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Research Article

NONMETALLIC MINERAL RESOURCES OF THE KYZYLKUM ORE MINING REGION

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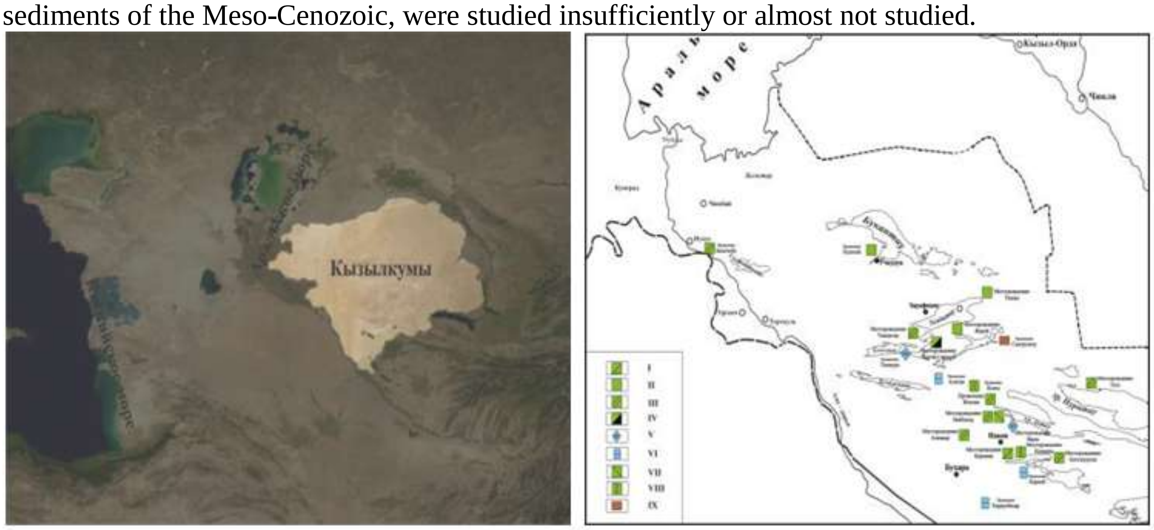
ABSTRACT
This work lists an incomplete list of nonmetallic minerals of the Kyzylkum ore mining region, confined to the marine formation of Paleogene sediments, where each mineral is of high quality, of course, when it is involved in the national economy, as a raw material with a wide range of application, with an obvious large economic effect.

Keywords: *Mineral, Carbonate, Sands And Sandstones, Bentonite Clays*

INTRODUCTION

Uzbekistan is famous for the richest mineral resources. If we take as an example only the Navoi region, in particular the Kyzylkum ore mining region, here, according to the data of geologists, the entire periodic table is presented, and it has always been in the center of close attention of geologists (Fig. 1).
In Kyzylkum, in connection with the discovery of the Muruntau gold deposit in the 60s and subsequent years of the last century, intensive geological exploration is being carried out. In the search for new gold and other ore deposits, large-scale (1: 50,000, 1: 25,000) geological mapping covered mainly the Paleozoic and pre-Paleozoic formations of the Kyzyl Kum from adjacent territories. At the same time, the main emphasis was placed on the identification of ore minerals, and nonmetallic minerals, common in the sediments of the Meso-Cenozoic, were studied insufficiently or almost not studied.



A B

Fig. 1. Kyzylkum - a view from space (A) and a schematic map of deposits and occurrences of nonmetallic minerals of the Paleogene (B): I - feldspar-quartz sands, II - quartz sands, III - bentonite clays, IV - phosphorites, V - dolomites, VI - gypsum, VII - palygorskite clays, VIII - opoka-like clays, IX - oil shale

An important role in the economic development of each state is played by the provision of its national economy with its own mineral resources. With the acquisition of independence by the Republic of Uzbekistan, state measures taken to localize production, increase the output of import-substituting and export-oriented products, highlight the development of scientific foundations of regional forecast and search for new deposits of high-quality mineral raw materials as priority tasks.

