



CRM of Ukraine Database Supplements

Mineral target:	Novopoltavske deposit
Commodity:	Niobium, tantalum, strontium

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Location: the deposit is located on the territory of Chernigivskiy and Pologivskiy districts of the Zaporizhia region, 0.5 km from the regional center of Chernigivka and 100 km southeast of the city of Zaporizhia. The nearest railway station, Verkhniy Tokmak, is 7.0 km away.

Degree of study: detailed exploration of the Novopoltavske deposit was carried out in 1982-1991.

Geological characteristics: the Novopoltavske deposit belongs to the complex of alkaline rocks and carbonatites of the linear type, which lies in a deep fault zone among Archean granitized and migmatized extrusive-sedimentary rocks of the Azov block of the Ukrainian Shield. The maximum width of the zone is 900 m, traced to a depth of up to 1300 m, along the strike for more than 12.5 km. The deposit is confined to the eastern side of the Chernigivska Depression, made up of Meso-Cenozoic sediments with an average thickness of 80 m. Carbonatites and their weathering crusts are apatite-bearing, to a lesser extent, carbonatized host rocks. Carbonatites form steeply dipping lenticular and sheet-like bodies, mainly with clear contacts, with a thickness from the first meters to 170 m and a length of 1,000 to 7,500 m.

The hard-rock ores are mostly overlain by loose apatite-bearing weathering crusts of the planar-linear type, the thickness of which reaches 180 m or more.

9 large bodies of carbonatites and a number of small and stockwork zones were discovered at the deposit. Two types of apatite ores are distinguished: hard-rock, represented mainly by carbonatites and their weathering crusts. The content of P_2O_5 in carbonatites is mainly 2.0-6.0%, sometimes up to 8-10%. The average content of P_2O_5 in the natural contours of carbonatite bodies is 4.4%. There are no harmful impurities.

During the weathering of carbonatites, all carbonates are completely decomposed, apatite changes slightly and accumulates, fergusonite, hatchetolite, pyrochlore are completely destroyed. The content of P_2O_5 in the weathering crusts of carbonatites fluctuates mainly in the range of 4.0-16.0, rising to 24% and more, in the weathering crusts of carbonatized rocks - 2.0-8.0% (up to 20%).

Taking into account the content of rare metals, two types of dense apatite ores are distinguished: apatite and rare metal-apatite. In addition to carbonatites, rare metals also form mineralization in alkaline rocks. The content of Nb_2O_5 in ore intervals is 0.1-0.2%, sometimes up to 0.4%, the content of zirconium is 0.1-2.0%, on average 0.50% with a conditional cutoff of 0.3%.

Enrichment schemes have been developed based on the results of technological research. During enrichment of apatite ores, apatite concentrates are obtained, which contain 37% P_2O_5 and are suitable for phosphoric fertilizers after processing the concentrates by sulfuric and nitric acid methods.

Two technological schemes are proposed for beneficiation of apatite ores: one is for beneficiation of loose weathered crust ores, and the other is for beneficiation of dense non-weathered ores.

From weathered crust ores, the following were obtained: apatite concentrate containing P_2O_5 37.5-38.8% with 78-90% extraction and 21.5-23.3% yield and hydromica concentrate. The following are obtained from dense ores: apatite concentrate, which contains 36-39% of P_2O_5 with extraction of 78-85% and a yield of 7.8-9.0%; magnetite concentrate, which contains magnetite in the rough concentrate of 65-75% with an extraction of 80-88% and a yield of 2.9-5.0%; carbonate concentrate, which contains 75-90% of carbonates with a recovery of 75-85% and a yield of 33-55%; raw rare metal concentrate containing 2.6% Nb_2O_3 ; pyroxene-mica product containing more than 75% of mica with a yield of 30-35%.

Overburden rocks are represented by Quaternary loams and a sandy-clay layer. The total thickness of overburden rocks is up to 100-120 m.

The hydrogeological and mining technical conditions for the development of the deposit are quite complex: the presence of a productive sequence of aquifers in the top and a variety of low-resistant rocks, the calculated possible water inflows into the mine with a depth of 500 m are estimated at 190

m³/h, into the horizontal adit - 0.08 m³/h per 1 m. But the main irrigation horizons have a limited location and large inflows are expected only at the first stages of the mining operations.

Assessment of resources/reserves: reserves are estimated to a depth of 500 m (absolute mark 320 m), according to categories B, C1 and C2. The deposit was comprehensively assessed (protocol of the DKZ of the USSR No. 11160, 1991), in ores, except for P₂O₅, approved reserves of fluorine, strontium oxide, tantalum oxide, niobium oxide, liquid earths, mining reserves of magnetite concentrate (the content of magnetite Fe in the concentrate is 66% with a yield of 2.4%) and reserves of carbonate raw materials that comply with GOST 14050-85 (concentrate yield - 39.1%), extractable reserves of U₃O₈ based on the yield of rough concentrate (yield 2.3%).

Information about mineral resources and reserves of rare metals is confidential.

Other resources: estimated reserves below the horizon -320 m (interval -320-500 m) in quantity by category, thousand tons:

C1 : ore – 271,496.4; including apatite (P₂O₅) – 13,592.2;

C2 : ore – 89,334.3; including apatite (P₂O₅) – 4,108.5.

As of 01.01.2023, reserves at the deposit remained unchanged and in accordance with the protocol of the DKZ of the USSR dated 12.20.1991 No. 11160 approved reserves are made up by categories, thousand tons:

B+C1 : ore – 859,628.0 , including apatite (P₂O₅) – 42,310.0; fluorine – 1,911.7; Fe (magnetite concentrate) – 19,452.3; carbonate raw materials – 357,797.6.

C2 : ore – 95,858.0, including apatite (P₂O₅) – 4,268.0; fluorine – 192.7; Fe (magnetite concentrate) – 2,158.9; carbonate raw material - 44326.6.

off-balance: ore – 34,039.0 , including apatite (P₂O₅) – 1,593.0.

Degree of development: not being developed.