ISSN: 2350-0328

International Journal of Advanced Research in Science, Engineering and Technology

Vol. 9, Issue 8 , August 2022

Mineralogical and Petrographic Investigations of the Kelenchek-Tashsay Area

Sharipov Sh.F., Nazarov U.H

PhD, Navoi Department of the Academy of Sciences of the Republic of Uzbekistan, Navoi, Uzbekistan
Master, National University of Uzbekistan, Tashkent, Uzbekistan

ABSTRACT: The article describes the location of the study area, tectonic boundaries, as well as the rocks involved in the geological structure of the Kelenchek-Tashsay area. Based on these rocks, mineralogical criteria have been determined, which are an indicator for determining the prospects of the deposit. In addition, the mineral compositions of biotite granites, rare-metal leucogranites and albitites and their average percentage in rocks are considered and determined using the example of thin sections.

KEYWORDS: Mineral, granites, albitites, rocks, grains, section,facies.

I.INTRODUCTION

The mineralogical criterion for the potential ore content of leucogranites for rare and rare earth elements is the presence of ore minerals in the rock composition - in biotite granites, rare metal leucogranites, albitites, quartz-KPSh-hematite, quartz-albite-hematite and quartz-chlorite metasomatites of the Kelenchek-Tashsay area. [1].

II. SIGNIFICANCE OF THE SYSTEM

The article describes the location of the study area, tectonic boundaries, as well as the rocks involved in the geological structure of the Kelenchek-Tashsay area. The study of methodology is explained in section III, section IV covers the experimental results of the study, and section V discusses the future study and conclusion.

III. METHODOLOGY

The study area is located in the southwestern part of the Arashan granitoid massif, between the Kelencheksay and Tashsay rivers, the right tributaries of the Angren River, in their middle and upper reaches (Fig. 1). In some publications, this part of the massif is called the Kelenchek or Aktau intrusion. From the north and northeast it is limited by the Arashan regional fault, from the south and southwest by Meso-Cenozoic deposits - developed on the right bank of the Angren River. The geological structure of the area includes porphyritic biotite granites, leucogranite dikes, albitites, metasomatites and hydrothermalites. Bodies of syenodorites and quartz syendiorites are rare. Coarse-grained (sometimes giant-grained) alaskitoid granites and alaskites are developed outside the area - in the northern and northeastern parts of the Arashan massif (Kyzyltor intrusion). [1].

ISSN: 2350-0328

International Journal of Advanced Research in Science, Engineering and Technology

Vol. 9, Issue 8 , August 2022

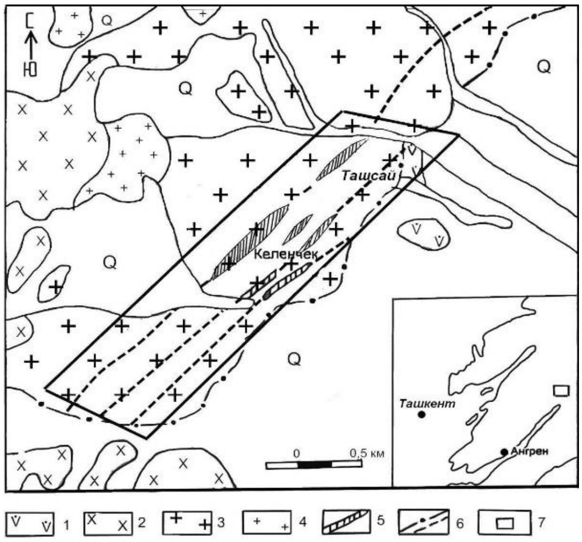

Fig.1 Schematic geological map of the southwestern part of the Arashan intrusion (according to R.G. Yusupov with additions by U.D. Mamamarozikov).
1 - quartz diorites, syenodiorites (C2), 2 - granodiorites (C3), 3 - biotite granites (P1), 4 - fine-grained granites (P1), 5 - zones of albitized rocks, 6 - faults, 7 - Kelenchek-Tash rare-metal area

