

- - -
/ / : / / :

*

III (PF-1) I
(PF-2) II
(PF-3) III
(PF-4) IV II (AOM) III
II () AOM
AOM
CD OI/HI
D
Fair oil III

HF / (ZnCl₂)

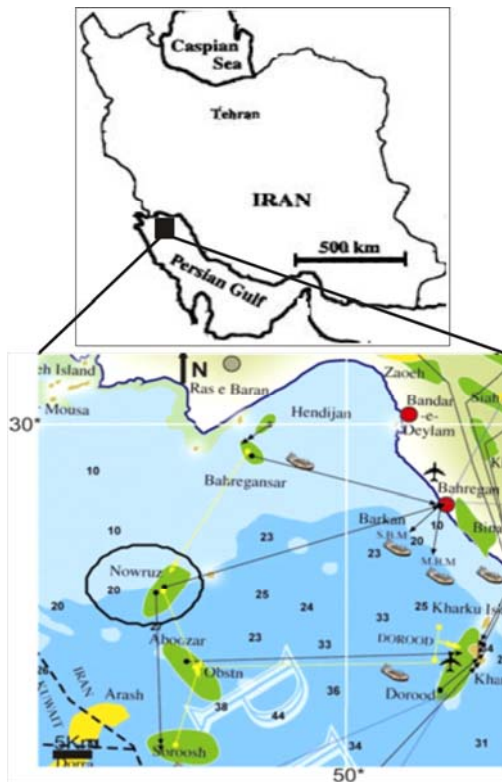
%

%

%

A

B



()

(Batten 1996, Tyson 1993)

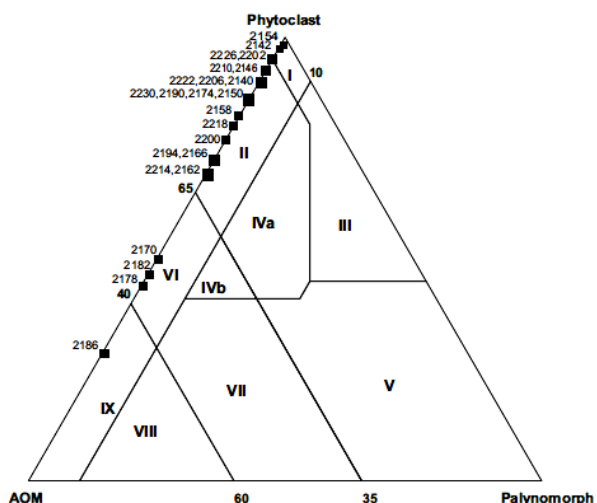
(Espitalie et al. 1984)

()

(Traverse 2008)

Ghasemi-Nejad et al. 2009

.(



- I: Highly proximal shelf or basin
- II: Marginal dysoxic-anoxic basin
- III: Heterolithic oxic shelf (proximal shelf)
- IV: Shelf to basin transition
- V: Mud-dominated oxic shelf (distal shelf)
- VI: Proximal suboxic-anoxic shelf
- VII: Distal dysoxic-anoxic shelf
- VIII: Distal anoxic shelf
- IX: Distal suboxic-anoxic basin

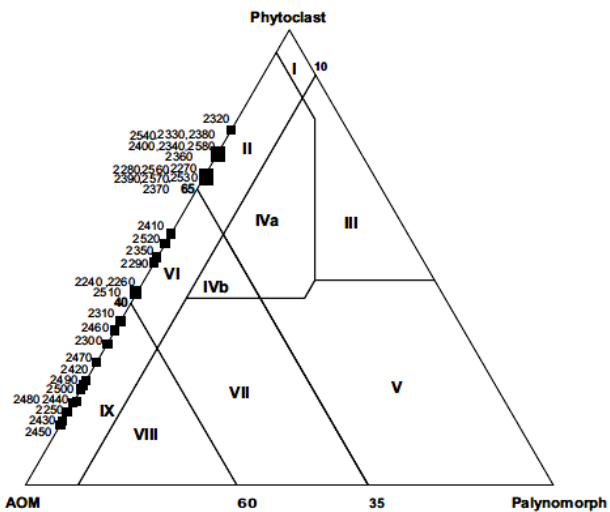
(Tyson 1993)

(Rock-Eval Pyrolysis)

(Behar et al.