The paleogene deposits of the Kyzylkum desert are rich in various deposits of nonmetallic minerals. The stable platform regime, the maximum uniformity of the surface, and the arid climate contributed to the differentiation of the deposited matter, the limited input of coarse detrital material with a simultaneous increase in the inflow of colloidal and regular solutions into the sedimentation basin. Here the role of mechanical, physicochemical, biochemical and chemical differentiation of sedimentary matter is very great. As a result of the clear isolation of facies units, deposits of a certain type of minerals were formed in each of them. Among them are nonmetallic minerals, in particular: quartz sands, bentonite clays, bentonite-like clays, carbonate-palygorskite clays, opoka-like clays, dolomites, marls, phosphorites, gypsum and oil shales occupy a special place due to their wide range of applications in various industries.

Sands and sandstones. Quartz sands are confined to the section of the Lower Eocene Suzak Rhythm Formation of the Southeastern Kyzyl Kum Formation and belong to the Kazakhtau Formation ($P_1^{2\text{-}3}$ kz) of the Upper Paleocene, as well as to the Upper Eocene Rishtan-Khanabad Rhythm Formation of the Lavlyakan Horizon of the Sugrali Formation ($P_2^{2\text{-}3}$ sg) of Cnetral Kyzylkum. The first are feldspar-quartz sands with quartz content up to 85-95%, fine-grained and well-sorted. Natural outcrops are noted on the southwestern slope of the South Nuratau ridge and on the northern slope of the Ziyaetdin mountains (Kalkanata and Kermina deposits) (Dalimov, 1998; Ilyashenko, 1966).

In Central Kyzyl Kum, quartz sands are clean with a quartz content of 98-99%, well-sorted, fine-grained. Dzheroy, Akmurat, Tamdy and other deposits are confined to them. Their formation is associated with the actions of underwater sea currents. These currents can be alongshore and discontinuous (Mirzaev AU, 2002). Alongshore underwater currents are formed when surge waves approach at an acute angle to the shores and act parallel to them. Discontinuous underwater currents are formed when surge waves approach directly to the banks with a convex configuration. Such underwater currents are usually directed towards the central part of the basin. If quartz - feldspar sands of the Kazakhtau Formation ($P_1^{2\text{-}3}$ kz) of the Upper Paleocene were formed as a result of the activity of alongshore underwater currents, then the quartz sands of the Lavlyakan horizon of the Sugrali Formation ($P_2^{2\text{-}3}$ sg) of the Upper Eocene owe their accumulation to discontinuous underwater sea currents.

High mechanical differentiation of sands and their structural maturity is associated with the repeated mobilization of material from previously prepared material in other dynamic facies zones. Thus, quartz sands of alongshore underwater currents of the Early Eocene age are primarily sediments of the Eolian-lowland facies belt, and quartz sands of discontinuous underwater currents of the Late Eocene originally formed in the clastic zone of the wave-surf facies belt from the material of deeply decomposed weathering crust. Therefore, in addition to structural, they also have mineral maturity (Fig. 2).

Bentonite clays. By genesis, bentonite clays can be hydrothermal, effusive-sedimentary, and allothigenically transformed. The Askan deposit (Georgia) of bentonite clays belongs to the first genetic type. It was formed due to hydrothermal alteration of andesite-trachyte tuffs of the Middle Eocene. Effusive-sedimentary bentonite clays are formed by underwater weathering (halmyrolysis) of volcanic glass and other pyroclastic material. This is evidenced by the relict ash structure and preserved fragments of unaltered volcanic glass. Their composition is almost monomineral - montmorillonite, has a massive texture and lumpy jointing. An example of them are the layers of white bentonite clays of the Oglanly (Turkmenistan), Azkamar (Uzbekistan) deposits and other occurrences (Zakirov MZ et al., 1989). Bentonite clays of allothigenically transformed genesis are formed by alterating clay minerals into montmorillonite under alkaline conditions. This genetic type also includes the Navbakhor (Uzbekistan) deposit of bentonite clays (Mirzaev AU, 2003).

