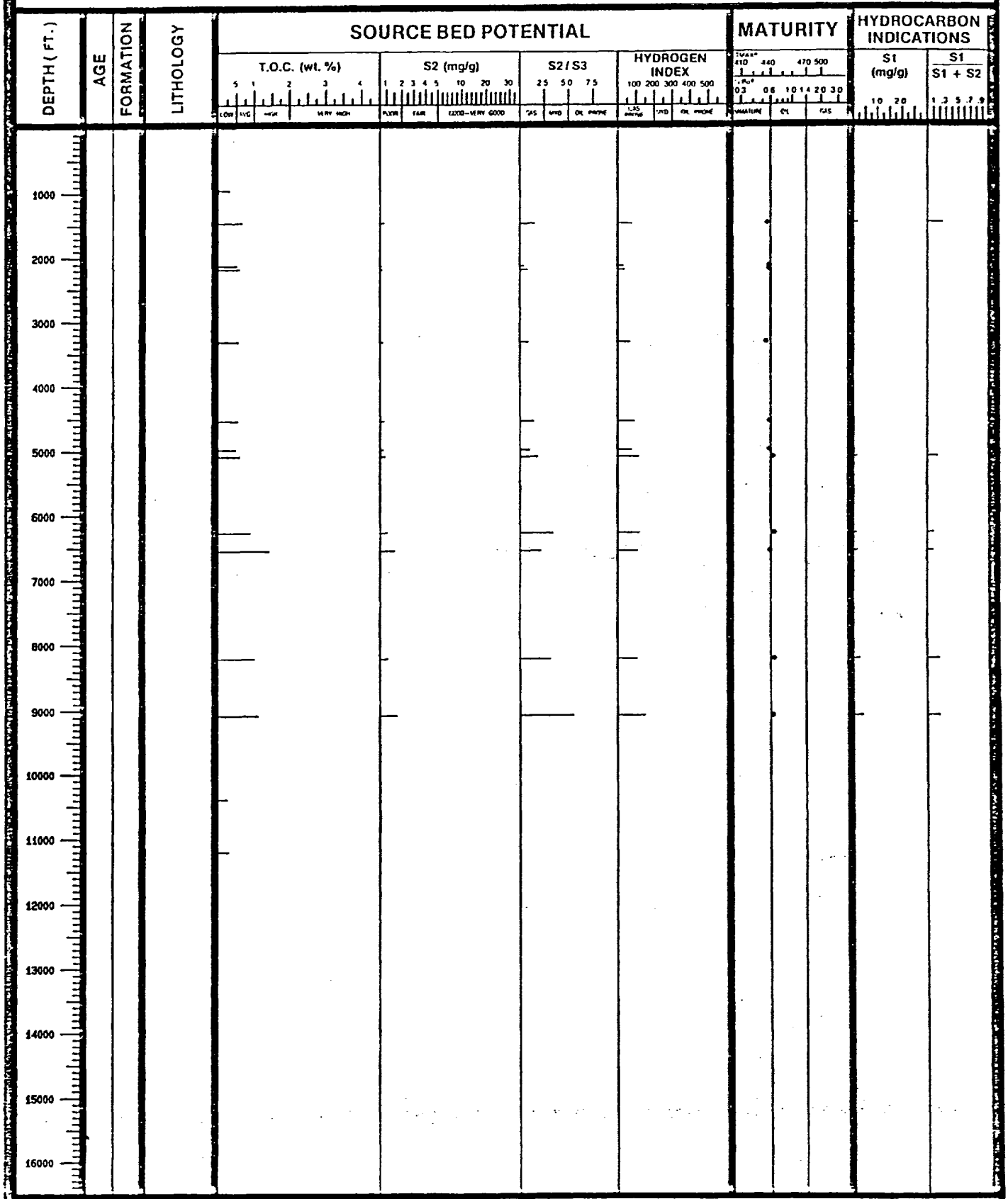
Sample Number	Depth (ft)	TOC (Wt.%)	S1 (mg/g)	S2 (mg/g)	S3 (mg/g)	Tmax (°C)	Production Index	Hydrogen Index	Oxygen Index
Iniskin Well:									
6436-001	930-960	0.30	---	---	---	---	---	---	---
6436-002	1430-1460	0.66	0.15	0.51	0.35	435	0.23	78	53
6436-003	2100-2130	0.50	<0.10	0.14	0.47	438	---	28	93
6436-004	2160-2190	0.57	<0.10	0.20	0.29	438	---	35	51
6436-005	3290-3320	0.54	<0.10	0.36	0.47	434	---	67	86
6436-006	4520-4540	0.53	<0.10	0.47	0.36	438	---	88	68
6436-007	4950-4980	0.46	<0.10	0.33	0.38	438	---	72	82
6436-008	5060-5090	0.58	0.11	0.65	0.37	441	0.15	112	64
6436-009	6240-6270	0.87	0.10	1.01	0.30	442	0.09	116	34
6436-010	6500-6550	1.41	0.13	1.50	0.72	438	0.08	107	51
6436-011	8180-8210	1.01	0.23	1.06	0.34	442	0.18	105	33
6436-012	9060-9080	1.11	0.36	1.65	0.30	441	0.18	149	27
6436-013	10370-10390	0.35	---	---	---	---	---	---	---
6436-014	11170-11200	0.28	---	---	---	---	---	---	---
Well: Iniskin Beal #1									
6438-023	480-570	0.58	0.10	0.56	0.16	438	0.15	96	28
6438-024	930-1020	0.75	<0.10	0.90	0.13	436	---	120	17
6438-025	1530-1620	0.53	<0.10	0.28	0.14	435	---	53	26
6438-026	1970-2030	0.55	<0.10	0.22	0.10	440	---	41	18
6438-027	2470-2500	0.79	<0.10	1.10	<0.10	436	---	140	---
6438-028	2990-3020	0.56	<0.10	0.28	<0.10	442	---	50	---
6438-029	3500-3530	0.66	<0.10	0.87	<0.10	441	---	131	---
6438-042	3530-3590	0.63	<0.10	0.60	<0.10	443	---	95	---
6438-030	3810-3840	0.46	<0.10	0.38	<0.10	439	---	83	---
6438-031	5070-5100	0.55	<0.10	0.44	<0.10	445	---	80	---
6438-032	5590-5620	0.55	<0.10	0.59	0.11	441	---	108	19
6438-033	5930-5960	0.85	0.15	0.96	0.12	443	0.14	113	14
6438-034	6510-6530	1.55	0.50	2.41	<0.10	444	0.17	156	---
6438-035	7000-7020	1.18	0.31	1.76	<0.10	446	0.15	149	---
6438-036	7500-7520	1.07	0.24	1.44	0.10	446	0.14	135	10
6438-037	8020-8040	0.99	0.22	1.25	0.16	445	0.15	126	16
6438-038	8520-8540	0.67	0.14	0.73	0.11	445	0.16	109	17
6438-039	8995-9020	0.70	0.28	0.69	0.42	440	0.29	98	59
6438-040	9380-9410	0.55	0.18	0.58	0.17	444	0.24	106	31
6438-041	8740-8760	0.90	0.34	1.09	0.16	448	0.24	121	18

BROWN & RUTH LABORATORIES, INC.

GEOCHEMICAL LOG

WELL NAME: INISKIN WELL

Antonio Zappa #



CONGLOMERATE
SANDSTONE
COAL
CASING CEMENT
SHALE • SILTSTONE
LIMESTONE
DOLOMITE
CHERT
HALITE
ANHYDRITE
IGNEOUS
VOLCANICS

S1 = Free Hydrocarbons Present in Rock
S2 = Hydrocarbons from Kerogen Pyrolysis
S3 = CO_2 from Kerogen Pyrolysis
Hydrogen Index = S2 / T.O.C.

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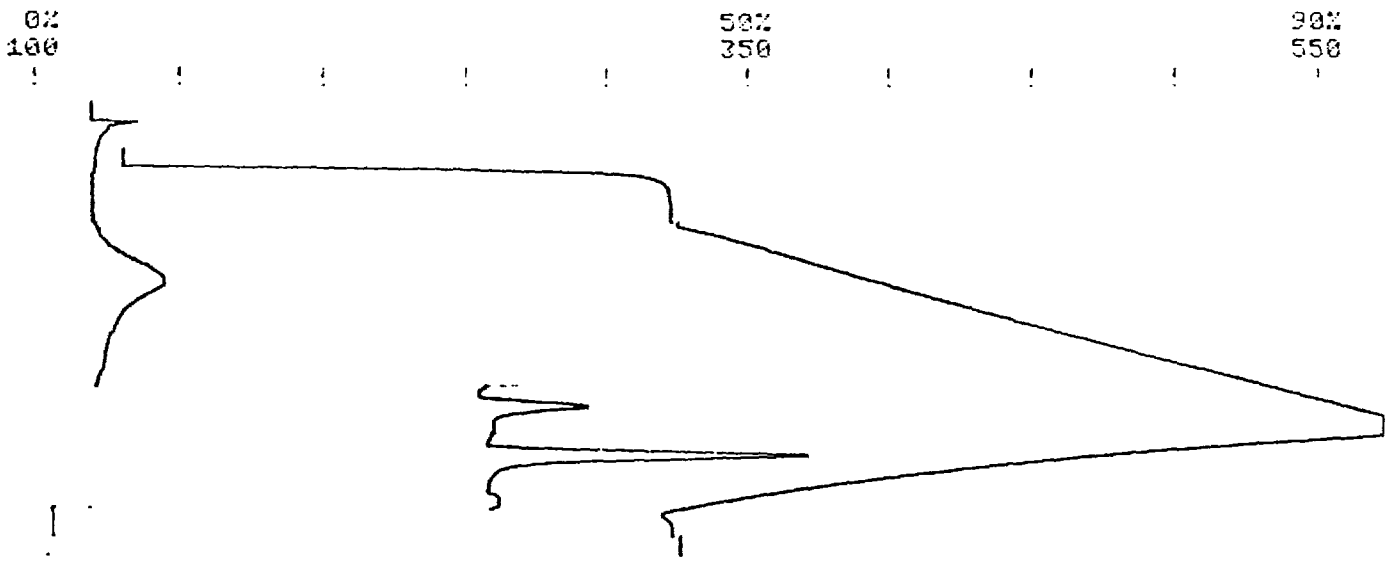
TCD ATTENUATION= 32



TOC = 0.79
WT = 120.0
TMAX = 436 DEGREES C
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S2= +5.684E-01 SUM= +4.299E+03
S3= +2.606E-01 SUM= +3.804E+03
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GEOCOM ROCK EVAL II

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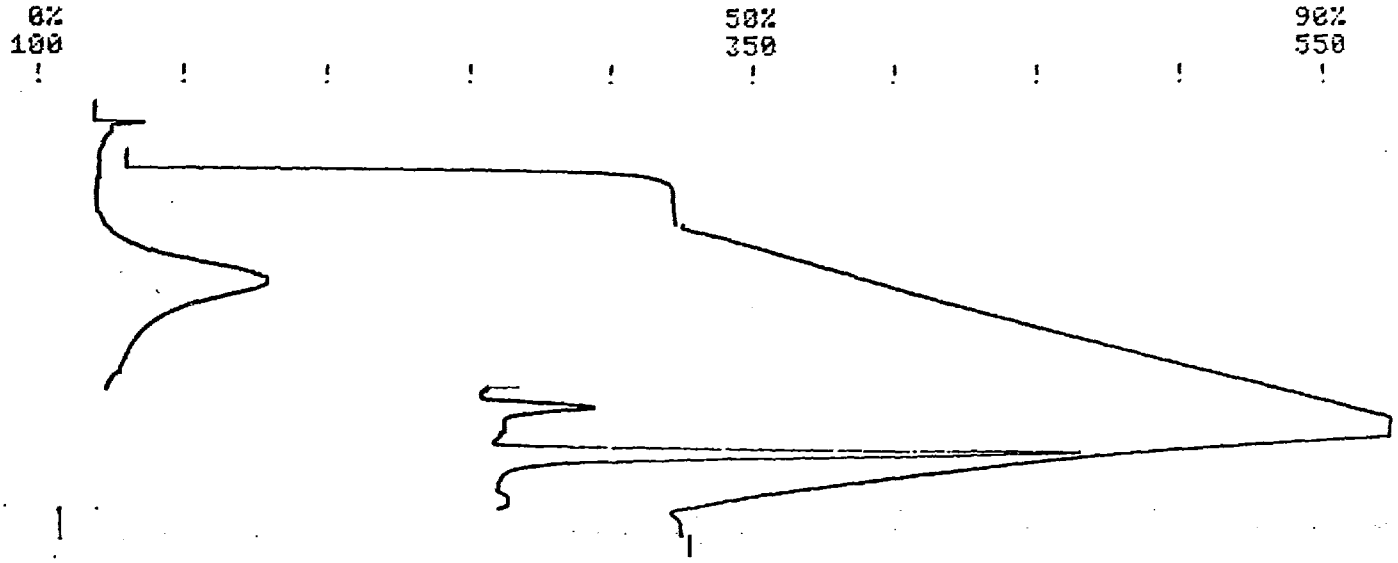
FID ATTENUATION= 32
TCD ATTENUATION= 32



