

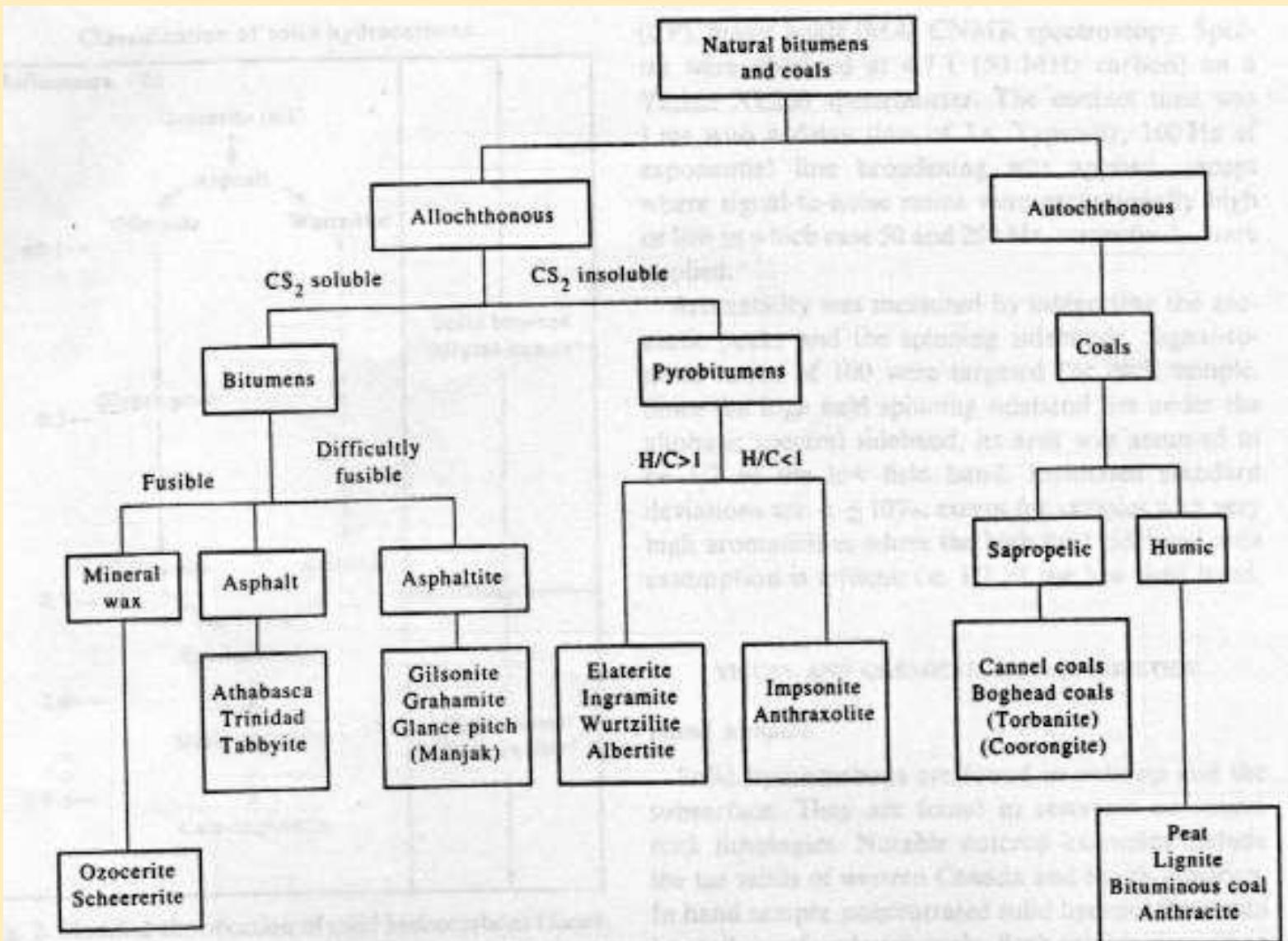
Nuevas Lineas de Investigacion

DECLARACION - DISCLAIMER

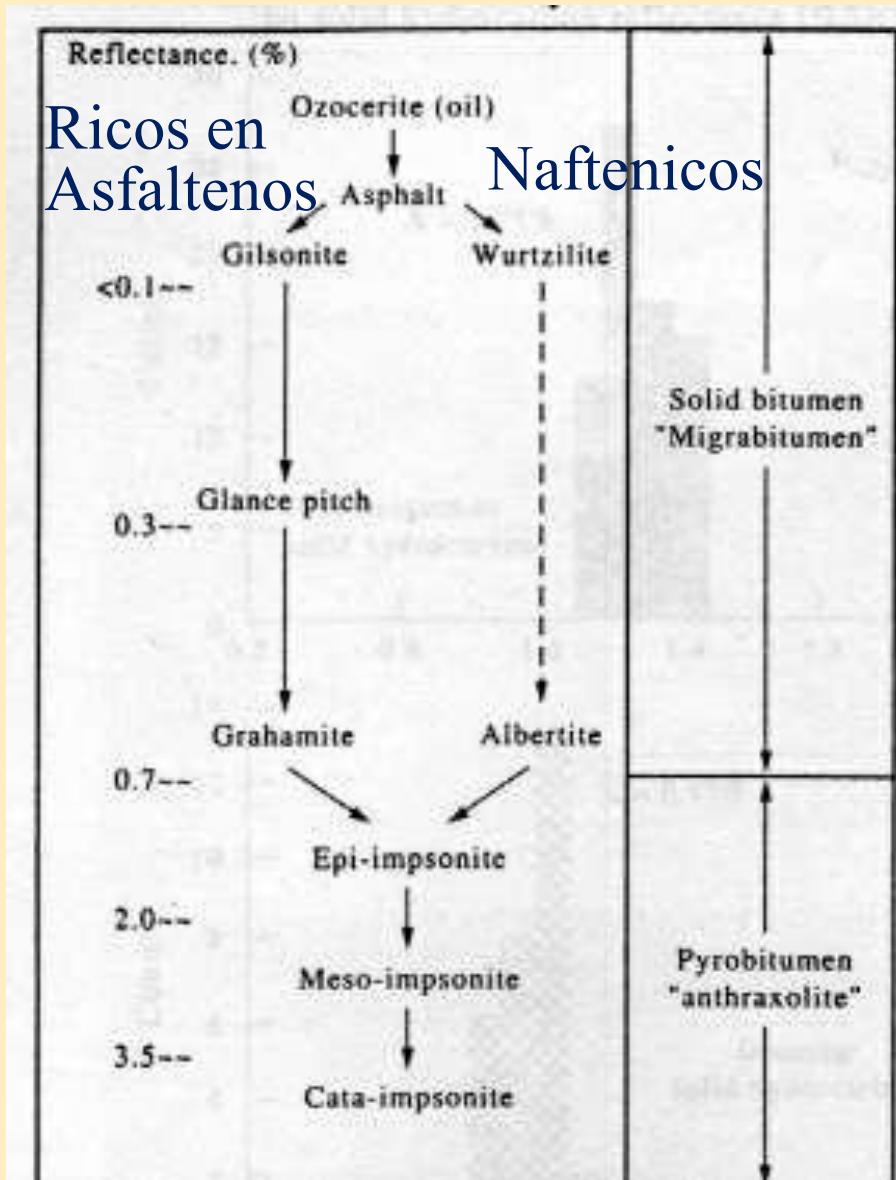
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Clasificación de Bitumenes



Clasificación de Bitumenes



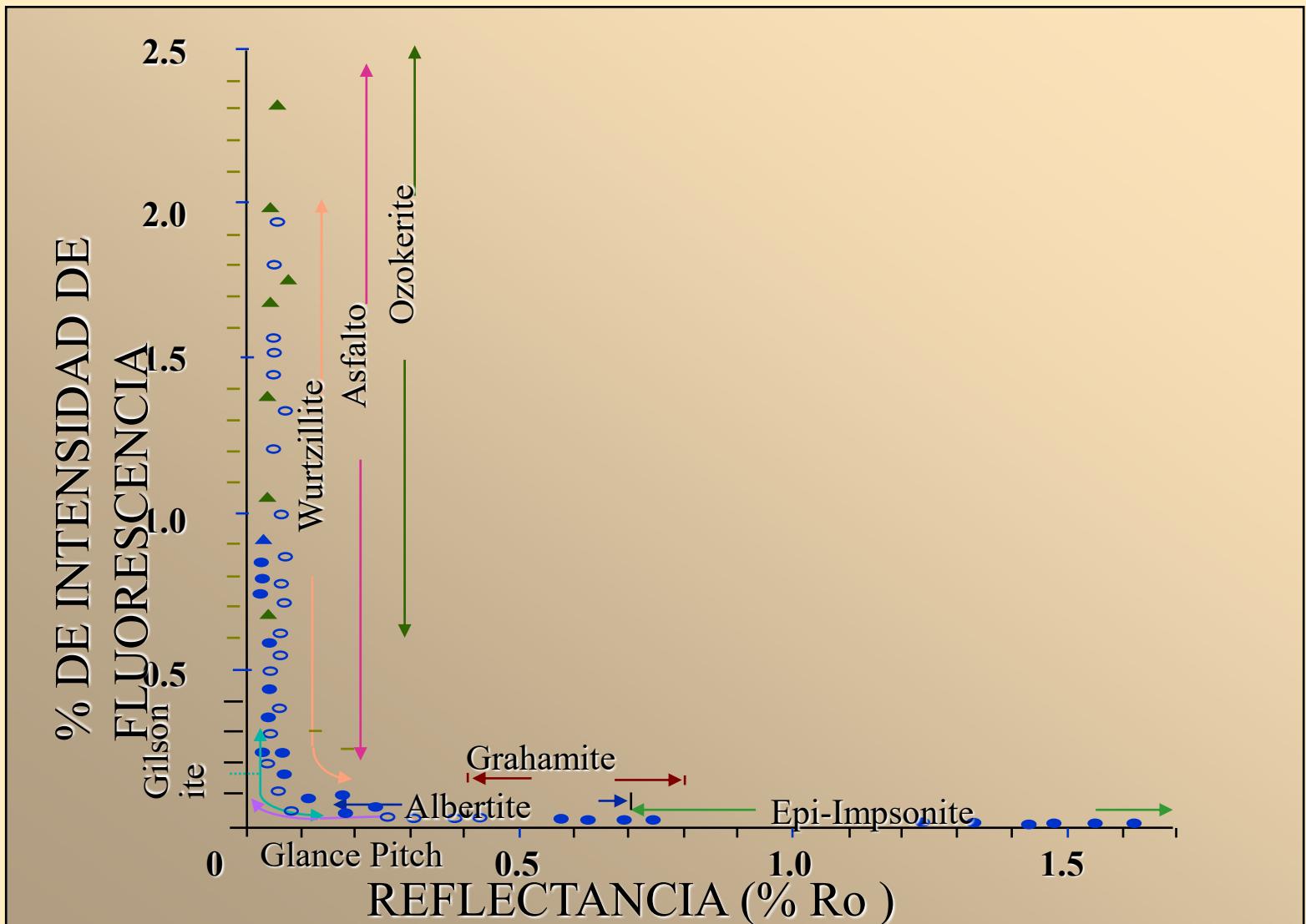
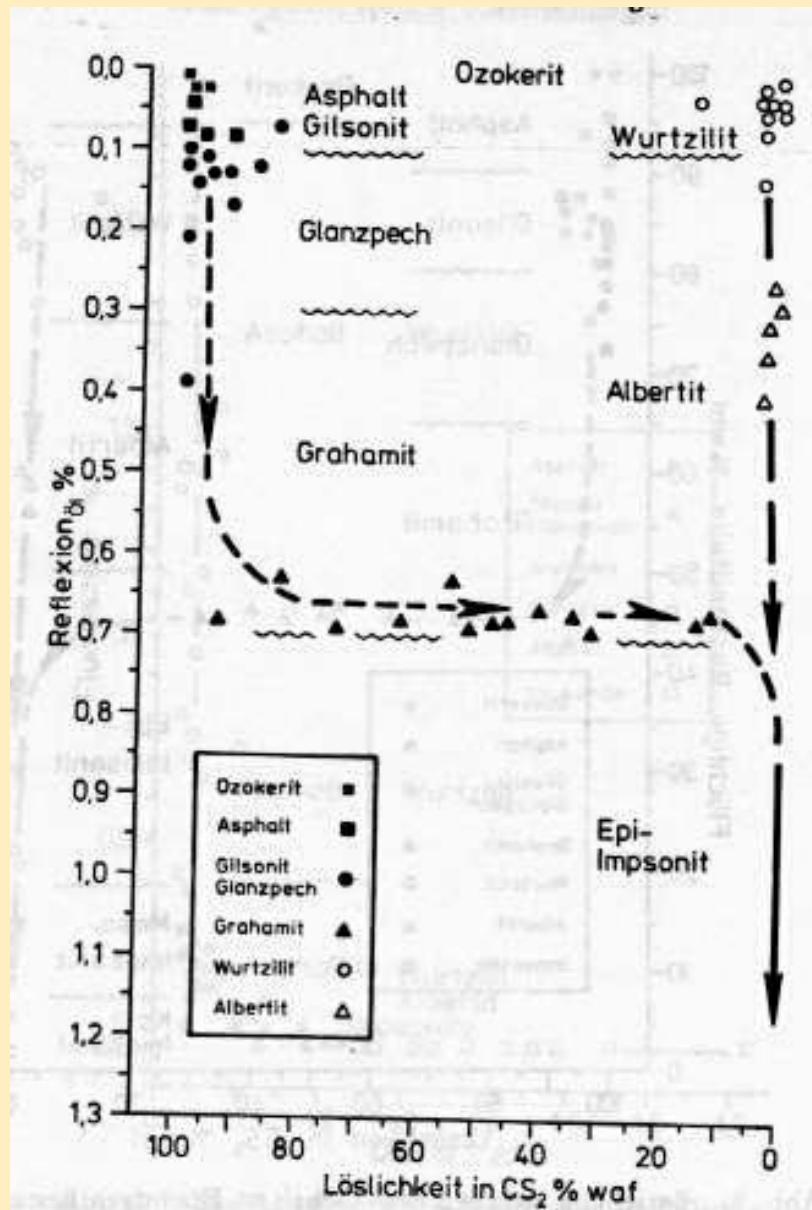


