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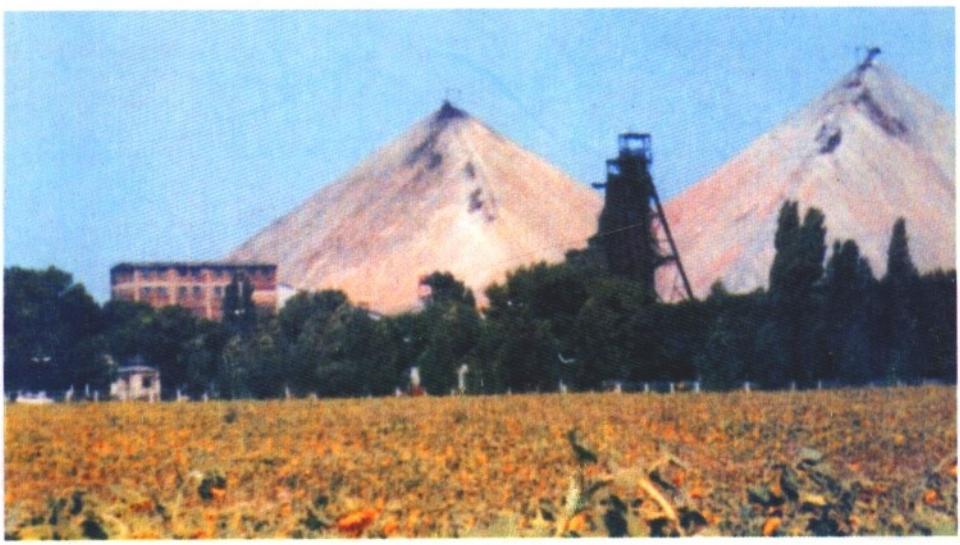
ABSTRACTS



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Ni, P, Y,Sc, Yb for overburnt argillites of waste pile of Mezhirichanska mine. Such elements as Ga (0.9-1.0), Sn (1.1-0.9), V(0.9-0.85) and Cu, Zn didn't modify their content in the process of argillites burning. As a result of the thermal process the content of Cu(1.7-6.6)>Sc(4.5-3.1) >Sn(10.8-2.2) >Be(3.3-1.6) >Ga(9.1-3.5) >Ti(2.2-1.5) >Sr(2.5-1.4) >Ba(5.6-1.3) >Cr(5.7-1.25) and V, Pb, Co, Yb, Y, Ni, Bi, Mn in **siltstones** grow in overburnt siltstones of pile of Mezhirichanska mine. At the same time, the part of microelements in overburnt siltstones were not revealed or they reduce their content. The overburnt **sandstones** are rich in Sn (3.3-2.6) >Ga (1.2-3.3) >Pb (2.4-1.8). The sand stones of the separate waste piles are also rich in Cr, Co, Ni (Mezhirichanska mine) and Cu, Sc, Zn, Ge, Ba (Vizejska mine). Set the process of sandstones burning lost such elements as P(0.8-0.8), Mn (0.-0.5) and Ni, Co, V in waste piles of Vizejska mine and Ba, Zr in rocks of Mezhirichanska mine.

ASSOCIATIONS OF MICROELEMENTS IN THE ROCKS OF WASTE PILE OF MINE "MEZHIRICHANSKA"

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The rocks of waste pile of mine of Mezhirichanska on the whole are impoverished microelements in comparatively with clarke. At the same time row of found out elements have higher values of concentration comparatively with clarke, in particular Yb (coefficient of concentration (Cc) 7,3), Mo (Cc 3,7), Pb (Cc 2,0). On separate areas content of Y, Mn, Yb, V, Co, Sc, P, Be, Cu exceeds clarke in siltages to 5 times. In particular content of Co and Mn on 36 % the areas of waste pile are exceeded by proper clarke, to the Y and Yb – 30, to V and Cu – 22 , to Scm – 20, to the Be – 18, to P – 12 %. On this account it is important to set conformities to the law of distribution of microelements in the rocks of waste piles, to reproduce the mechanisms of our concentration and dilution. For the decision of these tasks we took advantage of factor analysis.

As a result of factor analysis we are find out the associations of heavy metals in mixture of rocks of waste pile. It is set that the concentrations of almost all chemical elements are promoted except for a molybdenum on considerable territory related to ash level of rocks of waste pile. That these elements are mainly contained at inorganic component rocks. On it a factor specifies by F1 weight 38 %. Rocks of high ash level and enriched heavy metals form all, except for a slope,

surface of western part of waste pile. A rock on this area has middle ash level - 73 %. Middle content of microelements in the rocks of area such (in g/t): Ba – 239,1; Be – 2,58; P – 684,8; Mn – 868,7; Pb – 55,7; Sn – 1,7; Cr – 72,3; Ga – 14,02; Ni – 44,3; Mo – 5,17; V – 158,4; Ti – 3456,2; Cu – 50,3; Yb – 3,3; Y– 49,5; Zn – 57,4; Sc – 10,6; Zr – 85,2; Co – 24,6; Sr – 118,9. The rocks of slopes of western waste pile are characterized ash level - 62,7 % but by low content of the explored microelements. Consequently content of microelements in these areas of waste pile differs substantially. In particular for Sn the coefficient of concentration between these parts of waste pile is conditional achieves 44,6, to V - 7,8, Pb, Cr, Ti, Cu, Y it is been a greater 5.