.(2001

()



- I: Highly proximal shelf or basin
- II: Marginal dysoxic-anoxic basin
- III: Heterolithic oxic shelf (proximal shelf)
- IV: Shelf to basin transition
- V: Mud-dominated oxic shelf (distal shelf)
- VI: Proximal suboxic-anoxic shelf
- VII: Distal dysoxic-anoxic shelf
- VIII: Distal anoxic shelf
- IX: Distal suboxic-anoxic basin

(Tyson 1993)

.(Tyson 1989)

(Batten & Stead 2005; Batten

.(1996; Tyson 1995

(Al-Ameri & Batten 2001,

(PF-2) II

()
(AOM)

)
(AOM) (

() (Tyson 1989 & 1993)

II

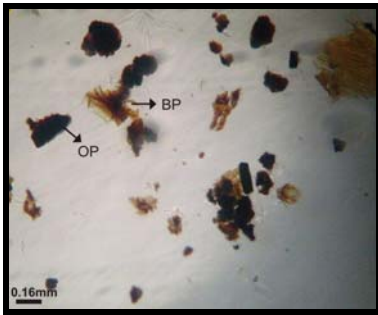
(Marginal dysoxic-anoxic basin)

(PF-1) I

AOM ()

III

()



(PF-2) II

()

I

(Highly proximal shelf or basin)

()

(Tyson 1993)

III

(PF-3) III

AOM

)

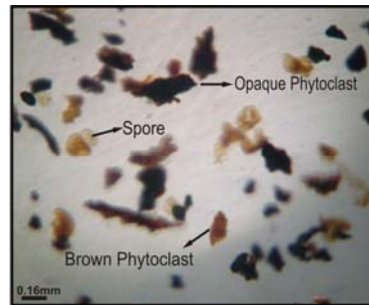
()

VI

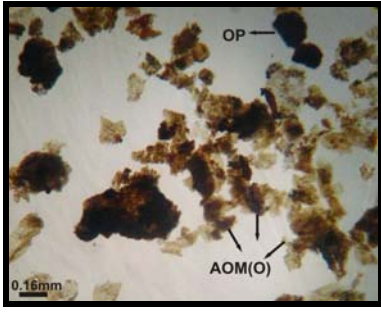
(Proximal

II

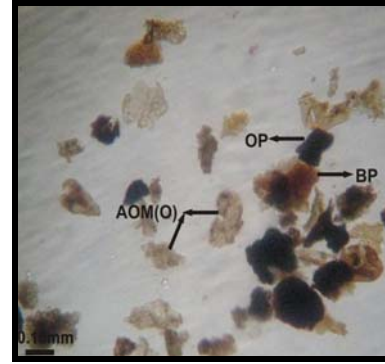
(suboxic-anoxic shelf



(PF-1) I



(PF-4) IV



(PF-3) III

S1, S2, S3, Tmax, HI, OI, TPI

()

TOC

(PF-4) IV

AOM

()

()

:

= S₁

(AOM)

(mg HC/g Rock)

°C

IX

()

(Distal

= S₂

(suboxic-anoxic basin

(mg HC/g Rock)

(II≥I) I,II

= S₃

°C

)

