

ANNOTATION

For the Doctor of Philosophy (PhD) degree by specialty 6D070600 - "Geology and exploration of mineral deposits"

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Geology and mineralogy of the basite-ultrabasite bodies of the Ulytau-Karsakpay zone

General description of the work

The territory under consideration is located within the extreme western part of the shallow hummock of Central Kazakhstan and the eastern margin of the Torgay Plain.

Metamorphic and sedimentary rocks of Precambrian and Paleozoic take part in the geological structure of the territory. The low-width mainly continental complex of Cenozoic, including quaternary formations, is widely used.

Formulation of the question and the relevance of the topic. Replenishment of the mineral resources of the country is the most important task before the geology of Kazakhstan. At the present time, the problem of providing the extracting and processing sector of the economy with a reliable mineral resource base and increasing the country's export potential is at stake. The results obtained during scientific research on the topic of this dissertation are a real contribution to the solution of this urgent problem.

The aim of the research is to study and clarify the geological structure Karsakpai-Ulytau area using modern geological surveys and satellite imagery data to identify within it promising for industrial field sites.

The object of the research. The subject of the study are magmatic and metamorphic formations confined to the deep faults of the Ulytau-Karsakpay structural zone of Central Kazakhstan.

The actual material was selected during the field geological investigations, in addition, the material collected during the work as a junior research scientist in the Scientific and Technical Program "Scientific Provision of Geological Exploration of the Subsoil and Geological Evaluation Work for Replenishment of Mineral Resources" was used on the topic " Development of remote methods of geological research, forecasting and prospecting of ore deposits in Kazakhstan ", Subprograms" Grant financing of scientific research "Priority" In ellektualny potential of the country "(2015-2017).

When writing the thesis, the geological material of other researchers was used, published in the press, both in Kazakhstan and abroad.

The methodology of research is scientific analysis of actual field geological data, laboratory tests performed with the use of modern high-precision equipment and the use of remote sensing materials for the study of the geological structure of the site work.

Samples of the selected rocks were produced 6 universal thin sections in the grinding workshop of the University of Adam Mickiewicz and 45 thin sections in

the interfacial grinding laboratory of the Institute of Geology and Oil and Gas. K.Turysova KazNTU. Laboratory studies of ore and rock-forming minerals using a polarizing microscope in high-resolution transmitted and reflected light were performed in the Innovative Geological and Mineralogical Laboratory of KazNTU named after KI. Satpaev in Almaty (Kazakhstan) and in the laboratory of the Department of "Mineralogy and Petrology" of the Adam Mickiewicz University (UAF) in Poznan (Poland). The chemical composition of minerals and rocks was studied by SEM (scanning electron microscopy) and EDS (energy-dispersive spectroscopy) in the laboratory of "Microscopy and microprobe" of the faculty of geology and geography of the UAM on the Hitachi S-3700N electron microscope (SEM).

The results of the work and their novelty. For the first time in Ulytau-Karsakpay region, a study was carried out of the capacity Precambrian formations, the deep geological structure of the region using space technologies. Geological prerequisites and signs of the region for various minerals have been identified based on data from field geological studies and remote sensing. Based on the interpretation and analysis of remote sensing data, geological structures have been identified and interpreted, cosmostructures and ore control factors have been identified that are not available for traditional geological studies.

The results of the research have been published in **15** publications and in the volume of 6 works on the international research, entering Scopus and the non-zero impact factor and **4** articles in the scientific researches, recommended by the Ministry of Education and Science of the Republic of Kazakhstan. The results have been widely disseminated in international and national scientific conferences such as "Problems and perspectives of development of geological cluster: education-science-production", which is devoted to the 80th anniversary of K. (Almaty, 2014), "Innovative Technologies and Innovations in the Mining and Metallurgical Complex, Their Scientific and Professional Development" (Almaty, 2014), "Strategy for Reality in the Role of Young People in Kazakhstan - 2050", dedicated to the 80th anniversary of KazNTU KI Satpayeva (Almaty, 2014), International Multidisciplinary Scientific GeoConference SGEM-2014, SGEM-2015, SGEM-2016, (Albena, Bulgaria), "Geology, Mineralogy and Perspective Development of Mineral-Resource Resources of the Republic of Kazakhstan and the CIS countries" (Almaty, 2014-2016).