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S2= +1.372E+00 SUM= +1.034E+04
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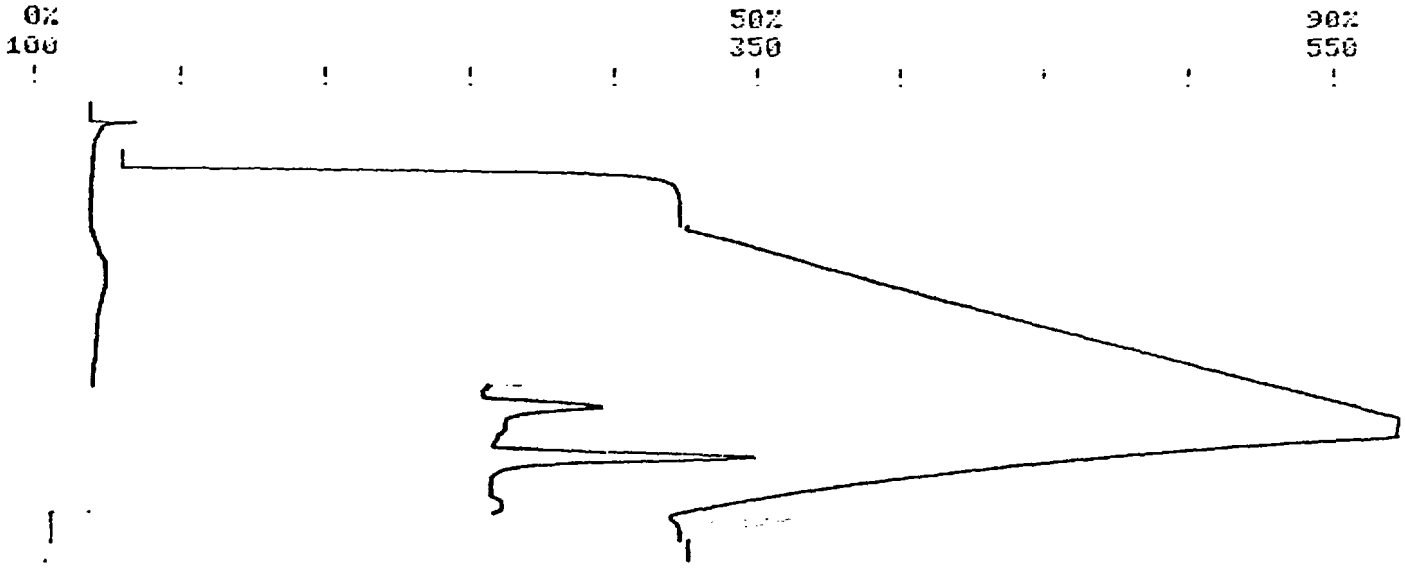
UNKNOWN

TIME= 1738
ID= 003
FID ATTENUATION= 32
TCD ATTENUATION= 32



TOC = 0.52
WT = 117.5
TMAX = 423 DEGREES C
S1= +2.255E-02 SUM= +1.670E+02
S2= +1.283E-01 SUM= +9.500E+02
S3= +1.818E-01 SUM= +2.799E+03
UNKNOWN

GEOCOM ROCK EVAL II

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TIME= 1805
ID= 004
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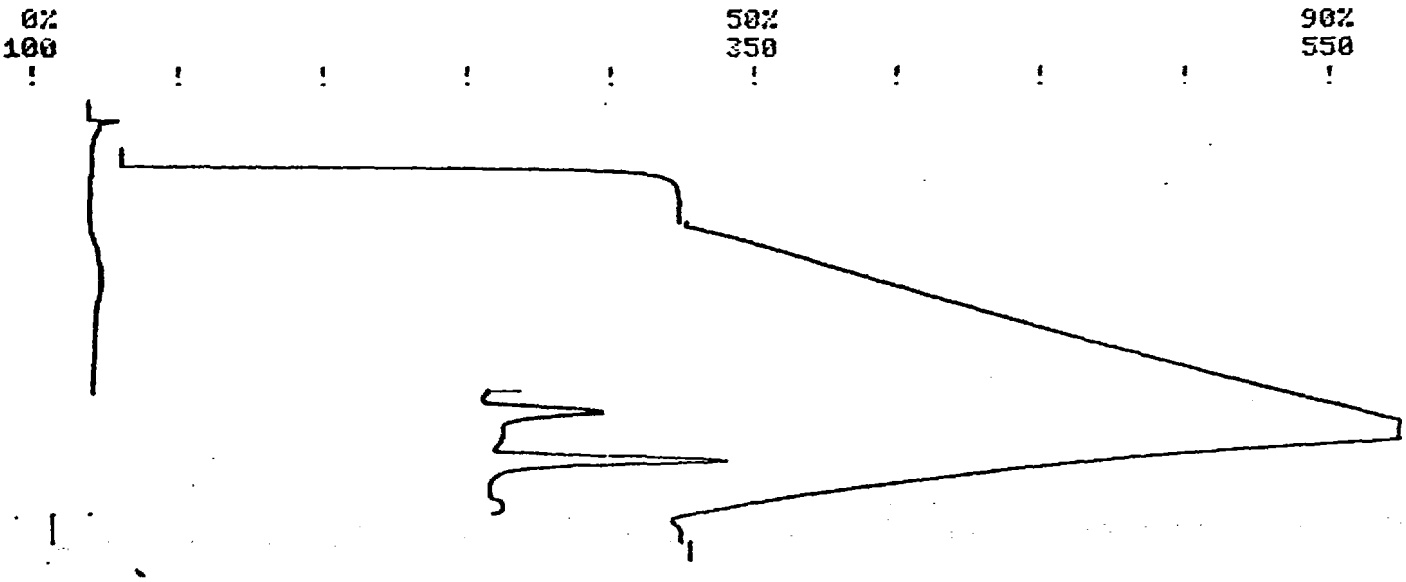
TCD ATTENUATION= 32



TOC = 0.44
WT = 121.7
TMAX = 416 DEGREES C
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S2= +8.540E-02 SUM= +6.550E+02
S3= +1.502E-01 SUM= +2.486E+03
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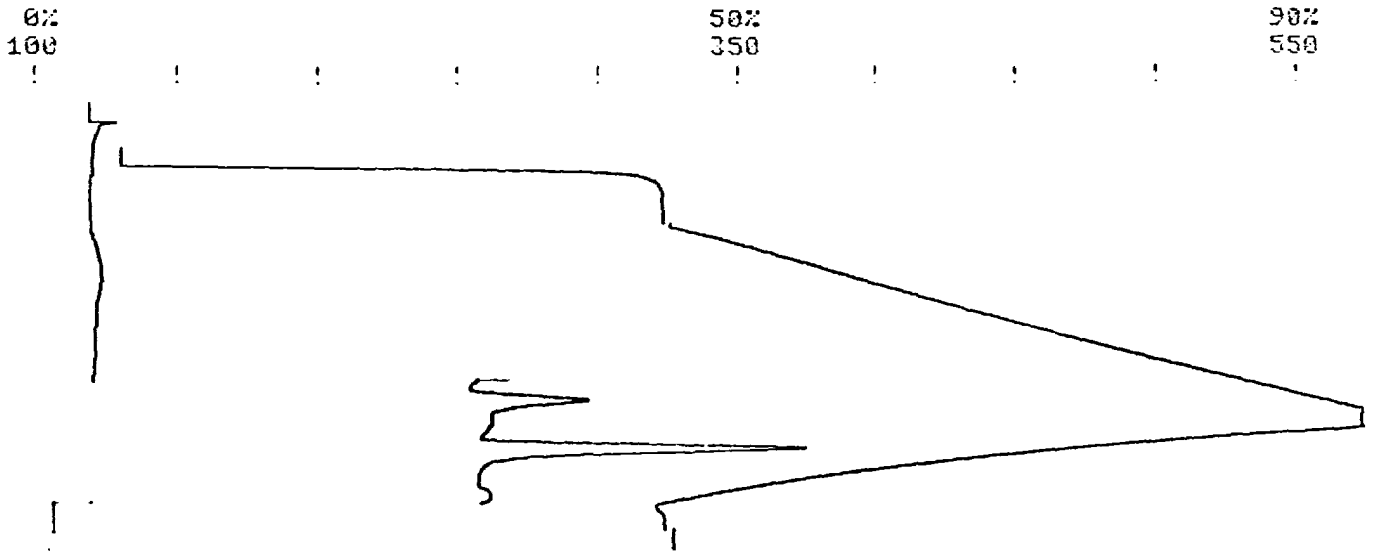
GEOCOM ROCK EVAL II

MAY 23, 1988
TIME= 1831
ID= 005
FID ATTENUATION= 32
TCD ATTENUATION= 32



TOC = 0.50
WT = 120.0
TMAX = 419 DEGREES C
S1= +1.494E-02 SUM= +1.130E+02
S2= +8.833E-02 SUM= +6.680E+02
S3= +2.427E-01 SUM= +3.586E+03
UNKNOWN

GEOCOM ROCK EVAL II

MAY 23, 1988
TIME= 1857
ID= 006
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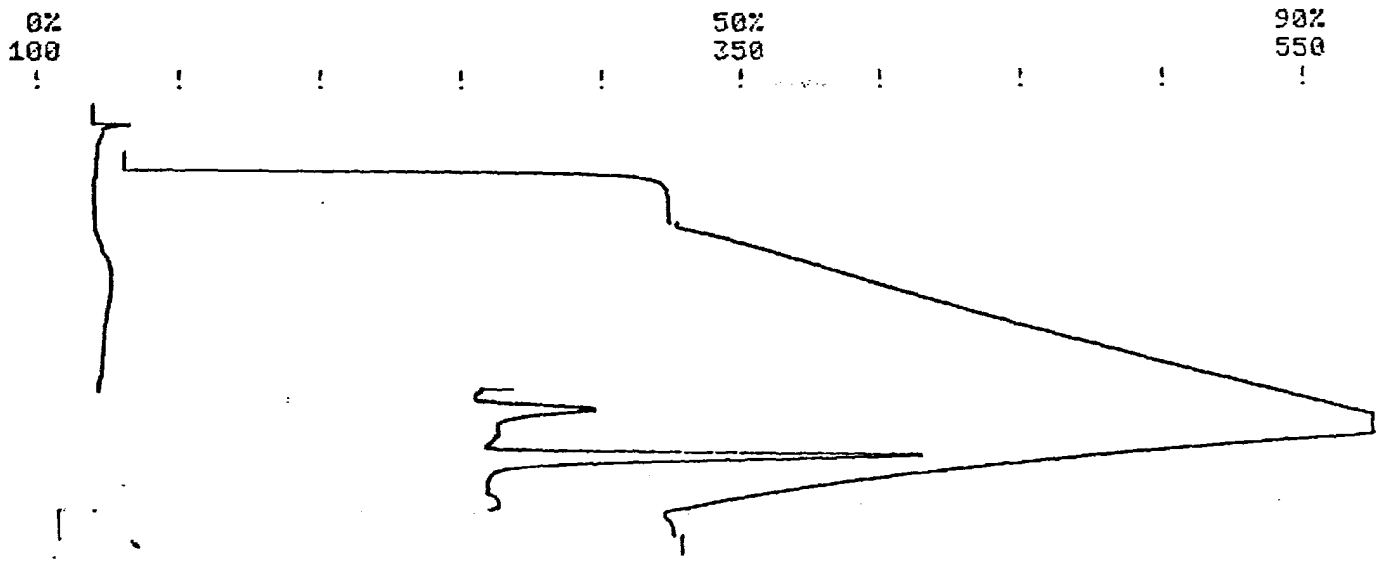
TCD ATTENUATION= 32



TOC = 0.69
WT = 120.0
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S2= +1.848E-01 SUM= +1.398E+03
S3= +3.399E-01 SUM= +4.769E+03
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GEOCOM ROCK EVAL II

MAY 23, 1988
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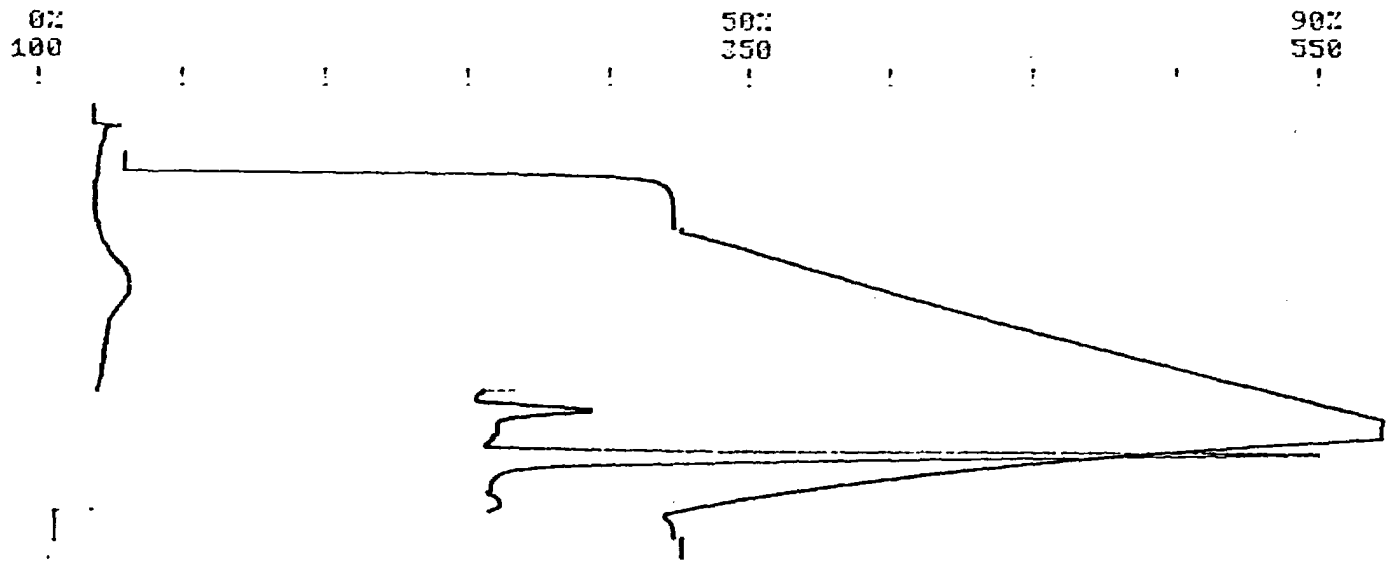
ID= 007
FID ATTENUATION= 32
TCD ATTENUATION= 32



