ГЕОЛОГІЯ

УДК 553.063+551.24.055(477.7)

O.V. Slyvna

State Higher Educational Institution "National Mining University", Dnipropetrovsk, Ukraine, e-mail: elena_2s@mail.ru

GRAPHIC PEGMATITES IN THE EVOLUTION OF THE AZOV BLOCK OF THE UKRAINIAN SHIELD

О.В. Сливна

Державний вищий навчальний заклад „Національний гірничий університет", м. Дніпропетровськ, Україна, e-mail: elena_2s@mail.ru

ПИСЬМОВІ ПЕГМАТИТИ В ЕВОЛЮЦІЇ ПРИАЗОВСЬКОГО МЕГАБЛОКУ УКРАЇНСЬКОГО ЩИТА

Purpose. The study of the material composition of granitoid formations of Western Azov and the establishment of regularities of formation of the pegmatite fields, spatially associated with weakened zones of major geological structures in the Eastern part of the Ukrainian shield.

Methodology. The petrographic, mineralogical and termobarogeochemical methods of research were used to solve the main tasks of the research, consisting in the study of petrology and conditions of formation of the pegmatite formations of the area.

Findings. Both pegmatites of the Azov block of the Ukrainian shield and enclosing their slates trough structures as well as gneisses and granites are the products of a single metamorphic process typical for the crystalline shields of Precambrian age. They are united by chemical, mineralogical and petrographic composition, structural position, and long period of formation and logical time sequence of formation. To determine the time and place of formation of the fields of pegmatite in the process of formation of the Azov block a study of existing models of the formation of the Ukrainian shield was conducted and compared with the results of the study of micro inclusions of quartz from pegmatites and granites. Pegmatites are formed as a result of a long evolution of mineral-forming process, as evidenced by the presence of typical solid and fluid inclusions of quartz rocks. The established inclusions convey both practical and genetic information. They are the criteria of the dismemberment of granitoid formations of the area and indicate the formation of these rocks by multiple metamorphic and metasomatic changes of source supracrustal strata. The results of our research prove that the geochemical specialization of granites and pegmatites (titanium, aluminum, aluminum-titanium) depends on the composition of the source magmatic rocks, terrigenous formations or their interdigitation with a predominance of one or the other. Subsequent geological processes that led to the formation of the pegmatite fields in Western Azov fit into the classic pattern of development of regional metamorphism.

Originality. The geochemical specialization of granites and pegmatites of the Western Azov was established. The revealed regularities of spatial distribution of pegmatite fields close to weakened zones are determined by the minimum manifestations of granitization. We proposed the model of the formation of graphic pegmatites within the Azov block of the Ukrainian shield.

Practical value. It was established that the pegmatites of the Azov block were formed on the pneumatic-hydrothermal stage, which was preceded by the processes of accumulation of volcanogenic-sedimentary strata and recrystallization (metamorphism) in gneiss, with subsequent metasomatic transformation in granites and pegmatites. The data obtained can be used to develop the correct scheme for dismemberment of volcanic and plutonic formations for geological survey, forecast-metallogenic and prospecting works.

Keywords: *granite, graphic pegmatite, model formation, Western Azov, Ukrainian shield*

Introduction. The pegmatites were formed at the final stage of formation of the Azov block on pneumatic-hydrothermal stage. Initially, the processes of accumulation of volcanogenic-sedimentary strata preceded it, as well as their recrystallization (metamorphism) and metasomatic changes.

Fields of graphic pegmatites are widespread within the Ukrainian shield. Currently, there are about two dozen objects potential both for ceramic raw materials and gemstones. At the present time on the territory of Western Azov block Ukrainian shield an active development of pegmatites deposits, with some of them have been developed. However, the question of origin of pegmatites remains open and unexplored completely, which affects the search and evaluation of pegmatites deposits.

Analysis of geological data. In the geological structure of Azov block Ukrainian crystalline shield, metamorphic complexes that make up the basis of crystalline shield, large tracts of granite and pegmatite veins are involved. These kin-ds of rocks comply with regularities of many well-known characteristics of Precambrian crystalline shields.

Metamorphic rocks, granites and pegmatites are three types of rocks, which are united by chemical and material composition, structural position, and a logical time sequence of formation

Granites and pegmatites are usually located in close proximity to each other. Volumes of pegmatites and granites are in direct dependence − the more granite, the more pegmatites.