Co₂

(

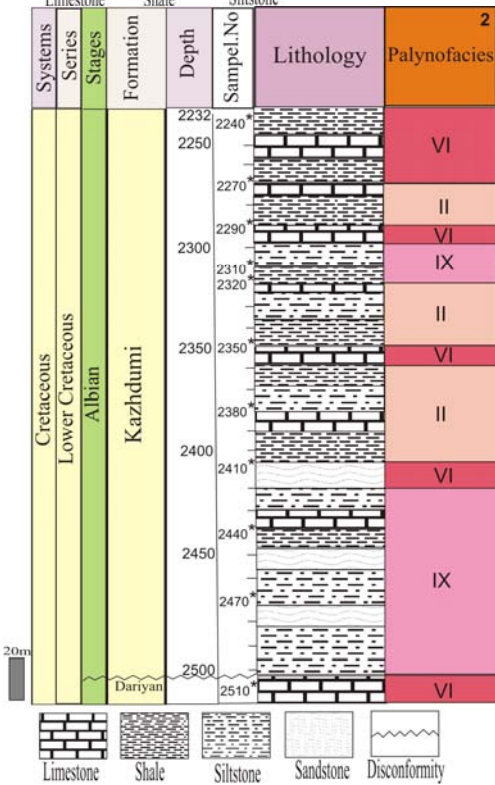
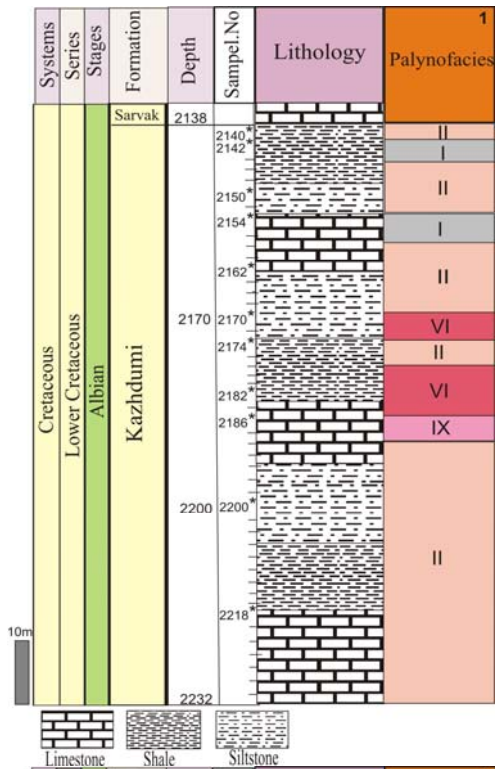
AOM

= Tmax

(Gorin &

(S₂)

(Steffan 1991



Tmax
:TOC
(
:(OI)
(
:(HI)
HI
(S2/TOC)
:(TPI)

.S1/(S1+S2)

Highly proximal shelf or basin)
(Distal suboxic-anoxic basin

AOM

(Bombardier & Gorin 2000)

AOM Marginal)
Distal suboxic-anoxic dysoxic-anoxic basin
(basin
AOM

Well/Sample	S1	S2	S3	S1+S2	S2/S3	Tmax	HI	OI	TPI	TOC
چاه ۱-2140	1.66	1.33	2.31	2.99	0.58	436	88	152	0.55	1.52
چاه ۱-2142	0.59	1.11	1.98	1.70	0.56	433	92	164	0.35	1.21
چاه ۱-2150	0.74	1.35	2.27	2.09	0.59	434	97	162	0.35	1.40
چاه ۱-2154	1.15	1.52	3.04	2.67	0.50	434	86	172	0.43	1.77
چاه ۱-2162	0.68	1.10	2.28	1.78	0.48	433	95	198	0.38	1.15
چاه ۱-2170	0.57	0.75	2.02	1.32	0.37	434	80	215	0.43	0.94
چاه ۱-2174	2.64	3.48	5.82	6.12	0.60	436	86	143	0.43	4.07
چاه ۱-2182	0.50	0.92	2.14	1.42	0.43	433	101	235	0.35	0.91
چاه ۱-2186	0.83	1.74	1.87	2.57	0.93	431	187	201	0.32	0.93
چاه ۱-2200	3.20	3.56	6.64	6.76	0.54	434	76	142	0.47	4.67
چاه ۱-2218	1.23	1.48	3.21	2.71	0.46	436	81	175	0.45	1.83
چاه ۲-2240	0.29	0.57	1.76	0.86	0.32	428	75	235	0.34	0.75
چاه ۲-2270	0.25	0.57	1.43	0.82	0.40	433	90	227	0.31	0.63
چاه ۲-2290	0.39	1.30	2.20	1.69	0.59	436	110	186	0.23	1.18
چاه ۲-2310	0.92	1.41	2.38	2.33	0.59	439	113	190	0.39	1.25
چاه ۲-2320	2.07	2.64	5.94	4.71	0.44	436	71	160	0.44	3.71
چاه ۲-2350	0.76	1.14	3.41	1.90	0.33	436	77	230	0.40	1.48
چاه ۲-2380	0.59	0.86	2.68	1.45	0.32	439	67	209	0.41	1.28
چاه ۲-2410	0.54	0.97	2.34	1.51	0.41	439	91	221	0.36	1.06
چاه ۲-2440	0.42	1.07	1.70	1.49	0.63	439	126	200	0.28	0.85
چاه ۲-2470	0.96	1.95	3.05	2.91	0.64	439	125	196	0.33	1.56
چاه ۲-2510	0.79	2.33	2.86	3.12	0.81	434	132	162	0.25	1.76

I,II

()

(Barker 1974; Hunt 1996)

