GSC open file
CGC dossier public
report # 2053

Vitrinite reflectance (Ro) of dispersed organics from Petro-Canada et al. West Esperanto B-78

Report No. EPGS-DOM.3-89MPA

M.P. Avery
Eastern Petroleum Geology Subdivision
Atlantic Geoscience Centre, G.S.C., Dartmouth
February 14, 1989

REPORT NO. EPGS-DOM.3-89MPA

Vitrinite reflectance (Ro) of dispersed organics from Petro-Canada et al. West Esperanto B-78

G.S.C. Locality No.: D216 **Location:** 44°47'03.41"N, 58°26'11.22"W

R.T. Elevation: 23m **Water Depth:** 92m **Total Depth:** 5703m

Sample Interval: 600 - 5703m **Interval Studied:** 745 - 5702m

Depth Units: Meters referenced to R.T.

Vitrinite reflectance has been determined on 26 rotary cuttings samples (Table II) from Petro-Canada et al. West Esperanto B-78 which was classified as a wildcat well and is located on the Scotian Shelf approximately 410 km east of Halifax, Nova Scotia. The well was plugged and abandoned.

Data acquisition and manipulation for this report utilized the Zeiss Photo-multiplier III Zonax system interfaced with a PC AT microcomputer which provides reliable data acquisition and fast statistical summaries.

Sample preparation followed the procedures listed in Appendix I. The analysis of the well revealed the thermal maturation intervals given in Table I. The specific maturation levels, as set out in this report, were based on those of Dow (1977) with modified terminology (Appendix II).

Table I
Inferred Thermal Maturation Levels*

(Seafloor)-1611m	0.23 - 0.4	% Ro	immature
1611-2280m	0.4 - 0.5	% Ro	immature approaching maturity
2280-2827m	0.5 - 0.6	% Ro	marginally mature
2827m	0.6	% Ro	onset of significant oil generation
3690m	0.8	% Ro	peak of oil generation
4359m	1.0	% Ro	onset of significant wet gas generation
4906m	1.2	% Ro	onset of significant dry gas generation
5259m	1.35	% Ro	oil floor
5703m T.D.	1.57	% Ro	beyond oil preservation limit
6438m	(2.0)	% Ro	wet gas preservation limit
7654m	(3.0)	% Ro	dry gas preservation limit

Note: ( ) indicate Ro extrapolated at 0.145 log Ro/km

* Maturation levels are provided for all types of organic matter. Actual hydrocarbon products depend on type of organic matter present.

Remarks

Sample coverage of vitrinite reflectance analysis (Figure 1, Table II) was good over the section penetrated by West Esperanto B-78. The data are plotted on a log Ro vs. linear depth scale and a linear regression line was calculated by the least squares method (Figure 1). The 'error bars' plotted on the maturation profile indicate one standard deviation on either side of the mean and may be deceivingly small for samples with very few readings. The slope of the maturation line is 0.145 log Ro/km.

Selection of the reflectance population which represented the true maturation of the sediments was aided significantly by the histogram display plot (Figure 2). This interpretation tool helps to reveal linear trends (populations) in the Ro data. It also demonstrates the effects of cavings, geology, casing points and other factors on the vitrinite reflectance populations.

The lithology strip plot (Figure 1) was produced directly from the E.P.G. LITHFILE database which extracts data from digitized CANSTRAT logs.

The vitrinite reflectance data provides evidence that the thermal regime at West Esperanto B-78 (between 2280 and 5259m) was suitable for the generation and preservation of hydrocarbons within the drilled section assuming potential source rocks and traps were present.

References

Dow, W.G., 1977. Kerogen studies and geological interpretations. Journal of Geochemical Exploration, no. 7, p. 77-99

February 14, 1989

M.P. Avery
Eastern Petroleum Geology

c.c. K.D. McAlpine, EPGS, Dartmouth
J.A. Wade, EPGS, Dartmouth
A.E. Jackson, EPGS, Dartmouth
EPGS Files, Dartmouth
G.R. Campbell, COGLA, Ottawa
Central Technical Files, Ottawa
J.S. Bell, ISPG, Calgary
L.R. Snowdon, ISPG, Calgary
D. Skibo, ISPG, Calgary
C. Beaumont, Dalhousie Univ., Halifax

Table II

Summary of kerogen - based vitrinite reflectance

Seq. #	Sample #	Depths in meters	Mean Ro (SD) non-rotated	Number of Readings Total	Edited
1	K0711A	745-785	0.28(±.05)	30	30
2	K0711B	865-875	0.36(±.05)	25	25
3	K0711C	1015-1055	0.31(±.07)	8	8
4	K0712A	1225-1265	0.39(±.04)	27	26
5	K0712B	1395-1435	0.41(±.05)	27	26
6	K0713A	1755-1795	0.46(±.08)	37	34
7	K0713B	1935-1975	0.49(±.06)	35	27
8	K0713C	2115-2155	0.51(±.05)	40	32
9	K0714A	2295-2335	0.54(±.05)	48	41
10	K0714B	2505-2545	0.53(±.07)	40	36
11	K0714C	2685-2725	0.58(±.07)	41	32
12	K0715A	2835-2875	0.56(±.08)	47	46
13	K0715B	3010-3050	0.63(±.07)	61	37
14	K0715C	3250-3290	0.63(±.04)	19	12
15	K0716B	3580-3620	0.70(±.08)	48	35
16	K0716C	3820-3860	0.75(±.06)	21	14
17	K0717A	3970-4010	0.77(±.07)	33	20
18	K0717B	4180-4220	0.84(±.12)	20	16
19	K0717C	4390-4430	0.90(±.10)	45	38
20	K0718A	4625-4665	1.01(±.12)	27	18
21	K0718B	4835-4875	1.12(±.07)	13	6
22	K0718C	5075-5085	1.26(±.08)	18	17
23	K0719A	5255-5265	1.52(±.15)	39	31
24	K0719B	5375-5415	1.70(±.19)	40	37
25	K0719C	5525-5565	1.78(±.10)	25	11
26	K0720A	5695-5702	1.78(±.12)	14	11

Note: All samples are kerogen concentrate type.

Table III

Formation Tops (Wade, pers. comm.)