Pegmatites are located in the trough structures among metamorphic shale rocks, in the form of large veins of up to 100 m at a power of several tens of centimeters to meters. Strongly prominent zonality − from aplites to graphic pegmatites, and in the center − the quartz cores, is the result of long evolution of mineralizing systems. Pegmatite veins have "cold" (sharp) contact with the enclosing rocks, which is without any changes of the latter ones.

The data stated above are indirect and give a reason to speak as of a magmatic nature of formation of these rocks, and of metamorphic.

An unambiguous answer to this question the inclusions in the rock-forming minerals can give, as they identify physical state of the mineral medium.

As a result of microscopic study of granitoids and pegmatites of Western Azov Ukrainian shield, in quartz of these rocks the inclusions of solids and volatiles are everywhere established.

Solid mineral inclusions are represented by pyroxene, hornblende, biotite, apatite, zircon, rutile, ilmenite, feldspar, sillimanite, monazite, quartz, pyrite. Fluid inclusions are present in liquid, gas species, and combinations thereof. The composition of the solid mineral inclusions often depends on the primary mineral composition of parent rocks and the mobility of elements in chemical reactions of recrystallization.

Genetically all installed inclusions are divided into protogenetic, syngenetic and epigenetic formation [1].

Protogenetic inclusions are relics of metamorphic minerals, which are typomorphic sign of quartz formation in a solid medium and indicates a low aggressiveness of granitizing fluids. Syngenetic inclusions of quartz reflect the specific conditions of its formation − geochemical specialization of structure. Their content from gneiss to pegmatite granite decrease and well correlates with the presence of inclusions of metamorphic minerals. Therefore, the mineral composition of metamorphic rocks determines the composition of syngenetic inclusions. Epigenetic inclusions, depending on aggregate composition, are divided into solid and fluid species. Solid inclusions are the products of decomposition of the solid solution. Fluid inclusions differ by the cosmopolitan submicroscopic cracks which indicate their epigenetic nature (Table 1).

Table 1

Genetic Classification of Inclusions from Quartz Granitoid Rocks of the Ukrainian shield

Genetic Type		Mineral Inclusion	Shape	Inclusions	Size μm	Orientation	The Composition of the Inclusions
Protogenetic		Hornblende Biotite Feldspar Apatite Zircon Titanite	Incorrect, rounded, relict, idiomorphic metamict crystals	Zircon with apatite, titanite, monazite melt inclusions inaccessory minerals	300 200 200 100−200	Undirected	The composition of the inclusions are similar to that of rock-forming minerals
Syngenetic		Rutile Sillimanite Apatite Ilmenite Feldspar Pyrite	Right, needle, long fiber, hexagonal	missing	50 100 50 50 50 100	Oriented, usually along one direction	Depending on the composition of the original rocks, and it reflects the composition of the impurity elements in the environment of mineral
Epigenetic	Solid	Rutile Spodumene	Right, needle	missing	10−30	Rigorouslyo riented	Inclusions reflects the composition impurity elements in the mineral formation medium
	Fluid	*F (CO)2* *L(CO)2* *L(H2O)* *F+L*	Incorrect, amoeboid, rarely − form of negative crystals	missing	1−10	They create the effect of imaginary cracks	Inclusion reflects the composition of the granitizing fluids

ISSN 2071-2227, Науковий вісник НГУ, 2015, № 6

Typomorphic features (species diversity, general content, form of release, particularly the composition and structure) established inclusions allowed to divide them into main and secondary ones. The main ones are syngenetic and epigenetic inclusions. They reflect the geochemical specialization of mi-neral formation middle of quartz and are instantiated by the ubiquitous presence in significant amounts only in grains of quartz. Secondary inclusion are subjacent of all the rock-forming minerals and are presented by solid (protogenetic) and fluid (epigenetic) species. Thus, the presence of an association of the main inclusions, reflecting the geochemical specialization of the medium/structure in the crystallization of quartz, is the criterion for the compartmentalization of granitic formations. So, depending on the chemical composition of mineral inclusions and their associations, the granitoids in the study area subdivided into five groups, each of which is characterized by a certain geochemical specializations quartz environment, namely titanium (*Ti*), titanium-aluminum (*Ti-AL*), aluminum (*AL*), aluminum-lithium (*AL-Li*), and aluminum – *TR* (*AL-TR*) (Table 2).