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WT = 120.7
TMAX = 429 DEGREES C
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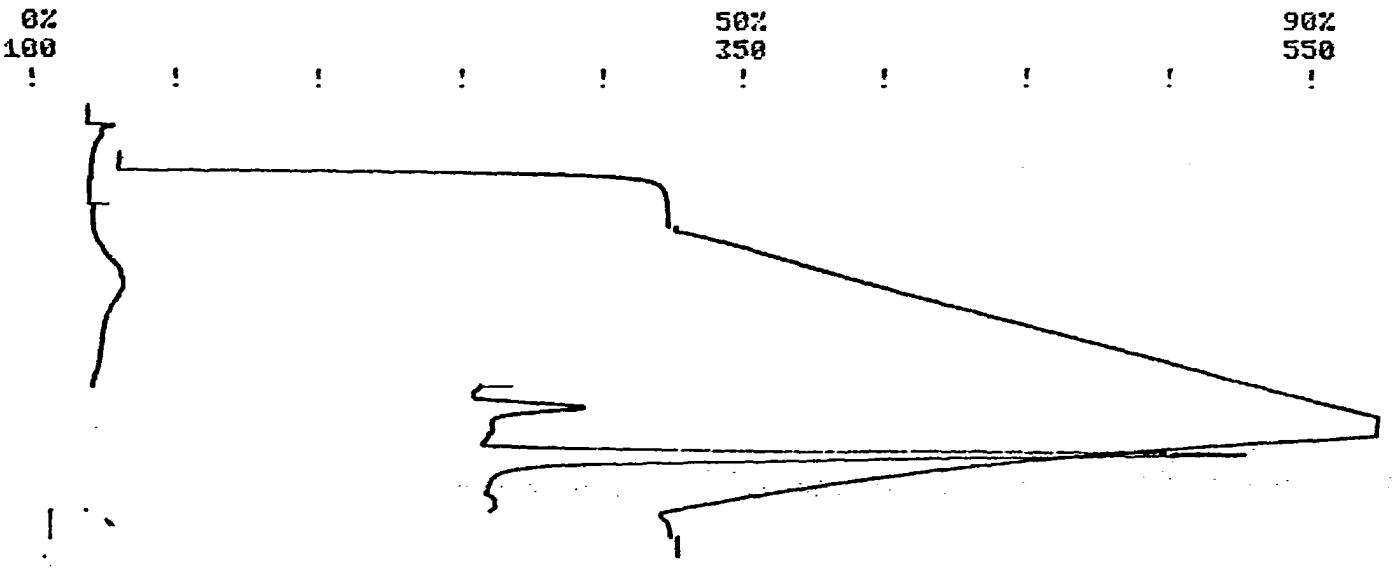
S2= +3.544E-01 SUM= +2.696E+03
S3= +7.174E-01 SUM= +9.416E+03
UNKNOWN

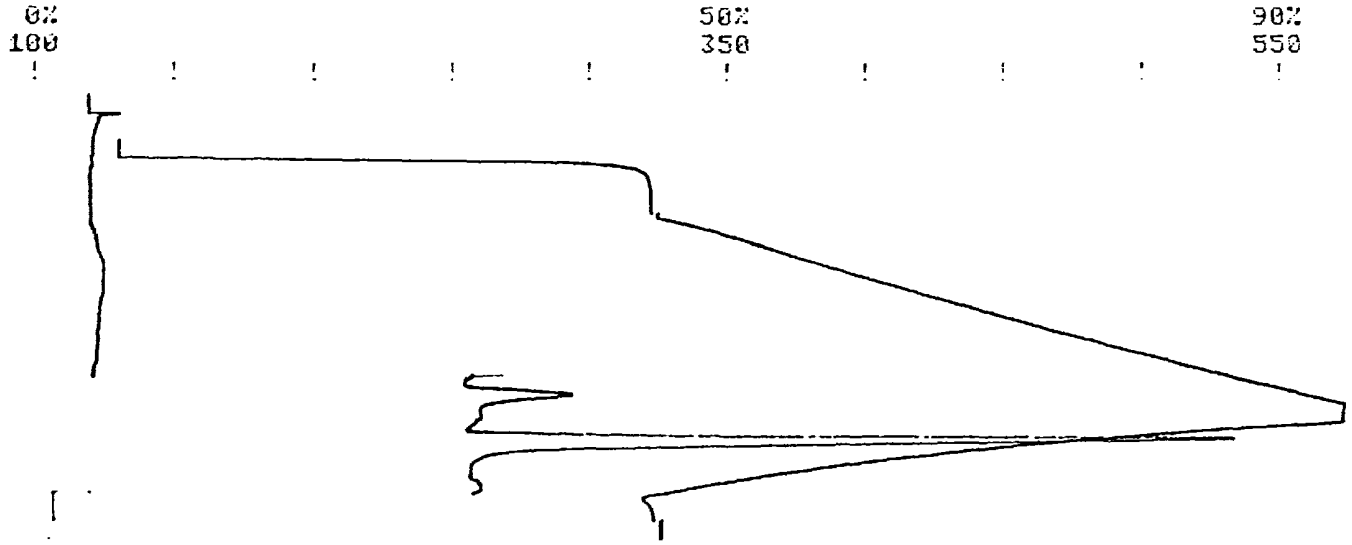
GEOCOM ROCK EVAL II

MAY 23, 1988
TIME= 1950
ID= 008
FID ATTENUATION= 32
TCD ATTENUATION= 32



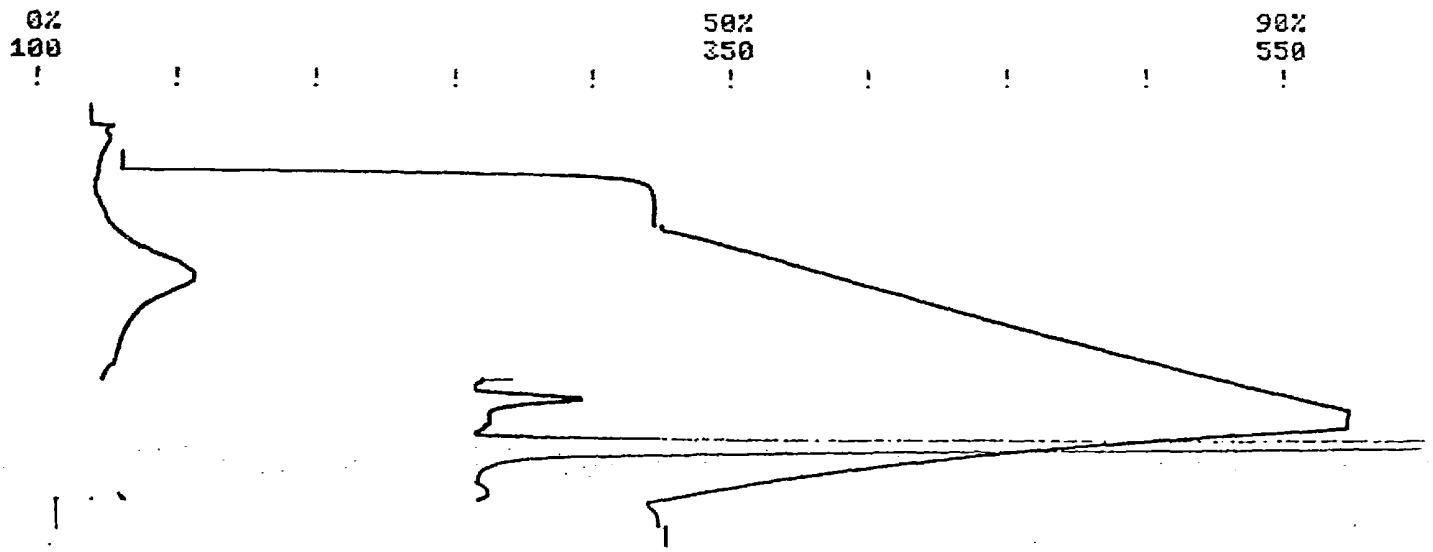
TOC = 0.92
WT = 121.3
TMAX = 432 DEGREES C
S1= +2.995E-02 SUM= +2.290E+02
S2= +3.458E-01 SUM= +2.644E+03
S3= +6.589E-01 SUM= +8.779E+03

GEOCOM ROCK EVAL II
MAY 23, 1988
TIME= 2016
ID= 009
FID ATTENUATION= 32
TCD ATTENUATION= 32



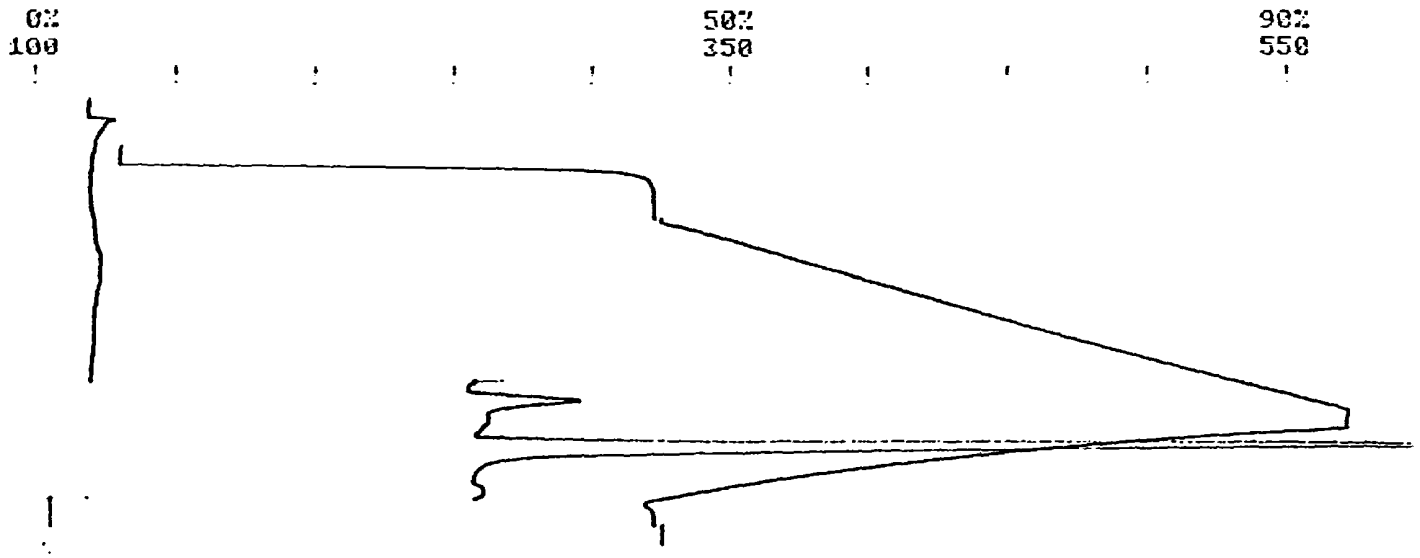
TOC = 0.61
WT = 120.9
TMAX = 436 DEGREES C
S1= +1.850E-02 SUM= +1.410E+02
S2= +1.395E-01 SUM= +1.063E+03
S3= +6.504E-01 SUM= +8.608E+03
UNKNOWN

GEOCOM ROCK EVAL II
MAY 23, 1988
TIME= 2043
ID= 010
FID ATTENUATION= 32
TCD ATTENUATION= 32



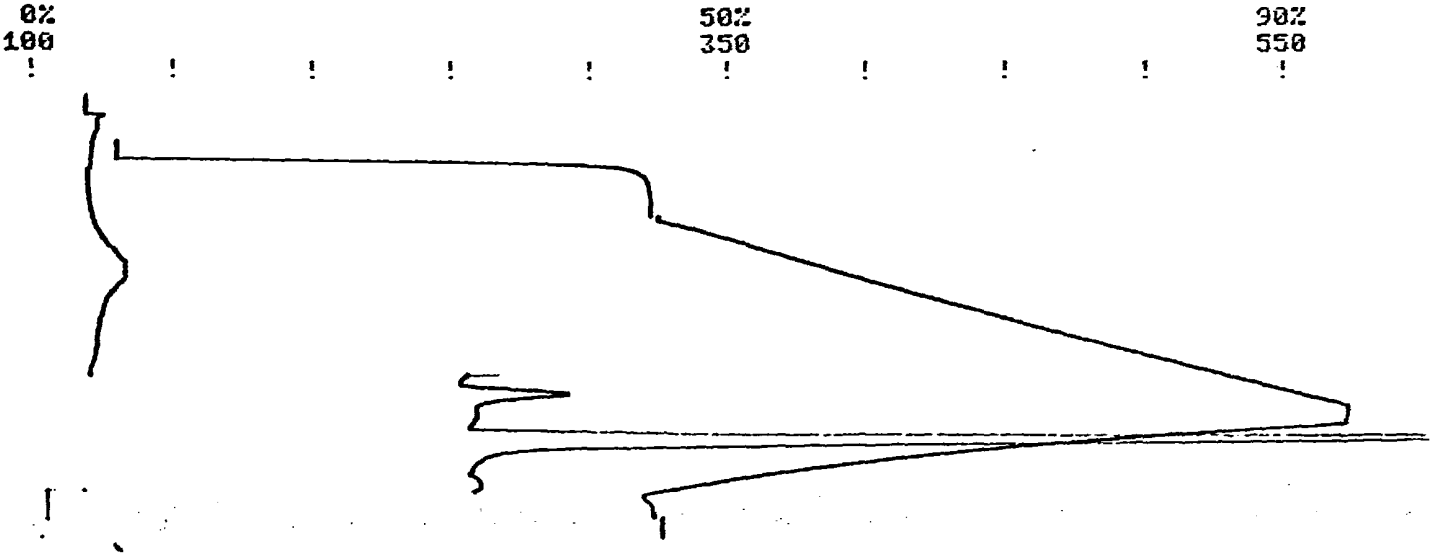
TOC = 1.98
WT = 118.7
TMAX = 430 DEGREES C
S1= +6.390E-02 SUM= +4.780E+02
S2= +1.074E+00 SUM= +8.034E+03