Formation	Depth
Banquereau	in casing
Wyandot	935m
Dawson Canyon	1156m
Petrel Mbr	1317-1328m
Logan Canyon	1396m
Marmora Mbr	1396m
Sable Mbr	1569m
Cree Mbr	1686m
Naskapi Mbr	2220m
Missisauga	2275m
upper mbr	2275m
"O" Marker	2378-2420m
middle mbr	2420m
Mic Mac	2972m
Top OP approx	4870m
T.D.	5703m

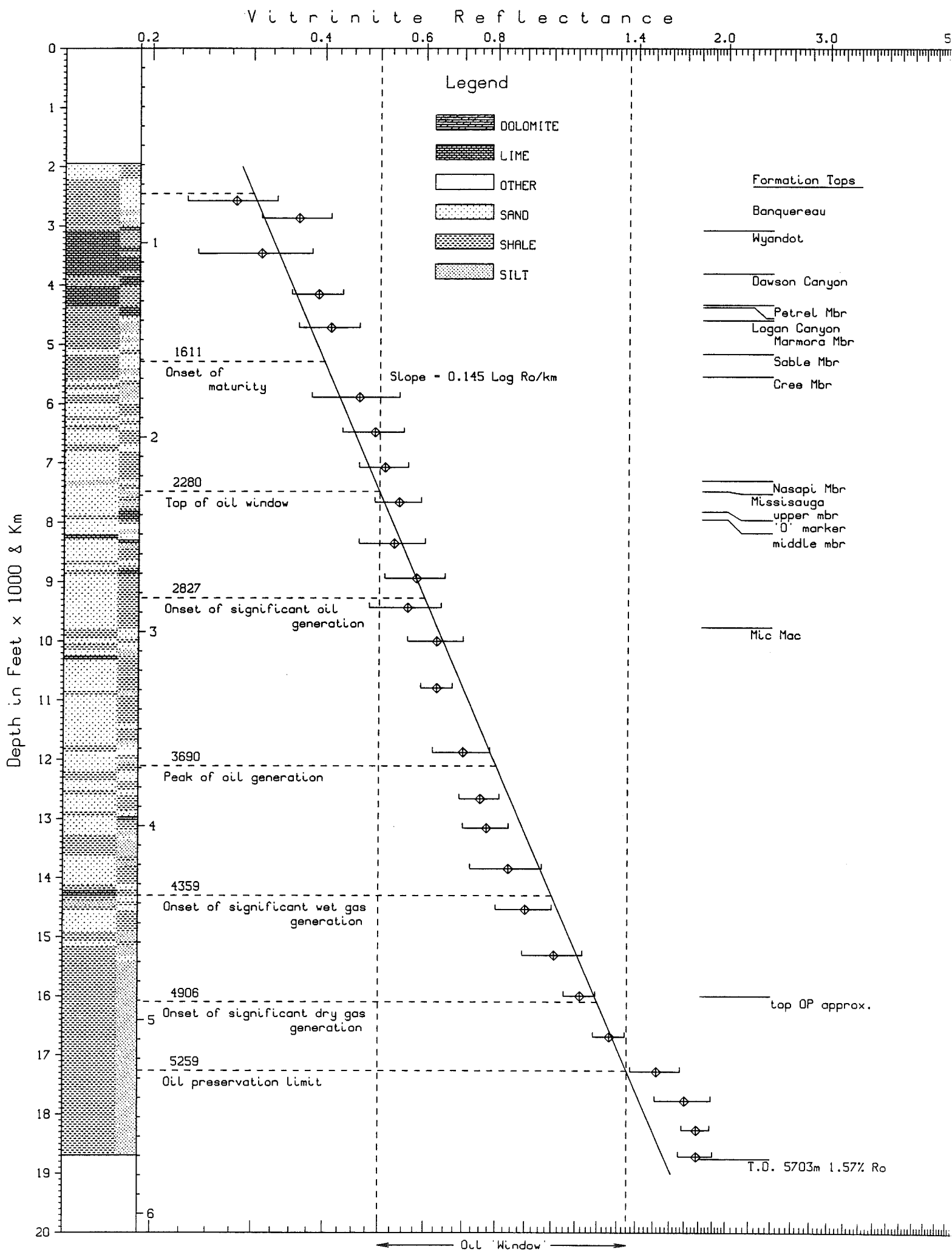


Fig. 1 West Esperanto B-78 < Maturation Profile

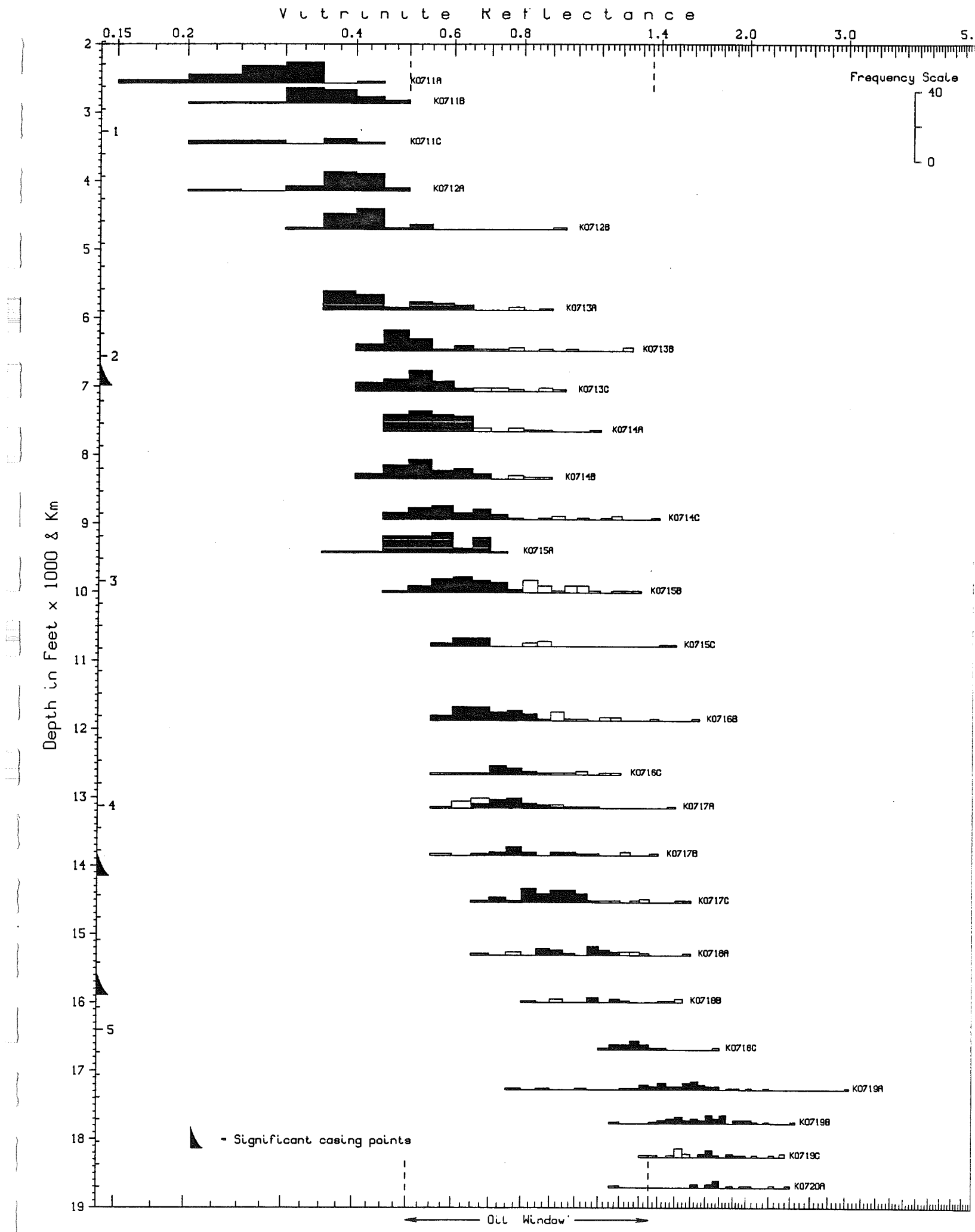


Fig. 2 West Esperanto B-78 H stograms >

APPENDIX I

Sample Preparation Method

COGLA Lab preparation

Preliminary Wash
Samples dried in oven
Split: a. all of coarse to Petrology Lab
b. ½ medium to Palynology Lab
c. rest of medium and all of fine combined for Micropaleo Lab
Split "b" is delivered to Palynology Lab and treated as follows:

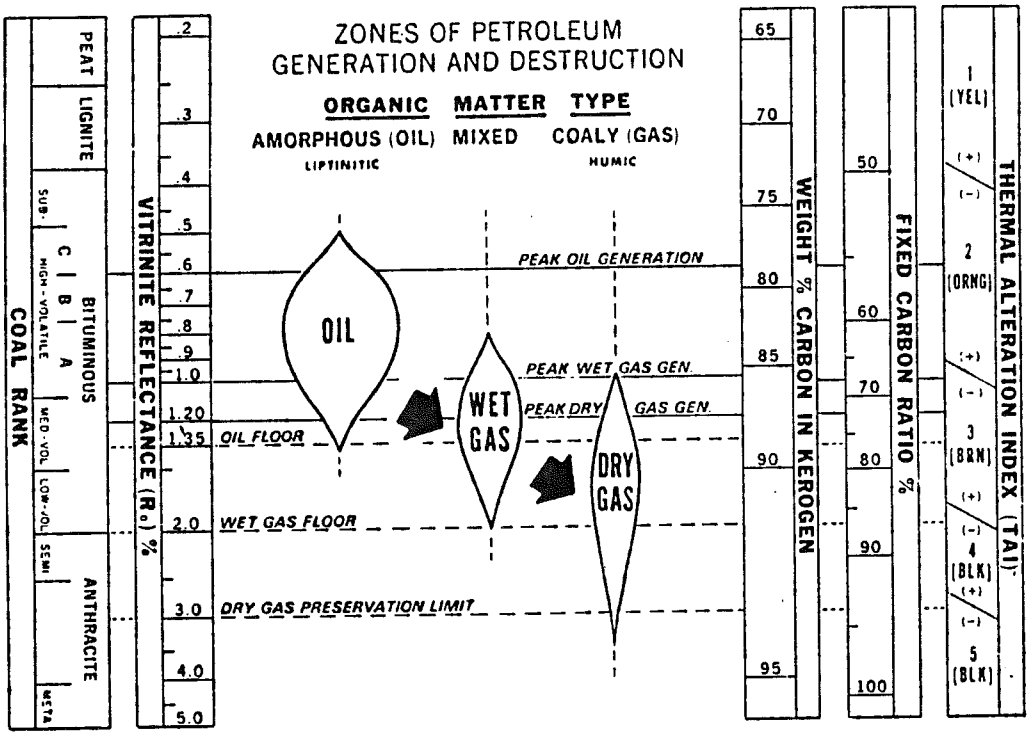
PALYNOLOGY Lab preparation

20-30 grams placed in 250 ml plastic beaker.
Add 10% HC1 till reaction ceases (removes carbonates).
Washed (rinsed) 3 times.
Conc. HF overnight (removes silicates).
Washed (rinsed) 3 times.
Heated (60-65°C) conc. HC1 (remove fluorides caused by HF).
Washed 3 times.
Then put into 15 ml test tube with 4-5 ml 4% Alconox.
Differential centrifuge at 1500 rpm for 90 sec.
Decant.
Wash 3 times with centrifuging.
Float off organic fraction using 2.0 S.G. Znbr solution.
Centrifuge 1000 rpm, 8 min.
Float fraction into second test tube.
Wash 3 times with centrifuging.
Kerogen smear slide made.
Remaining kerogen material delivered to Vitrinite Reflectance Lab.

VITRINITE REFLECTANCE Lab preparation

Excess water pipetted off.
Freeze dried.
Mounted using epoxy resin (EPO-TEK 301) in predrilled plastic stubs.
Polished using modified coal petrology polishing methods.
Examined under oil lens at approximately 800x mag'n.

Appendix II (Dow, 1977)



Note: In this report, the terminology used to describe the various maturation levels has been modified. The 'peak' designation, as used in this figure, has been changed to 'onset of significant' and 0.8 Ro is here used as the 'peak of oil generation' (Table I, Figure 1).

Appendix III

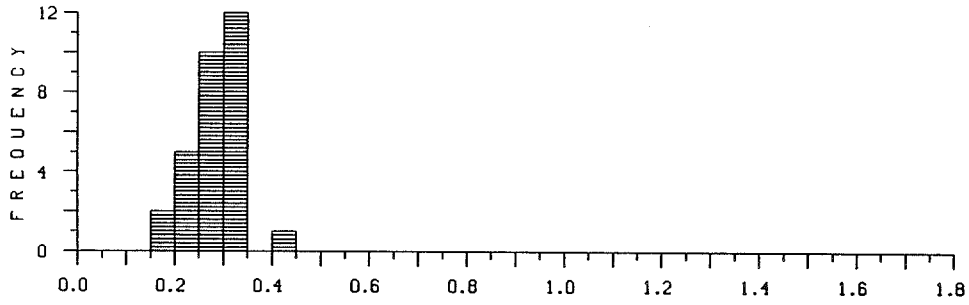
Sample Reports

K0711A,745-785M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.18<	.19<	.20<	.20<	.21<	.23<	.24<	.26<	.26<	.28<
1	.28<	.28<	.28<	.28<	.29<	.29<	.29<	.30<	.30<	.31<
2	.31<	.32<	.32<	.32<	.33<	.33<	.33<	.33<	.34<	.43<

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.28	.05	30	.18	.43	8.51
EDIT<	.28	.05	30	.18	.43	8.51

REFLECTANCE HISTOGRAM

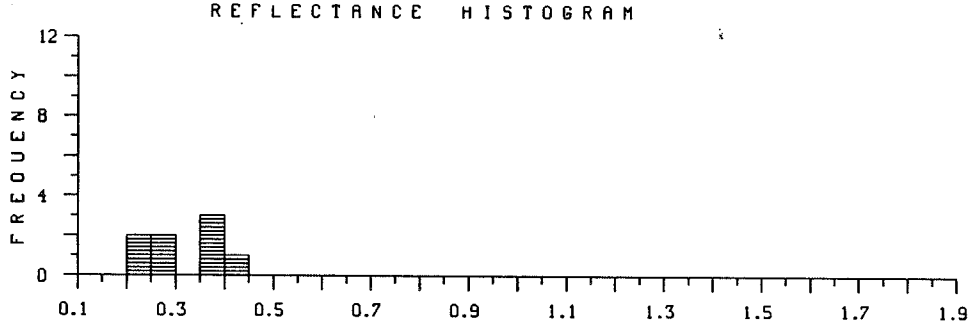


K0711C,1015-1055M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.22<	.24<	.26<	.29<	.35<	.35<	.36<	.40<		

