Organic Geochemistry of Lower Miocene Coaly Units: Example of the Soma Formation, Manisa, Turkey

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In the present study, source rock evaluation, biomarker distribution and carbon isotopic composition of n-alkanes in coalsamples, collected from KM2-Lower coal seam in the Soma Formation located at the south of the Soma Basin (Manisa, Turkey), were investigated by Rock-Eval pyrolysis, vitrinite reflectance measurement, gas chromatography (GC) and gas chromatography-mass spectrometry (GC-MS) analysis. Total organic carbon (TOC) values of the samples were determined between 28.45 and 73.38 wt.% while hydrogen index (HI) values were calculated 67 - 246 mg HC/gTOC. These values indicate that the organic matter contained in the samples is sufficient to serve as good source rock for oil and gas. Several plots from the Rock-Eval pyrolysis classified the organic matter in the samples as type III kerogen. The n-alkanes profile, isoprenoid values, abundance of hopanes, homohopanes (C_{31}-C_{35}) and C_{29} steranes in the most of the samples indicate terrestrial matter, algal/bacterial source organisms contributions to the organic matter forming the coal, and deposition and peatification of KM2 samples in paleoswamp. Pr/Ph ratio (0.82-16.29) determined in the samples indicates suboxic - oxic condition of organic matter deposition. The 20S/20S+20R sterane, ββ/ββ+αα C_{29} sterane, Ts/Ts+Tm, 22S/22S+22R C_{32} homohopane, moretane/hopane and C_{29} Ts/C_{29} Ts+C_{29} H maturity ratios range from 0.04 to 0.12, 0.27 to 0.40,0.02 to 0.24, 0.1 to 0.3, 0.31 to 0.63 and 0-0.16 respectively. The biomarker maturity ratios and the vitrinite reflectance values (0.21-0.63% Ro) showed that the samples are immature-early mature.