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THE OLIGOCENE SOURCE ROCKS OF THE GLINA DEPRESSION IN THE INTERNAL DINARIDES (CROATIA)

Darko ŠPANIĆ[1], Slobodan KOLBAH[2], Ljubica RUMENJAK[1], Tamara TROSKOT-ČORBIĆ[1], Veronika ČULJAK[1], Marija MARIČIĆ[1] and Irenka STANKOVIĆ[1]

[1] *INA - Industrija nafte d.d. - Corporate Processes, Research and Development Sec., Lovinčićeva bb, 10000 Zagreb, Croatia (darko.spanic@ina.hr)*
[2] *INA - Industrija nafte d.d. – Naftaplin, Šubićeva 29, 10000 Zagreb, Croatia.*

The outcrop samples from four locations of the Oligocene source rocks from Glina Depression in the Croatian part of Internal Dinarides were geochemically and petrologically analysed and typified.

External or Karst Dinarides represent carbonate platform which exists from the Jurassic to the Middle Eocene, while Internal Dinarides correspond to contemporaneous periplatform carbonate flysch interlayered with distal pelagic sediments of the Tethys Sea. At the Eocene-Oligocene boundary, plate tectonic activity caused destruction of the western part of the Tethys Sea, which resulted in the appearance of the Mediterranean Basin in the south and the intracontinental euxinic Paratethys Basin in the north (Rögl, 1999).

Present-day Internal Dinarides corresponds to southern margin of the Paratethys. Glina Depression was probably restricted lagoon with brackish influences and periodically suboxic to anoxic bottom conditions.

Dark laminated carbonaceous shales have organic carbon in the range from 2.03 to 13.61 %. Rock Eval pyrolysis indicates kerogen type I-II with consequently good to excellent potential for hydrocarbon generation (HI= 331-946 mg HC/g TOC; S_2= 6.71-128.78 mg HC/g rock). Pyrolytic maturity parameters show diagenetic stage in thermal evolution (T_{max}= 428-438°C, PI= 0.01-0.06).

Microscopic examinations and stable carbon isotope analyses on kerogen concentrates, as well as gas chromatographic analyses of the alkane fraction of extractable organic matter revealed two types of organic facies:

1. Strong yellow fluorescing bituminite (amorphous organic matter) without any traces of structured macerals. Thermal alteration indices, estimated on isolated amorphous organic matter, are 2- (0.35-0.45 VR). Stable carbon isotope analyses give values from -28.61 to -31.08 $\delta^{13}C_{PDB}$. Gas chromatographic analyses show dominance of C18-C24 normal alkanes.

2. Moderate yellow-orange to orange-brown fluorescing bituminite with traces of yellow fluorescing liptodetrinite and up to 20 % vitrinite (huminite). Vitrinite reflectance values are from 0.33-0.49 % VR. This type of kerogen is richer in heavy stable carbon isotope

(-25.16 to -27.22 $\delta^{13}C_{PDB}$) in comparison with former type of organic facies. In the gas chromatograms dominate odd alkanes in the range C25-C31.

REFERENCES

Rögl, F. (1999) Mediterranean and Paratethys. Facts and hypothesis of an Oligocene to Miocene paleogeography (short overview). Geologica Carpathica, **50**, 4, 339-349.