Figure 2: Cross multidirectional oblique bedding of wave-breaker type in quartz sands of the Dzheroi deposit (Lavlyakan horizon of the Sugrali suite ($P_2^{2\text{-}3}$ sg) of the Upper Eocene).

Bentonite clays of allothigenically transformed genesis are widely developed in the section of the Lower Eocene of the Southeastern Kyzylkum, which are distinguished under the name of the Nuri Formation and constitute the main part of the section of the Early Eocene Suzak Rhythm Formation of the Southeastern Kyzylkum (Mirzaev AU, 2003). They have a fine-plated texture, highly colloidal, finely dispersed, oily to the touch. The mineral composition is sharply dominated by montmorillonite, the content of which reaches 80-85%. The second most abundant is hydromica. More than ten deposits and occurrences of high-quality bentonite clays have been discovered in Kyzylkum, such as the Navbakhor, Ulus, Jizlan, Karakata, Tamdytau, Akoy, Northern Istiklol deposits, etc. On the basis of the Navbahor deposit, in 2002, a plant for the production of bentonite clay powders was built, named as “Bentonite” JV, part of “Uzbekneftegaz" NHC.

Bentonite clays are widely used in mechanical engineering, metallurgy, mining, oil and gas, petrochemical, chemical, light, food industries, agriculture.

Due to their high sorption properties, they are used in the purification of drinking and waste water, for the whitening of animal fats, vegetable oils, grape and horticultural wines and juices during the regeneration of waste oils.

The main consumer of these clays is the production of drilling operations. The solutions prepared from them are distinguished by high viscosity, structural, mechanical and thixotropic properties. A stable suspension of clays helps to keep the cuttings in suspension during a temporary stop of the drilling rig, thereby preventing its accumulation in the bottom hole and prevents sticking of the tool.

Alkaline bentonites can replace expensive and scarce products used in yarn sizing in the textile industry. At the same time, the threads have an even smooth surface, high strength and elasticity. The yarn is easily washed and degreased.

In the chemical industry, bentonite clays are used in the production of various varnishes and paints, vitamins, rubber and organobentonite synthetic materials.

A bentonite soap can be created from bentonite clay. This not only saves deficient fatty acids, but also sharply decreases water hardness. When washing, bentonite soap removes greasy stains from the surface of fabrics, which cannot be done with conventional products. In this case, clay particles with fat form a stable emulsion and leave with foam.

In the cosmetic industry, various pastes, ointments, creams, lipsticks, powders are made on the basis of alkaline bentonites. Bentonite creams suck out dirt and fats from the micropores of the skin, smooth out wrinkles on the face.

This is not a complete list of industries in which bentonite clays are used. Their wider use will give both the country and the region enormous economic benefits and will contribute to solving acute environmental problems.

The Kyzylkum mining region has always been in the focus of attention of geologists as a "storehouse" of many ore and non-metallic minerals.

REFERENCES

Dalimov TN, Shayakubov TSh (1998). Geology and Mineral Resources of the Republic of Uzbekistan. *University Publishing*, Tashkent, 722.

Ilyashenko VYa (1966). Paleogene phosphorites of Western Uzbekistan. *Lithology and sedimentary minerals of Uzbekistan*, *Fan Publishing house*, *Tashkent*, 84-93.

Mirzaev AU, Chinikulov Kh (2002). Underwater sea currents in the Kyzyl Kum Paleogene sea basin. *Geologiya va Mineral Resurslar, Journal, Tashkent*, **5**.

Mirzaev AU, Chinikulov Kh (2003). Clays of the Navbahor deposit (Uzbekistan). *Lithology and minerals Journal, Moscow*, **3**, 3-11.

Zakirov MZ, Egamberdiev ME, Mirsaidov MM, Karzhauv AT (1989). Alkaline bentonites of Uzbekistan. *Exploration and Protection of Mineral Resources*, Moscow, **2**, 10-14.