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Lilia ISHCENKO

**HYDRO- AND GASOGEOCHEMICAL ZONALITY
IN DRUZHKOVSKO-KONSTANTINOVSKAYA ANTICLINE (DONBAS)**

V. N. Karazin Kharkiv National University

Hydro- and gasgeochemical zoning is a reflection of the geological processes occurring in the earth's stratum, under the influence of various geodynamic factors. One of the main factors in its formation is tectonic movements of the earth's stratum, which determine the ascending movement of fluids in bursting and folded structures. The phenomenon is characteristic of the hydrothermal ore fields of the Donbas region. Within them there is a hydrogeochemical and gasgeochemical inversion, which discover itself in a sharp change in the chemical composition of groundwater and gases.

Research of this item in the region was engaged by G. Yanovska, S. Kirikilitsa, I. Friedman, O. Suyarko, V. Suyarko and other geologists.

At Druzhkovsko-Konstantinovskaya anticline, consisting of Carboniferous and Permian breeds of the Paleozoic and controlled by Druzhkivsko-Konstantinovskiy fault zone. Here is an ore mineralization that forms the same ore field.

Within the Druzhkovka-Konstantinovskiy anticline there are modern and newest tectonic movements witness of its constant lifting to 10–15 mm/year. The result of tectonic movements are formation of hydro and gasgeochemical inversions. This inversion manifests itself in the form of gas-geochemical anomalies.

Here is a modern discharge of groundwater of deep formation and deep gases, which is a consequence of gas-hydrogeochemical inversion (table).

The chemical composition of groundwater Druzhkovsko-Konstantinovskaya anticline

№	Depth of test	Gas composition, mg/l	Hydrogeochemical type of groundwater
D1		CO ₂ – 26,7	M7,3 SO ₄ -Mg pH-1,4
D2	122,5–129,9 м	CO ₂ – 60,2	M1,2 Cl-Na pH-8,2
D3	10 м	CO ₂ – 23,0	M0,2 HCO ₃ - Ca pH – 7,55
D4	60 м	CO ₂ – 43,0	M0,2 HCO ₃ - Na pH – 7,2
D5	9,0–11,5	CO ₂ – 32,6	M1,0 SO ₄ - HCO ₃ - Na pH-7,2
D6	15,4–17,3	CO ₂ – 30,8	M1,0 SO ₄ - Mg pH-7,0
D7	9,0–12,0	CO ₂ – 54,3	M3,4 SO ₄ - Na pH-7,0
D8	12,1–12,8	CO ₂ – 52,5	M2,4 SO ₄ - Na pH-7,0
D9	2,6–4,8	CO ₂ – 36, 2	M 1,6 SO ₄ - Ca pH-6,9
D10	3,5–3,7	CO ₂ – 52,5	M 1,6 SO ₄ -Ca pH-7,1

In the background of hydrocarbonate-calcium-magnesium waters at the depths of 50–120 m there are alkaline chloride-sodium and low-mineralized low-alkali hydrocarbon-sodium water, and in “gas streams” dominated by carbon dioxide, methane, nitrogen, mercury and inert gases, in particular helium. The content of $\delta^{13}\text{C}$ in carbon dioxide which is discharged in faults with chloride-sodium and hydrocarbonate-sodium waters varies from $-0,5$ to $-1,51$ ‰, which mean its deep origin (Moiseenko V., 1984).

Gas geochemical inversion is accompanied by geothermal anomalies, which are discover in the increased pressure of the geothermal field. The temperature of groundwater of the Carboniferous and Mesozoic sediments at depths of 0–300 m reaches $23\text{--}27$ °C at background values of $10\text{--}12$ °C.

All this may mean that within the structure there are modern processes of heat transfer, which points out the post-hydrothermal stage of the hydrothermal system evolution (Suyarko V., 2006).