Sphere of application - geology and subsoil use

Protected positions:

- Ulytau-Karsakpai zone of basite-ultrabasites and metamorphic complexes is a fragment of the second geosuture zone and its formation is associated with the geodynamics of Kazakhstan, which has a plum-tectonic nature (according to Prof. Baibatsha AB). Active manifestation magmatic and metasomatic processes is determined by their localization in the linear zone geosuture characteristic varied mineralization ore region.

- Compiled unified scheme Precambrian stratigraphic region where mean complexity and tectonic structure of the local intensity of the thermodynamic conditions in the deep rock fracture zone undergo complex metamorphism and

Metasomatic changes. According to actual field research data, the total thickness of the Precambrian thickness of the region is about 9-10 km, and the number of stratigraphic nomenclatures does not exceed 10. According to Yu.A. Zaitsev et al. (1970), the total thickness of these formations was estimated to be of the order of 35-40 km, which is due to the mapping of essentially the same strata in different tectonic blocks independently and, as a result, multiple duplication took place.

- The activity of the geosuture zone, expressed in the introduction of the asthenosphere material into the continental lithosphere in the form of linearly extended ultrabasic bodies, occurs during the period of the Lower Paleozoic. A consistent introduction from ultrabasic-basite to acidic intrusions along the linear geosuture can be considered as a manifestation of the stratification of the material of the upper mantle that has penetrated the earth's crust. The formation of granitoids in the geosuture zone can be associated with the process of stratification of magma, and granitoids of an area character outside the geosuture - a local manifestation of anatexis and palingenesis in the continental crust. Pulsating tectono-magmatic and associated metasomatic activity of the geosuture zone determines its prospects for ore formation and the forecast of promising areas.

- For a substantiated forecast of sites for industrial minerals, it is promising to use the cosmogeological technology to identify ore control structures. Thus, the Karotorgai manifestation of copper-nickel sulphide ores in peridotites in the northern part of the Ulytau-Karsakpai zone belongs to the segregation type and is studied in detail by cosmogeological methods of 1: 50,000 scale.

Scientific novelty of the work and personal contribution of the author For the first time in the Ulytau region, a deep geological structure of the region covered with deposits was studied using space technologies. Geological prerequisites and signs of the region were identified based on remote sensing data. On the basis of interpretation and analysis of data, structures were identified and interpreted, cosmogeological structures and ore control factors were identified, which are not available for traditional geological studies.

Scope and structure of work. The thesis consists of an introduction, five chapters and a conclusion, and a list of references.

List of published works on the topic of the dissertation

1. A.B. Baibatsha, A.A. Bekbotaeva, E.Zh. Mamanov. Allocation of prospective areas into deep and hidden structures based on space geological schemes. News of the National Academy of Sciences of the Republic of Kazakhstan. Series of geology and technology sciences. ISSN 2224-5278, Vol.5, Number 419 (2016), 150-160.

2. A.B. Baibatsha, E.Zh. Mamanov. Geology and geodynamics of Karsakpay-Ulytau geosuture zone and its prospects for minerals. News of the National Academy of Sciences of the Republic of Kazakhstan. Series of geology and technology sciences. ISSN 2224-5278, Vol. 1 Number 421 (2017), 46-62

3. А.Б. Байбатша, Е.Ж. Маманов. Перспективы выявления поисковых геологических предпосылок по данным космического зондирования. Вестник КазНТУ имени К.И. Сатпаева. Алматы, 2015. № 1. С.8-13.

