

GEOCHEMISTRY OF OILS FROM DEEP-BURIED FIELDS

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The analysis of composition of deep-buried field oils from different tectonic type basins - Pre-Caspian, South Caspian, Fore-Caucasus is executed. Deep-buried oils are from fields deeper than 4000m (in our study from 4000m to 6000m). It believed that on high deeps the oils can have the “smoothed” composition (mainly bulk data).

The majority of the studied oils are interpreted to be derived from the different source type, although a range of maturity is represented. Oils are all derived from shale, calcareous shale or argillaceous limestone source rocks containing marine algal and high plant organic material. These oils are interpreted to be derived from Palaeozoic to Neogene source rocks. Most oils have low sulphur content (but some greater than 1%), API^o gravity from 30 to 45, low asphaltene content (but some more than 2%), wax content mainly from 2 to 6 %. There are different contents of alkanes (from 50 to 90%) and aromatic HC's (from 5 to 35% per oil), Unexpectedly different content of gasoline fraction – from 25% (only) to 70 % and different boiling point temperature – from 50 to 120°C. $\delta^{13}C$ of alkane and aromatic fractions are from -30,5 to -23,5 ‰ (mainly around – 27 ‰).

Biomarker characteristics of oils are as follows: relative abundance of tricyclic terpanes compared to pentacyclic triterpanes (hopanes); different content of C₂₄ tetracyclic terpene; relative abundance of short side-chain steranes compared to C₂₇-C₂₉ steranes; from low to high abundance of rearranged steranes (diasteranes) compared to regular steranes and isosteranes.

Biomarker parameters used for calculation of relative organic matter maturity at the time of oil generation and probably at post-generation history are modify. So, traditional sterane maturity ratio $\beta\beta^{20S+R}/\alpha\alpha^{20S+R} + \beta\beta^{20S+R}$ good useful on middle and late middle maturity stage (Ro over 0,6) and attain equilibrium at 0.85. All our oils have relatively high ratios (mainly 0,55-0,6) but not equilibrium. Some oils have 0,4 and lower values. Ts/Tm ratio – from 0,7 to 10 (but mainly 0,9-2). We see good correlation between moretane indexes – ratios m₃₀/H₃₀ and m₂₉/H₂₉ around 0,1- 0,2 (but some samples have 0,4-0,6 values). Methyl-dibenzothiophene index - 4MDBT/1MDBT - again shows variety – from 2 to 30 (but mainly from 5 to 15). Methyl-phenanthrene index shows a good correlation with deeps. Tri-aromatic steroids indexes mainly show high values (TA₂₀₋₂₁/TA₂₀₋₂₈ more than 0,7 but in some oils less than 0,2).

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We see that oils from deep-buried fields have a wide spectrum of bulk and biomarker composition.