Division of loadings of factor F2, weighing 17 %, testifies that siderite and pyrite foremost contained in argillite, and about burnt out rocks are presented more frequent in all aleurolite and sandstones, and unburnt argillite. The row of factors influences on content of microelements, namely: degree of stage of burned rock of rock, presence of pyrite, chalcopyrite, siderite, and lithologic composition of rocks. Burnt out rocks are mainly located in western part of waste pile. The unburnt rocks form east part of waste pile and separate slopes in western part.

Areas of negative values of marks (factor scores) of factors are on 98 % made the unburnt rocks. After lithologic composition substantially prevail argillites. Amount of pyrite, chalcopyrite, and siderite here in 1,5 times greater, than on the average in the waste pile of mine of Mezhirichanska. Table of contents of Cu in 1,6 times, Sn, Y, V in 1,5, Mn, Be, Ni in 1,3 times exceeds middle content of these metals in the rocks of surface of waste pile of mine.

Comparatively with clarke for clays and argillite in found out by us parts of waste pile the concentration of Mo is higher in 2 times, Pb in 1,8, to the Y – 1,4 more time. The near to the clarke concentration have Ti and V. In the areas of positive values of factor scores of factor F2 coefficient of concentration of Mo relatively clarke - 2,7, Pb – 2,0, to the Y and Mn – 0,5, to V – 0,4.

Exploring separately burnt out and unburnt rocks assert that burnt out rocks comparatively with unburnt have higher ash level (in 1,6 times) and concentration of Cr – in 2,6, Sc – 2,5, Ga – in 2,3, Ba – in 2,2 times, Sn, Zr –2,1, V – 1,9, Sr – 1,8, Be, Ti – 1,7, Zn, Co – 1,6, P, Cu – 1,4. At the same time in burnt out rocks it is set a dilution Mo – in 0,1, Pb – 0,5, to the Y – 0,6, Mn – in 0,7 times. On content of nickel (Cc 1,1) and ytterbium (Cc 0,8) the degree of stage of burned rock of rock does not influence practically. More correctly will be to confront content of metals in the ash of burnt out and unburnt rocks. In this case we got the following row of change of concentration as a result of their burnt: Cr (1.8)>Sc (1.7)>Ga (1.6)>Va, Sn (1,5)>Zr (1.4)>V (1.3)>Be, Ti, Sr (1.2)> Zn, Co (1.1)>Cu, P (1.0)>Ni (0.8)>Mn, Yb (0.5)>Y (0.4)>Pb (0.3) > Mo (0.04).

Factor F3 weights 8 % selects the association of coal – molybdenum – unburnt rocks – pyrite (Fig. 4b). That a molybdenum is concentrated within the limits of the

unburnt areas of waste pile of enriched coal and pyrite. To our opinion, primary is connection between the amount of coal and content of molybdenum in mixture of rocks of waste pile. Exactly absence of coal in burnt out rocks, instead of absence of pyrite causes the decline of content of molybdenum in rocks. A table of contents of molybdenum is in burnt out on 50 % rocks makes 1,84 g/t, burnt out on 75 % – 1,82 g/t, that is safe for an environment.

In negative part of factor F4 weights 5 % the association is selected Cu, Y, V, Ni, Ba, Be, (Sn), weathered rock of rock; in positive part – Mo, Sc (Ga). It can testify that on areas intensively weathered rock rocks copper is concentrated, ytterbium, vanadium, nickel, barium, beryllium, (stannum) and a molybdenum, scandium, gallium, is washed (diminish the content). Coefficient of concentration of chemical elements within the limits of areas weathered rock of rocks comparatively with their middle content in the rocks of waste pile such: Cu-2.6; Y-1.9; Be, V-1.8; Ba, Ni-1.7; Sn-1.5; Cr-1.4; Zr-1.3; Ga, Sc-0.7; Mo-0.5. From rocks which tested weathering a molybdenum and less intensively gallium and scandium is intensively washed. This process obviously causes to piling up of molybdenum in lower horizons of waste pile and creates the threat of his entering environment, in particular in the river of Rata.

Factor F5 weight 4 % specifies on washing of molybdenum from the slopes of waste pile. This fact testifies to high mobility of this element.

COAL TOXICOSIS OF LVIV-VOLYN' COAL BASIN

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Sulfur, beryllium, arsenic, mercury are those toxic components which are created in the usage of solid fuel. Manganese, lead, nickel, vanadium and chrome are those toxic components which are held potentially. The combination of those elements is related to the list of toxic, while average concentration is not great, the local concentration is high, the possibility of harmful influence is problematic and the results of pollution are unknown.

Sulfur is one of the coal basic elements, it is related to toxic and technologically harmful components. The determination of sulfur contents is not the task of microelemental research. Quantative study of this element is held while defining quality with the help of special methods, which are regulated by state standarts.

Sulfur in fuel of Lviv – Volyn' coal basin has been studied enough. The maps of sulfur broadering in industrial and perspective layers are completed and described, geological and genetic pecularities of its consent ration are outlined. Sulfur contents in some layers and regions is changed from 0, 4 - 0, 7 to 5-8, sometimes to 10% (in average amount 3-4%).

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