



Geochemistry of Lower Cretaceous lacustrine oil shales in Central Mongolia

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Lower Cretaceous oil shale samples, collected from six different locations in central Mongolian basins, have been analyzed to determine their depositional environments and petroleum source rock potential. Results indicate that Lower Cretaceous oil shale samples have highly oil prone type I kerogen, emphasized by high TOC (avg. $10.1 \pm 1.5\%$), S₂ (68.7 ± 12 mgHC/g rock) and HI (avg. 619 ± 42 mgHC/g TOC). Organic matter in oil shales is accumulated in stratified lakes with anoxic bottom water, reflected by low Pr/Ph ratios (< 0.28) and highly negative $\delta^{13}\text{C}_{\text{org}}$ (avg. $-30.6 \pm 0.5\text{‰}$) and highly positive $\delta^{15}\text{N}_{\text{t}}$ ($+10.5 \pm 0.4\text{‰}$) values. The salinity of lakes was different, suggested by variable gammacerane index ranging from 0.03 to 0.44. Due to small size and instability of paleolakes, depositional environment and organic matter input type were variable that was reflected in n-alkane distributions, carbon preference index and terrigenous/aquatic ratio of hydrocarbons of each oil shale. In summary, organic geochemical characteristics and depositional environments of studied oil shales in Central Mongolia are comparable to those in east and southeastern Mongolia as well as Eastern China. It is therefore concluded that Lower Cretaceous oil shale-bearing unit in central Mongolia have great petroleum source rock potential.