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.31	.07	8	.22	.40	2.47
EDIT<	.31	.07	8	.22	.40	2.47

REFLECTANCE HISTOGRAM

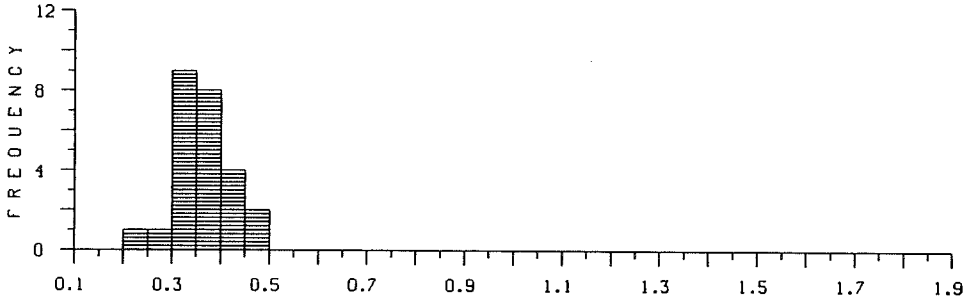


K0711B,865-875M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.24<	.29<	.30<	.31<	.32<	.32<	.33<	.34<	.34<	.34<
1	.34<	.35<	.36<	.37<	.37<	.38<	.38<	.39<	.39<	.40<
2	.41<	.41<	.44<	.45<	.48<					

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.36	.05	25	.24	.48	9.05
EDIT<	.36	.05	25	.24	.48	9.05

REFLECTANCE HISTOGRAM

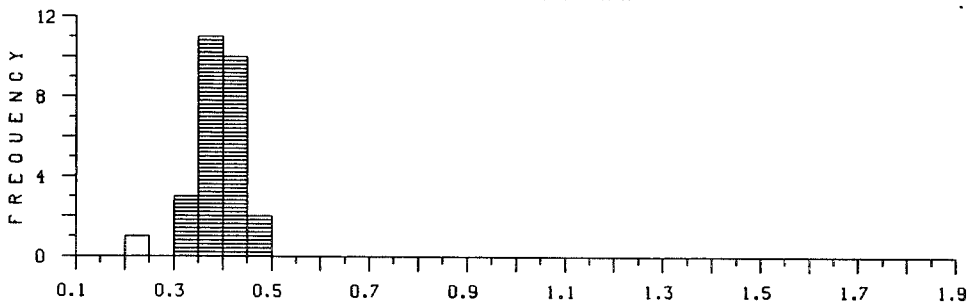


K0712A,1225-1265M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.24	.33<	.33<	.34<	.35<	.35<	.35<	.36<	.36<	.36<
1	.37<	.37<	.38<	.39<	.39<	.40<	.40<	.41<	.41<	.41<
2	.41<	.42<	.42<	.42<	.44<	.45<	.45<			

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.38	.05	27	.24	.45	10.31
EDIT<	.39	.04	26	.33	.45	10.07

REFLECTANCE HISTOGRAM

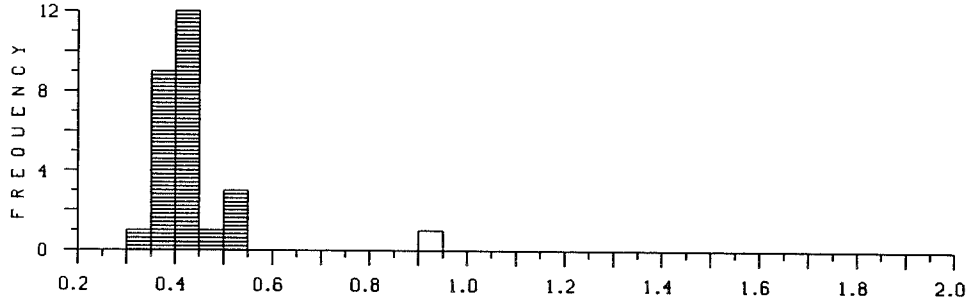


K0712B,1395-1435M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.32<	.35<	.35<	.38<	.38<	.38<	.39<	.39<	.39<	.39<
1	.40<	.40<	.40<	.41<	.41<	.41<	.41<	.41<	.42<	.42<
2	.43<	.43<	.46<	.50<	.51<	.52<	.91			

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.43	.11	27	.32	.91	11.57
EDIT<	.41	.05	26	.32	.52	10.66

REFLECTANCE HISTOGRAM

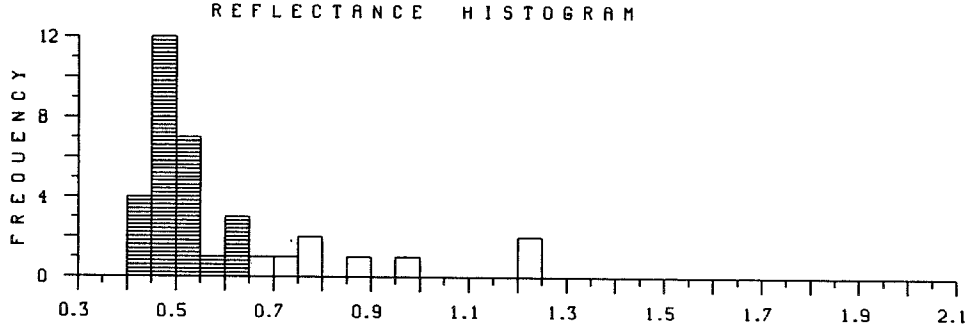


K0713B,1935-1975M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.40<	.42<	.42<	.43<	.45<	.45<	.45<	.46<	.46<	.47<
1	.48<	.48<	.48<	.48<	.49<	.49<	.50<	.50<	.50<	.51<
2	.51<	.51<	.53<	.59<	.60<	.60<	.63<	.67	.72	.76
3	.78	.87	.95	1.20	1.24					

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.59	.21	35	.40	1.24	20.48
EDIT<	.49	.06	27	.40	.63	13.29

REFLECTANCE HISTOGRAM

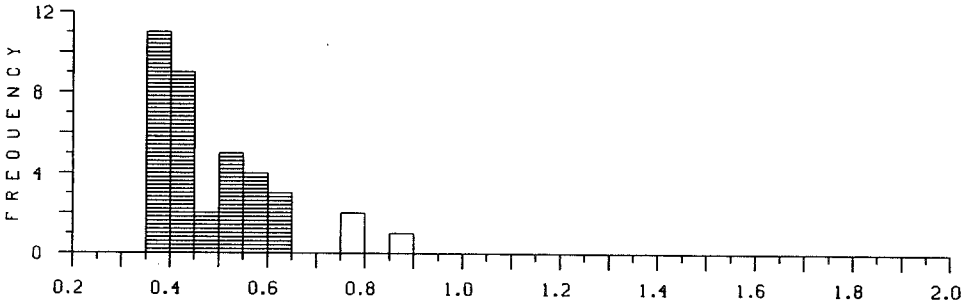


K0713A,1755-1795M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.35<	.36<	.36<	.37<	.37<	.38<	.39<	.39<	.39<	.39<
1	.39<	.40<	.41<	.41<	.42<	.42<	.43<	.43<	.43<	.44<
2	.47<	.47<	.50<	.50<	.53<	.54<	.54<	.55<	.55<	.57<
3	.58<	.60<	.61<	.64<	.75	.77	.86			