II I

: III

Tissot et al. 1974

HI

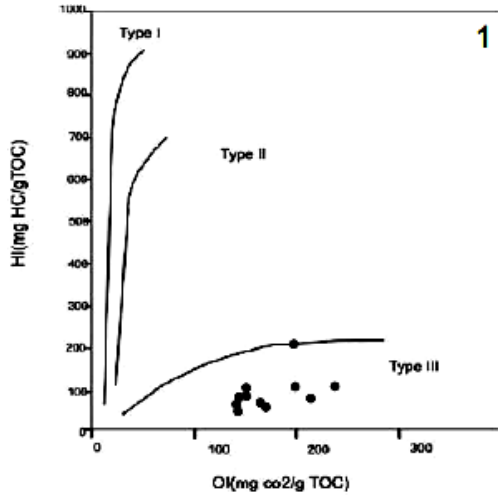
III, II, I

: I

I

Inertinite Vitrinite

600 (mgHC/gTOC) (HI)



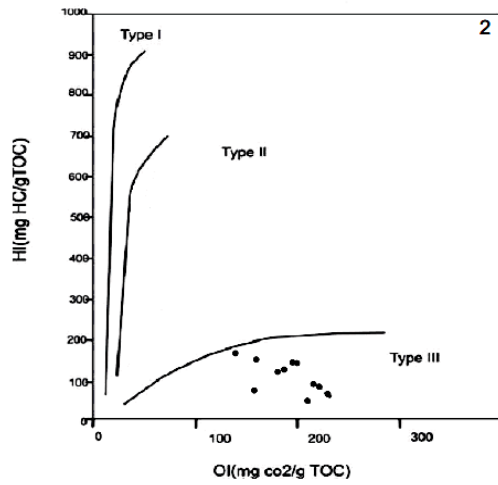
Alginite

Tasmanites

Botryococcus

: II

CO₂



HI OI

HI

II

II

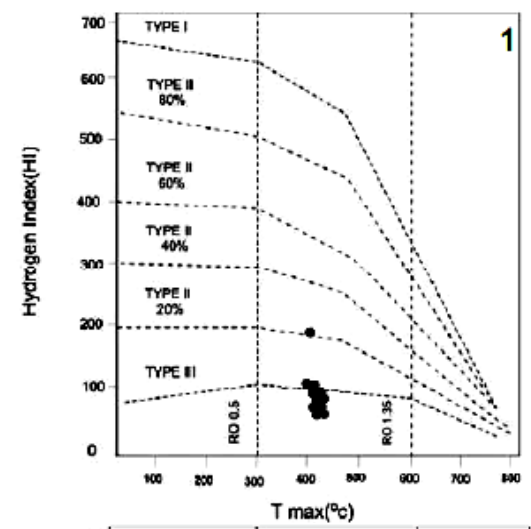
(Hunt 1996; Espitalie et al. 1977)

AOM
 AOM
 (Bombardier & Gorin
 AOM (2000

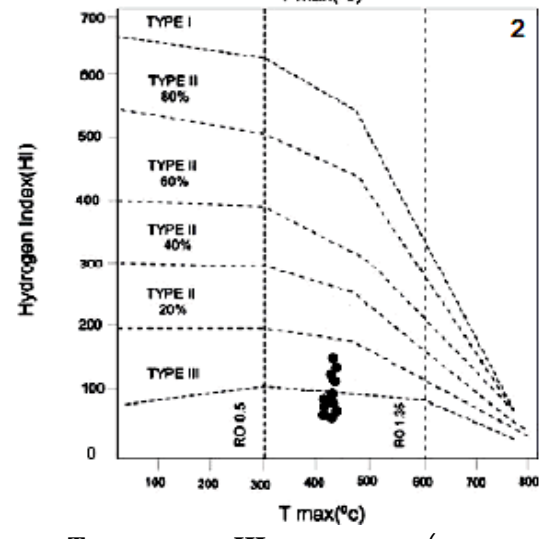
(Hunt 1996; Espitalie et al. 1977)
 (Peters 1986) Tmax HI

AOM
 HI (Buckley & Tyson, 2003)
 AOM

() III



Tmax HI



S2/S3
 / /
 () HI

() HI/Tmax

Tmax HI (Peters 1986)

