



CRM of Ukraine Database Supplements

Mineral target:	Irshanske deposit
Commodity:	Titanium ores

Version: 17 April 2024

Project	101075609 — GSEU — HORIZON-CL5-2021-D3-02
Supplement Data	
Supplement number:	MO.400012
Dissemination level:	Public
Supplement type:	Description
Work package:	WP2: Critical Raw Materials, the International Centre of Excellence and United Nations Framework Classification (CRM-ICE-UNFC)
Lead WP/ Supplement beneficiary:	[EGS]

Supplement status	
Endorsed (WP leader):	Guillaume Bertrand, BRGM
Supervised	Boris Malyuk, BRGM/GIU
Approved (Metadata Coordinator):	Oleksiy Likhosherstov, GIU
Author(s):	Affiliation:
Nataliya Kovalenko	GIU
Stella Shekhunova	IGS
Vitaliy Sukach	IGMOF
Maria Kurylo	UAG

Location : Zhytomyr Oblast, Zhytomyr District, 1.1 km from Irshanskiy GZK, to the west from Nova Borova railway station.

Research: in 1994, the Australian company Renison GoldsTilds Consolidated Limited became interested in the beneficiation waste from two factories of the Irshanskiy Mining and Processing Plant and turned to the State Committee of Ukraine for Geology and Subsoil Use with a proposal to explore the tailings, in which the presence of titanium minerals, for various reasons, accumulated with beneficiation waste .

In November 1994-1995, the Zhytomyrska party of the Pivnichukrgeology enterprise conducted exploration of the Irshanske man-made ilmenite deposit. Based on the results of the works, titanium ore reserves were approved by the State Committee of Ukraine, protocol dated 12.20.1995 No. 358.

Geological structure : the Irshanske deposit was formed as a result of the processing (enrichment) of 50% ore concentrates and is a tailings deposit of sands from beneficiation factories.

As a result of geological exploration work, industrial concentrations of titanium minerals were established in the upper parts of the layer of sand washed in the tailings.

The man-made field is confined to the quarries that store the tailings of the Irshanska beneficiation factory. Ore-bearing formations are quartz sands.

The Irshanske deposit in plan has an isometric shape measuring 580x400m. A productive body with an average ilmenite content of 7.0% and an average thickness of 6.2 m lies on the day surface. Its internal structure is quite simple, the content of ilmenite naturally decreases from the roof to the footwall, which is established according to test data.

Quartz sands of man-made origin are ore-bearing in the deposit. The main mineral is quartz, secondary ones are represented by ore and clay minerals in various proportions.

There are no overburden rocks in the deposit, the roof of the ore deposits coincides with the day surface, which is characterized by unevenness with drops of up to 10 m.

The main titanium-bearing minerals of the deposit are: ilmenite + leucoxenized ilmenite / leucoxene / rutile. The ratio of ilmenite + leucoxenized ilmenite and rutile to each other in Irshanski ores is 10:0.2. The amount of ilmenite in the sum of heavy minerals in the deposit is on average 78.2%.

The distribution of ilmenite + leucoxenized ilmenite in the ore bodies is uneven, which is confirmed by the coefficients of variation of the content, which amounted to 77.9% in the Irshanske deposit.

The ilmenite of the deposit has been significantly altered and is characterized by the following indicators: TiO₂ content from 57.6% to 61.8%, average - 60.52%.

In addition to titanium-bearing minerals, the ores of the deposit include: zircon, staurolite, disten, sillimanite, garnet, apatite, pyrite.

The mining and technical conditions of the deposit are estimated to be favorable for their exploitation by open pit.

The absence of overburden and the presence of artificial dams, limiting the ore-bearing "tails" of enrichment, make it possible to minimize losses during mining.

Ore-bearing rocks are multi-grained quartz sands with a density of 1.66-1.75 t/m³.

As a result of a comprehensive study of the deposit, the following accompanying minerals and components were found: Group I - rutile and zircon in ores, Group II - vanadium and scandium in ilmenite.

Rutile and zircon are the most common minerals in man-made ores and are of industrial interest. The content of these minerals is: rutile 0.12%, zircon 0.16%.

Rutile contains up to 98% TiO₂, and zircon – up to 67% ZrO₂. Hafnium (up to 0.12%) and yttrium (0.04%) are noted in zircon. In the process of magnetic separation, both minerals fall into the non-magnetic fraction.

The ilmenite of the deposit contains in the form of an isomorphic impurity a whole group of elements, of which vanadium and scandium are of industrial interest. The content of vanadium pentoxide and scandium oxide in ilmenite is 0.29% and 61 g/t, respectively.

It is possible to obtain construction, molding, glass quartz sand and sand for sprinkling roofing material from the enrichment tailings.

Information on the mineral reserves and resources is confidential.