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.49	.12	37	.35	.86	17.96
EDIT<	.46	.08	34	.35	.64	15.58

REFLECTANCE HISTOGRAM

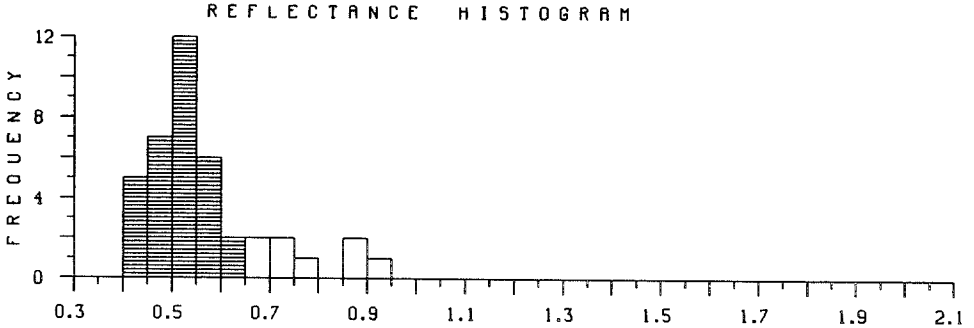


K0713C,2115-2155M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.43<	.43<	.43<	.44<	.44<	.46<	.46<	.47<	.47<	.48<
1	.49<	.49<	.50<	.50<	.50<	.51<	.51<	.52<	.52<	.52<
2	.52<	.53<	.54<	.54<	.55<	.55<	.56<	.57<	.57<	.59<
3	.62<	.64<	.69	.69	.70	.72	.75	.88	.89	.94

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.57	.13	40	.43	.94	22.61
EDIT<	.51	.05	32	.43	.64	16.35

REFLECTANCE HISTOGRAM

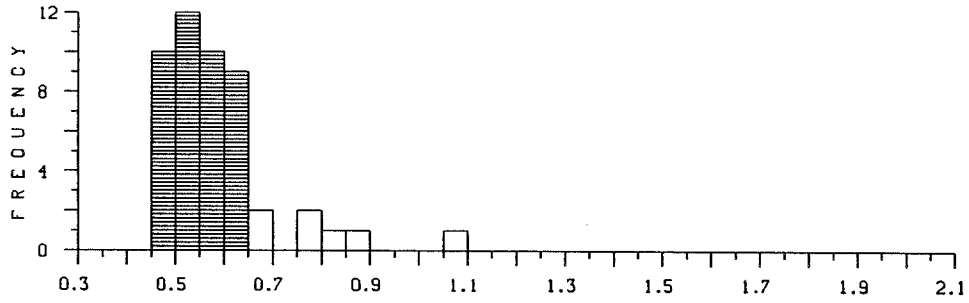


KO714A,2295-2335M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.45<	.46<	.46<	.46<	.47<	.47<	.48<	.48<	.49<	.49<
1	.50<	.50<	.51<	.51<	.51<	.52<	.52<	.53<	.53<	.53<
2	.54<	.54<	.55<	.56<	.56<	.56<	.56<	.57<	.58<	.58<
3	.59<	.59<	.60<	.60<	.60<	.60<	.60<	.61<	.61<	.61<
4	.63<	.69	.69	.76	.79	.80	.88	1.08		

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.58	.12	48	.45	1.08	27.80
EDIT<	.54	.05	41	.45	.63	22.11

REFLECTANCE HISTOGRAM

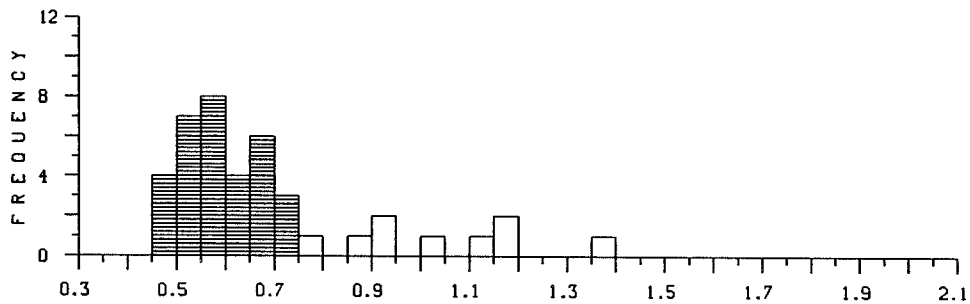


KO714C,2685-2725M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.46<	.47<	.47<	.49<	.50<	.51<	.51<	.52<	.52<	.54<
1	.54<	.55<	.55<	.56<	.57<	.57<	.57<	.58<	.58<	.60<
2	.61<	.61<	.62<	.65<	.65<	.65<	.66<	.68<	.69<	.70<
3	.71<	.72<	.78	.86	.90	.94	1.01	1.11	1.15	1.17
4	1.36									

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.68	.22	41	.46	1.36	27.89
EDIT<	.58	.07	32	.46	.72	18.61

REFLECTANCE HISTOGRAM

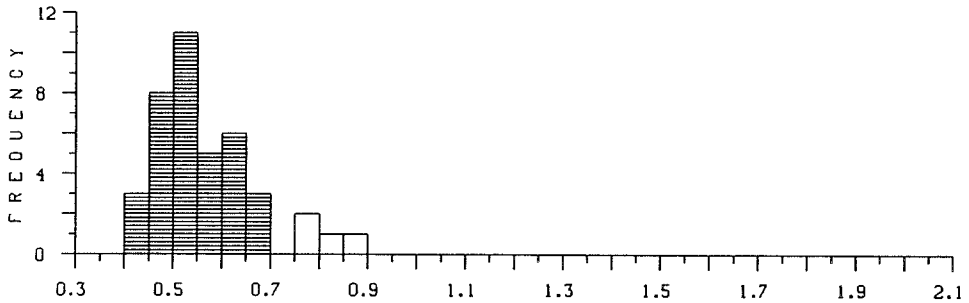


KO714B,2505-2545M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.40<	.40<	.44<	.46<	.47<	.47<	.48<	.48<	.48<	.48<
1	.49<	.50<	.50<	.51<	.51<	.51<	.52<	.52<	.52<	.53<
2	.53<	.54<	.55<	.55<	.55<	.56<	.59<	.60<	.60<	.60<
3	.62<	.63<	.64<	.65<	.66<	.66<	.76	.78	.80	.86

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.56	.10	40	.40	.86	22.40
EDIT<	.53	.07	36	.40	.66	19.20