II

HI

(Peters 1986) S2/S3

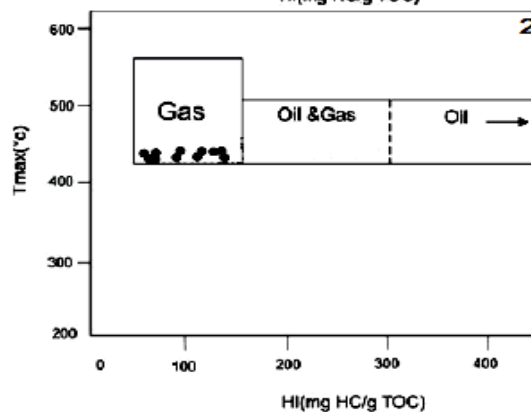
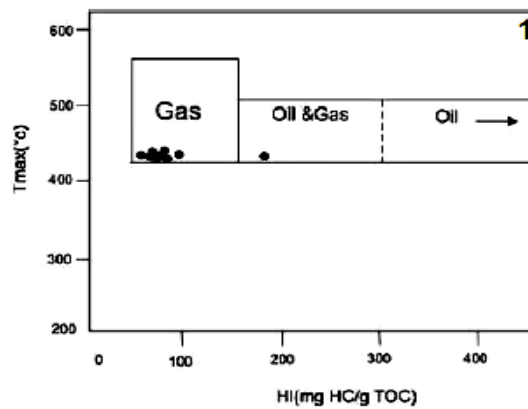
S2/S3	HI
>	>

(Peters 1986) S1+S2,S2,S1

S1+S2	S2	S1
/	/	/
/	/	/
>	>	>

(Peters 1986) TOC

TOC (wt%)	TOC (wt%)
/	/
/ /	/
/	
>	>



Tmax HI

(Peters 1986)

S1+S2 S1,S2

(Peters 1986)

S1+S2

TOC

TOC S1+S2

S1+S2

TOC

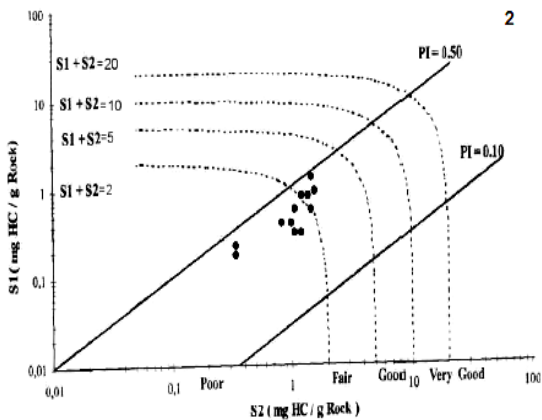
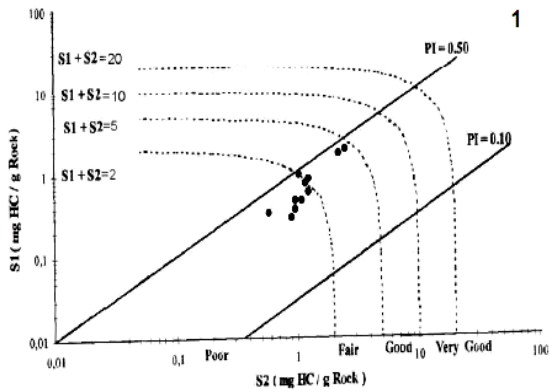
S1+S2

()

Parameter Well-1	S1	S2	TOC	Tmax
Range	5.0-3.2	0.75-3.56	0.91-4.67	431-436
Average	1.25	1.66	1.92	434

Parameter Well-2	S1	S2	TOC	Tmax
Range	0.25-2.07	0.57-2.64	0.63-3.71	428-439
Average	0.72	1.34	1.41	436.1

S2 S1
()



S1/S2

()

(Peters & Cassa 1994)

S2(mgHC/g rock)	S1(mg HC/g rock)	TOC (wt%)
-----------------	------------------	-----------

/ / /
/ / /
> > >

Kerogen type	S2/S3	HI(mgH C/g TOC)
--------------	-------	-----------------

IV > >
III
II/III
II
I > >

Tmax(c)	R0(%)
---------	-------

< / /
/ /
/ /
> > /

S1,S2,TOC, Tmax

()