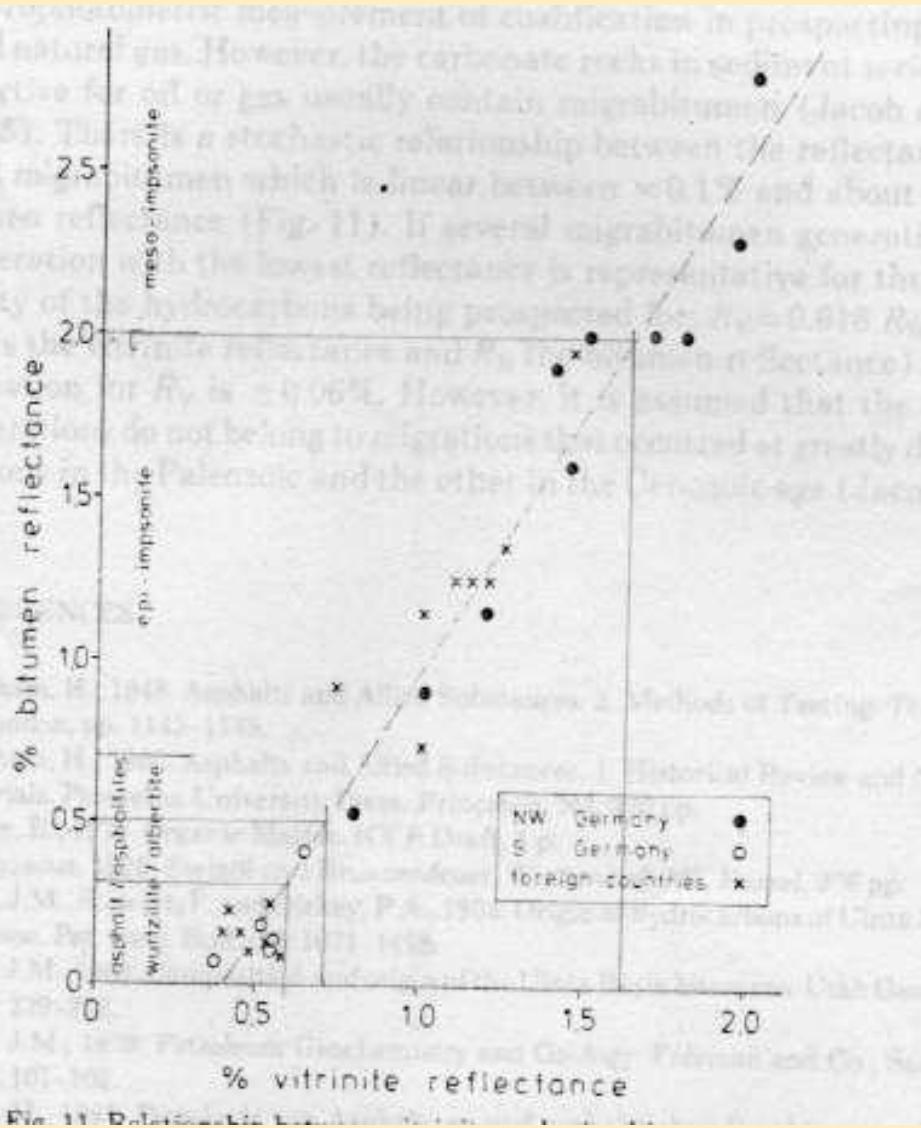
Fig. XX. Intensidad de la Fluorescencia de bitumenes en función de su Reflectancia
 (Tomado de Jacob, 1976)

Grupo	Subgrupo	Maceral
		Ozocerite
		Asphalt
Migrabitumen	Asphaltite	Gilsonite Glance pitch Grahamite
		Wurtzilite Albertite
	Impesonite	Epi-impesonite Meso-impesonite Cata-impesonite

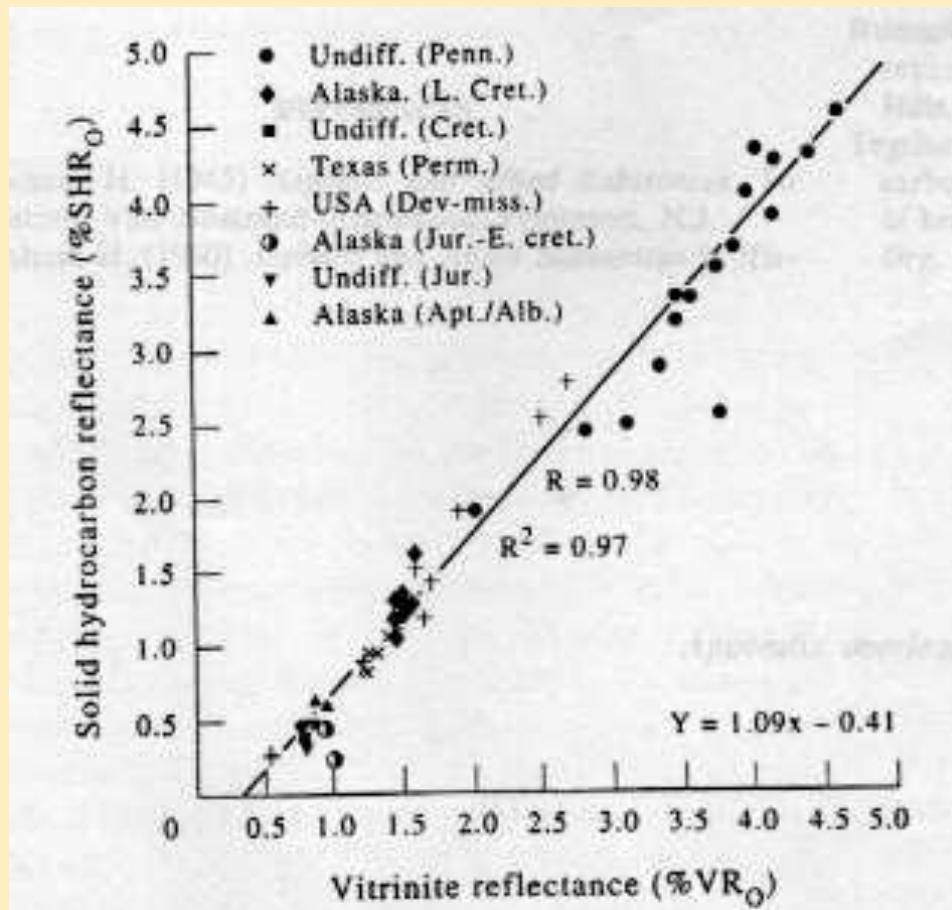
Maceral	% Reflectancia Random (Oil)	Densidad
Ozocerite	< 0,01 -0,02	0,80 - 0,90
Asphalt	0,02 -0,07	1,00 - 1,10
Gilsonite	0,07 - 0,11	1,00 - 1,10
Glance pitch	0,11 - 0,30	1,10 - 1,15
Grahamite	0,30 - 0,70	1,15 - 1,25
Wurtzilite	< 0,01 -0,10	1,00 - 1,10
Albertite	0,1- 0,7	1,10 - 1,20
Epi-impesonite	0,70 - 2,00	1,20 - 1,70
Meso-impesonite	2,00 - 3,50	
Cata-impesonite	3,50 - 10,0	

Variación de la solubilidad en función de la reflectancia





$$Ro(\text{vitrinita}) = 0,618(Ro \text{ Solid Bitumen}) + 0,40$$



$$Y = 1,09VRo - 0,41$$

originating from the limestone

Table 2

Major Axis Equations for Relationships Between the Standardized Reflectance of Vitrinite (R_o std) and the R_o of Solid Bitumens (Proto- and Migrabitumen) for Gaspé Peninsula (A), Mingan Archipelago-Anticosti Island (B), Central St. Lawrence Lowlands (C), and Mackenzie Area (D)^a

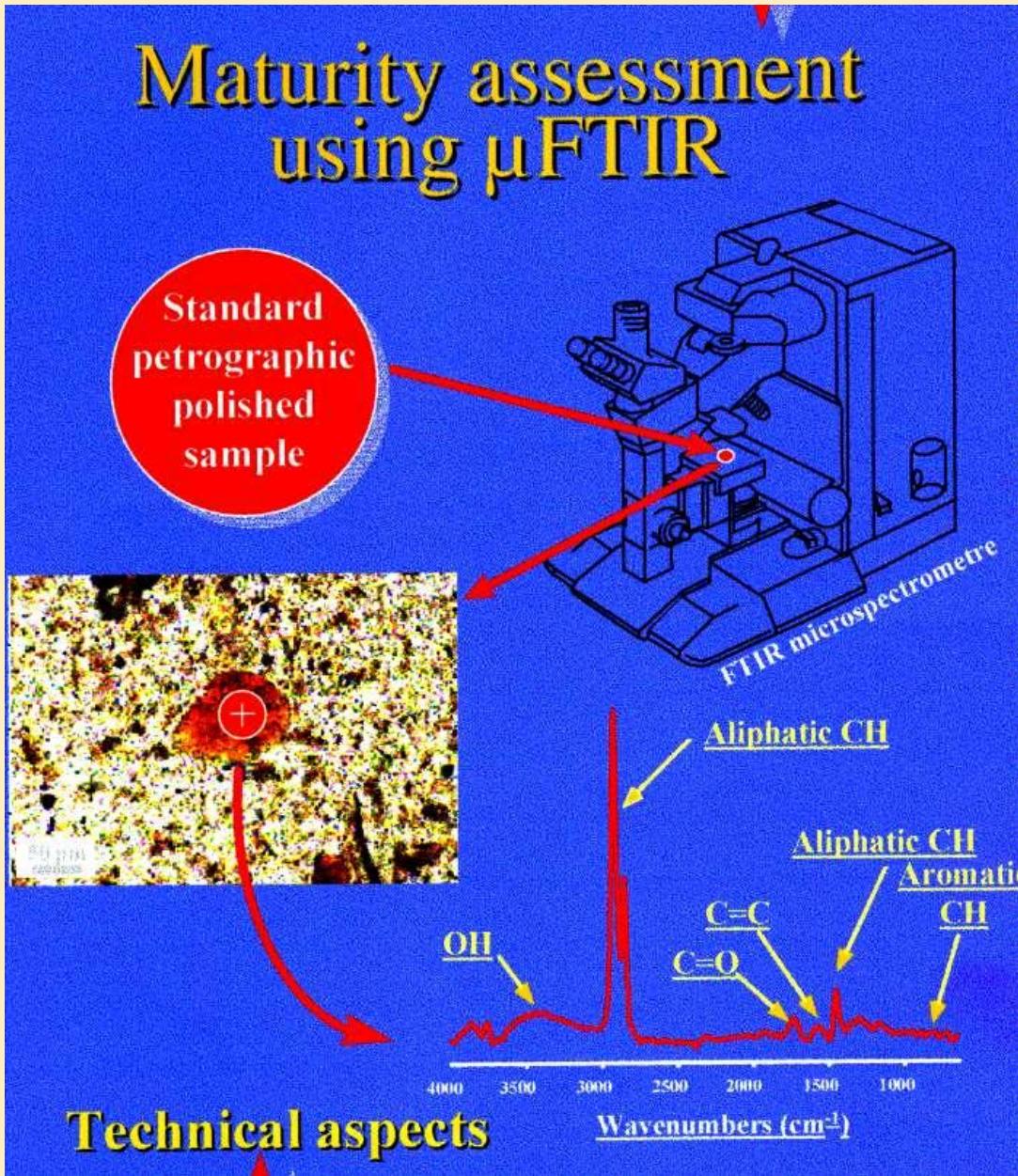
		Slope	Origin	<i>r</i>
A.	$\log (R_o \text{ std})$	$- 1.063 \times \log (R_{\text{omigra.limestone}})$	+	0.067
	$\log (R_o \text{ std})$	$- 0.718 \times \log (R_{\text{omigra.shale}})$	+	0.115
	$\log (R_o \text{ std})$	$- 0.719 \times \log (R_{\text{omigra.sandstone}})$	+	0.018
B.	$\log (R_o \text{ std})$	$- 0.904 \times \log (R_{\text{omigra.limestone}})$	+	0.097
	$\log (R_o \text{ std})$	$- 0.804 \times \log (R_{\text{omigra.marl}})$	+	0.073
C.	$\log (R_o \text{ std})$	$- 0.896 \times \log (R_{\text{omigra.limestone}})$	+	0.131
	$\log (R_o \text{ std})$	$- 0.734 \times \log (R_{\text{omigra.shale}})$	+	0.163
	$\log (R_o \text{ std})$	$- 0.801 \times \log (R_{\text{omigra.sandstone}})$	+	0.166
D.	$\log (R_o \text{ std})$	$- 0.922 \times \log (R_{\text{omigra.lms./shale}})$	+	0.087
	$\log (R_o \text{ std})$	$- 1.138 \times \log (R_{\text{omigra.sands./shale}})$	-	0.055

^aMigra. = migrabitumen, lms. = limestone, sh = shale. *r* = Pearson correlation coefficient.

