

The ecological role of geoactive zones of the Earth

I.S. Kopylov

Perm State National Research University

The main regularities in the formation of geo-ecological conditions of different territories are determined by natural and technogenic factors. The leading role among many natural factors belongs to the geodynamic factor - to the geoactive zones of the Earth. The methodology for studying geodynamic activity is based on the use of lineament-geodynamic and morphotectonic analysis of territories. The main methods are: aerospace, geophysical, geomorphological, geochemical, hydrogeological methods [1]. Their use makes it possible to reliably identify large and medium-sized geoactive zones in the platform and folded continental regions of different regions.

Assessment of geodynamic activity is an important part of the overall complex of regional geoecological studies, and the index of geodynamic activity is considered as one of the leading criteria for integrated geoecological assessment and zoning of territories. The influence of geoactive zones on the formation of geochemical anomalies is considered as the most important component of the geoecological conditions of many regions of Russia: the Volga region, the Urals, the Siberia, the North, the Far East, as well as Kazakhstan, Uzbekistan, Turkmenistan, where dozens of zones of the regional level (macrozones) with areas 1 -10, an average of 2-4 thousand km² [2-4], which include hundreds of local mezo- and microzones.

In the Urals in carrying out regional geo-ecological, geological-geochemical, hydrogeological researches, multi-purpose geochemical mapping, a large number of geochemical anomalies have been revealed in many components of the geological environment with a significant excess of the maximum permissible concentrations. The overwhelming majority of the anomalies lie within the 21 complex litho-geochemical anomalous zones mapped (with the area and local propagation of Pb, Zn, Cd, Be, P, As, Ni, Co, Cr, Mo, Cu, Sb, Mn, V, Ba, Sr, Sn, Ti, Zr, Ga) and 13 hydrogeochemical anomalous zones (with the area and local distribution of Br, B, Ba, Mn, Ti, Sb, Be, Cd, V, Cr, Ni, Pb, Sr, Zn, Co, Mo) with an area of 1-9 thousand km². Their position reveals good spatial convergence with regional geoactive zones. At the same time, most local geochemical, hydrogeochemical, hydrogeological anomalies are characterized by elevated values of the calculated geodynamic parameters. Sites in the contours of geochemical anomalies are characterized by significant modern geodynamic activity. All this testifies and fully proves the irrefutable fact about the very significant role of modern tectonics and modern geodynamics in the formation of geochemical anomalies, and at the same time - geoecological conditions.

Geospatial analysis of the territory, including the study of geoactive zones (with a very high density of tectonic disruptions in lineamento-geodynamic analysis), zones of ecological danger (for a set of indicators - chemical, radioactive, etc. pollution of soils, underground and surface water, air, degree of disturbance of landscapes; damage to the territory of geological and other processes and areas of the incidence of the population shows that the vast majority of areas (up to 90%), geoactive zones are within the non-core an aggravated and very unfavorable ecological condition, which is also characterized by the highest percentage of the overall morbidity of the population (especially children), and it is possible to attribute quite clearly all areas of geoactive zones to zones of ecological risk. In recent years, studies of "small" geoactive zones with positive influence on trees have appeared, and also on microorganisms in the aquatic environment [5, 6].

The main ecological role of geoactive zones is: 1) to identify and predict the movements of the Earth's matter; 2) assessment of contamination of the earth's shells and territories; 3) identification of geopathic zones; 4) active formation of geo-ecological conditions of the regions and, consequently, consideration as one of the leading criteria for integrated geo-ecological assessment and regionalization of territories; 5) identification of geo-ecological features of natural and urbanized territories, cities, various facilities in order to assess the geological and ecological safety of the planned economic activities, including. - subsoil use.

References

1. Kopylov I.S. Geocological role of geodynamic active zones // International Journal of Applied and Fundamental Research. 2014. №. 7. pp. 67-71.
2. Kopylov I.S. Geoecology of oil and gas bearing areas of the southwest of the Siberian platform. Perm, 2013. 166 p.
3. Kopylov I.S. Geodynamic active zones of the Urals, their manifestation in geophysical, geochemical, hydrogeological fields // Successes of modern natural science. 2014. № 4. pp. 69-74.
4. Kopylov I.S. Regional geological factors of formation of ecological conditions // Successes of modern natural science. 2016. №. 12-1. pp. 172-177.
5. Kopylov I.S., Dal L.I. Hemotoxic biotesting of natural waters for environmental assessment // International Journal of Experimental Education. 2016. № 5-3. P. 351.
6. Rogozin M.V., Kopylov I.S., Krasilnikov P.A. Biological aspect of geodynamic active zones // Geology and minerals of the Western Urals. 2017. №. 17. P. 223-227.