TOC

TOC

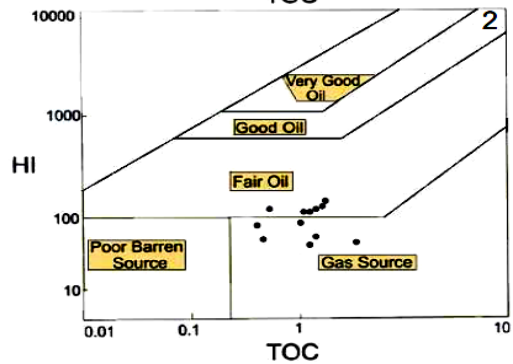
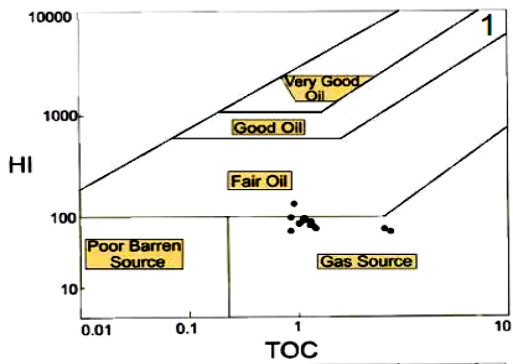
S1+S2

Fair Oil

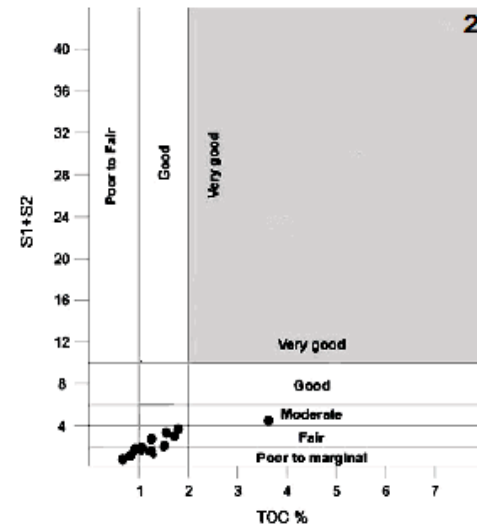
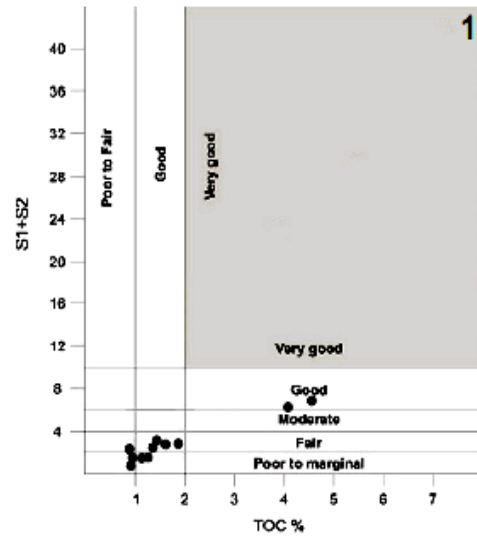
()

Fair Oil

()



HI/TOC
(Peters 1986)



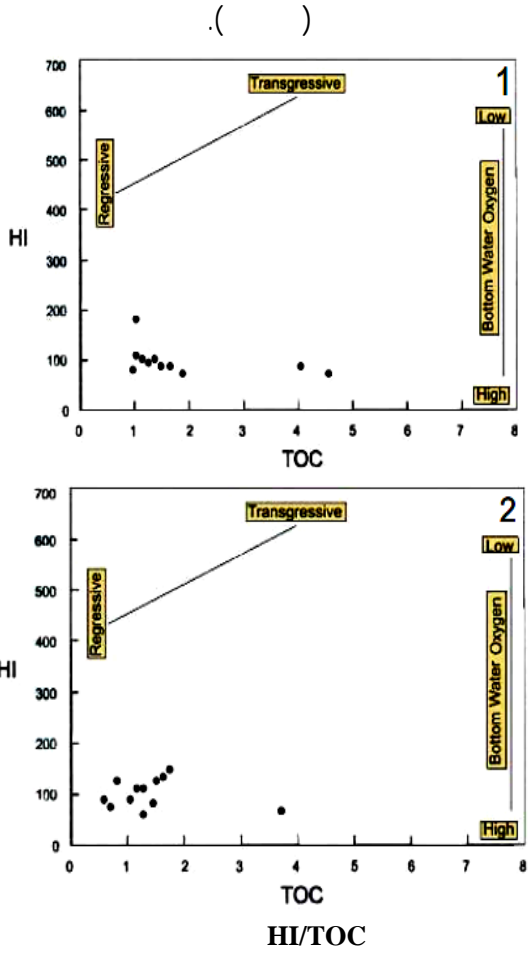
S1+S2/TOC
(Barker 1974)