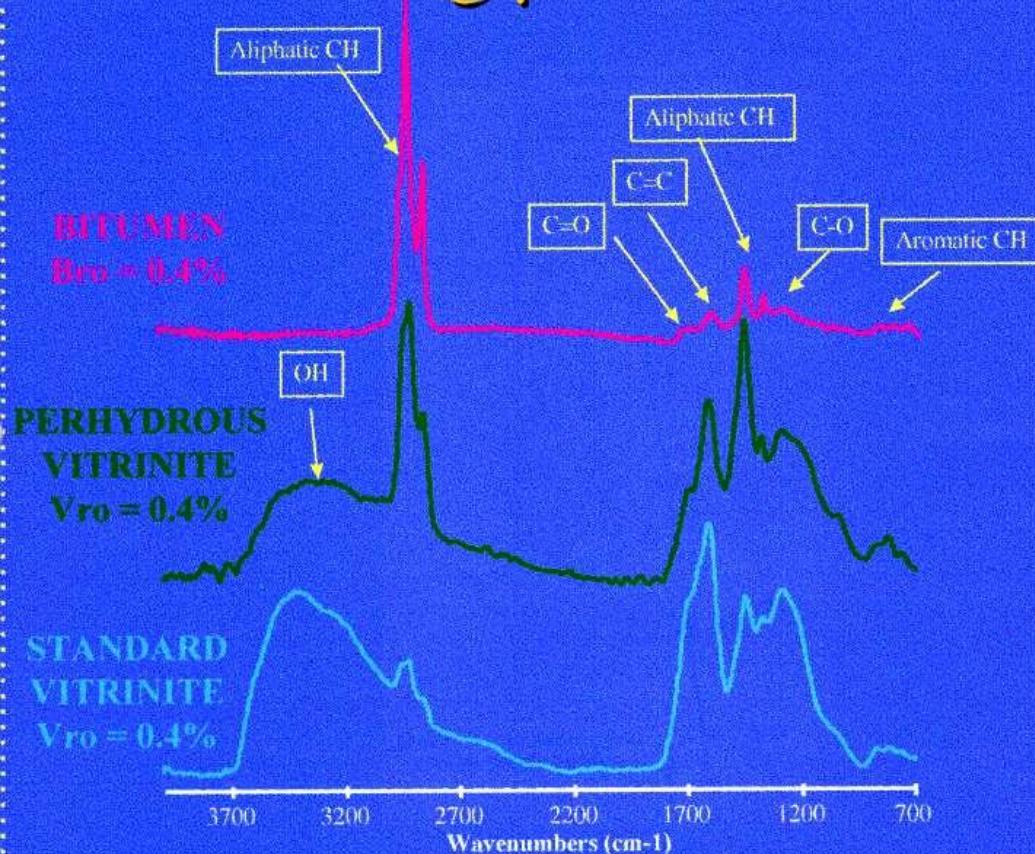
TECNICAS

- Microscopia Electrónica (M.E.B.)
 - electron retrodifuso
- Microscopia Electrónica de transmisión (M.E.T.)
- Microscopía de emisión ionica (SIMS)
- Espectroscopía Auger
- Microespectroscopía Infraroja (μ FTIR)
- Microscopía de fluorescencia laser por impulsos
- Mediciones de color
 - ICA/SPD
 - TCI

Microespectroscopía Infraroja (μ FTIR)