Kelenchek-Tashsay area of albitites with prospects for rutile, niobium and tantalum, rare earths has concomitant mineralization of zirconium, niobium, tin, thorium and rare earths. The albitites themselves, containing rare-metal and rare-earth mineralization, are 98% albite. The main rock-forming minerals are albite (97.6%) and quartz. The ore components consist of rutile, zircon, monazite, apatite, orangite-torite, fluorite, etc. Albite is characterized by idiomorphic crystal forms. The mineral contains thin (<1 mm) inclusions of zircon, apatite, acicular pyroxene, and rutile.[1]

Albite is of interest for ceramic, glass and other industries, and can also serve as a fertile material for the manufacture of heat-resistant equipment. They may well claim to prevail in the structure of the mineral resources of Uzbekistan for a complex of rare earths, tantalum, niobium, rutile, zircon concentrates, etc. [2]

IV. EXPERIMENTAL RESULTS

In the Kelenchek-Tashsai area, among the porphyritic biotite granites, the main intrusive facies of the Kelenchek (Aktau) intrusive, varieties belonging to three subfacies are distinguished: the lower (deep) - coarse-grained porphyritic granites and the upper - medium-coarse-grained porphyritic granites. The endocontact facies of the intrusion of biotite porphyritic grants is also represented by porphyritic varieties. [3]

Porphyritic biotite granites of the Kelenchek-Tashsai area have a rather simple mineral composition: (cf. 10 lath, %): plagioclase 24.0 - 36.0, potassic feldspars 28.0 - 35.0 quartz 25.0 - 30 0, biotite 5.0-7.50, muscovite up to 0.5, amphibole 0.1-0.2, accessory and ore minerals 0.8-1.0. [3].

ISSN: 2350-0328
International Journal of Advanced Research in Science, Engineering and Technology
Vol. 9, Issue 8 , August 2022

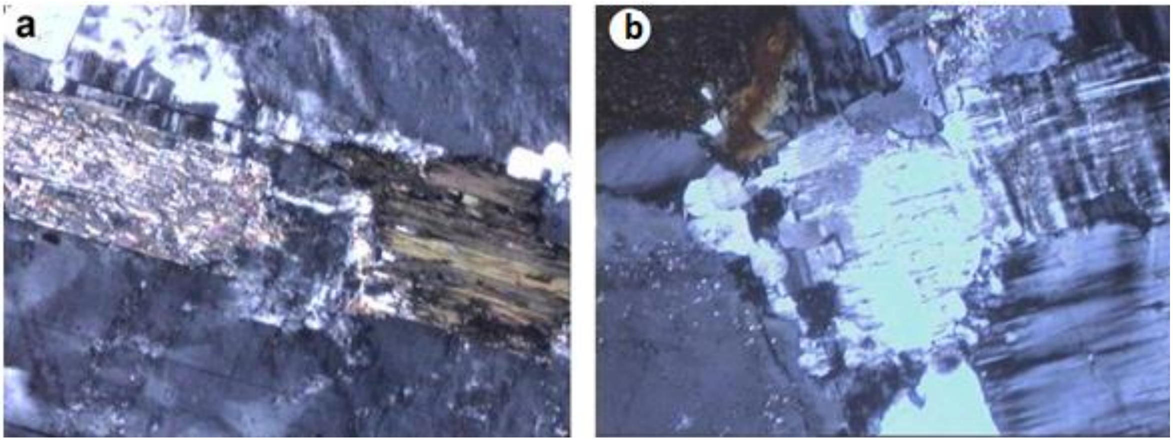

Fig.2 Biotite granite.
(a) sericitized plagioclase crystal in the center, biotite on the right; b – clusters of isometric grains of microcline-microperthite. Microperthite segregations of albite are cordlike. Nicoli //. Magnified 50 times. Thin section 13-M-06. (according to U.D. Mamamarozikov, R. Akhundzhanov).

