08.1

The application of organic geochemical techniques to the Ulukisla Basin oil shale (Nigde, Turkey) to analyze its source rock potential

Abdurrahman Murat, Ilker Senguler

General Directorate Mineral Research and Exploration, Ankara, Turkey

Oil shale deposits in Turkey are widely distributed in middle and western Anatolia. The Ulukisla basin, situated in the south central part of Turkey, has distinguishable oil shale which was screened for evaluation of its source rock potential in this study.

The Maastrichtian - Late Eocene aged Ulukisla basin is a typical representative of the prominent Early Tertiary basins in central Anatolia with regard to overall evaluation in tectonics and sedimentation. The Ulukisla basin formed after the emplacement of ophiolite and melange in Late Cretaceous and terminated with the emergence of Late Eocene deformation and onset of non-marine deposition in Oligo-Miocene.

Ulukisla oil shale underlies some conglomeratic rocks with an average thickness of 13 m. The caloric value of the analyzed oil shale samples is as high as 3184 kcal/kg, and 2790 kcal/kg in average.

In this study economical utilization limits of oil shale samples collected from the sediments of the Miocene aged Ulukisla basin were evaluated through the petrographic, organic geochemical, and gas chromatographic analyses.

Organic matter is mostly of type to produce oil and gas (type II kerogen). Total organic carbon (TOC) of the Ulukisla oil shale is between 0.20 and 26.88 wt %. The thermal maturation of the unit was determined through the spore color index (2.0-3.5), Tmax (421-433°C), hydrogen index (5-883 mgHC/gTOC) and production index (0.08-0.6 S1/S1+S2) and it falls into the diagenetic zone. Total genetic potential values (S1+S2) of the oil shale are between 0.02 and 221.40 mg HC/g rock. Gas chromatography (GC) analyses indicate that the Ulukisla oil shale was deposited in anoxic conditions. Oil shale of Ulukisla basin bears perfect source rock potential in regard to its organic carbon content.