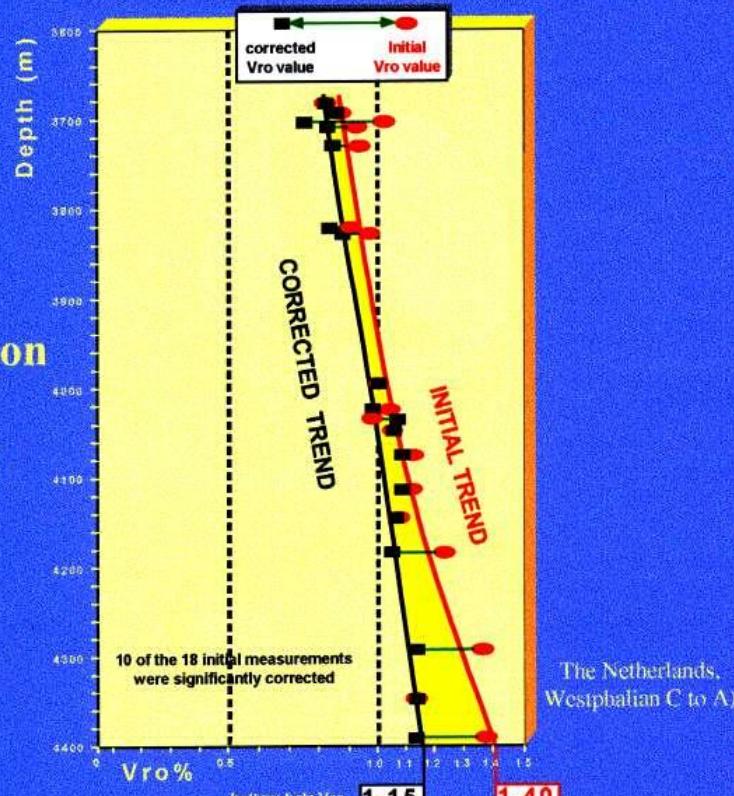
Maturity assessment using μ FTIR



Identification of optically undiscriminable
organic particles

Maturity assessment using μ FTIR

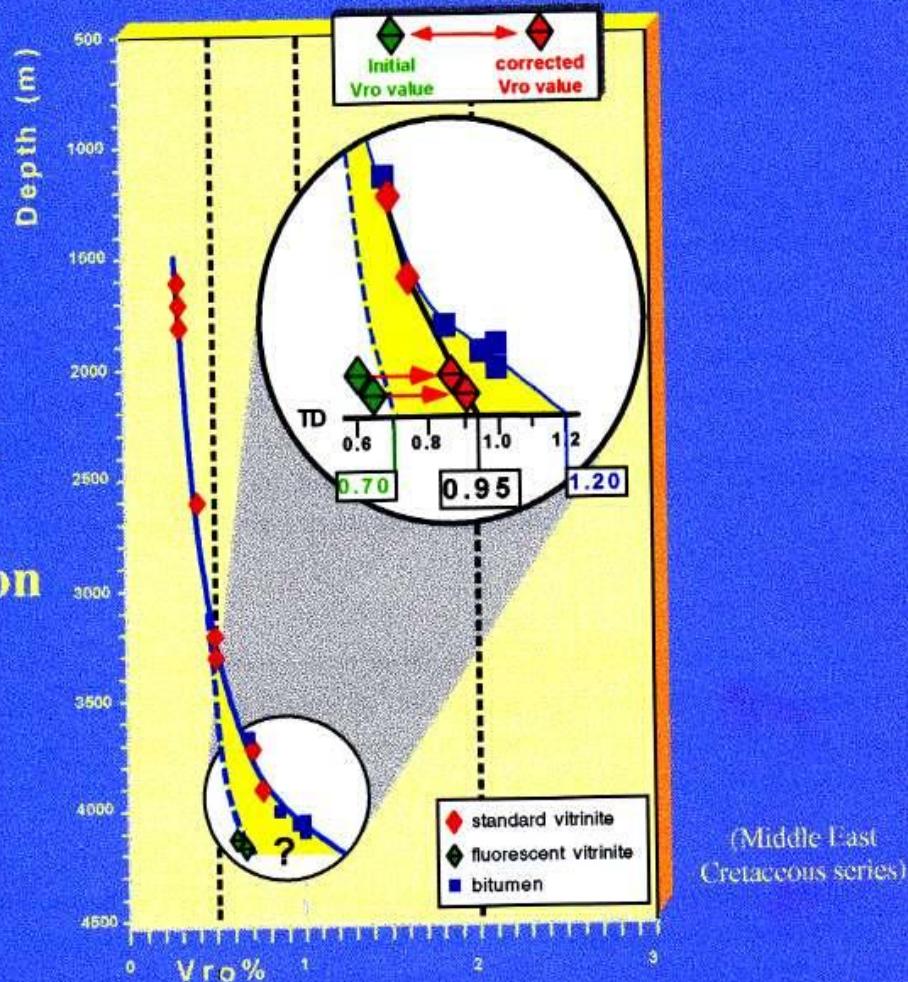
Vro
overestimation
due to
oxidation



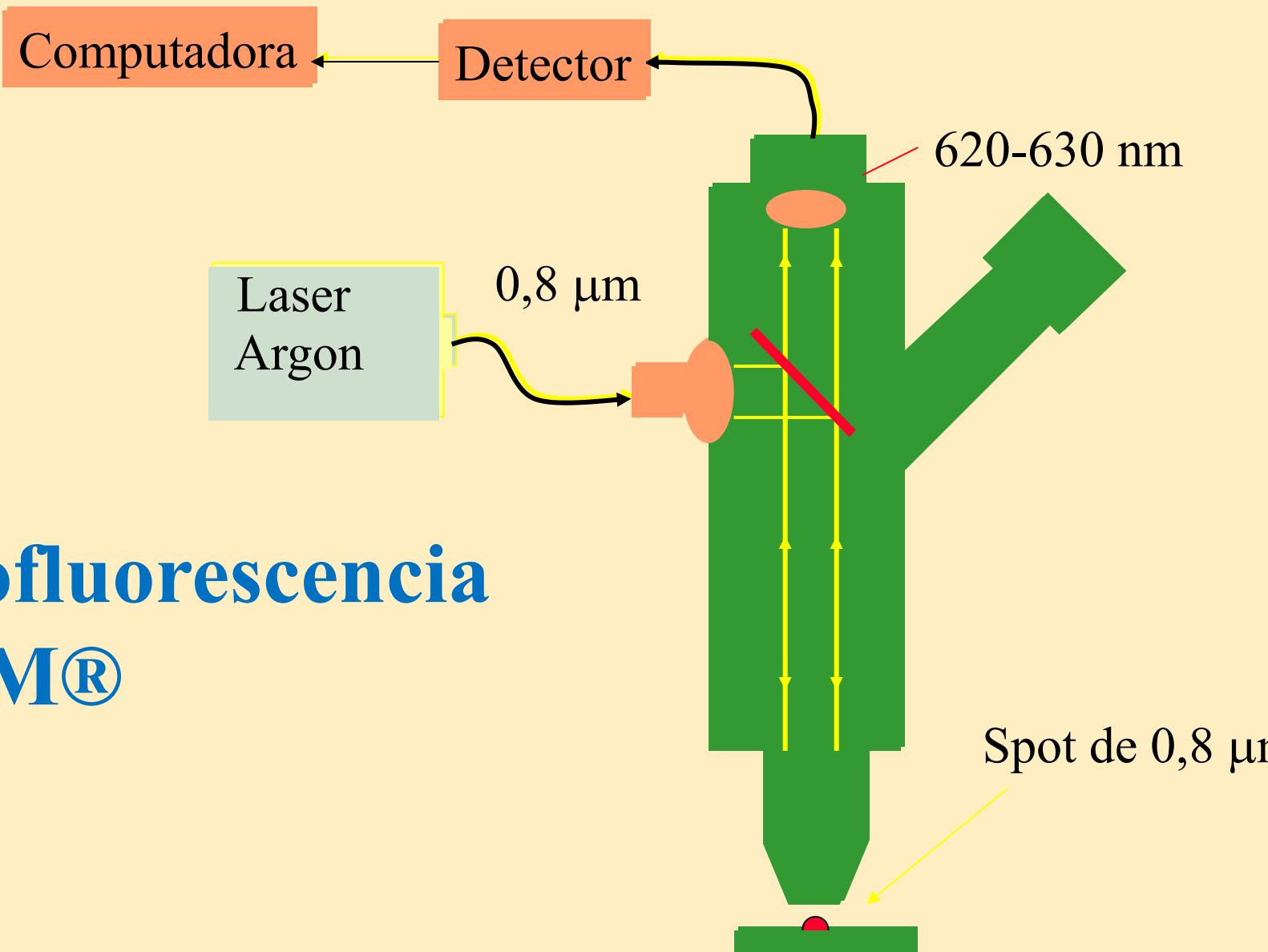
Vro correction from non thermal effects

Maturity assessment using μ FTIR

Vro
 under-
 estimation
 due to
 HC retention

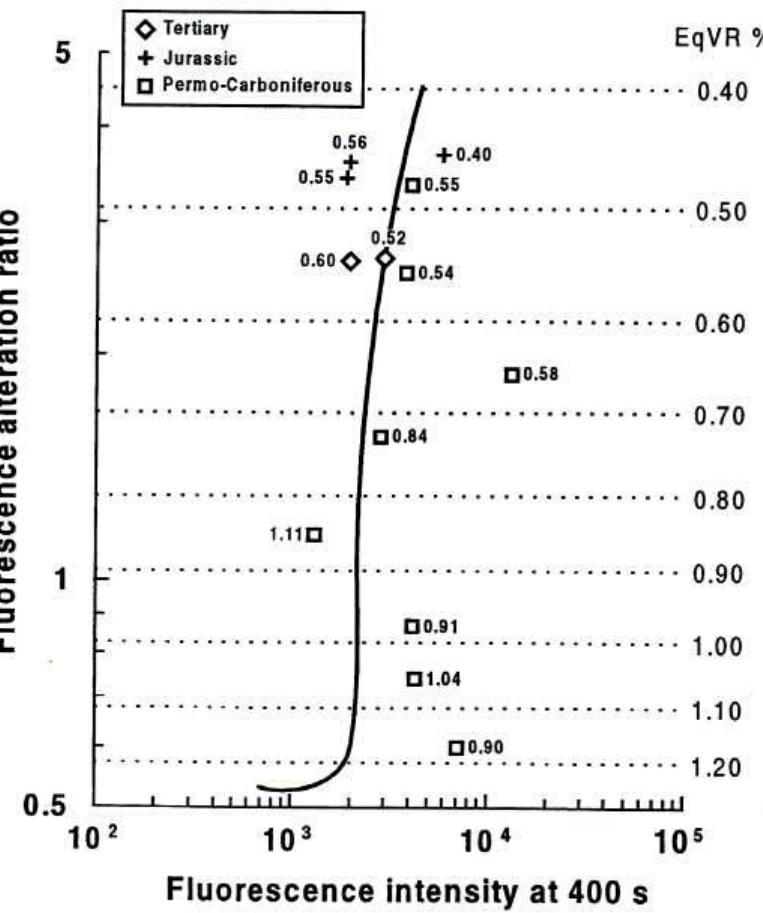


Vro correction from non thermal effects

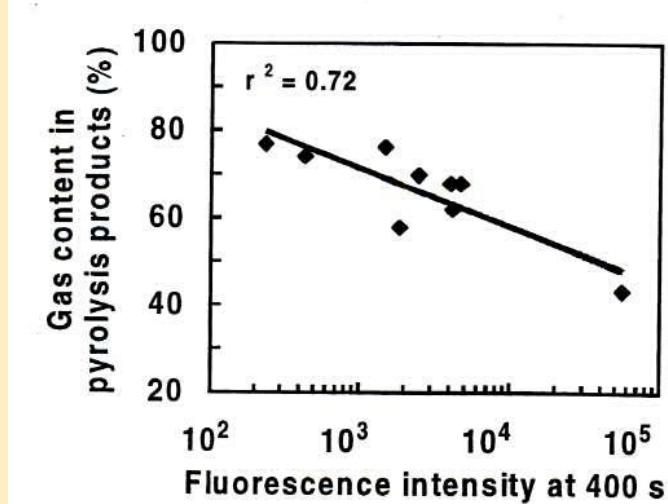
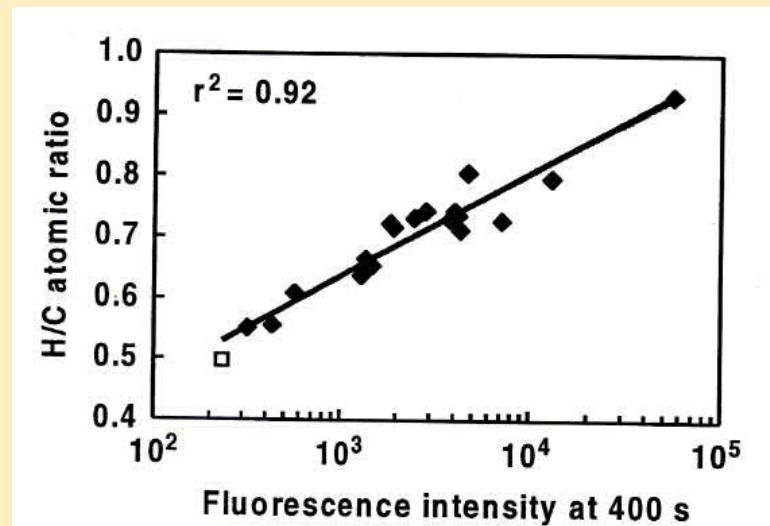


Microfluorescencia FAMM®

Microfluorescencia FAMM®



Sherwood et al. (1999)



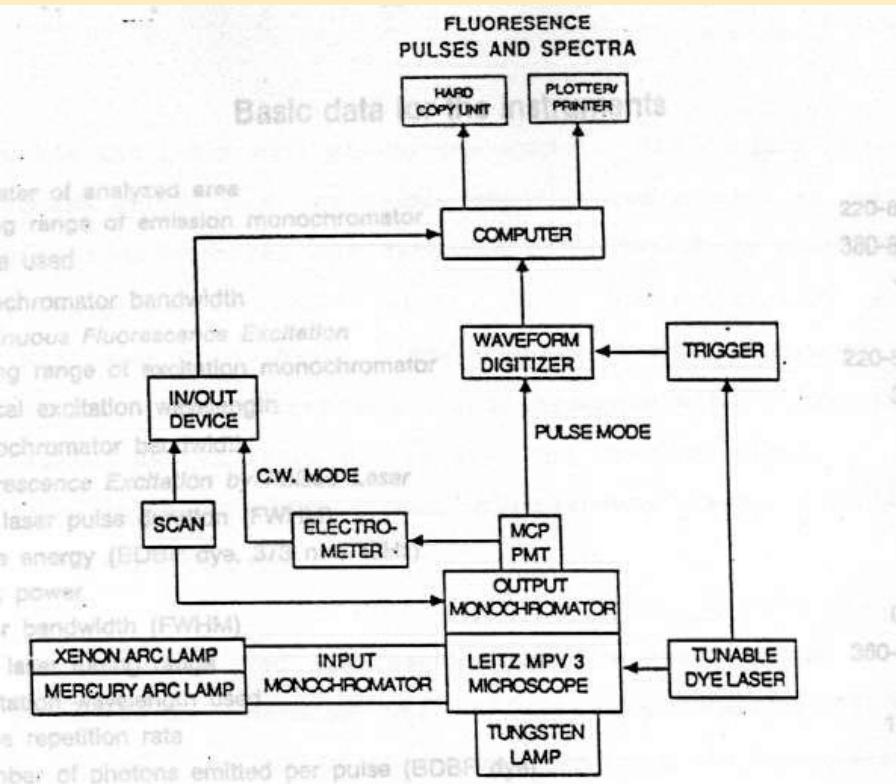
Microscopía de fluorescencia laser por impulsos

TIME-REMOVED FLUORESCENCE ANALYSIS OF COAL MACERALS							
heterogeneous (Hiawatha 561-alpha Resinite Concentrate)							
Color	λ_{peak} (nm)	Q 650/500	Q_{max} max/500	τ_m (ns)	τ_1 (ns)	τ_2 (ns)	τ_3 (ns)
Violet	440	0.05	1.70	7.02 ± .86	0.36 15.6	2.93 36.6	12.32 47.8
Blue	462	0.11	1.17	5.63 ± .83	0.43 20.6	3.13 39.9	10.85 39.5
Green	480	0.17	1.03	3.79 ± .29	0.38 27.0	2.35 29.0	6.84 44.0
Yellow	500	0.22	1.00	2.60 ± .19	0.35 38.0	2.30 23.7	5.01 38.3
Orange	538	0.56	1.15	1.68 ± .36	0.36 57.5	2.68 26.1	4.68 16.4
Red	558	0.95	1.35	0.93 ± .02	0.17 72.5	3.00 27.5	~ 0

Pulsed laser: 373 nm excitation, 20 ns scale, no exc. filter
 CW data: 365 nm, 24 nm bandwidth, 10^{-8} A scale, no exc. filter
 20 X Rolyn air objective.
 Fluorescence monitored at 500 nm.

El método usa Nitrogeno como excitador el cual produce el “decay” de los fluoroforos.
 Los fluoroforos tienen un tiempo caracteristico de “decay”

Microscopía de fluorescencia laser por impulsos

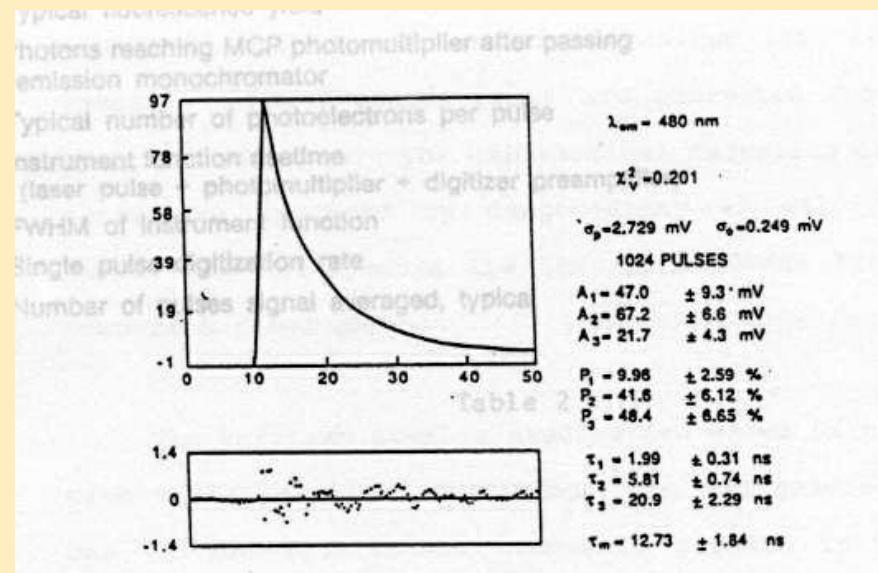


Condensado
480 nm.