The vein rocks of the main intrusive facies are represented by gently dipping veins of biotite granite-aplites, aplite-like and chalk-grained granites up to 10-15 cm thick. They are concentrated in areas of xenolith accumulation and in the apical zones of the intrusion. The average quantitative and mineralogical composition of granite-aplites (cf. from 4 lines): plagioclase - 25.0, microcline-perthite - 40.0, quartz - 33.0, muscovite up to 0.4, accessories 2.0. [3]

Later dikes are represented by leucogranites. In contrast to the gently sloping vein rocks associated with biotite porphyritic granites, they form steeply dipping (from 650 to 850), fairly extended fissure intrusive bodies up to 5 m thick (usually 1-3 m) with a northeast strike (usually 1-3 m), coinciding with the direction of the albitite zones (fig.1), their cataclasis, silicification and quartz veins (strike azimuth of leucogranite dikes 160-200). The rocks are light gray, white, fine-grained. They consist of albite (35-38%), microcline (25-30%), quartz (28-32%), single leaflets of biotite, amphibole, high-iron chlorite and ore-generating fluorine fluid microsegregations associated with ore minerals of tantalum-niobates, rare-earth and radioactive elements (Fig. 3). [3]

ISSN: 2350-0328
International Journal of Advanced Research in Science, Engineering and Technology
Vol. 9, Issue 8 , August 2022

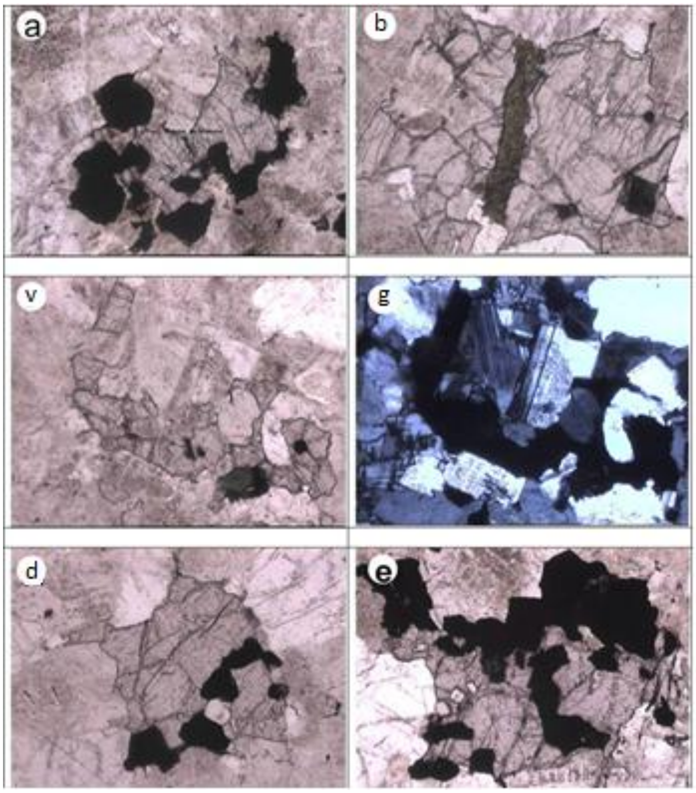

Fig.3 Rare-metal leucogranite.
a-, b-, c-, e-, f – in the center of the quartz-feldspar mass, fluid segregations of fluorite with minerals of tantalum-niobates, rare-earth and radioactive elements. Nicoli. Magnified 50 times. d – polysynthetic twins of albite, microcline at the bottom left, irregular and isometric grains – quartz, dark – fluorite. Nicoli +. Magnified 50 times. a-, b- thin section No. 33-M-06; c-, d-, e-, e- thin section No. 34-M-06; (according to U.D. Mamamarozikov, R. Akhundzhanov).

Quartz is established in the form of porphyroblasts (from 1 to 5-8 mm) in the mass of finely lamellar albite. The mineral forms transitions from relic grains of irregular shape to idiomorphic crystals with hexagonal outlines. Relics of early oligoclase are characteristic of quartz grains. In quartz, later albite plates penetrate through cracks. In albitites, the quartz content ranges from less than 1 to 2.5-3%. The main ore mineral - rutile - forms small (up to 0.1 - 0.15 mm) irregularly shaped segregations, often in the form of xenomorphic metacrystals. Rutile crystals are characterized by zonality of structure. The central part of the mineral is light grayish in color, and the rim is dark brown, which is due to the heterogeneity of the chemical composition of the mineral matrix. Zircon, apatite, thorite - orangeite, etc. are closely associated with rutile. In the ore, radioactive thorite - orangeite and apatite in association with rutile and zircon are indicators of the rare earth mineralization of albitites. (Fig. 4) [3].