TIME= 2109
ID= 011
FID ATTENUATION= 32
TCD ATTENUATION= 32



TOC = 0.57
WT = 121.4
TMAX = 418 DEGREES C
S1= +3.516E-02 SUM= +2.690E+02
S2= +1.266E-01 SUM= +9.690E+02
S3= +9.412E-01 SUM= +1.222E+04
UNKNOWN

GEOCOM ROCK EVAL II
MAY 23, 1988
TIME= 2135
ID= 012
FID ATTENUATION= 32
TCD ATTENUATION= 32



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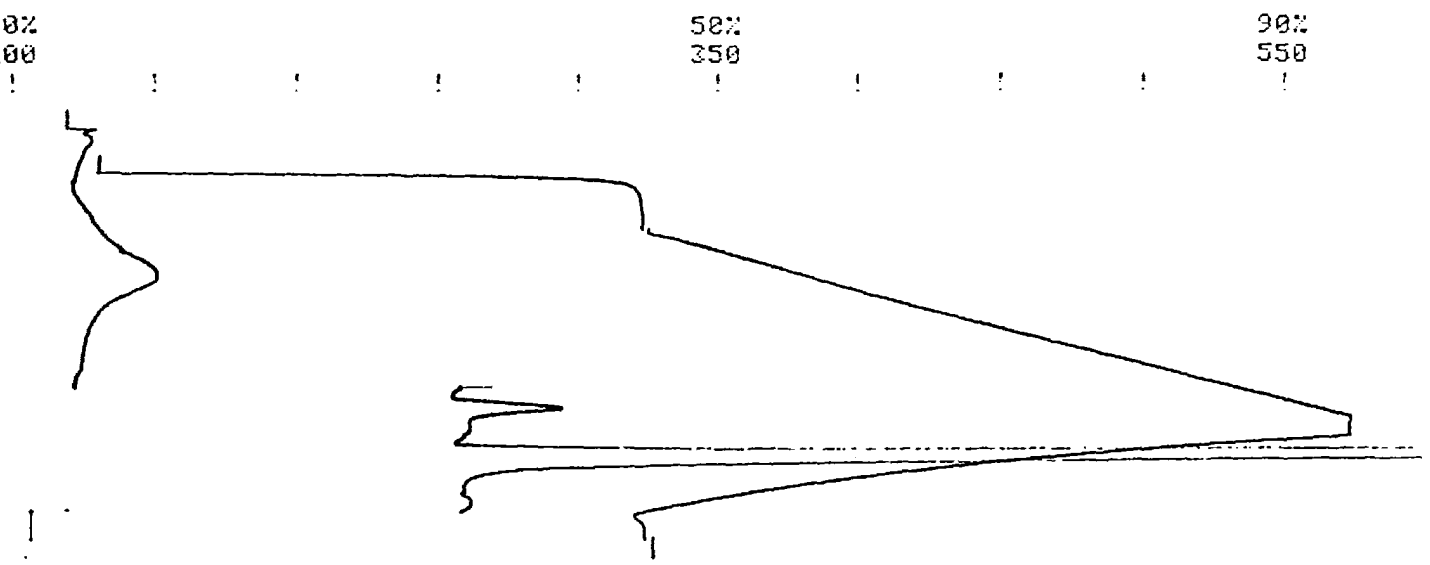
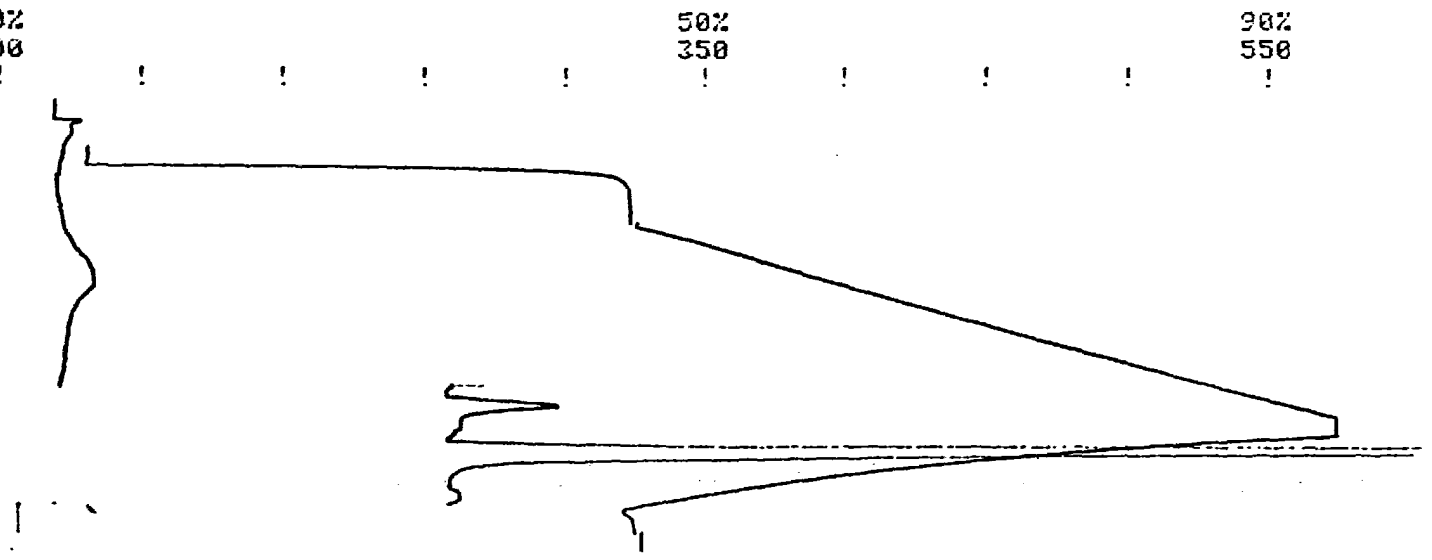
WT = 119.5
TMAX = 428 DEGREES C
S1= +2.921E-02 SUM= +2.200E+02
S2= +3.849E-01 SUM= +2.899E+03
S3= +1.191E+00 SUM= +1.507E+04
UNKNOWN

GEOCOM ROCK EVAL II
MAY 23, 1988
TIME= 2202
ID= 013
FID ATTENUATION= 32
TCD ATTENUATION= 32



TOC = 1.28
WT = 119.3
TMAX = 424 DEGREES C
S1= +9.084E-02 SUM= +6.830E+02
S2= +8.847E-01 SUM= +6.652E+03
S3= +2.265E+00 SUM= +2.805E+04
UNKNOWN

GEOCOM ROCK EVAL II
MAY 23, 1988
TIME= 2228
ID= 014
FID ATTENUATION= 32
TCD ATTENUATION= 32

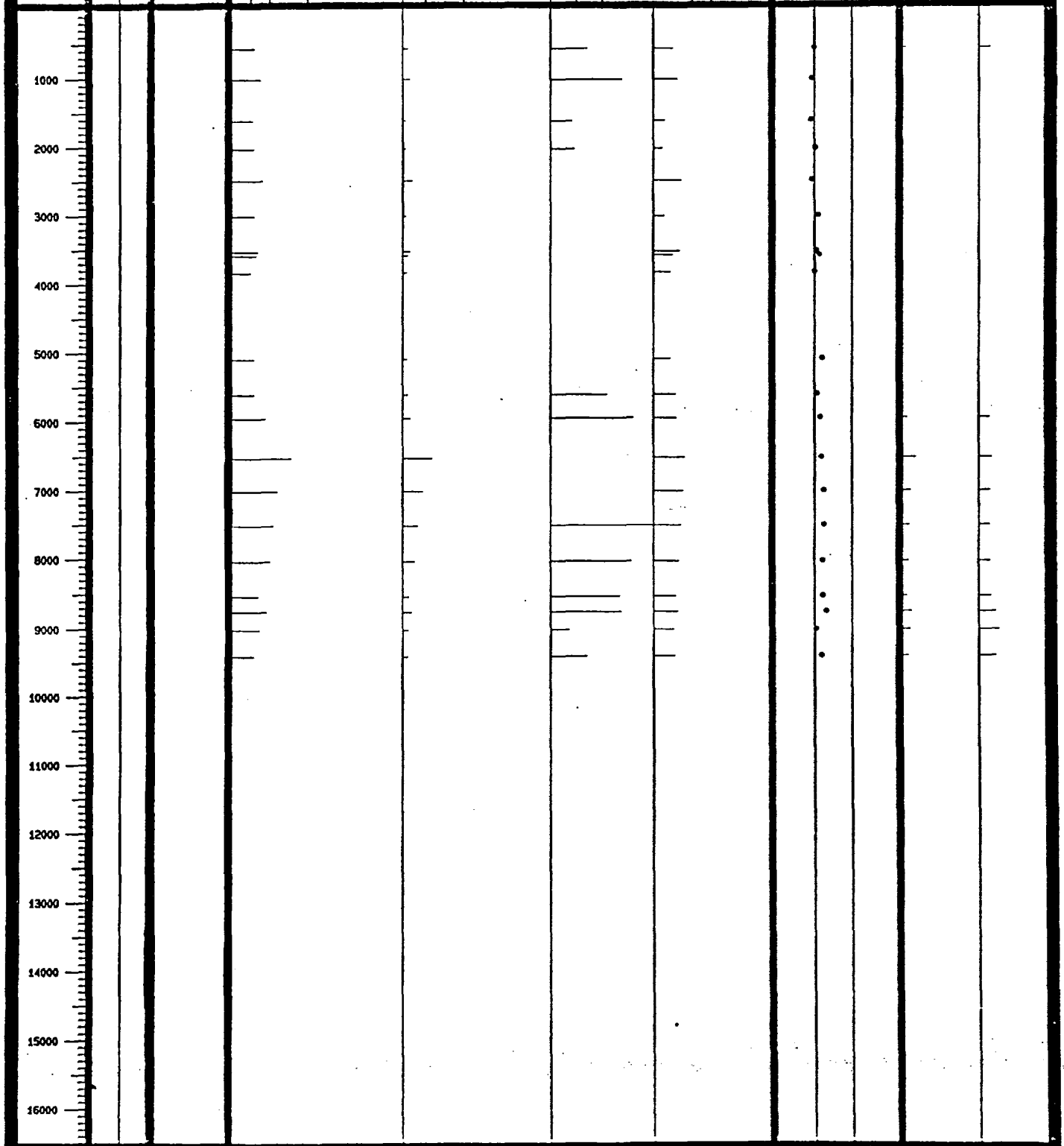


TOC = 1.08
WT = 121.3
TMAX = 427 DEGREES C
S1= +4.500E-02 SUM= +3.440E+02
S2= +3.812E-01 SUM= +2.914E+03
S3= +1.473E+00 SUM= +1.875E+04

BROWN & RUTH LABORATORIES, INC.

GEOCHEMICAL LOG

WELL NAME: INISKIN BEAL #1

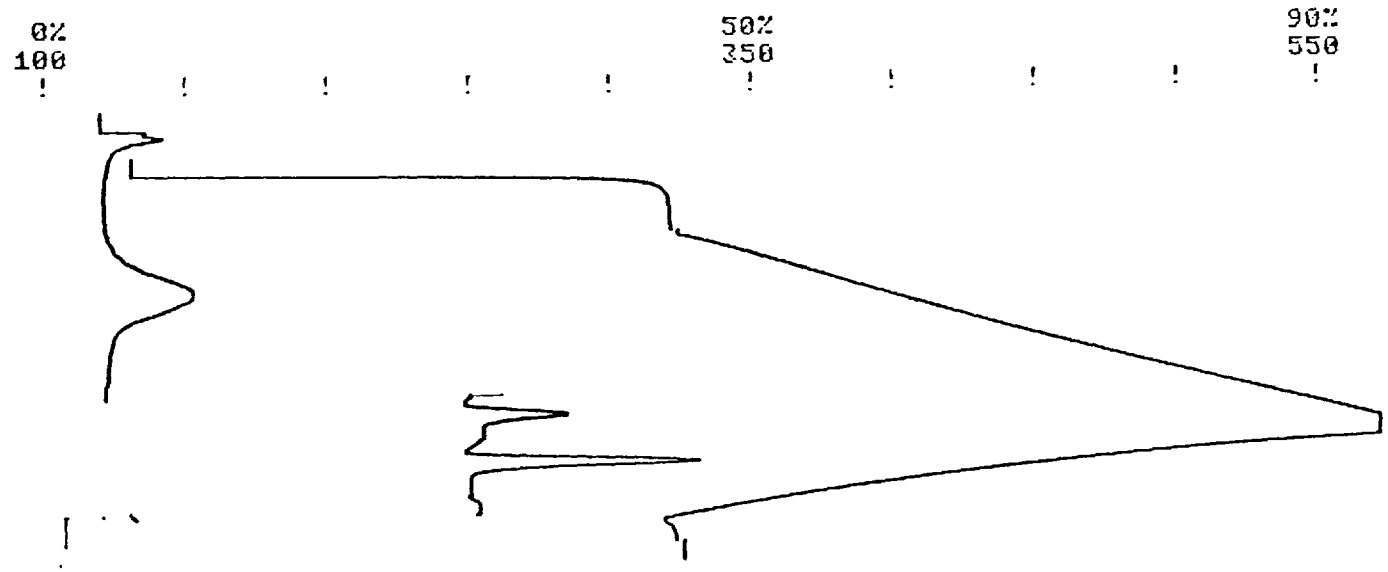


CONGLOMERATE
SANDSTONE
COAL
CASING CEMENT
SHALE • SILTSTONE
LIMESTONE
DOLOMITE
CHERT
HALITE
ANHYDRITE
IGNEOUS
VOLCANICS

S1 = Free Hydrocarbons Present in Rock
S2 = Hydrocarbons from Kerogen Pyrolysis
S3 = CO_2 from Kerogen Pyrolysis
Hydrogen Index = S2 / T.O.C.