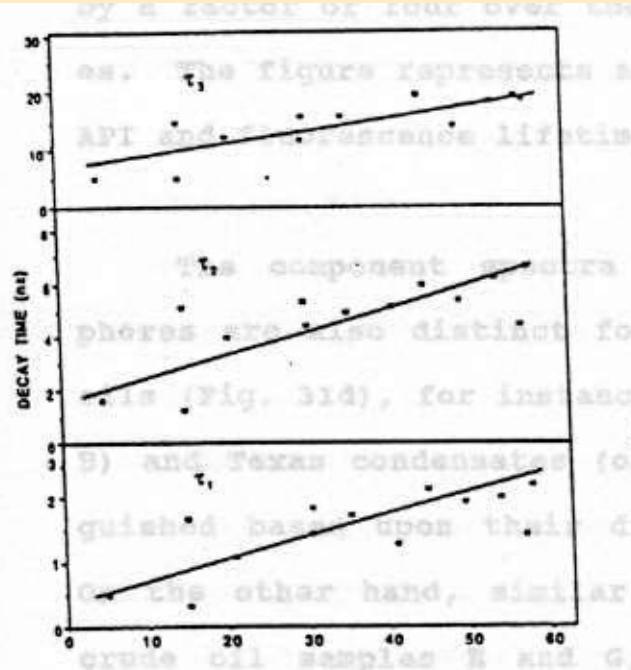
Respuesta



Equipo

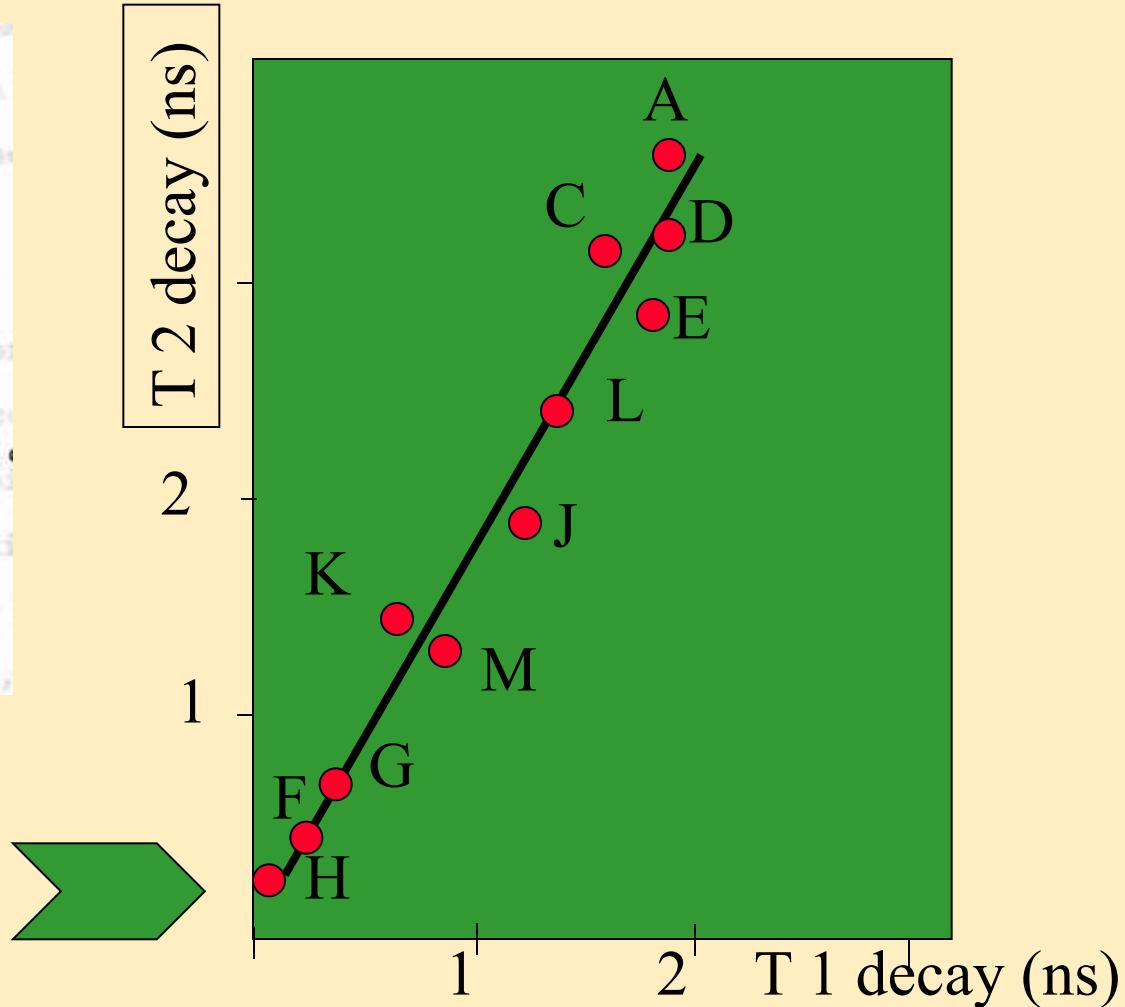


Microscopía de fluorescencia laser por impulsos



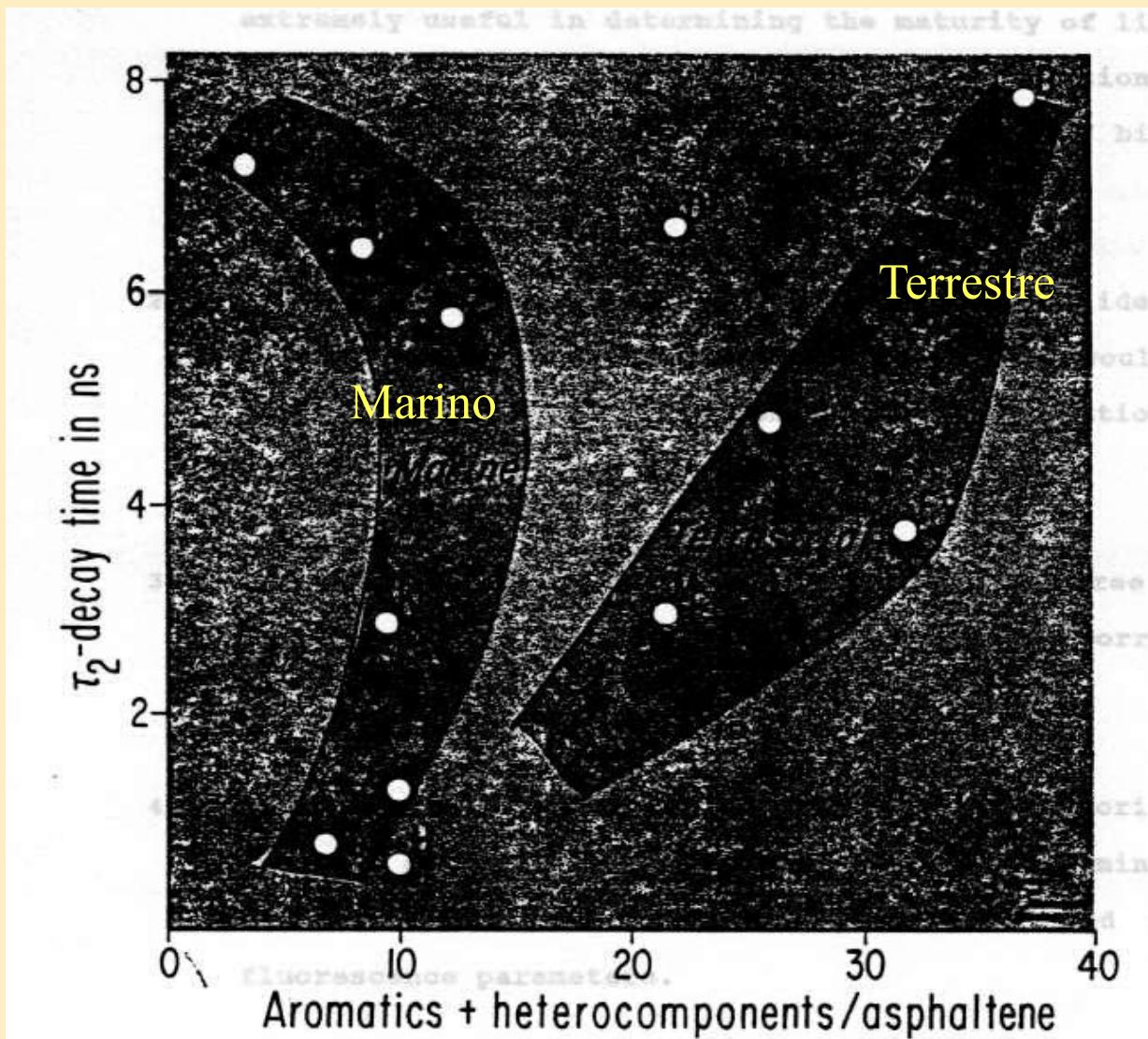
API

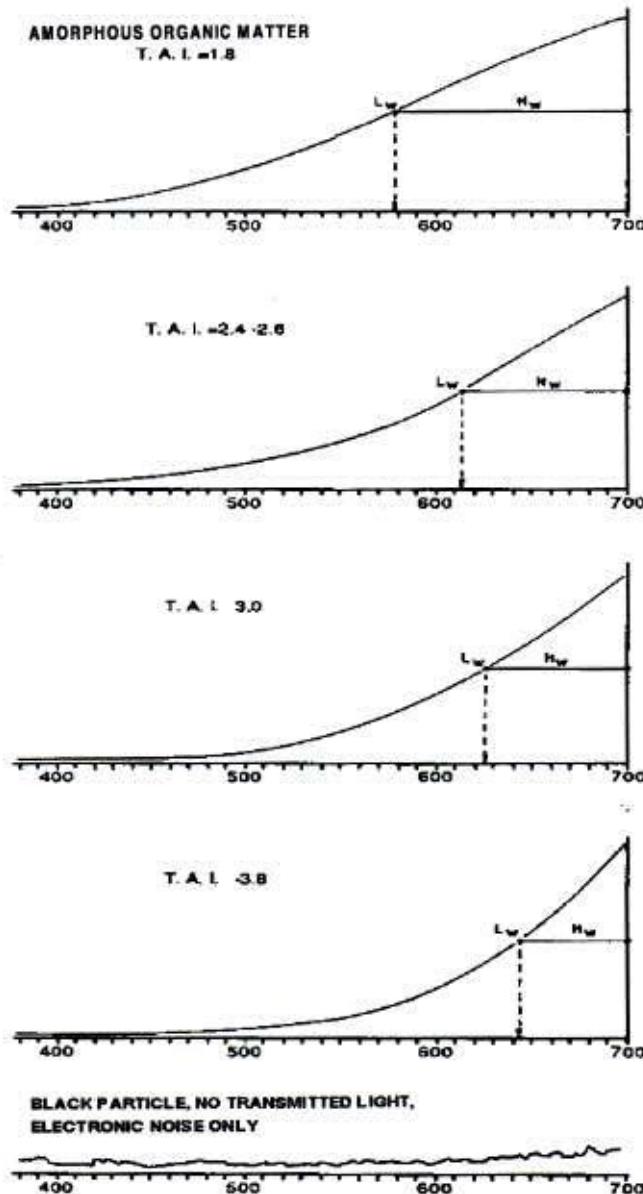
A, B, C = condensados
 D, E, H, L = crudos norm.
 J, F, M = Biodegradado



Mukophaday, 1988

Microscopía de fluorescencia laser por impulsos



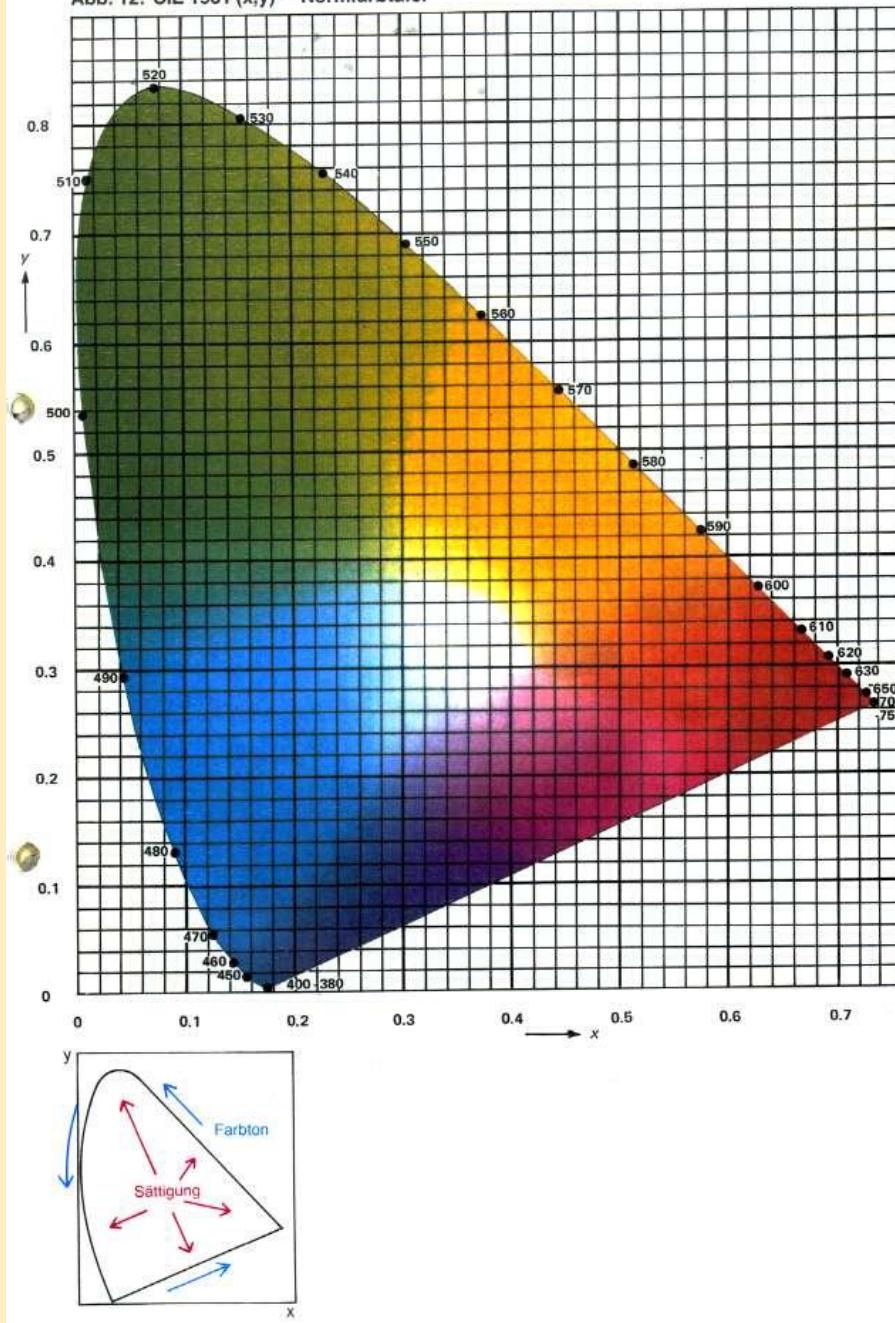


TCI

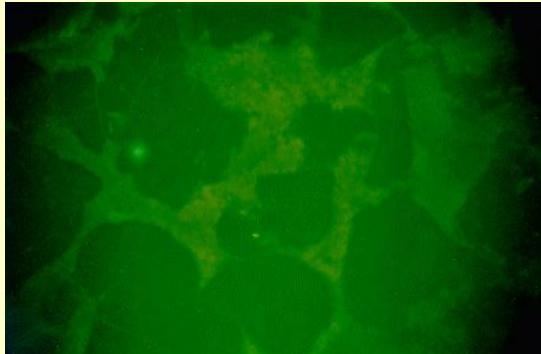
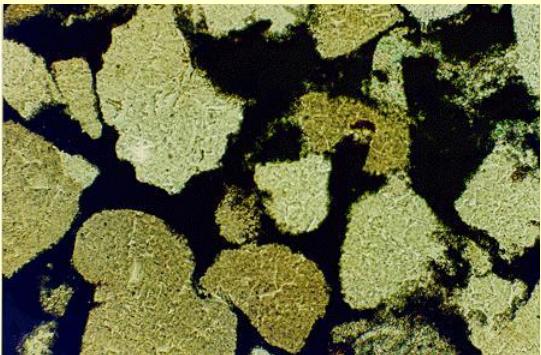
- Muestras sin vitrinitas y sin esporas
- Sedimentos anteriores al Devónico

Van Gijzel, (1990)

Abb. 12: CIE 1931 (x,y) – Normfarbtafel

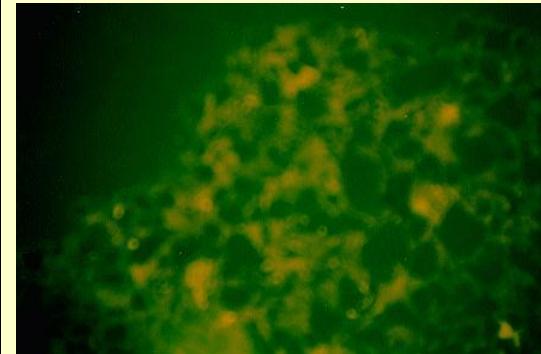
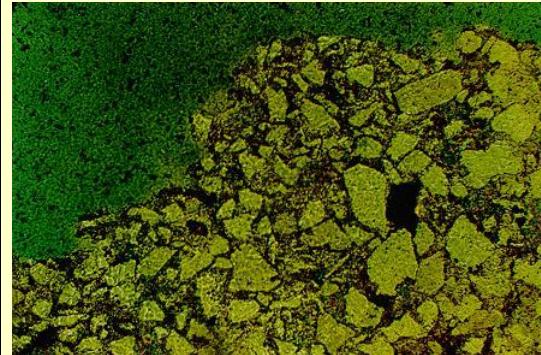


