

THE THEORETICAL AND EXPERIMENTAL RESEARCH OF JET HALO ABOVE DEPOSITS OF OIL AND GAS AND ITS APPLICATION

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In the later years, the use of geoelectrochemical methods (partial extraction of metals; the method of diffusive extraction of metals; method based on the form of existence of elements and thermomagnetic geochemical method) for investigation of deposits of oil and gas discovered the phenomenon of the jet halo of dispersion of heavy metals of the mobile forms above the deposits. The jet halo, which is much different from lithogeochemical halo, has two features: 1) high anomaly content of metals exist around the projection of oil and gas deposits on the surface of the Earth; 2) there exists weak relation between the maximum of anomaly and the depth of the deposits. In order to explain the phenomenon of jet halo above deposits of oil and gas, Putikov. O. F and his colleagues put forward the possibility of migration of heavy metals, which is connected with the vertical moving of gaseous bubble through rock. The physic-mathematical models of jet halo of dispersion of heavy metals for homogeneous and inhomogeneous (two layers) surrounding rocks are established. The models are used to interpret geoelectrochemical field data. The good result of fitting of field data with the theoretical curves shows the possibility of estimation of parameters of oil and gas deposit by the solution of geoelectrochemical inverse problem. The experiment, carried out in the Saint-Petersburg Mining Institute, show the possibility of one-dimensional and two-dimensional migration of heavy metals owing to the vertical moving of gaseous bubbles.