

Organic Geochemistry of Algyó, the largest oil and gas field in the Pannonian Basin

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This study shows the oils and condensates of Algyó field and the close highs around it. Forty-two samples are examined using bulk composition, isotopic and molecular geochemistry to describe the compositional differences among them. 18 oils of them [1 and 2], ~55 gases and ~25 oils of the area [3] were studied previously. The geological history of the area studied (structures and trap formation, basin filling, timing etc.) has already been discussed in details [4].

The goals of the present work were to determine the source facies and thermal maturity of the hydrocarbons and to understand the relationship among the oils and condensates and the processes regulating their composition.

Unusual trends of decreasing maturities and increasing densities as a function of depth were found on the basis of biomarker results, i.e. the most-matured oils were trapped in the shallower Pliocene reservoirs, whereas thermally less-altered oils accumulated in deeper reservoirs.

The basin forming tectonic activity resulted in several types of faulting (wrench, thrust, extensional, listric, normal) and intra-basement arches provide conduits for hydrocarbons. The Algyó high has 30-40 important reservoirs, and the pay thickness varies between 5 and 20 metres.

The isoprenoid and n-alkane profiles helped us to elucidate the migration processes responsible for the differences observed.

The isotopic composition of oils and condensates fall in the same range. However, on the basis of carbon isotope type-curves, reflecting major differences in the isotopic composition of asphaltenes and resins, the oils originating from the Upper and from the Lower Pannonian (above and below ~1950 m depth, respectively) are separated from each other.

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