Arena: O1



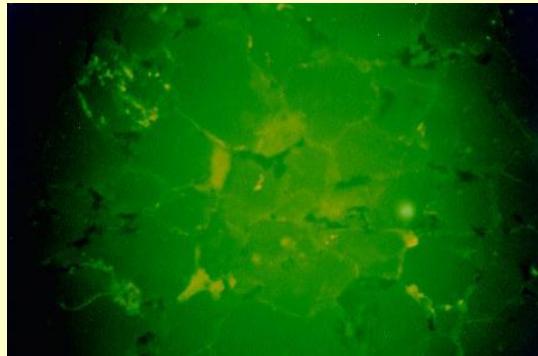
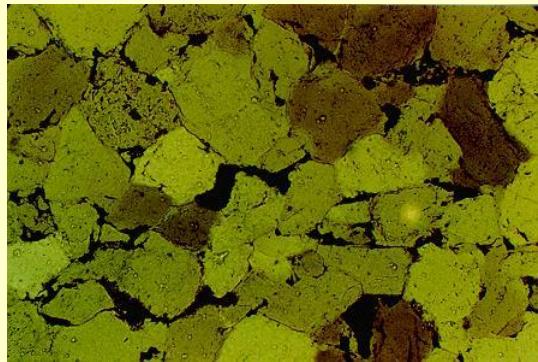
17500'

Arena: I-3U



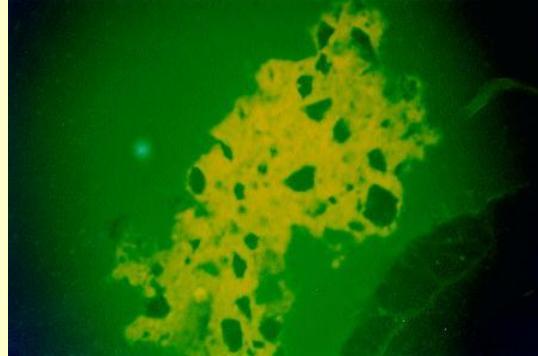
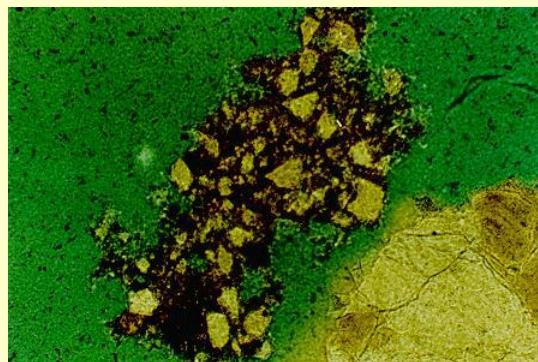
15870'

Arena: U3



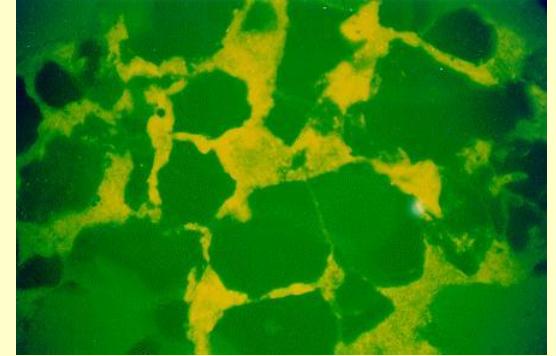
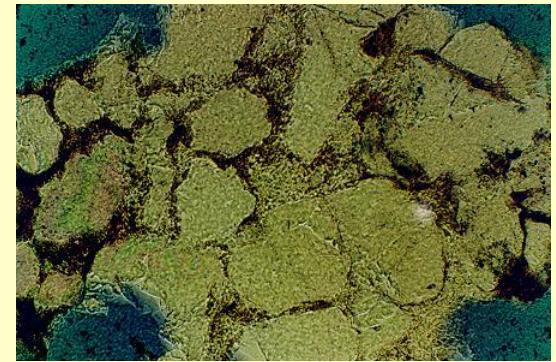
19040'

Arena: I-3U

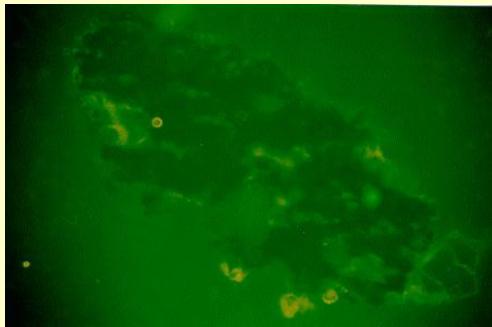


15870'

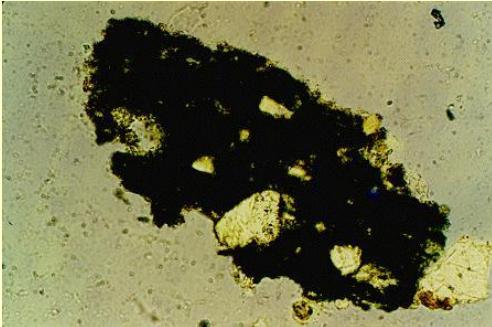
Arena: T-M



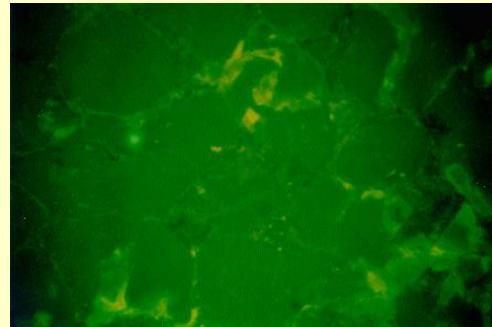
18675'



Arena: R-O

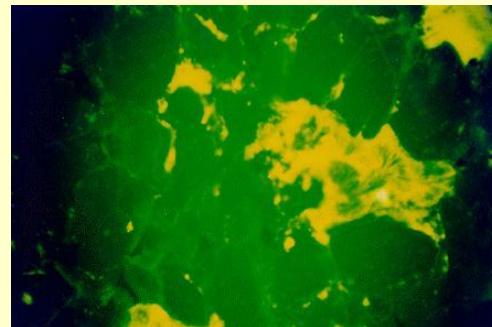


17855'



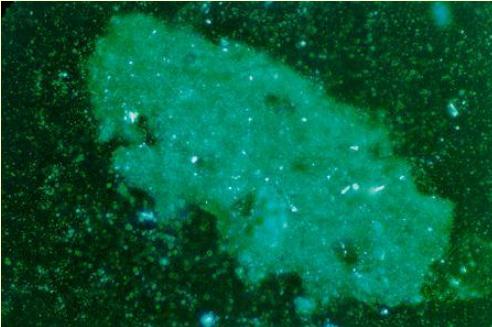
Arena: I-3U

15870'

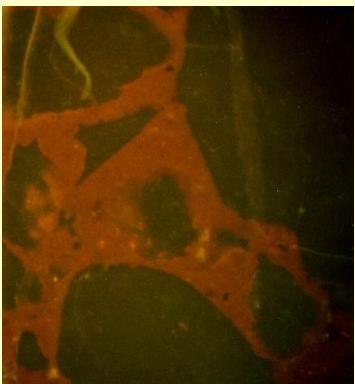
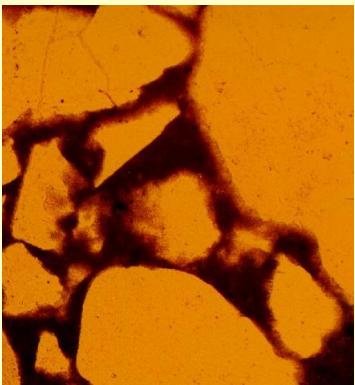


Arena: S3

18550'

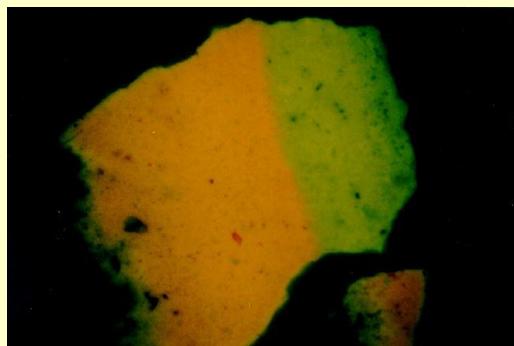
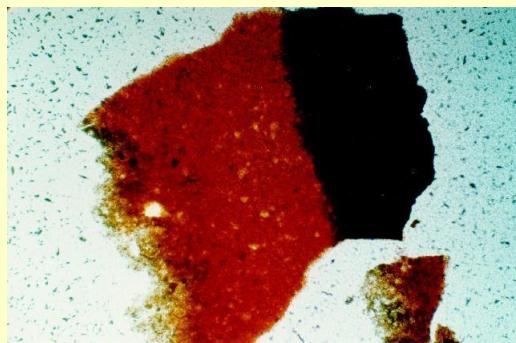


Arena: I-3U



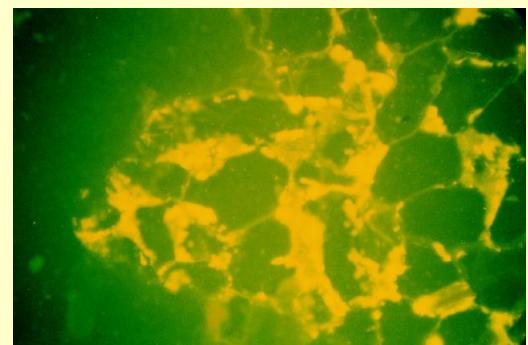
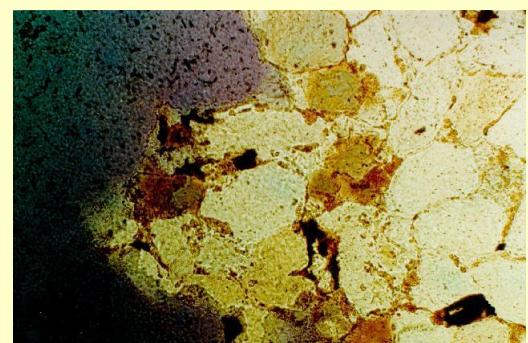
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Arena: R-4L

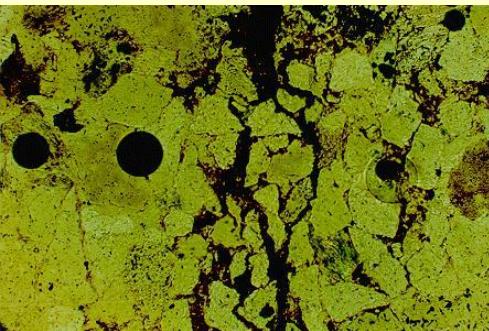


18210'

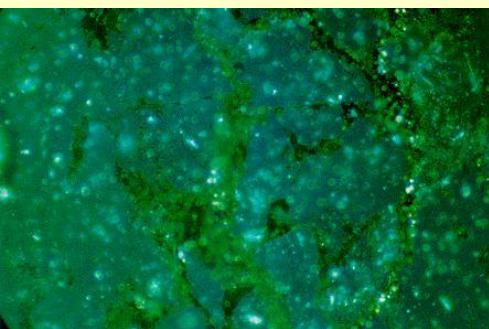
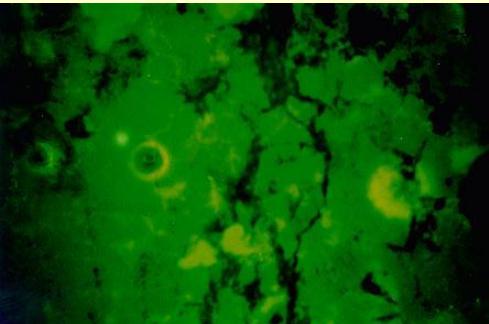
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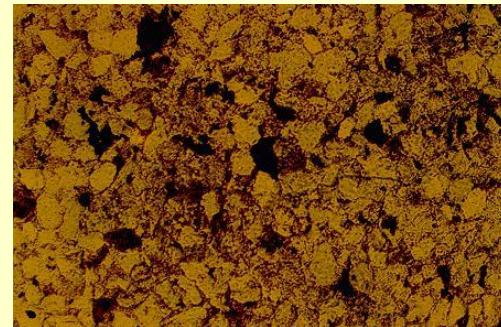
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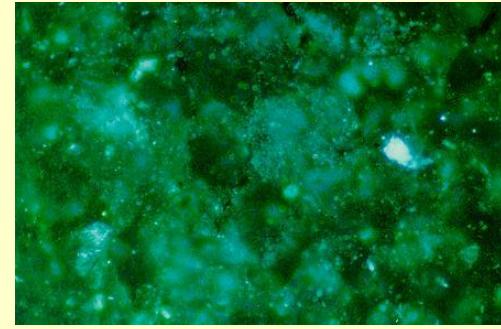
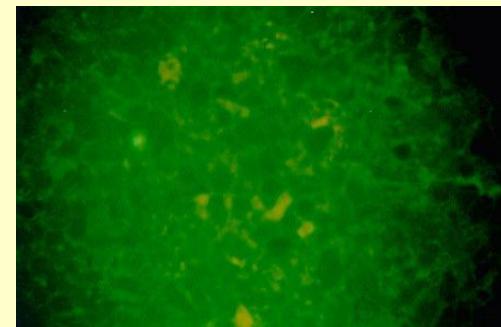
Arena: H2



15480'

