

## **Forming of karst water composition by the technogenic factors**

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Karst regions are the terrains of the specific geostructural and hydro-geological conditions. Geological environment of these regions is very unstable. Assimilation of the karst regions is connected with dangerous situations and unreversible changes of the natural conditions. Karst process determines the equilibrium of geological environment in the areas which cover more than 180000 square kilometers of the Urals.

Chemical composition of the coal mine water depends on contents of the sulfur, carbonated and diffused elements in the coal formation. If the contents of sulfur in coal is more than 4% karst water acquired acid reaction (pH=2-3) and sulfate composition. Sulfate - Iron - Aluminum - Natrium - Calcium water acquired mineralization 2.5-19 g/l.

The sulfur contained minerals and the organic compounds yield sulfuric acid by process biochemical oxidation. During exploitation of the coal deposits, in connection with increase of the water influxes, air exchange and volumes of the rocks in geochemical process the mineralization can increase to 35 g/l. In the mine water as compared with natural karst water content of lead, copper, zinc, silver, nickel, cobalt increased in several tens time.

The rivers of the West Ural coal mine districts have hydrocarbonate- calcium-sodium hydrochemical facies with mineralization 90-150 mg/l before of the mine water tributaries fall in water of this rivers is fresh and ultrafresh, slightly acid (pH=5.8). After of the mine water fall in water of the karst rivers acquired Sulfate-Iron-Aluminum composition and mineralization from 640 to 5000-6000 mg/l. Content sulfate is from 1000 to 3700 mg/l, iron from 160 to 900 mg/l, aluminum from 11 to 160 mg/l when pH=2.5- 2.9.

Throw of the mine water has greatly changed the natural regime of the karst rivers. The iron contained deposits (with hematite about 46%) partly or fully had filled karst cavities in excepted underground flow and increased part of surface drainage.

The sediments of bottom have very intensive pollution too. The water extracts by pollution were changing from hydrocarbonate-calcium to sulfate-calcium. Contain of the chemical salt increased from 300-350 mg/l to 9500-9700 mg/l. The reaction was changed from slightly acid (pH- 5.5) to very acid (pH=2.5-4). The sediments are sources of the secondary pollution.

The underground karst water are partly isolated from the surface stream and active pollution by naturally-technogenic reasons. Nevertheless, the pollution from the surface flows by filtration is existing and not only during the flood periods. Atmospheric water going through the coal slag-heaps are concentrated sulfate and polluted subsurface water on depth 30-50 m. Hydrochemical hydrocarbonate - calcium facies is changed under source of pollution to sulfate - hydrocarbonate - calcium (contain sulfate achieved 300-350 mg/l when mineralization is 700-760 mg/l).