ISSN: 2350-0328
International Journal of Advanced Research in Science, Engineering and Technology
Vol. 9, Issue 8 , August 2022

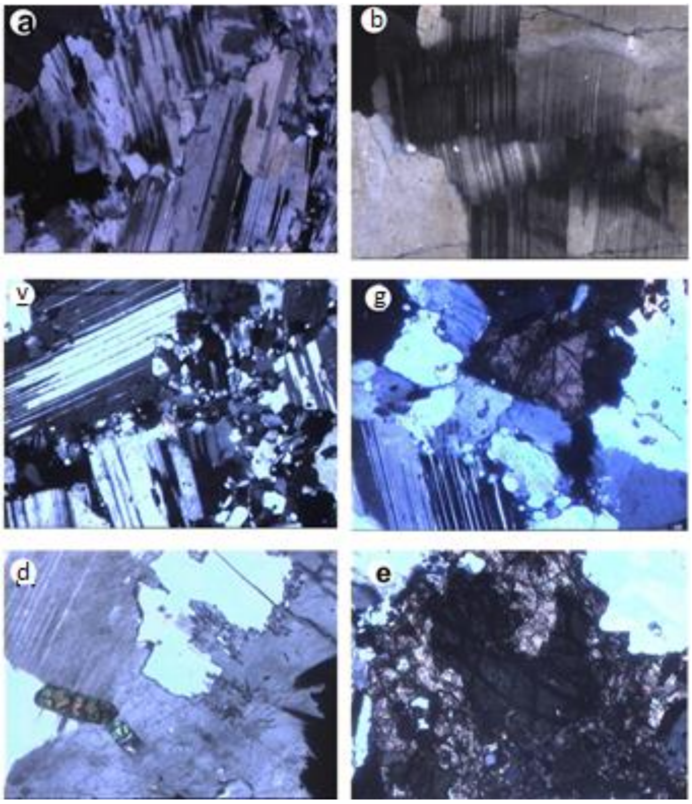

Fig. 4 a - polysynthetic tabular albite crystals and their corrosion by quartz. Section 45M 06. Nicoli +, SW. x50 times; b - curved polysynthetic twins of albite. Thin section 12-M-06. Nicoli +. Increase x25 times; (c) cataclasite after al6itite; interstices between tabular plagioclases are filled with crushed grains of al6ite and quartz. Thin section 43-M06. Nicoli+. SW. x25 times; d-development of quartz and rare earth minerals (orthite) in albitite. Thin section 45-M-06. Nicoli +. SW. x25 times. (according to U.D. Mamamarozikov, R. Akhundzhanov).

V. CONCLUSION AND FUTURE WORK

In the Kelenchek-Tashsai area, the mineralogical criteria for the ore content of magmatites, near-ore metasomatites and albitites are clearly expressed. Rutile-bearing albitites of the Kelenchek-Tashsai area, being complex in mineral composition (the presence of titanium in the form of TiO_2, zircon, niobium, tantalum, REE and yttrium, thorium, quartz-feldspar non-metallic raw materials in the form of albite, suitable for the ceramic industry, as well as the manufacture of heat-resistant equipment) gain industrial importance as raw materials for extremely scarce titanium, rare-metal-rare-earth components for industrial development.

REFERENCES

[1]. Akhundzhanov R., Mamarozikov U.D., Suyundikova G.M. Associations of rare-metal acid intrusions (Chatkal-Kuramin region, Western Tien Shan). T .: Fan AN RUz, 2009. - 165 p.
[2]. Ezhkov Yu.B., Rakhimov R.R., Novikova I.V. Rare earth elements: geochemistry, mineralogy, deposits. Tashkent; SE "NIIMR", 2013. 180 p.
[3]. Yusupov R.G., Fatkhullaev Sh.D. Kelenchek-Tashsai ore field of rare-metal, rare-earth, yttrium and thorium mineralization // Geology and Mineral Resources, 2012, No. 3.