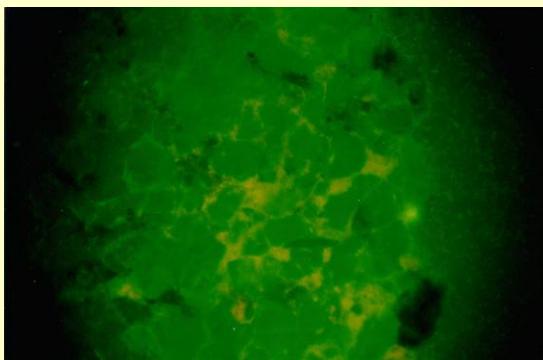
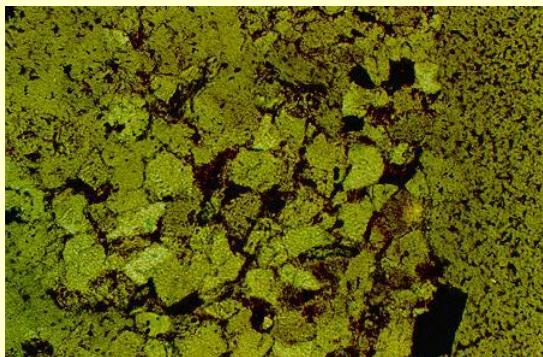


Arena: L4



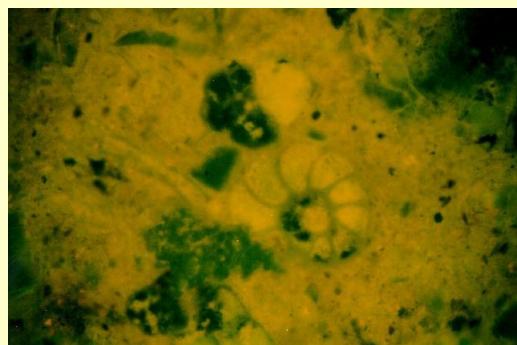
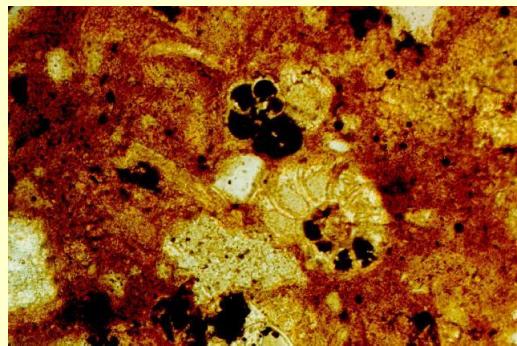
16840'

Arena: I-U2



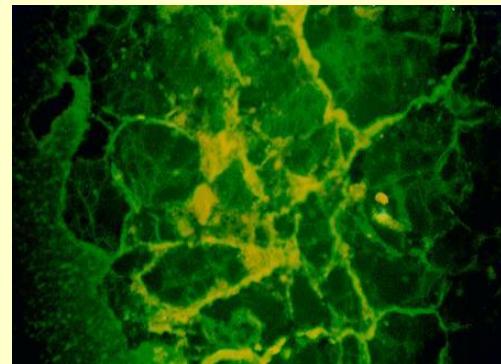
15800'

Arena: M1

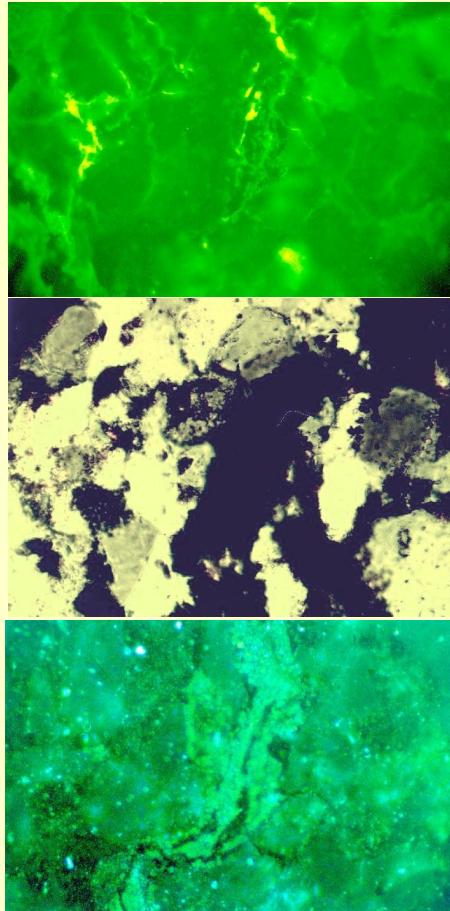


16930'

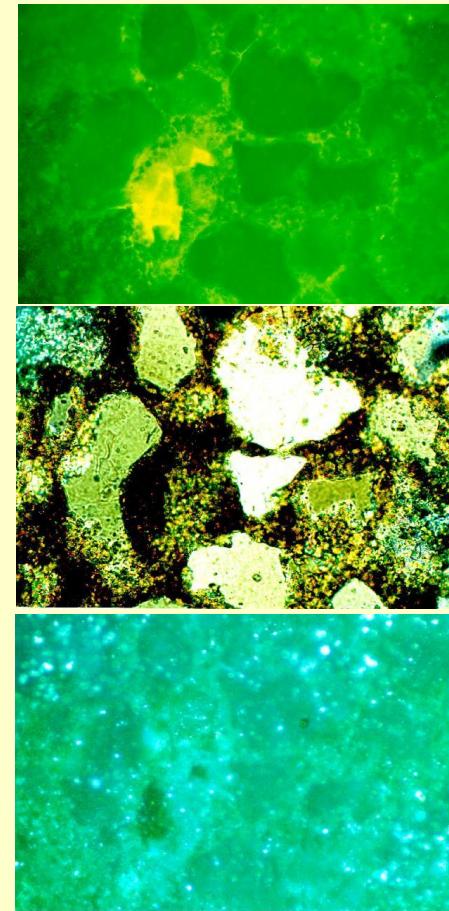
Arena: G



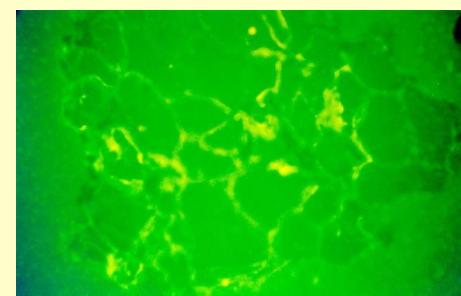
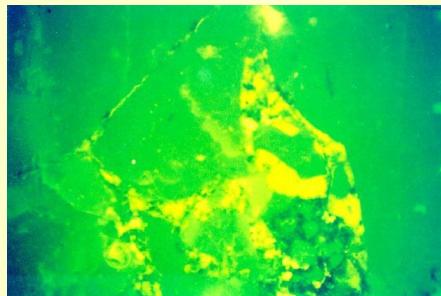
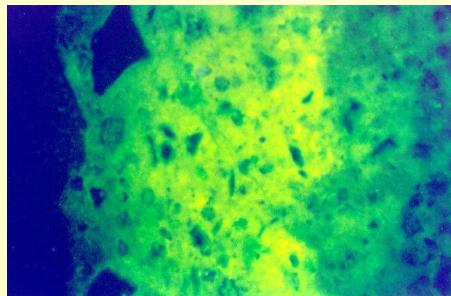
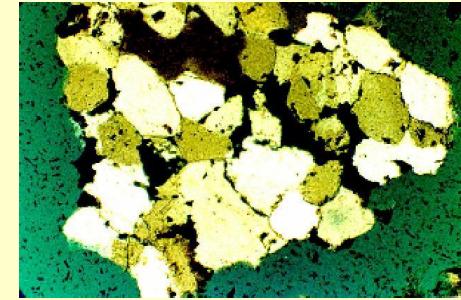
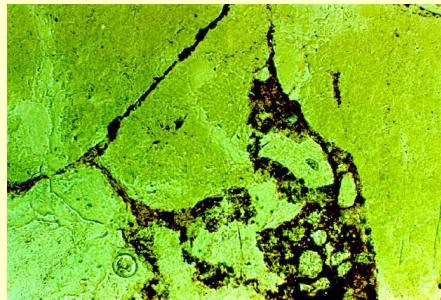
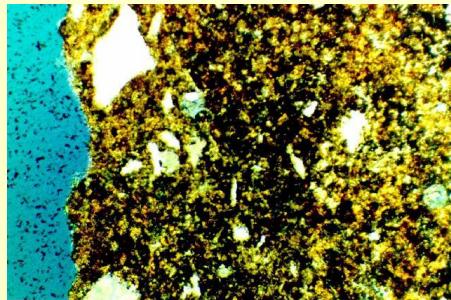
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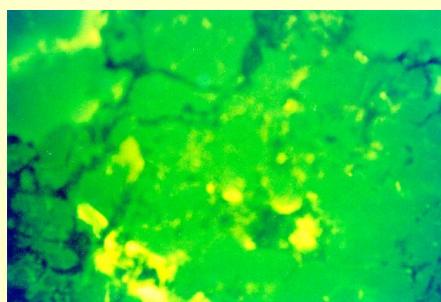
15200'



16830'

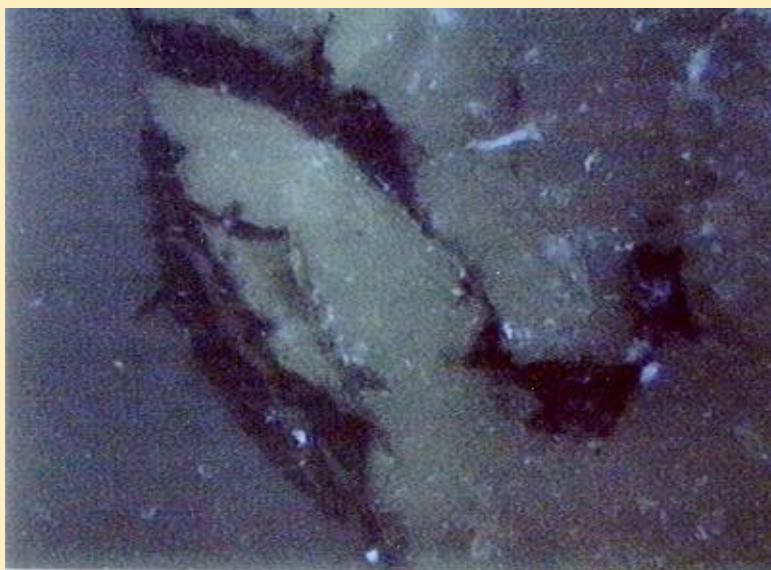
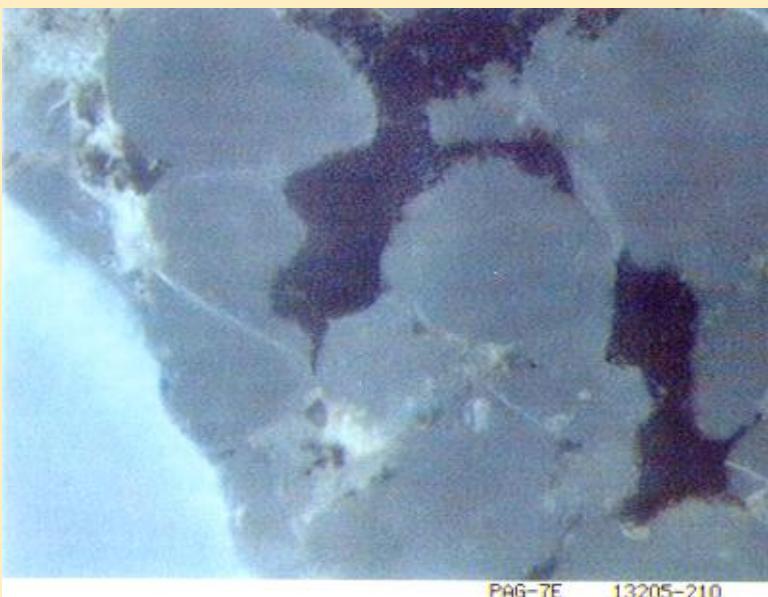
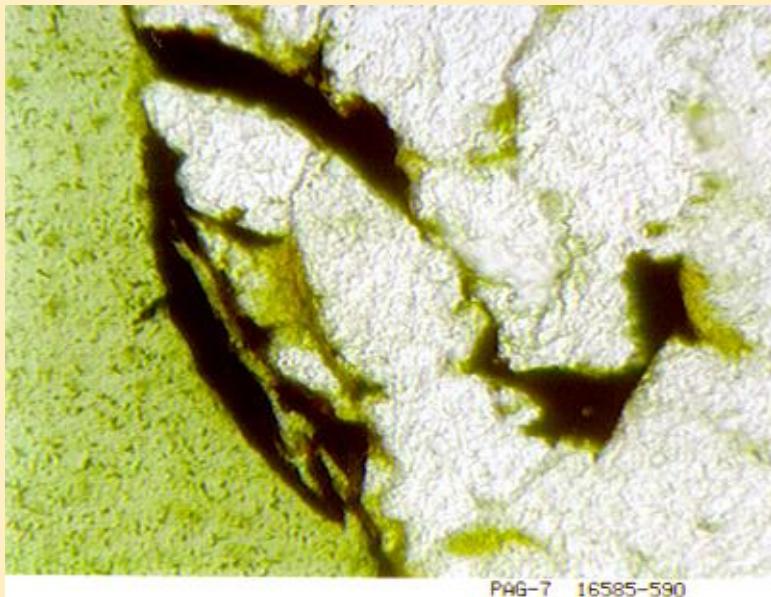


15200'



