Olga Gavrilyk O. M. Beketov

HYDROGEOCHEMICAL ANOMALIES BROMINE AS CRITERIA OF FORECASTING OF HYDROCARBON ACCUMULATIONS

National University of Urban Economy in Kharkiv

In the underground waters of different age of the south-eastern part of the Dnieper-Donets Basin bromine is one of the most frequently-found elements. It is present in 93% of selected samples. The maximum concentrations of the element are concentrated in the deeper groundwater horizons of Paleozoic (> 1000 m), where they reach 100 - 600 mg/dm^3.The dispersion halos of bromine can be traced in the areas of regional faults of different directions that are accompanied by the anticlinal structures. Their formation is associated with areas of modern heat and mass transfer, which are often coincided with accumulations of hydrocarbons in rocks.

The spatial relationship of bromine and hydrocarbons is observed at Spivakovskaya, Balakleyskaya, Cervono-Donetskaya, Shebelinskaya, Shevchenkovskaya anticlinal structures of the region. Thus, at the structure of Spivakovskaya the element content reaches 477 – 509 mg/dm3 at Shebelinskaya structure – 348 -– 402 mg /dm3, at Chervono-Donetskaya structure – 272 - 502 mg/dm3, at Balakleyskaya structure – 116 - 163 mg/dm3, at Shevchenkovsko structure – 354 - 390 mg/dm3. At the same time in the rocks of the same structures large oil and gas fields are set.

Despite the fact that the aqueous dispersion haloes of bromine are characterized by large size, their most contrasting parts are confined to discontinuous tectonic disturbances. This indicates an upward migration of the element with chloride-sodium waters of deep horizons.

The hydrocarbon migration occurs at the same fissure channels with underground bromine-containing waters. At the same time their discharge is often observed at anticlinal structures. Due to the recent tectonic intensification , the anticlinal structures uplift (grow), which leads to the removal of fluid dynamic pressure. As a result of this, the fluid flows direct to the upper parts of the anticlinal structure, which leads to the formation of contrast hydrogeochemical anomalies of bromine. These anomalies are an important hydrogeochemical criterion in search for oil and gas deposits.

The results of hydro-geochemical search for oil and gas in the south-eastern part of the Dnieper-Donets Basin let the author affirm, that bromine is a reliable element-indicator of accumulations of hydrocarbons in rocks.