



## Organic Geochemistry of Upper Devonian-Lower Carboniferous black shales in the Taurus Belt, Southern Turkey

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Upper Devonian-Lower Carboniferous aged black shales with intercalated sandstone and limestone are exposed in Eastern Taurus autochthonous units (southern Turkey). In this study, the amount, type and maturity of organic matter in the black shales in the Belen and Nalta region were investigated, together with the shales' hydrocarbon potential and depositional environments.

Total organic carbon (TOC) values of the black shales from Belen and Nalta locations range from 0.11-5.61 and 0.04-1.74% wt., respectively. Hydrogen Index values for Nalta and Belen locations are generally low except for a few examples.  $T_{max}$  values of black shales in the Belen and Nalta locations vary from 432-452 °C and 444-456 °C, respectively and these data indicate that the black shale samples contain mature organic matter. Pyrolysis data prove that the organic matter in the black shales consists of mixed of Type II and III kerogen.

Analysis of solvent extracts from black shales show a unimodal n-alkane distribution with a predominance of low carbon number ( $C_{14}$ - $C_{22}$ ) n-alkanes. Pr/Ph ratios and CPI values range from 1.57-166 and 1.08-1.11, respectively. According to Pr/n- $C_{11}$  and Ph/n- $C_{18}$  ratios, the black shales samples consist of the mixed type (II/III) organic matter.

Sterane distribution is  $C_{27} > C_{29} > C_{28}$  as determined by sum of normal and isosteranes.  $20S/(20S+20R)$  and  $\beta\beta/(\beta\beta + \alpha\alpha)$  sterane ratios (for  $C_{29}$ ) range from 0.51-0.54 and 0.53-0.57, respectively. These values are very high and  $20S/(20S+20R)$  sterane isomerization has reached equilibrium.

The tricyclic terpanes were recorded in a significant abundance in m/z 191 mass chromatograms and  $C_{23}$  is dominant tricyclic terpane.  $C_{29}$  norhopane has higher concentrations than the  $C_{30}$  hopane for black shale samples.  $C_{30}$  diahopane and  $C_{29}$  Ts were recorded for all black shale samples. Ts and Tm were recorded in similar abundance. Moretane/hopane ratios are very low. The 22S homohopanes are dominant over the 22R homohopanes and the  $22S/(22R + 22S)$   $C_{32}$  homohopane ratios of black shale samples are found to range from 0.59-0.62, indicating that homohopane isomerization has attained equilibrium.  $C_{31}$  homohopanes are dominant and abundance of homohopanes decrease towards the higher numbers.