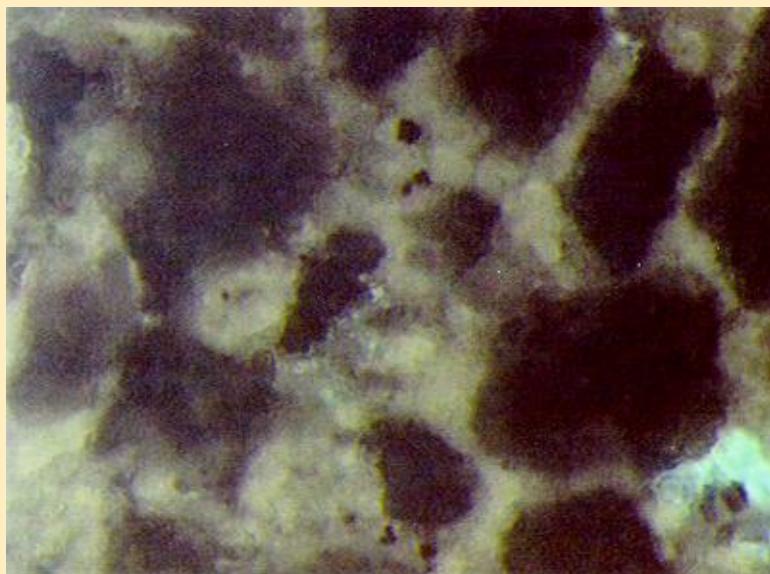
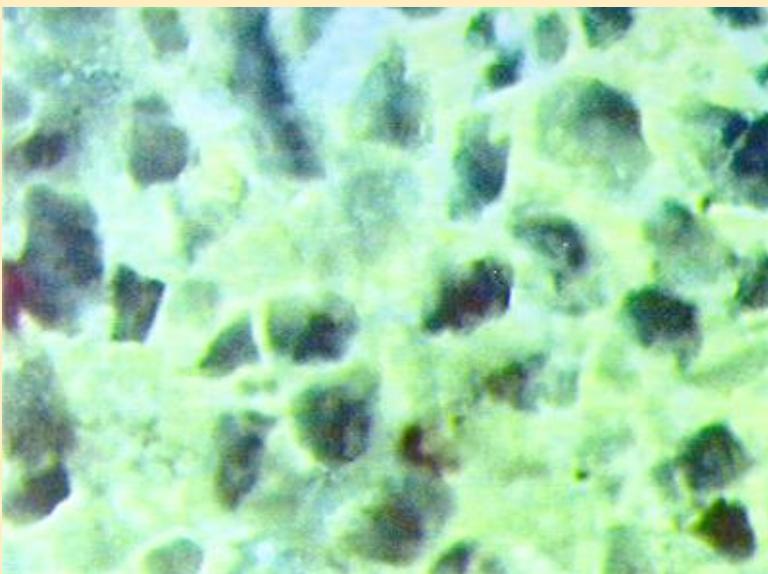
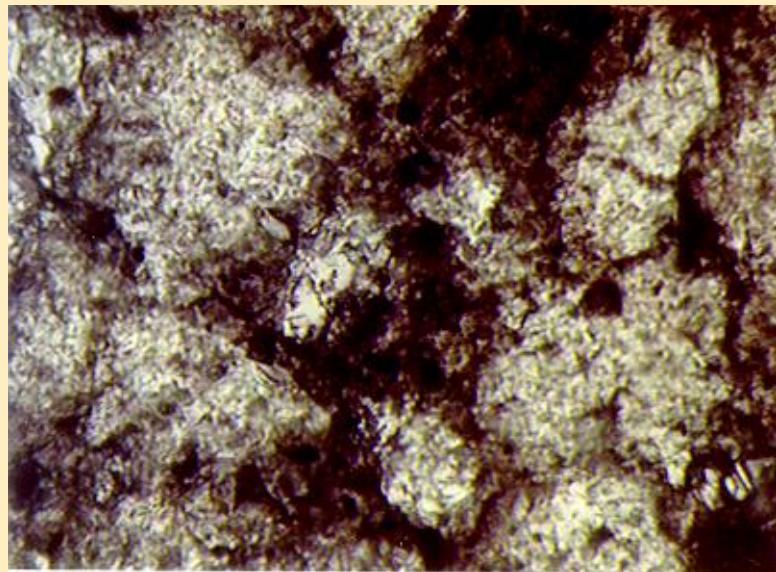
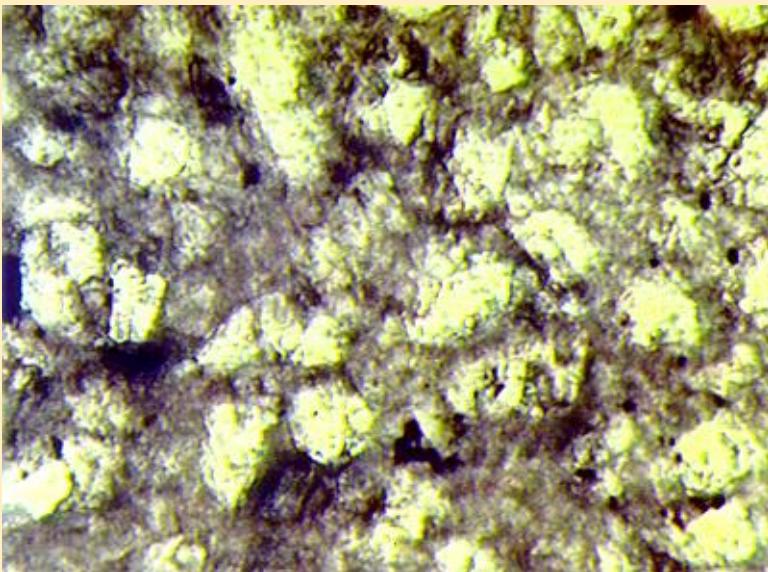
18350'

15200'



PAG-7E 13205-210

PAG-7 16585-590



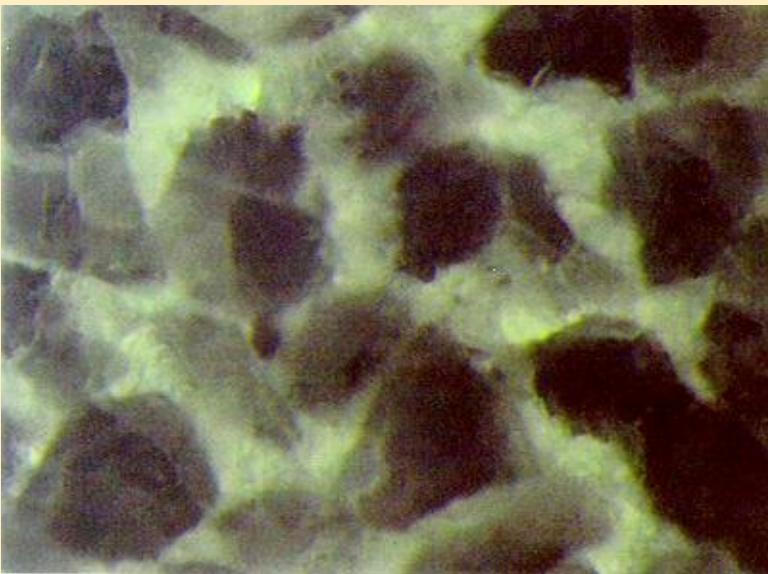
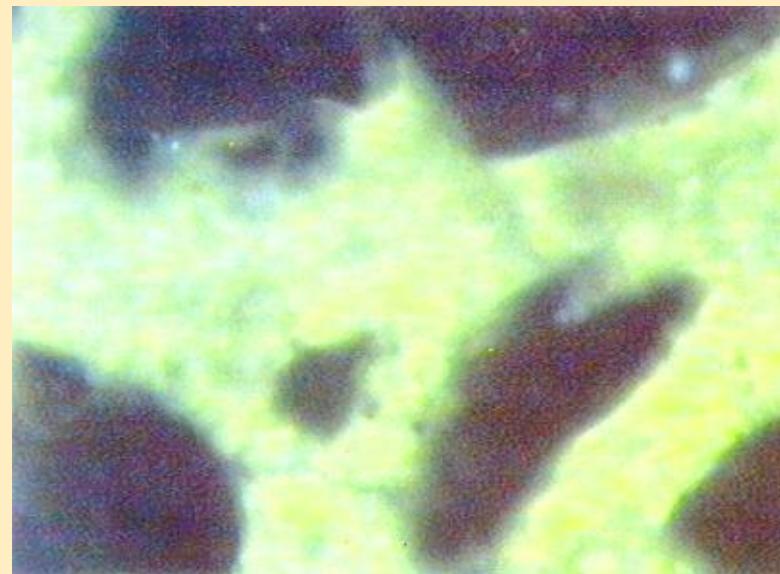


TABLA RESUMEN POR ARENA

Arena	Color de la fluorescencia	Ubicación del hidrocarburo					
		Borde de grano	Poro	Matriz	Microfracturas	Estilolitas	Perfil de grano
E-2		X	X				
E-2			X				
F-0		X	X	X	X	X	
F-1					X		
F-1				X			
F-4		X	X		X	X	
F-4			X				
F-4			X		X		
F-7					X	X	
F-7		X	X				
F-7				X			
F-8		X			X	X	
F-8		X	X	X			
F-8				X			

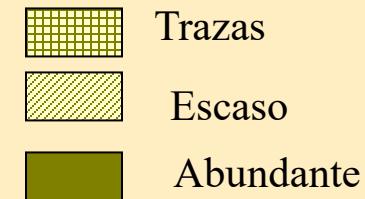


TABLA POR PROFUNDIDAD

Prof.	coloración	Ubicación del hidrocarburo						COMENTARIOS
		Abundancia	Borde de grano	Poro	Matriz	Fracturas	Estilolitas	
								perfil de partículas
14250'-14260'	AM-V							
	AM							
	N							
	M							
	NO FLUO							
	M.O							
14260'-270'	AM-V							
	AM							
	N							
	M							
	NO FLUO							
	M.O							
14920'-14930'	AM-V							
	AM							
	N							
	M							
	NO FLUO							
	M.O							

 Trazas
 Escaso
 Abundante

TABLA DE COMPARACION

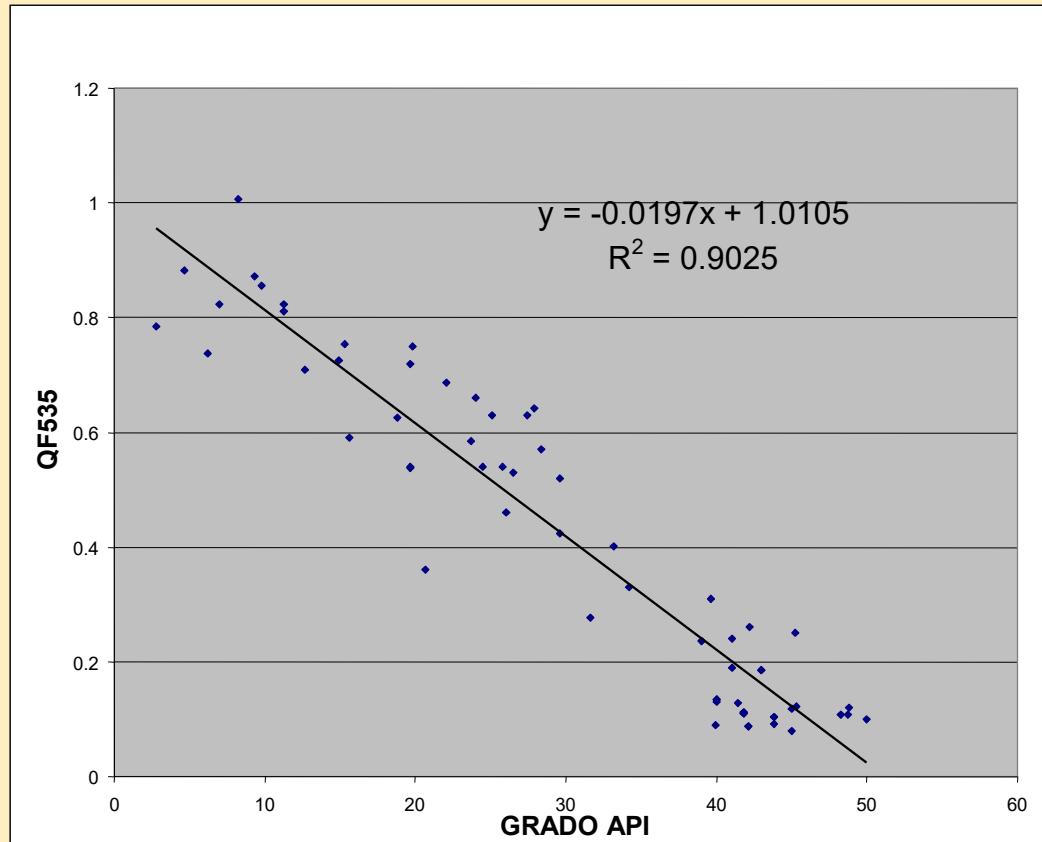
						Fluorescencia												
				HIDROCARBURO			M. ORGANICA											
		Porosidad Visual		No fluoresce	Marron	Marron Rojizo	Marron	Amarillo	Amarillo Verdoso	Verde	No fluoresce	Marron	Marron Rojizo	Marron	Amarillo	Amarillo Verdoso	Verde	
Arena	Prof.	Fract	Disol	Petrof	Produc.													
I-4	16020-16030	2-3	5															
I-4	16030-16040			X														
I-4	16040-16050			X														
I-4	16550-16560			X														
L-3	16750-16760	X	15-20															
L-3	16830-16840																	
L-4	16840-18850	3-5	3-5															
L-4	16850-16860																	
M-1	16930-940	1-2	<1		X													
M-3	17090-17120			X														
O-2	17410-420	3-4	8-11															
R-1	17660-17665	3-4																

 INTERVALO CONSIDERADO BUENO POR GEOQUIMICA

 INTERVALO CONSIDERADO BUENO POR PETROFISICA

NO CUANTIFICADO
TRAZA

ESCA SO
ABUNDANTE



Espectro de crudos