(Jones, 1987)

OI HI

()

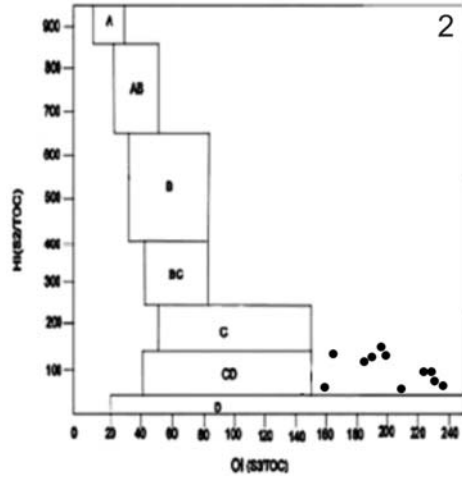
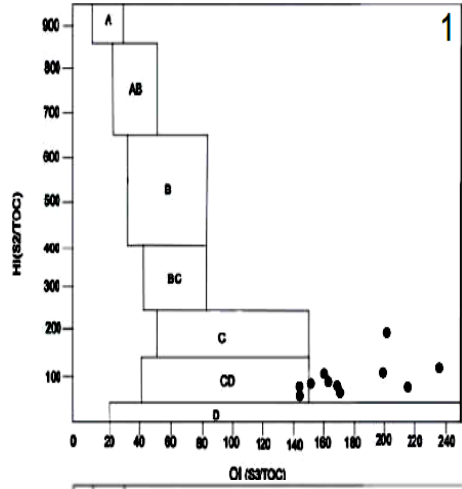
D CD



(Dean et al. 1986)

HI/Tmax
(Tmax)

()



OI HI

AB

A :

B

BC

C

CD

(Jones

D

(1987)

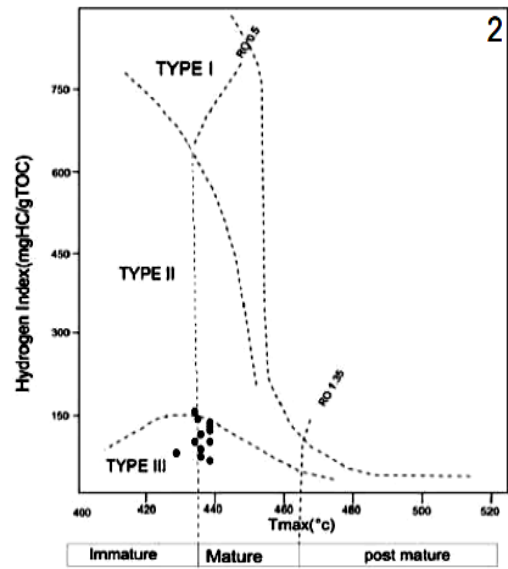
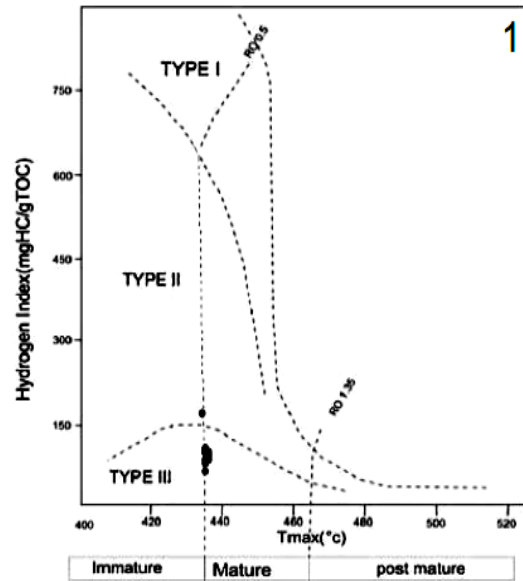
III

AOM

AOM

III

D CD



HI/Tmax

(Tissot & Welte 1984)

Mature

(Early

(mature

-Bombardier, L., and G.E. Gorin, 2000, Stratigraphical and lateral distribution of sedimentary organic matter in Upper Jurassic carbonate of SE France: *Sedimentary Geology*, v. 132, p. 177-203.

