Geophysical Research Abstracts
Vol. 16, EGU2014-13745, 2014
EGU General Assembly 2014

Geochemical features of the Osovey Area, perspective for the polymetallic mineralization revealing (Polar Urals)

Olga Savicheva, Vladimir Sholokhnev, and Yuliya Makarova
Russian Federation (Olga_Savicheva@vsegei.ru)

Osovey prospective area (184 km2) is located in the north of the Polar Urals within the Verhnekarsk Eletsk metallogenic zone, specialized on the base metals, barium and bauxite. Three structural stages, namely Riphean-Early Cambrian, the Late Carboniferous, and Triassic-Cenozoic are identified in the geological structure of the area. They are divided by the stratigraphic and angular unconformity. Volcaniclastic rocks of the Oyuyahinskaay Formation such as basaltic andesite, apovolcanogenic shales, mediosilicic and basic composition tuffs, as well as black banded shales of carbon-clay-siliceous composition related to the Silurian-Early Devonian Harotskaay Formation are predominant.
Area is characterized by complex landscape conditions for the prospecting. Increased thickness of loose sediments, transeluvial weakly dissected lowlands, superaqual landscapes in lower parts of the slopes are widespread.
In 2012 at the 1:50 000 scale geochemical prospecting (sampling density 500×50 m), carried out in the Osovey Area, 6000 samples were picked out from unconsolidated sediments. The samples were analyzed by the ICP MS method. Principal typomorphic elements of the polymetallic mineralization (Zn, Pb, Cu, Ag) as well as elements-indicators such as Bi, Sb, Se, Mo, etc. were defined. In addition to the polymetallic mineralization the Osoveysky area is perspective on the identification of iron-manganese ores, barites with polymetals, phosphorites, and vanadium. Such elements as Mn, P, V, U, Ba were also defined for this reason.
Contrast secondary dispersion halos of Cu (up to 2060 ppm), Ag (1,45 ppm), Sb (12,3 ppm), Mo (18,9 ppm), Mn (7, 6 %), P (1,05%), Ni (338 ppm), and medium-low contrast ones of Zn, Pb, Co, V, Se, Sr, Bi, Sn, Ba, Ti, U, Cr, Zr were identified according to the results of the geochemical prospecting. Five anomalous geochemical fields (AGF) of the ore deposit rank (n ×100 km2) were identified according to the results of geochemical data processing and their integrated analysis with use of monoelement dispersion halos as well as halos of the ore complex elements multiplicative indicator (Cu×Zn×Pb×Mo×Ag×Bi×Sb). In the geochemical spectrums of all five AGF Cu is on the first position and followed by Zn, Co, Mo, Ag, while Pb, Bi, Sn, As, and Ba are secondary and sporadically occurring elements. Bedrock sources of the identified AGF are attributed to the copper-sulfide formation as a result of the generalized spectrum comparison with the known ore deposits. Two of the identified AGF, located in the southern and northern Osovey Area, have a zonal structure: centripetal elements (ore complex elements), namely Cu, Ag, Mo, Zn, Bi, are accumulated in the core zone, while centrifugal elements Mn, V, Cr, Ti are moved out; an exchange zone, setting off the nuclear zone, is characterized by the opposite spectrum of elements. These AGF in the Osovey Area have the highest production of the Cu, Ag, Mo dispersion halos. In 2013 geological and geochemical explorations at 1:10 000 scale were carried out within these AGF (including confirmatory operations of contrast dispersion halos by ditches). Anomalous contents of base metals, as well as phosphorus and barium (in samples from talus-eluvial deposits) are recorded within the perspective geochemical anomalies contours according to the preliminary results.