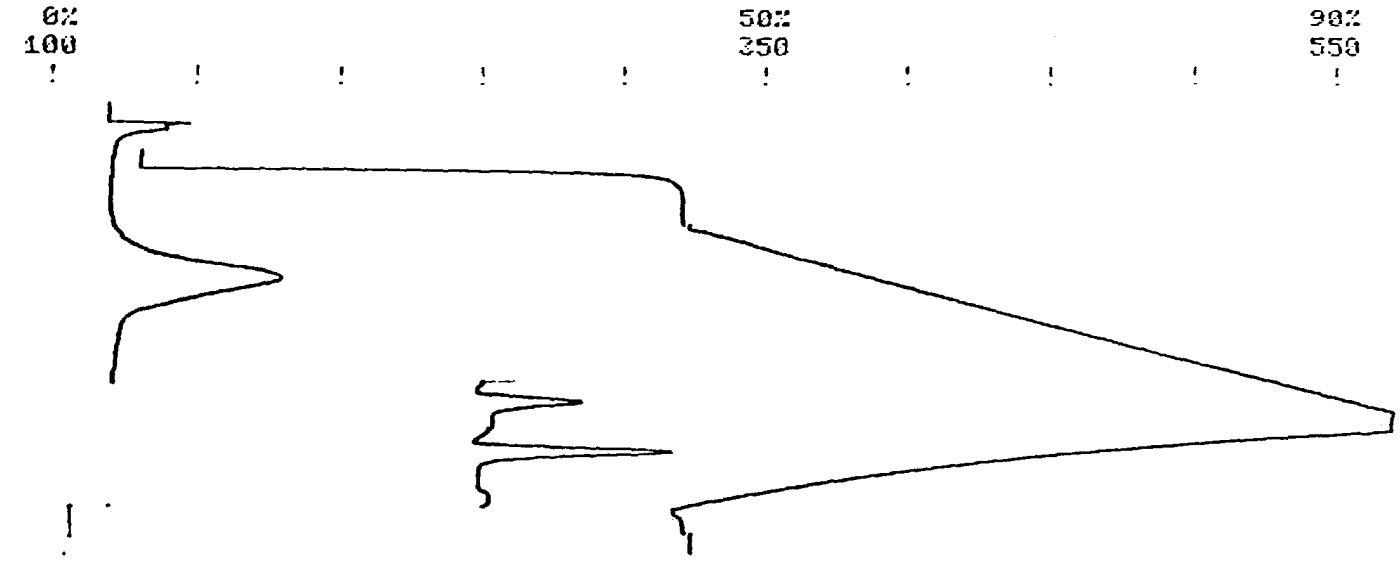
GEOCOM ROCK EVAL II

MAY 24, 1988
TIME= 1246
ID= 023
FID ATTENUATION= 32
TCD ATTENUATION= 32



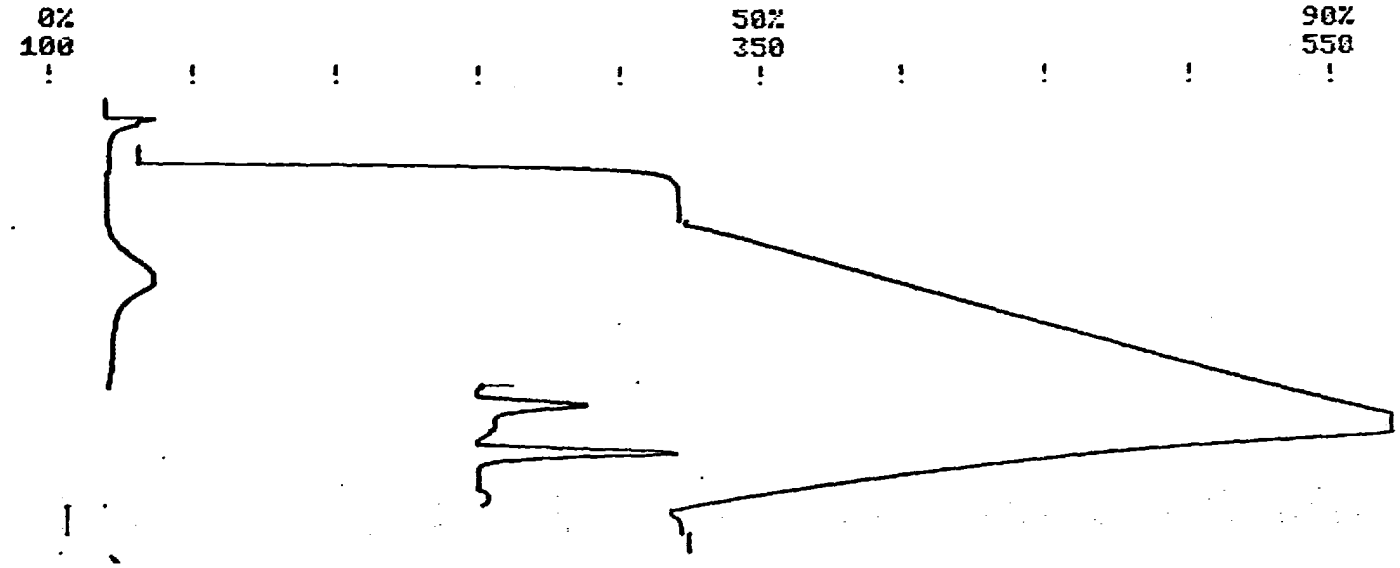
TOC = 0.58
WT = 120.8
TMAX = 436 DEGREES C
S1= +9.539E-02 SUM= +7.720E+02
S2= +5.570E-01 SUM= +4.508E+03
S3= +1.623E-01 SUM= +2.226E+03

MAY 24, 1988
TIME= 1313
ID= 024
FID ATTENUATION= 32
TCD ATTENUATION= 32



TOC = 0.75
WT = 120.4
TMAX = 434 DEGREES C
S1= +7.860E-02 SUM= +6.340E+02
S2= +9.006E-01 SUM= +7.264E+03
S3= +1.263E-01 SUM= +1.803E+03
UNKNOWN

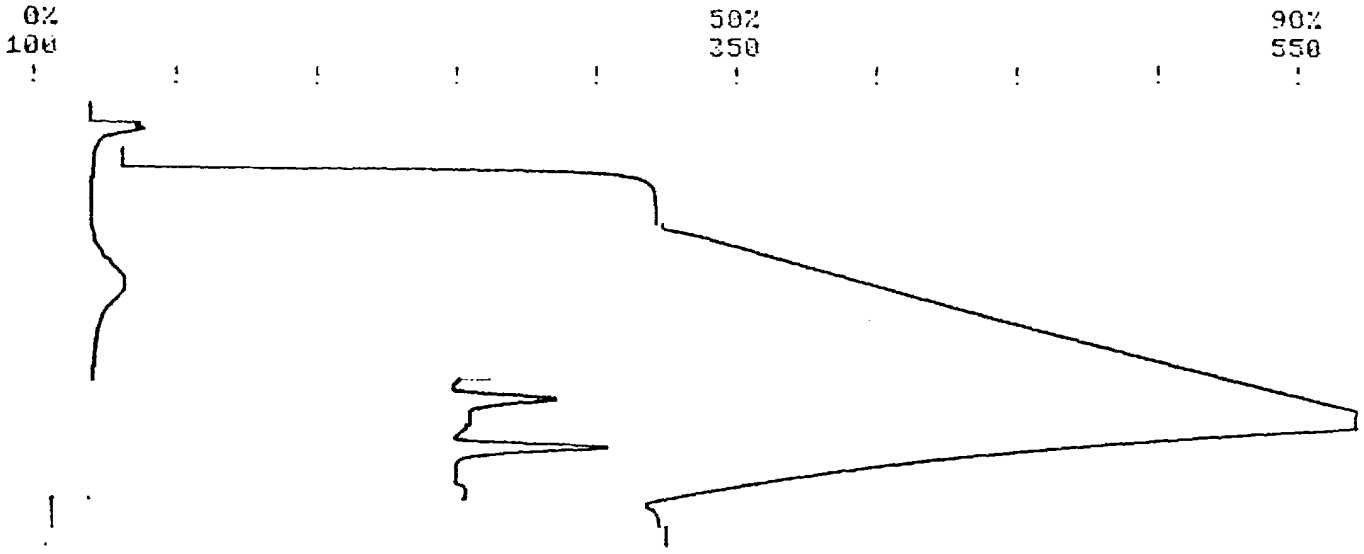
GEOCOM ROCK EVAL II
MAY 24, 1988
TIME= 1339
ID= 025
FID ATTENUATION= 32
TCD ATTENUATION= 32



TOC = 0.53
WT = 120.8
TMAX = 433 DEGREES C
S1= +4.510E-02 SUM= +3.650E+02
S2= +2.784E-01 SUM= +2.253E+03
S3= +1.360E-01 SUM= +1.921E+03
UNKNOWN

GEOCOM ROCK EVAL II

MAY 24, 1988
TIME= 1405
ID= 026
FID ATTENUATION= 32
TCD ATTENUATION= 32



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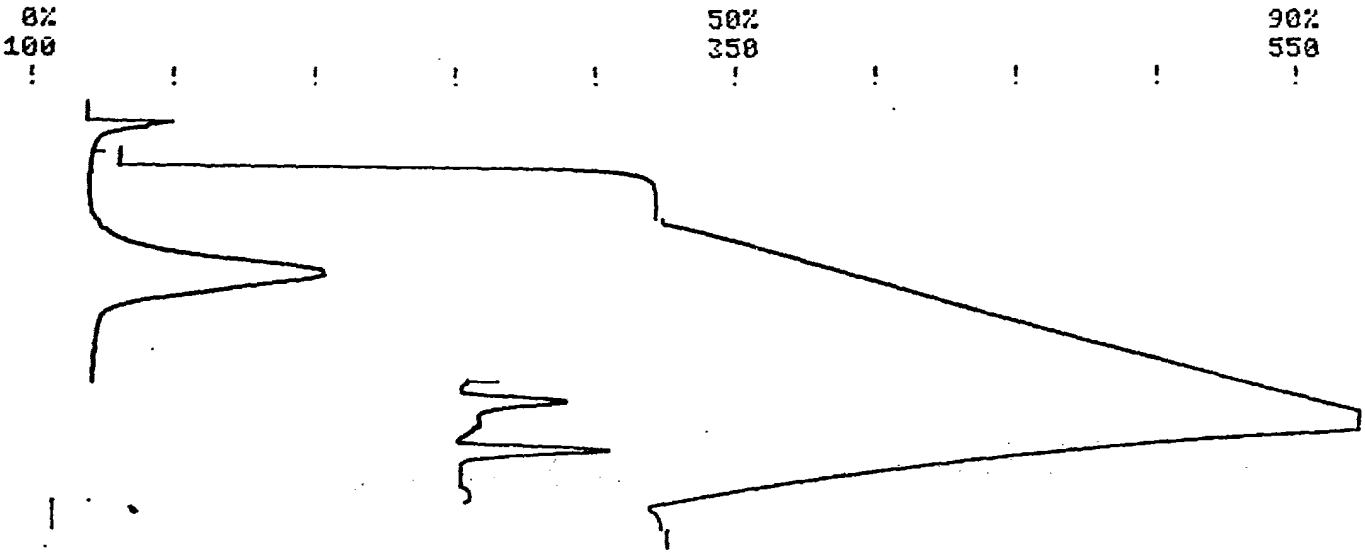
WT = 120.9
TMAX = 438 DEGREES C
S1= +7.433E-02 SUM= +6.020E+02
S2= +2.244E-01 SUM= +1.818E+03
S3= +9.623E-02 SUM= +1.460E+03
UNKNOWN