4. А.Б. Байбатша, К.Ш. Дюсембаева, Е.Ж. Маманов. Минералогия рудмедно-никелевого рудопроявления «Караторгай». Известия НАН РК Серия геология и технические науки. Алматы, 2015. №5 С.90-95

5. А.Б. Байбатша, А.Т. Касенова, Е.Ж. Маманов. Петрографическая характеристика горных пород рудопроявления «Караторгай». Вестник КазНТУ имени К.И. Сатпаева. Алматы, 2015. №6. С.33-39

6. А.Б. Байбатша, К.Ш. Дюсембаева, А.Т. Касенова, Е.Ж. Маманов, С. Болатбекулы. Microproparagenetic associations of gold in ore-forming minerals from deposits of different geological and industrial types of Kazakhstan. International Scientific and Practical Conference devoted celebration of 80th anniversary of KaratayTurryssov "Problems and perspectives of geological cluster development: Education-science-production. Almaty. 2014. С. 227-233

7. E.Zh. Mamanov. Prospects of deposits in strengthening magmatic type copper resources of Kazakhstan. Международная научно-практическая конференция «Инновационные технологии и прокеты в горно-металлургическом комплексе, их научное и кадровое сопровождение. Алматы, 2014. С.120-121

8. А.Б. Байбатша, Е.Ж. Маманов. Минераграфия рудопроявления в ультрабазитах участка Караторгай Северного Улытау. Международные Сатпаевские чтения – 2015 «Роль и место молодых ученых в реализации новой экономической политики Казахстана». КазНТУ. Алматы, 2015. С. 123-126

9. А.Б. Байбатша, Е.Ж. Маманов. Выявление скрытых магматических массивов по данным обработки и дешифрирования космоснимков. Международные Сатпаевские чтения – 2015 «Роль и место молодых ученых в реализации новой экономической политики Казахстана». КазНТУ. Алматы, 2015. С. 127-130

10. A.B. Baibatsha, A.A. Bekbotaeva, E.Zh. Mamanov. Detection of deep ore-controlling structure using remote sensing. 15th International Multidisciplinary Scientific Geoconference SGEM-2015. Albena, Bulgaria, 2015. P.P. 113-118

11. A.B. Baibatsha, S.N. Mustapaeva, K.Sh. Dyussebayeva, E.Zh. Mamanov. Mineralogy of copper-nickel ores in Ulytau zone (Central Kazakhstan). 15th International Multidisciplinary Scientific Geoconference SGEM-2015. Albena, Bulgaria, 2015. P.P. 307-312.

12. А.Б. Байбатша, К.Ш. Дюсембаева, А.Т. Касенова, Е.Ж. Маманов. Ұлытау ультрабазиттеріндегі «Қараторғай» мыс никель кенбілінімі геологиялық құрылысының ерекшеліктері. Материалы МНК «Геология, минерагения и перспективы развития минерально-сырьевых ресурсов Республики Казахстан и стран СНГ». – Алматы, 2015. С.242-247.

13. А.Б. Байбатша, А.А. Поцелуев, Е.Ж. Маманов. О возможности детальных космогеологических работ для выявления скрытых геологических образований. Материалы МНК «Геология, минерагения и перспективы развития минерально-сырьевых ресурсов Республики Казахстан и стран СНГ» Алматы, 2015. С.28-33.

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15. A.B. Baibatsha, A. Muszynski, E.Zh. Mamanov. Mapping of ore controlling structures Ulytau-Karsakpai zone according to remote sensing. 16th International Multidisciplinary Scientific Geoconference SGEM2016. Albena, Bulgaria, 2016. PP. 353-359.

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17. А.Б. Байбатша, Е.Ж. Маманов. Геология и геодинамика Карсакпай-Улытауской зоны геосутур и ее перспективы на полезные ископаемые. Сборник материалов XXI Международного научного симпозиума имени академика М.А. Усова студентов и молодых ученых «Проблемы геологии и освоения недр». ТПУ. г. Томск (2017) 582-583.

18. А.Б. Байбатша, Е.Ж. Маманов. Особенности формирования и минералогия медно-никелевых руд в Улытау-Карсакпайской зоне. Сборник материалов Седьмой Российской молодёжной научно-практической школы «Новое в познании процессов рудообразования». ИГЕМ РАН. г. Москва (2017), 191-194.