-Buckley, I., and R.V. Tyson, 2003, organic facies analysis of the cretaceous lower and basal upper Colorado group, Western Canada sedimentary basin- a preliminary report, in summary of investigations 2003: Saskatchewan Geological Survey, Sask, Industry Resource, misc. paper A-1,13.

-Dean, W.E., M.A. Arthur, and G.E. Claypool, 1986, Depletion of ^{13}C in Cretaceous marine organic matter, Source, diagenetic, or environmental signal: *Marine Geology*, v. 70, p. 119-157.

-Espitalie, J., M. Madec, B. Tissot, J.J. Menning, and P. Leplate, 1977, Source rock characterization on method for petroleum exploration: proceeding of the 9th annual offshore technology conference, Houston, p. 439-444.

-Espitalie, J., F. Marquis, and L. Sagel, 1984, Geochemical logging, in: Voorhees, K, J. (ed), Analytical pyrolysis: Butterworths, Boston, p. 23-46.

-Ghasemi_Nejad, E., M. Head, and M. Naderi, 2009, Palynology and petroleum potential of the Kazhdumi Formation (Cretaceous: Albian-Cenomanian) in the South pars field, Northern Persian Gulf: *Marine and Petroleum Geology*, v.26, p.805-816.

- Gorin , G.E., and D. Steffan, 1991, Organic facies as a tool for recording eustatic variation in marine fine-grained carbonates-examples of the Berriasian Stratotype at Barrias (Ardeche, SE France): *Paleo III*, v. 85, p. 303-320.

-Hunt, J.M., 1996, Petroleum geochemistry and geology (2nd ed), pp. 291, 370, 380-388.

-Al-Ameri, T.K., and D.J. Batten, 2001, Palynostratigraphy and Palynofacies indication of depositional environment and source potential for hydrocarbons, the mid cretaceous Nahr Umr and Lower Madud formation, Iraq: *Cretaceous Research*, v. 22, p. 735-745.

-Barker, C., 1974, Pyrolysis techniques for source-rock evaluation: *The AAPG Bulletin*, v. 58, p. 2349-2361.

-Batten, D.J., and D.T. Stead, 2005, Palynofacies analysis and its stratigraphic application, In Koutsoukos, E, A, M. (Ed): *Applied Stratigraphy*, p. 203-226.

-Batten, D.J., 1996, Palynofacies and petroleum potential Palynology, principle and application: *AASP foundation*, v. 3, p. 1065-1084.

-Behar, F., V. Beaumont, and B. Pentea do, 2001, Rock-Eval 6 Technology, performances and development: *Oil & Gas Sci. Tech-Rew*, v. 56, p. 111-134.

- Jones, R.W., 1987, Organic Facies, in Brook J. Welte D. eds. Advances in petroleum geochemistry: Academic Press, New York, p. 1-90.
- Peters, K.E., 1986, Guidelines for evaluating petroleum source rock using programmed pyrolysis: AAPG Bulletin.v. 70, p. 318-329.
- Peters, K.E., and M.R. Cassa, 1994, Applied source rock geochemistry, In: Magoon,L,B,Dow,W,G. (Eds), The petroleum system from source to trap: AAPG memoir, v. 60, p. 93-120.
- Tissot, B.P., B. Durand, J. Espitalie, and A. Combaz, 1974, Influence of nature and diagenesis of organic matter in formation of petroleum: AAPG Bulletin, v. 58, p. 499-506.
- Tissot, B.P., and D.H. Welte, 1984, petroleum formation and occurrence (2nd ed): Berlin Springer-Verlag, v. 223, p. 509-523.
- Traverse, A., 2008. Palaeopalynology, second edition: Springer, London, 814 pp.
- Tyson, R.V., 1989, Late Jurassic palynofacies trend, Piper and kimmerdg clay Formation, UK onshore and Northern Sea . In: Batten, D. J & Keen, M. C (Eds) Northwest European Micropaleontolog and palynology, p. 135-172.
- Tyson, R.V., 1993, Palynofacies analysis, In: Jenkins, D.J. (Editor): Applied Micropalaeontology, Kluwer Academic Publishers, Dordrecht, 269p.
- Tyson, R.V., 1995, Sedimentary organic matter, organic facies and palynofacies: Chapman and Hall London, 616p.