GEOCOM ROCK EVAL II

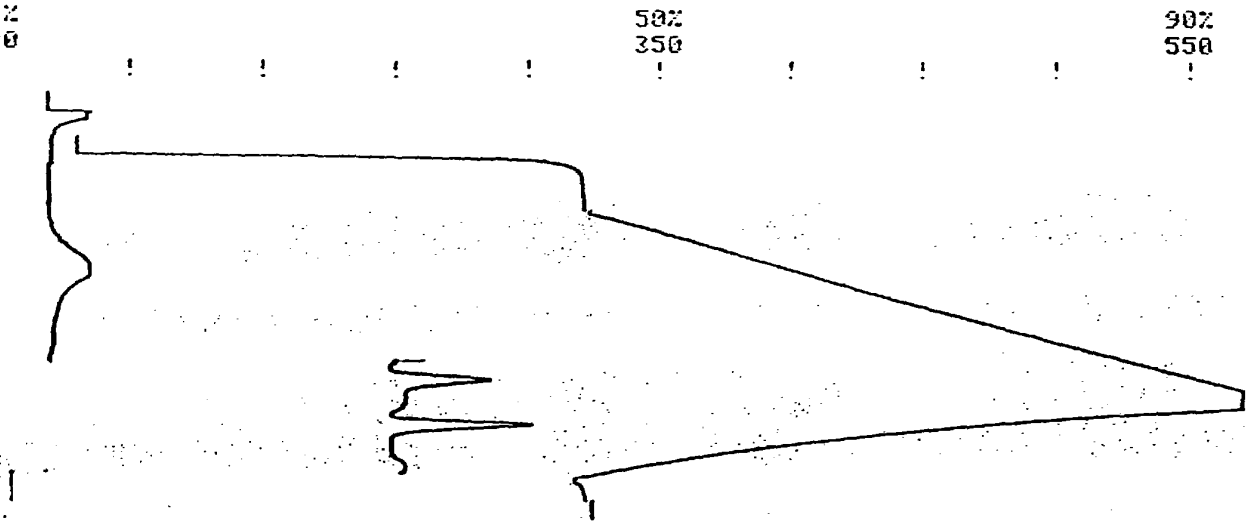
MAY 24, 1988
TIME= 1431
ID= 027
FID ATTENUATION= 32
TCD ATTENUATION= 32



TOC = 0.79
WT = 123.4
TMAX = 434 DEGREES C
S1= +8.480E-02 SUM= +7.010E+02
S2= +1.102E+00 SUM= +9.111E+03
S3= +8.592E-02 SUM= +1.361E+03

GEOCOM ROCK EVAL II

MAY 24, 1988
TIME= 1458
ID= 028
FID ATTENUATION= 32
TCD ATTENUATION= 22



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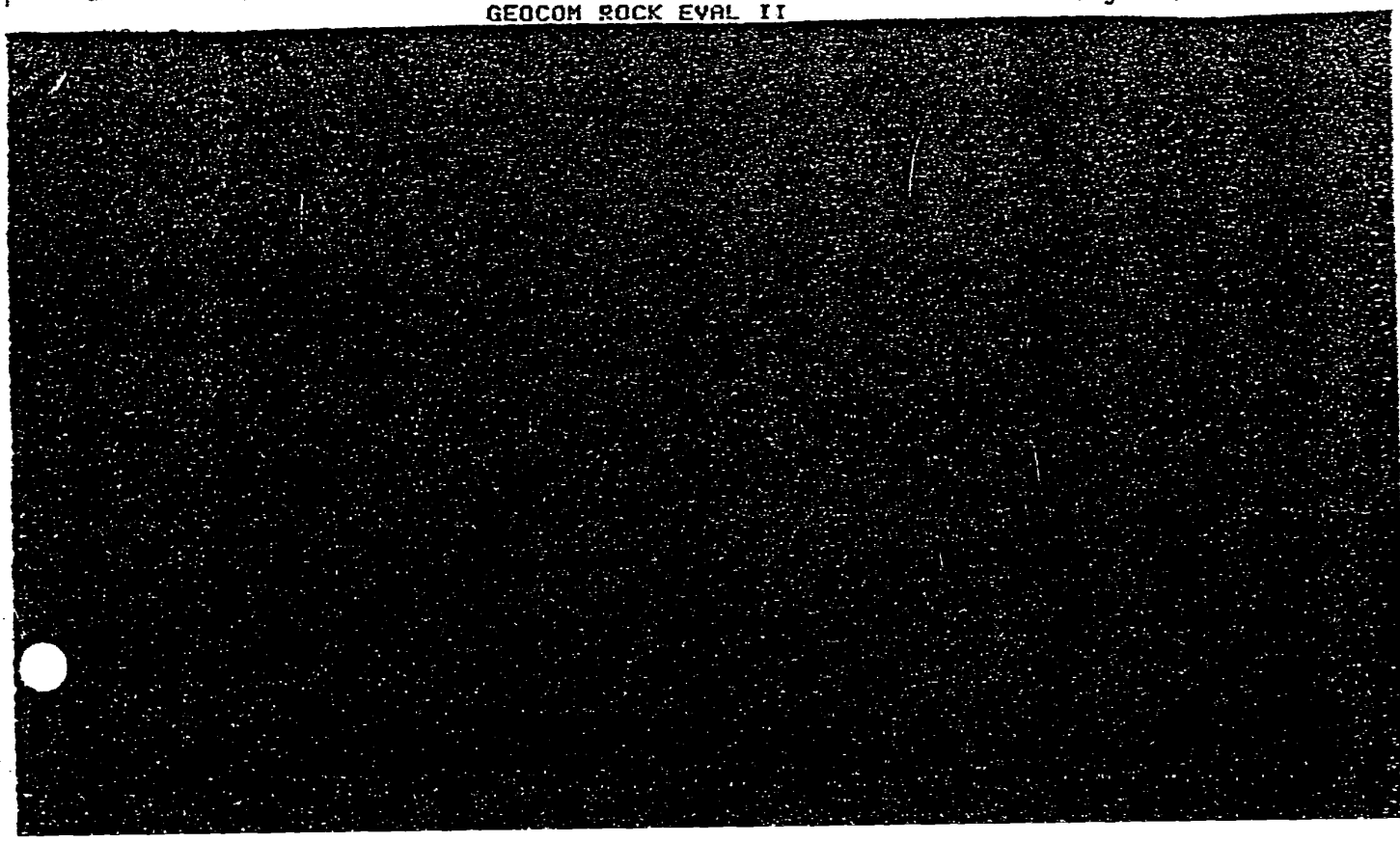
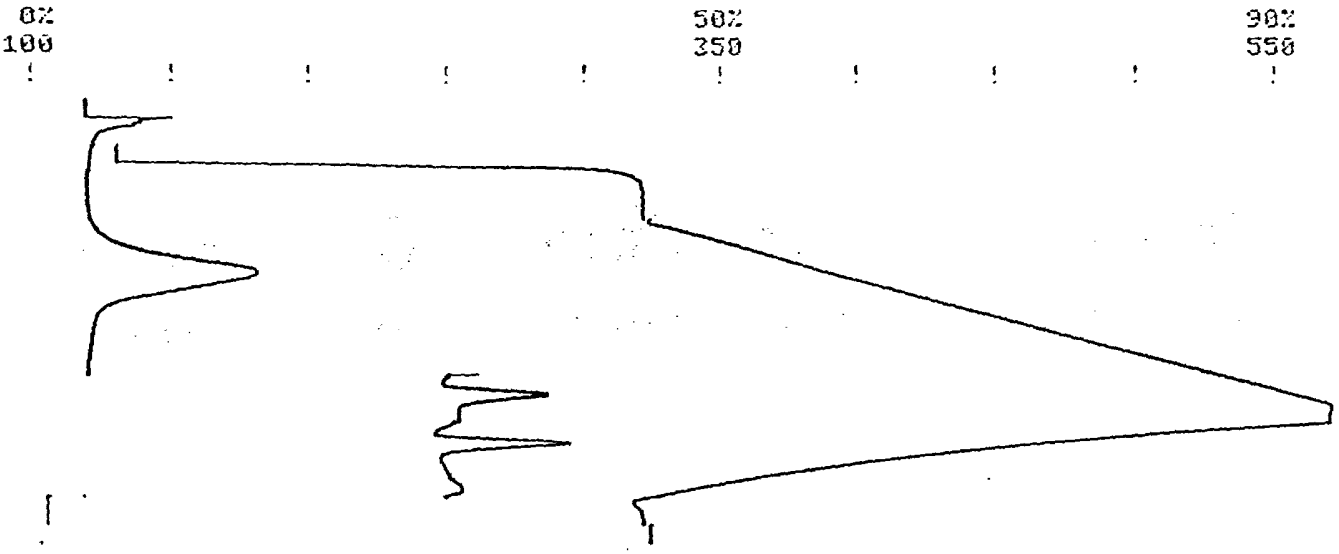
WT = 124.2
TMAX = 440 DEGREES C
S1= +6.069E-02 SUM= +5.850E+02
S2= +2.799E-01 SUM= +2.329E+03
S3= +8.621E-02 SUM= +1.371E+03
UNKNOWN

GEOCOM ROCK EVAL II



GEOCOM ROCK EVAL II

MAY 24, 1988
TIME= 1743
ID= 38029
FID ATTENUATION= 32
TCD ATTENUATION= 32



TOC = 0.66
WT = 122.4
TMAX = 438 DEGREES C
S1= +8.422E-02 SUM= +6.800E+02
S2= +8.674E-01 SUM= +7.003E+02
S3= +7.552E-02 SUM= +1.101E+03
UNKNOWN

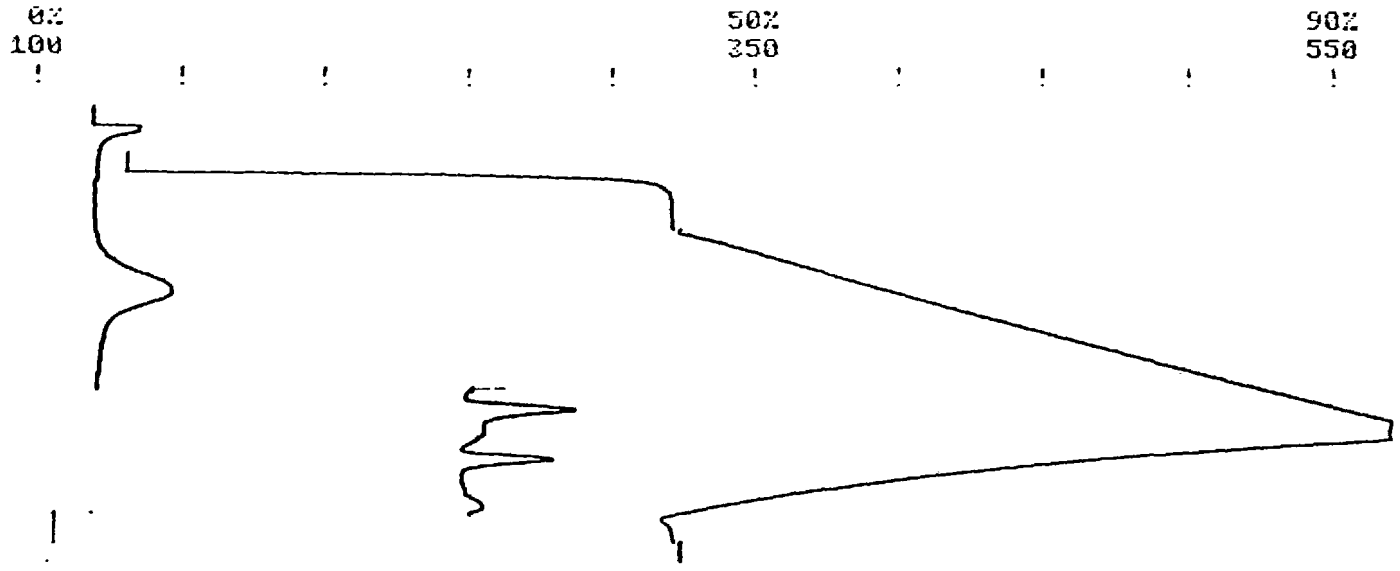
GEOCOM ROCK EVAL II

MAY 24, 1988
TIME= 1809
ID= 030
FID ATTENUATION= 32
TCD ATTENUATION= 32

TOC = 0.46
WT = 121.4
TMAX = 436 DEGREES C
S1= +4.945E-02 SUM= +3.960E+02
S2= +3.803E-01 SUM= +3.046E+03
S3= +4.763E-02 SUM=

GEOCOM ROCK EVAL II

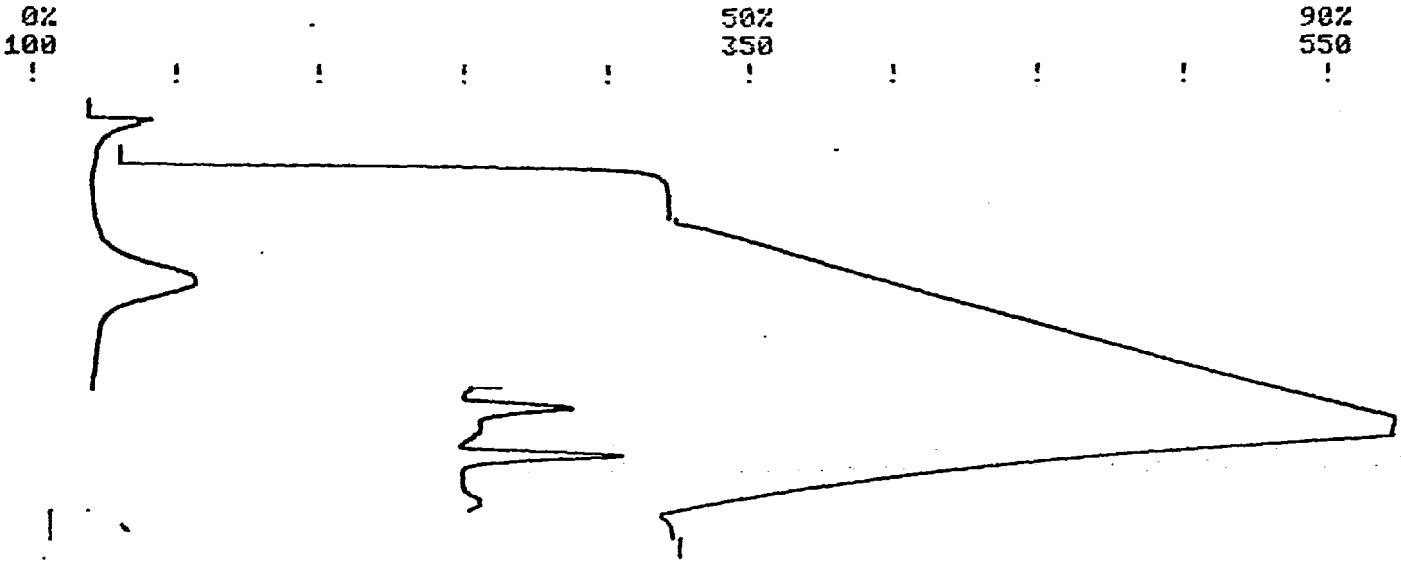
MAY 24, 1988
TIME= 1835
ID= 031
FID ATTENUATION= 32
TCD ATTENUATION= 32



TOC = 0.55
WT = 120.0
TMAX = 442 DEGREES C
S1= +5.988E-02 SUM= +4.740E+02
S2= +4.418E-01 SUM= +3.497E+03
S3= +4.180E-02 SUM= +6.930E+02
UNKNOWN