REFLECTANCE HISTOGRAM

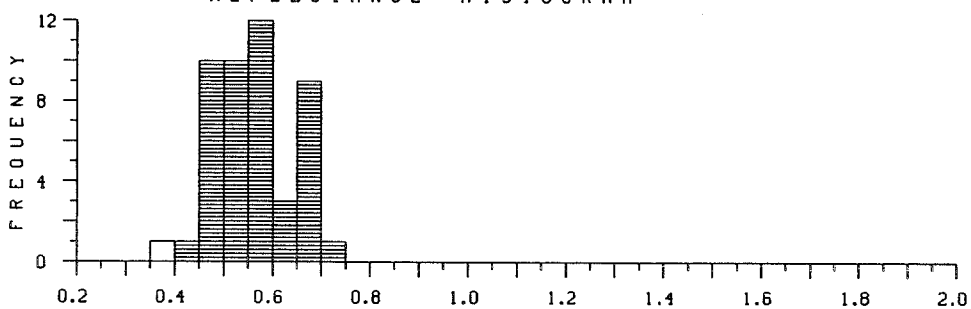


KO715A,2835-2875M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.38	.43<	.45<	.45<	.46<	.46<	.46<	.46<	.46<	.47<
1	.47<	.47<	.50<	.50<	.51<	.52<	.52<	.52<	.53<	.53<
2	.54<	.54<	.55<	.56<	.56<	.57<	.57<	.57<	.58<	.58<
3	.58<	.59<	.59<	.59<	.60<	.61<	.61<	.65<	.65<	.65<
4	.65<	.66<	.66<	.67<	.67<	.68<	.71<			

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.55	.08	47	.38	.71	25.99
EDIT<	.56	.08	46	.43	.71	25.61

REFLECTANCE HISTOGRAM

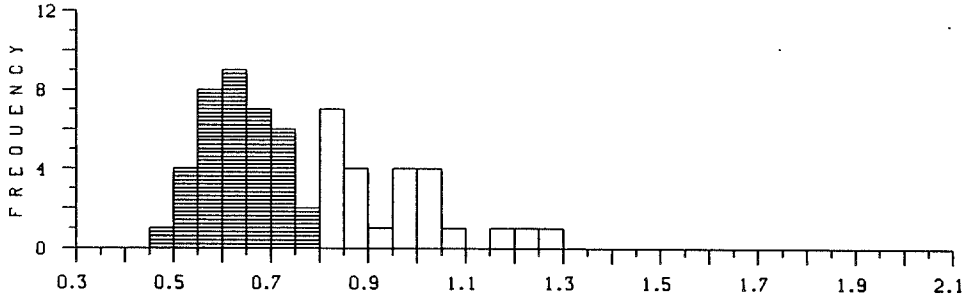


K0715B,3010-3050M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.48<	.52<	.52<	.53<	.53<	.55<	.55<	.56<	.56<	.57<
1	.57<	.59<	.59<	.60<	.60<	.60<	.61<	.62<	.62<	.62<
2	.64<	.64<	.65<	.66<	.69<	.69<	.69<	.69<	.69<	.70<
3	.70<	.71<	.71<	.72<	.74<	.75<	.76<	.80	.81	.81
4	.81	.83	.84	.84	.85	.87	.87	.88	.93	.95
5	.95	.99	.99	1.00	1.02	1.03	1.04	1.06	1.17	1.24
6	1.25									

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.75	.19	61	.48	1.25	46.05
EDIT<	.63	.07	37	.48	.76	23.22

REFLECTANCE HISTOGRAM

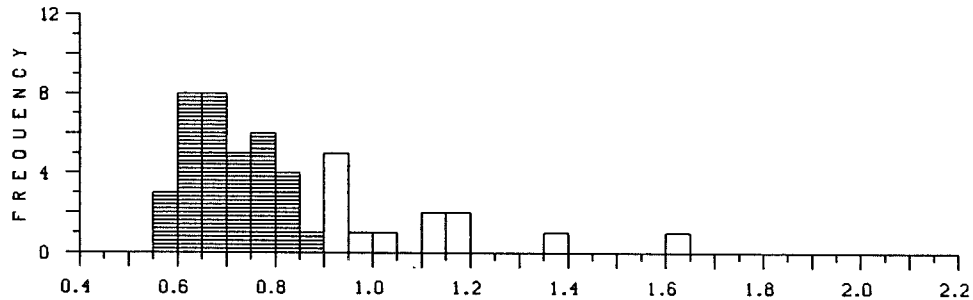


K0716B,3580-3620M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.56<	.57<	.59<	.60<	.60<	.61<	.62<	.62<	.62<	.64<
1	.64<	.65<	.67<	.67<	.67<	.67<	.68<	.68<	.69<	.70<
2	.71<	.72<	.73<	.74<	.75<	.75<	.76<	.78<	.78<	.78<
3	.81<	.83<	.83<	.83<	.85<	.91	.91	.94	.94	.94
4	.95	1.01	1.14	1.14	1.15	1.18	1.35	1.63		

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.80	.22	48	.56	1.63	38.59
EDIT<	.70	.08	35	.56	.85	24.40

REFLECTANCE HISTOGRAM

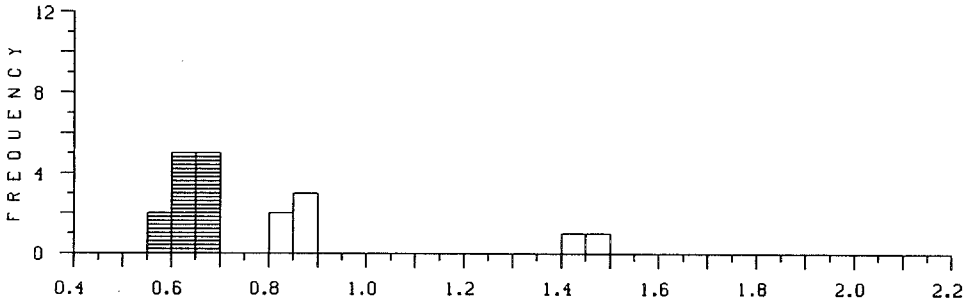


K0715C,3250-3290M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.56<	.56<	.60<	.62<	.62<	.64<	.64<	.65<	.65<	.67<
1	.68<	.69<	.83	.84	.87	.87	.88	1.42	1.46	

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.78	.26	19	.56	1.46	14.75
EDIT<	.63	.04	12	.56	.69	7.58

REFLECTANCE HISTOGRAM

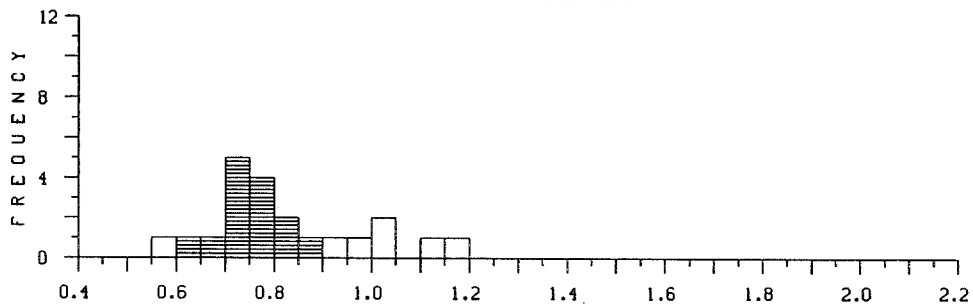


K0716C,3820-3860M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.56	.64<	.68<	.71<	.72<	.73<	.74<	.74<	.75<	.77<
1	.78<	.79<	.80<	.84<	.85<	.94	.95	1.00	1.02	1.11
2	1.19									