GEOCOM ROCK EVAL II

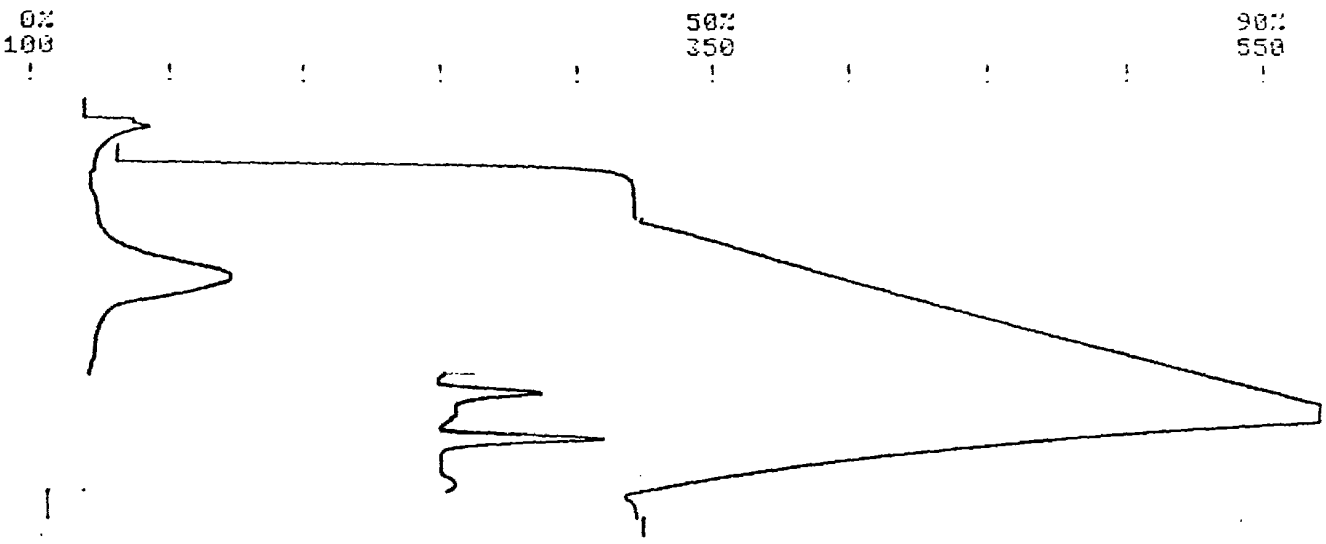
MAY 24, 1988
TIME= 1902
ID= 032
FID ATTENUATION= 32
TCD ATTENUATION= 32



TOC = 0.55
WT = 120.7
TMAX = 438 DEGREES C
S1= +9.458E-02 SUM= +7.530E+02
S2= +5.916E-01 SUM= +4.710E+03

GEOCOM ROCK EVAL II

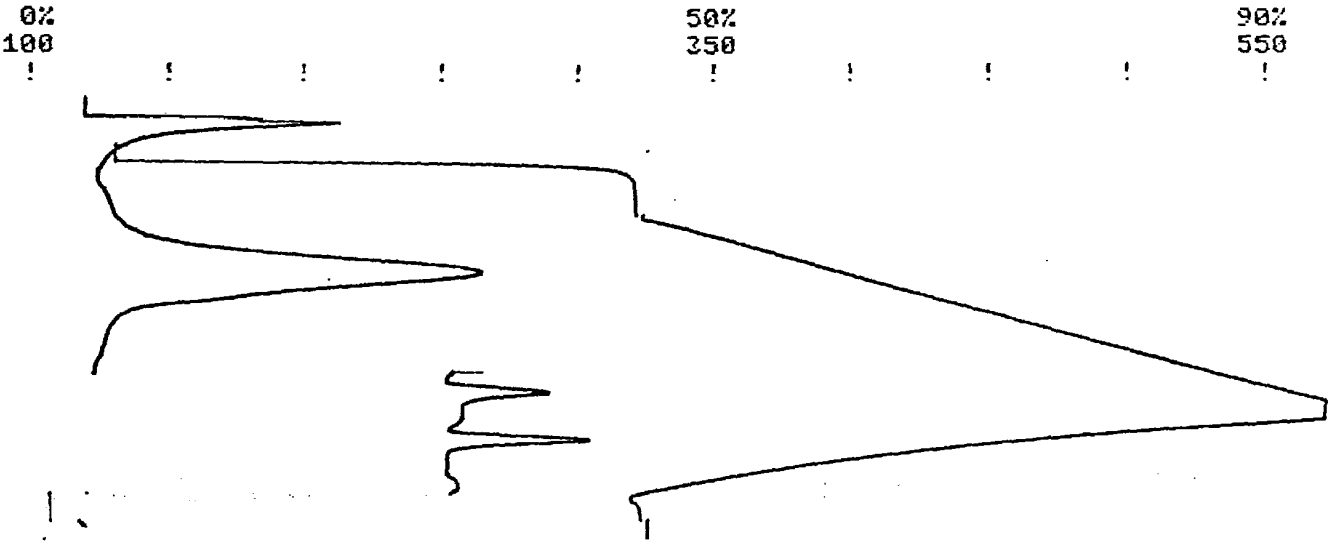
MAY 24, 1988
TIME= 1928
ID= 033
FID ATTENUATION= 32
TCD ATTENUATION= 32



TOC = 0.85
WT = 123.2
TMAX = 440 DEGREES C
S1= +1.533E-01 SUM= +1.246E+03
S2= +9.620E-01 SUM= +7.818E+03
S3= +1.193E-01 SUM= +1.628E+03
UNKNOWN

GEOCOM ROCK EVAL II

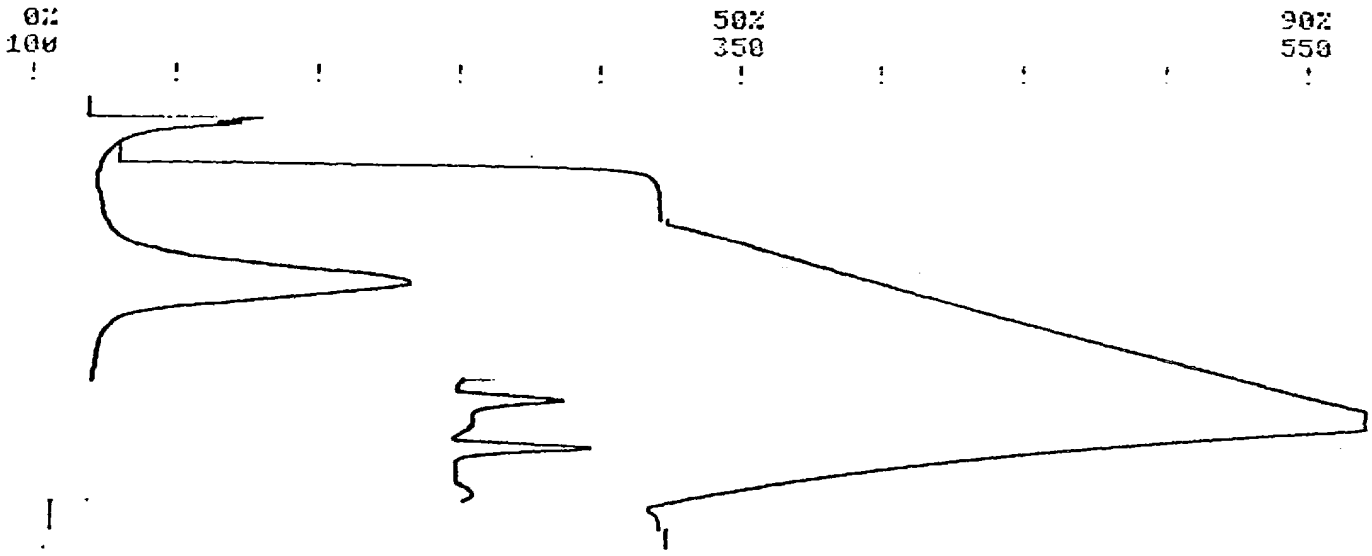
MAY 24, 1988
TIME= 1954
ID= 034
FID ATTENUATION= 32
TCD ATTENUATION= 32



TOC = 1.55
WT = 120.8
TMAX = 441 DEGREES C
S1= +4.995E-01 SUM= +3.980E+03
S2= +2.411E+00 SUM= +1.921E+04
S3= +8.905E-02 SUM= +1.247E+03
UNKNOWN

GEOCOM ROCK EVAL II

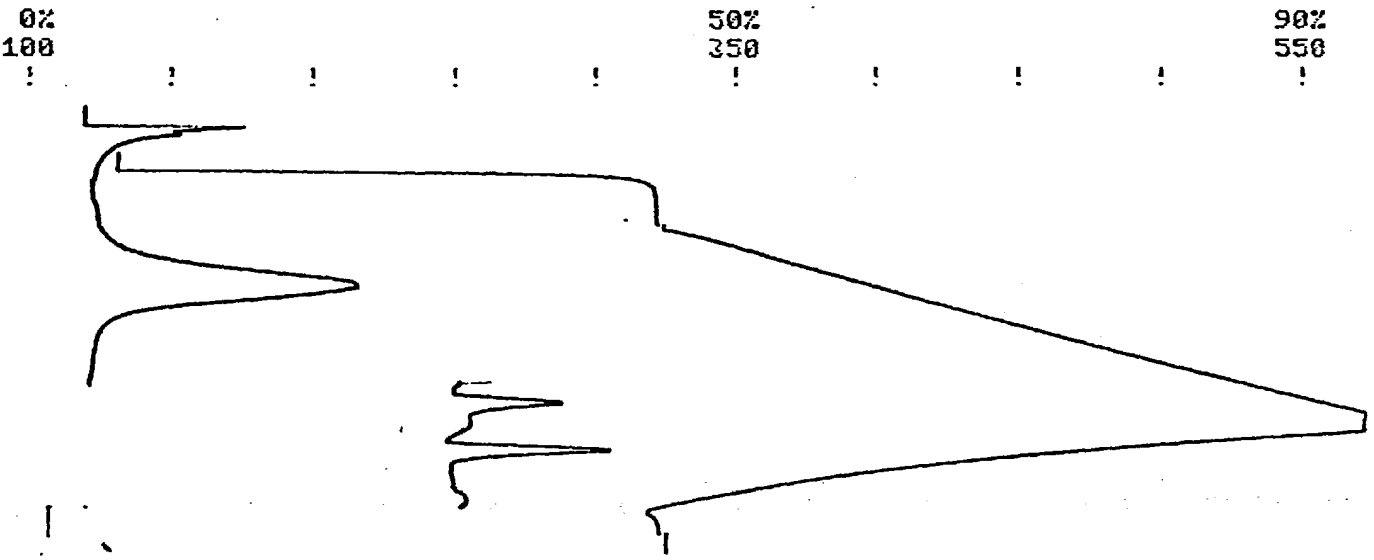
MAY 24, 1988
TIME= 2021
ID= 035
FID ATTENUATION= 32
TCD ATTENUATION= 32



TOC = 1.18
WT = 121.6
TMAX = 443 DEGREES C
S1= +3.098E-01 SUM= +2.485E+03
S2= +1.755E+00 SUM= +1.407E+04
S3= +7.662E-02 SUM= +1.108E+03
UNKNOWN

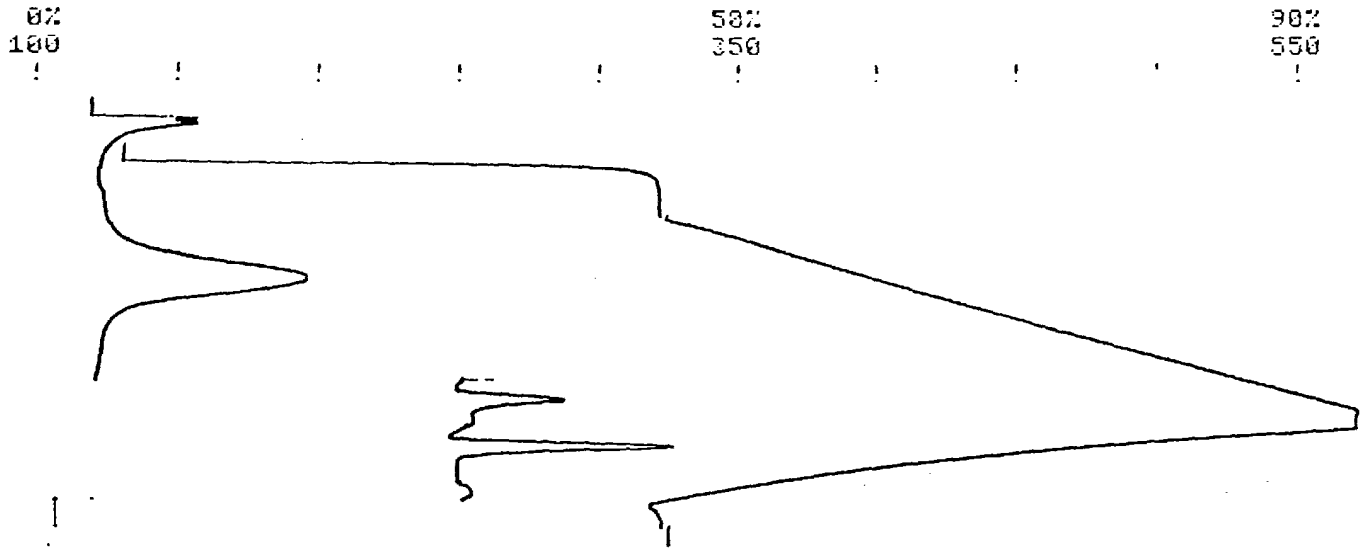
GEOCOM ROCK EVAL II

MAY 24, 1988
TIME= 2047
ID= 036
FID ATTENUATION= 32
TCD ATTENUATION= 32



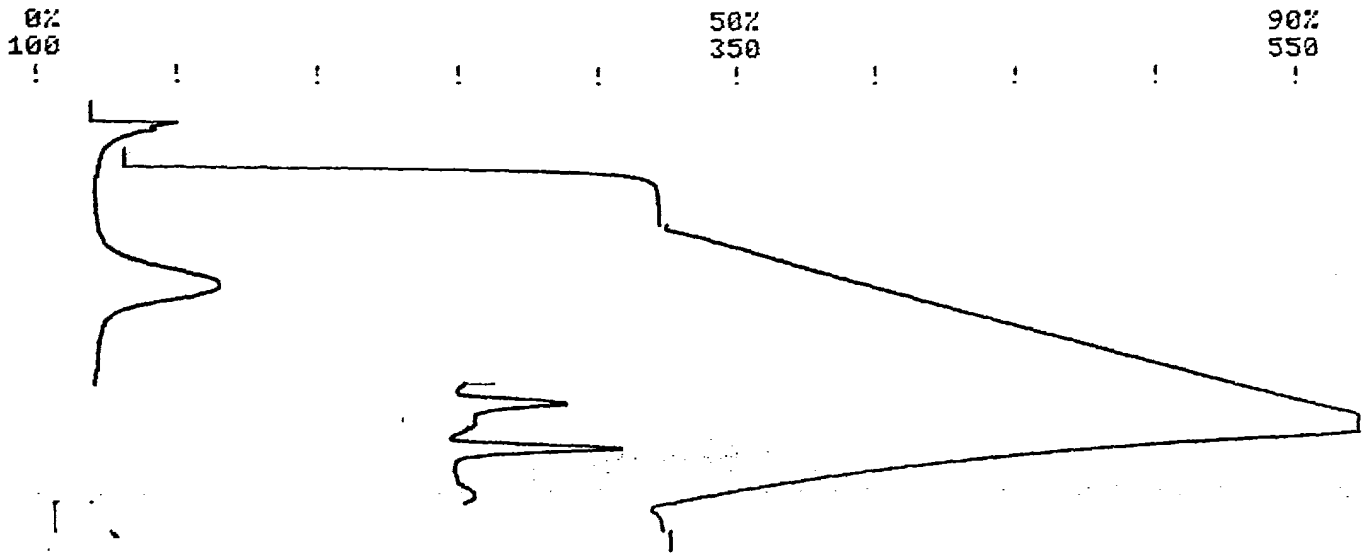
TOC = 1.07
WT = 120.3
TMAX = 443 DEGREES C
S1= +2.383E-01 SUM= +1.891E+03
S2= +1.441E+00 SUM= +1.143E+04
S3= +1.013E-01 SUM= +1.391E+03

GEOCOM ROCK EVAL II
MAY 24, 1988
TIME= 2113
ID= 037
FID ATTENUATION= 32
TCD ATTENUATION= 32



TOC = 0.99
WT = 120.5
TMAX = 442 DEGREES C
S1= +2.247E-01 SUM= +1.786E+03
S2= +1.245E+00 SUM= +9.898E+03
S3= +1.604E-01 SUM= +2.074E+03
UNKNOWN

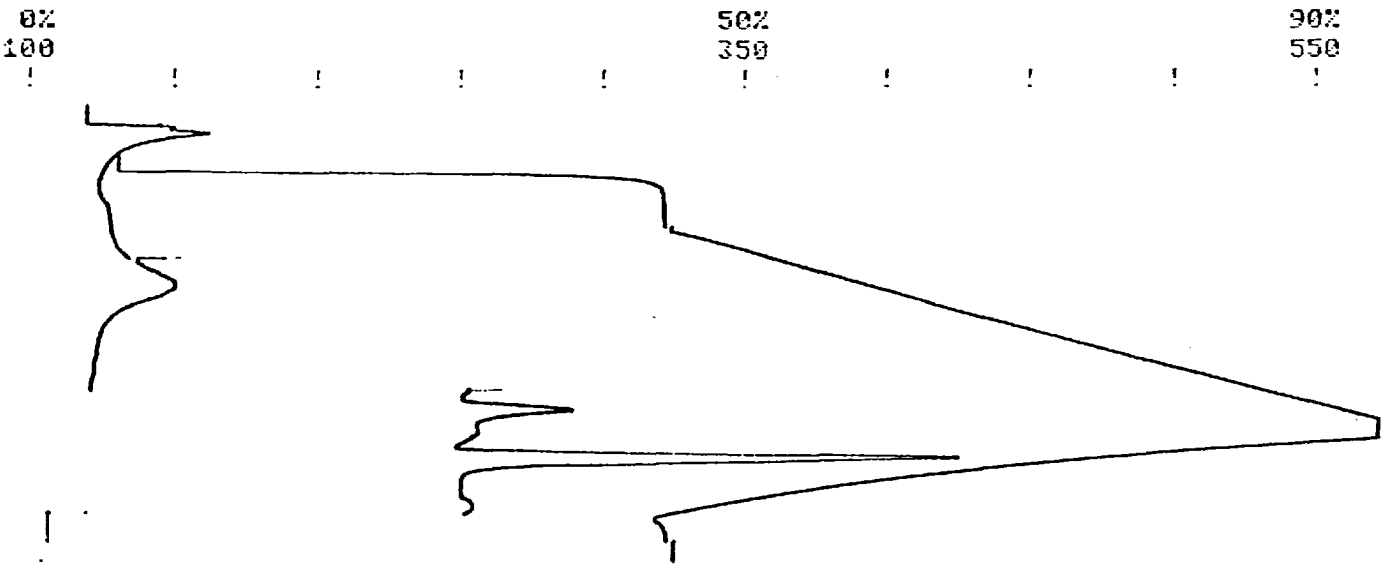
GEOCOM ROCK EVAL II
MAY 24, 1988
TIME= 2140
ID= 038
FID ATTENUATION= 32
TCD ATTENUATION= 32



TOC = 0.67
WT = 119.5
TMAX = 442 DEGREES C
S1= +1.409E-01 SUM= +1.111E+03
S2= +7.292E-01 SUM= +5.748E+03
S3= +1.120E-01 SUM= +1.501E+03

GEOCOM ROCK EVAL II

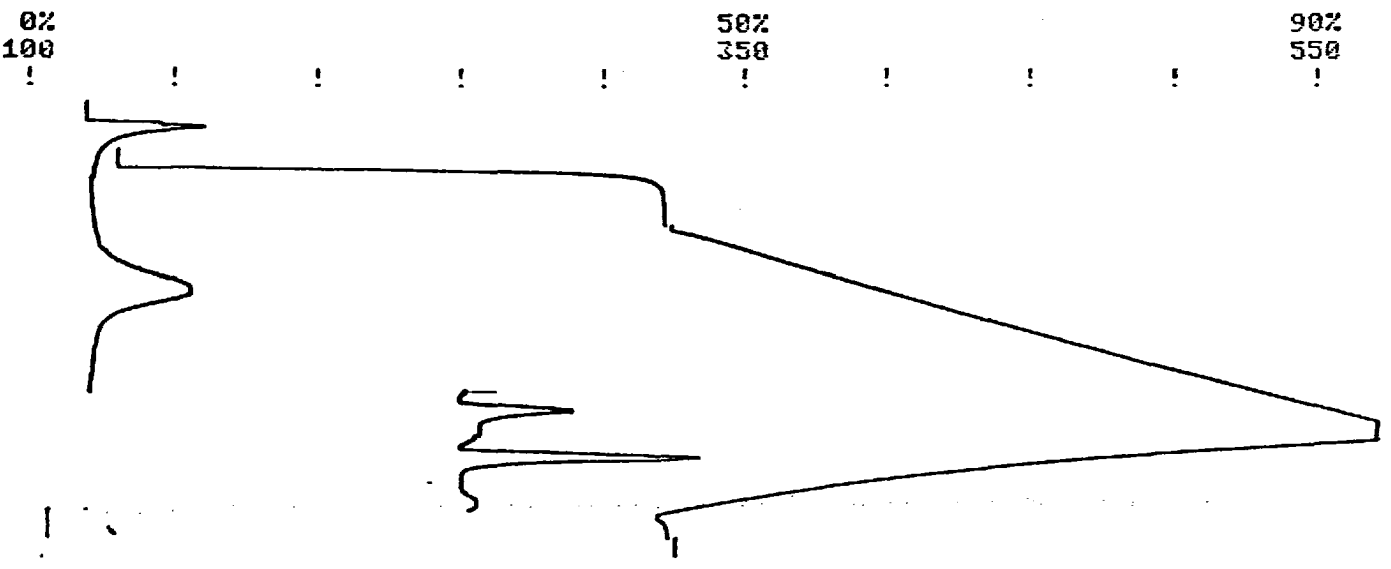
MAY 24, 1988
TIME= 2206
ID= 039
FID ATTENUATION= 32
TCD ATTENUATION= 32



TOC = 0.70
WT = 122.0
TMAX = 437 DEGREES C
S1= +2.809E-01 SUM= +2.261E+03
S2= +6.889E-01 SUM= +5.544E+03
S3= +4.156E-01 SUM= +5.102E+03
UNKNOWN

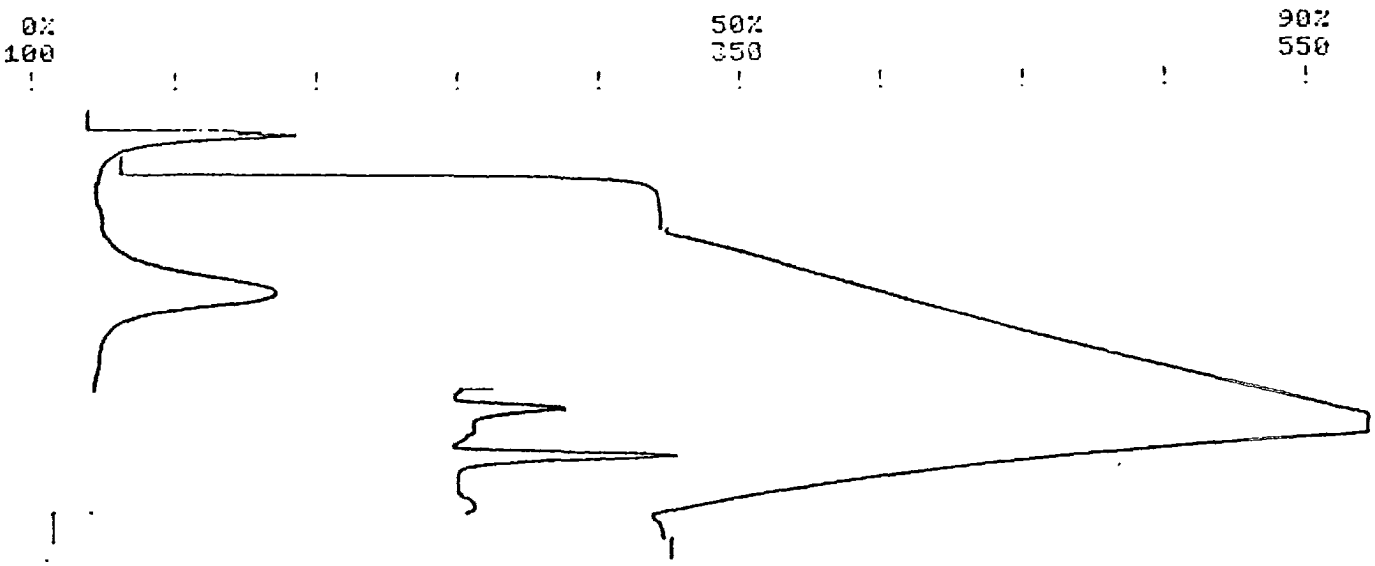
GEOCOM ROCK EVAL II

MAY 24, 1988
TIME= 2232
ID= 040
FID ATTENUATION= 32
TCD ATTENUATION= 32



TOC = 0.55
WT = 120.5
TMAX = 441 DEGREES C
S1= +1.836E-01 SUM= +1.460E+03
S2= +5.847E-01 SUM= +4.648E+03
S3= +1.710E-01 SUM= +2.198E+03
UNKNOWN

MAY 24, 1988
TIME= 2258
ID= 041
FID ATTENUATION= 32
TCD ATTENUATION= 32



TOC = 0.90
WT = 122.5
TMAX = 445 DEGREES C
S1= +3.391E-01 SUM= +2.740E+03
S2= +1.088E+00 SUM= +8.796E+03
S3= +1.577E-01 SUM= +2.074E+03
UNKNOWN