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.82	.16	21	.56	1.19	17.31
EDIT<	.75	.06	14	.64	.85	10.54

REFLECTANCE HISTOGRAM

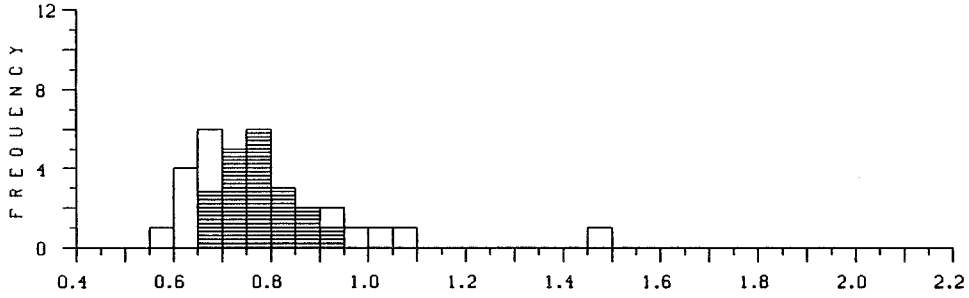


K0717A,3970-4010M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.58	.60	.61	.64	.64	.65	.65	.66	.69<	.69<
1	.69<	.70<	.71<	.73<	.73<	.73<	.75<	.76<	.78<	.78<
2	.78<	.79<	.80<	.82<	.83<	.88<	.89<	.90<	.93	.97
3	1.00	1.09	1.49							

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.79	.18	33	.58	1.49	25.94
EDIT<	.77	.07	20	.69	.90	15.43

REFLECTANCE HISTOGRAM

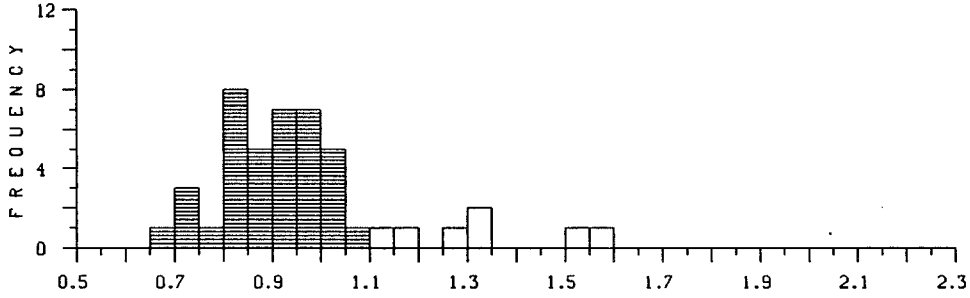


K0717C,4390-4430M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.68<	.73<	.73<	.74<	.78<	.81<	.82<	.83<	.83<	.83<
1	.83<	.84<	.84<	.86<	.87<	.88<	.88<	.89<	.90<	.90<
2	.91<	.91<	.91<	.93<	.94<	.96<	.97<	.97<	.98<	.99<
3	.99<	.99<	1.00<	1.02<	1.02<	1.03<	1.04<	1.09<	1.13	1.16
4	1.28	1.30	1.33	1.54	1.57					

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.97	.19	45	.68	1.57	43.43
EDIT<	.90	.10	38	.68	1.09	34.12

REFLECTANCE HISTOGRAM

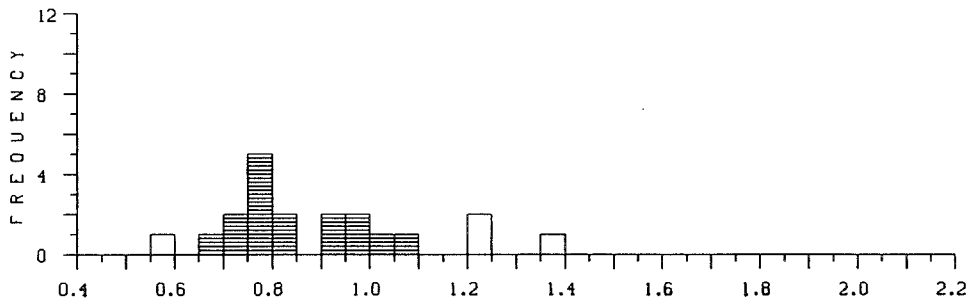


K0717B,4180-4220M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.58	.69<	.73<	.73<	.75<	.76<	.76<	.77<	.77<	.83<
1	.84<	.94<	.94<	.95<	.96<	1.00<	1.07<	1.20	1.23	1.39

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.89	.20	20	.58	1.39	17.89
EDIT<	.84	.12	16	.69	1.07	13.49

REFLECTANCE HISTOGRAM

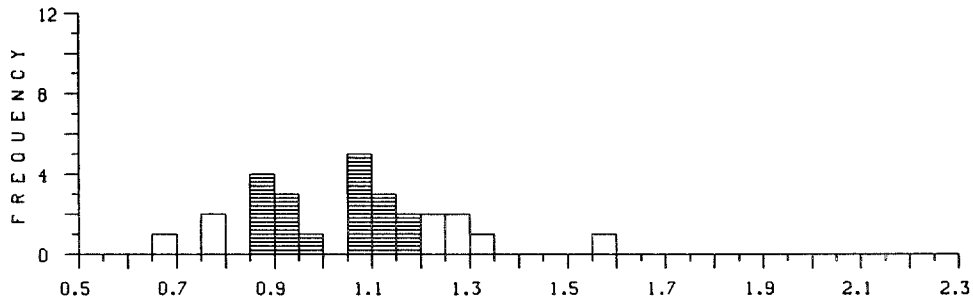


K0718A,4625-4665M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.69	.78	.79	.85<	.85<	.85<	.85<	.91<	.91<	.94<
1	.96<	1.07<	1.07<	1.07<	1.09<	1.09<	1.10<	1.12<	1.12<	1.15<
2	1.16<	1.20	1.20	1.26	1.27	1.31	1.56			

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	1.05	.20	27	.69	1.56	28.22
EDIT<	1.01	.12	18	.85	1.16	18.16

REFLECTANCE HISTOGRAM

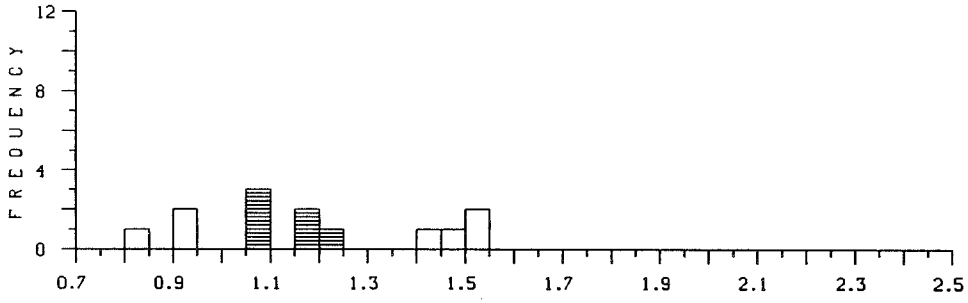


K0718B,4835-4875M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.80	.93	.94	1.05<	1.06<	1.06<	1.17<	1.17<	1.22<	1.42
1	1.45	1.50	1.53							

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	1.18	.24	13	.80	1.53	15.30
EDIT<	1.12	.07	6	1.05	1.22	6.73

REFLECTANCE HISTOGRAM

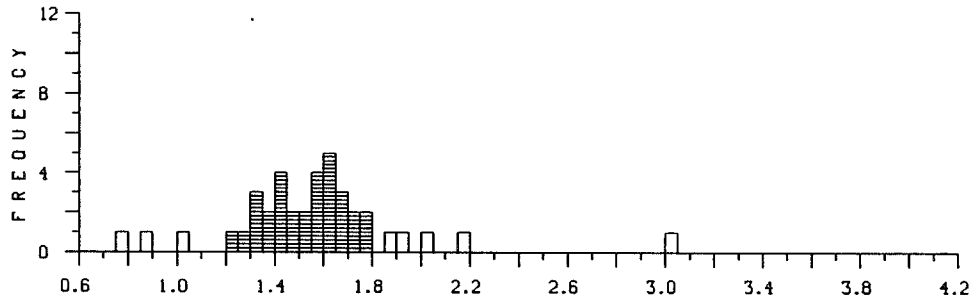


K0719A,5255-5265M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.76	.89	1.04	1.21<	1.28<	1.30<	1.32<	1.33<	1.37<	1.38<
1	1.40<	1.42<	1.42<	1.43<	1.47<	1.48<	1.52<	1.53<	1.55<	1.56<
2	1.56<	1.57<	1.60<	1.61<	1.63<	1.63<	1.64<	1.66<	1.67<	1.69<
3	1.73<	1.74<	1.76<	1.79<	1.87	1.92	2.00	2.18	3.00	

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	1.56	.36	39	.76	3.00	60.91
EDIT<	1.52	.15	31	1.21	1.79	47.25

REFLECTANCE HISTOGRAM

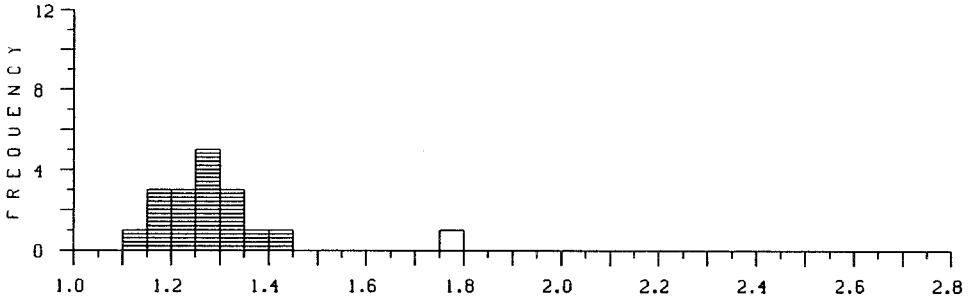


K0718C,5075-5085M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	1.14<	1.15<	1.15<	1.18<	1.20<	1.20<	1.23<	1.26<	1.26<	1.27<
1	1.29<	1.29<	1.31<	1.32<	1.32<	1.36<	1.43<	1.77		

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	1.29	.14	18	1.14	1.77	23.13
EDIT<	1.26	.08	17	1.14	1.43	21.36

REFLECTANCE HISTOGRAM

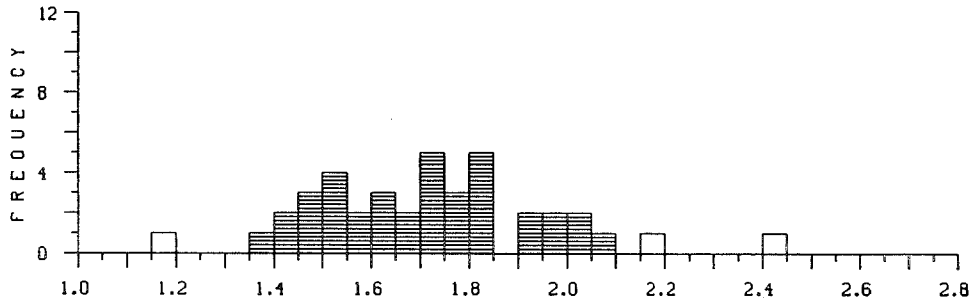


K0719B,5375-5415M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	1.17	1.35<	1.40<	1.42<	1.45<	1.48<	1.48<	1.50<	1.54<	1.54<
1	1.54<	1.57<	1.58<	1.63<	1.63<	1.64<	1.67<	1.67<	1.70<	1.73<
2	1.74<	1.74<	1.74<	1.77<	1.79<	1.79<	1.80<	1.81<	1.81<	1.82<
3	1.82<	1.90<	1.91<	1.96<	1.99<	2.03<	2.04<	2.05<	2.18	2.44

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	1.72	.24	40	1.17	2.44	68.82
EDIT<	1.70	.19	37	1.35	2.05	63.03

REFLECTANCE HISTOGRAM

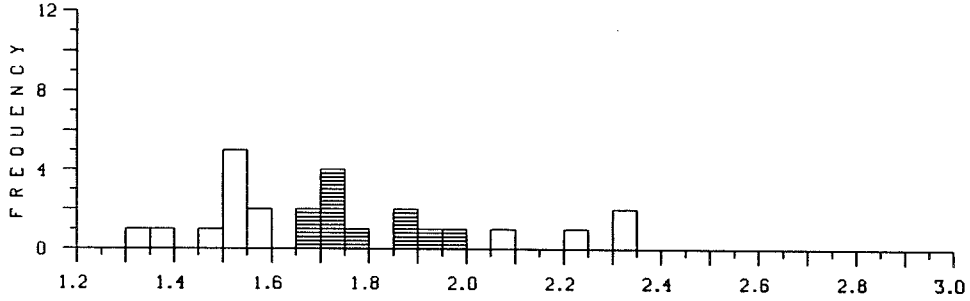


KO719C,5525-5565M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	1.32	1.39	1.49	1.50	1.51	1.52	1.53	1.53	1.55	1.56
1	1.66<	1.66<	1.70<	1.71<	1.72<	1.74<	1.79<	1.85<	1.87<	1.91<
2	1.95<	2.09	2.22	2.30	2.33					

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	1.74	.27	25	1.32	2.33	43.40
EDIT<	1.78	.10	11	1.66	1.95	19.56

REFLECTANCE HISTOGRAM



KO720A,5695-5702M,WEST ESPERANTO B-78

COL >	1	2	3	4	5	6	7	8	9	0
ROW	1.17	1.60<	1.60<	1.72<	1.74<	1.76<	1.77<	1.77<	1.78<	1.87<
1	1.95<	2.00<	2.21	2.35						

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	1.81	.28	14	1.17	2.35	25.29
EDIT<	1.78	.12	11	1.60	2.00	19.56

REFLECTANCE HISTOGRAM