Table 2

The Correlation Diagram of the Precambrian Rocks from Western Azov block (Ukrainian Shield)

Specialization of Environment	Name of Rock	Criteria of Division	Supercrust Rocks
AL - U	KATA-ROCK	SILLIMANIT ILMENIT-RYTIL MONAZIT	TEMRYUK STRATA AR_3 *tm*
AL	PEGMATOID GRANITES, PEGMATITES	SILLIMANIT	OSIPENKOVSKAYA SERIES AR_3 os
AL - Li	PEGMATITES WITH THE RELICT OF SPODUMENE	SILLIMANIT, SPODUMENE EPIGENETIC	
	PLAGIOGRANITES PLAGIOGNEISS, PEGMATITES	SILLIMANIT, SPODUMENE EPIGENETIC	TEMRYUK STRATA *AR_3 tm*
AL – Ti	PLAGIOGNEISS, PLAGIOGRANITES	SILLIMANIT, RUTIL LONG-STAPLE	
AL – Li	SPODUMENE AND ALBIT-SPODUMENE PEGMATITES	SILLIMANIT, SPODUMENE SINGENETIC	OSIPENKOVSKAYA SERIES *AR_3 os*
Ti	GRAFIC GRANITES, GRANITES	RUTILE ORIENTED	
	PLAGIOGRANITES PEGMATOID GRANITES	RUTIL LONG-STAPLE	KAYINKULAKSKAYA STRATA *AR_1 knk*
	PLAGIOGNEISS, PLAGIOGRANITES	RUTIL LONG-STAPLE, RUTIL NEEDLE, TITANIT, ITTROTITANIT	
	GRANITIZATION AMPHIBOLITES	TITANIT, ITTROTITANIT	KOSIVTSEVSKAYA STRATA *AR_1 ks*

Depending on mineral supplies major inclusions, granitoids with titanous specialization represented by gneisses, granite-gneisses, plagiogranites, granites and, to a lesser extent, pegmatites dnepropetrovsk, shevchenko and saltykov complexes. The ubiquitous presence of inclusions of metamorphic (hornblende, biotite) and accessory (apatite, zircon) minerals in the quartz of these rocks indicates on the quartz formation, and, consequently, of granitoids in the solid state due to the regional metamorphism and metasomatic processes of the supracrustal rocks western azov and central azov series.

The granitoids containing quartz aluminum-titanium specialization are attributed to the second group and presented by biotite gneisses, granites, gneisses and granites of the river of saltychia complex and granite-gneisses temryuk strata. They contain grains of quartz with inclusions of silli-

manite, retile and sphene. The secondary inclusions – hornblende, biotite, apatite, prismatic zircon of two generations are significantly observed in quartz. Protogenetic nature of these inclusions indicate some the formation of quartz from the metamorphic rocks.

The third group of rocks with aluminum specialization of quartz, including granite-gneisses, granites and pegmatite granites from saltychia complex are characterized by the presence of quartz with inclusions of sillimanite. Among accessory and metamorphic minerals there is biotite, hornblende, apatite and zircon. Often, quartz does not contain inclusions of mafic minerals, due to significantly sour quartz-feldspar composition of source supracrustal rocks.

The fourth group of rocks with aluminum-lithium specialization contains granite-gneisses and granites of saltychia complex, the quartz of which is saturated with inclusions of sillimanite and spodumene. Among minor inclusions biotite, hornblende, zircon of the first generation are widespread. Specialization of syn- and epigenetic inclusions from quartz of granitoids of this group is determined by the composition of the original metamorphic rocks. For example, in the composition of the amphibole xenoliths (305/337a) high content of Li (7x10−5%) is observed, and in granitized quartz rock microinclusions of needle-shaped spodumene (305/337g) are observed. In the formation of granitoids at the expense of amphibolites with a high content of ittrium, the inclusion of itrotitanit in quartz appear.

In the fifth group with aluminum-rare earth specialization quartz containing inclusions of sillimanite, ilmenorutile, monazite are included. They are represented by biotite granites and the gneiss and granite of the Saltychia complex.

The obtained results confirm the genetic information content and practical significance of quartz inclusions: main inclusions are the criteria for the compatmentalization of granitoid formations of the area, and secondary ones indicate the formation of these rocks by multiple metamorphic transformation of original supracrustal strata.

Depending on the mineral appurtenance of main inclusion, granitoids with titaniferous specialization are presented by gneiss, granite-gneisses, plagiogranites, granites and, to a lesser extent by pegmatites of dnipropetrovsk, shevchenko and saltychia complexes.

Ubiquitous presence of the metamorphic inclusions (hornblende, biotite) and accessory (apatite, zircon) minerals in quartz of these rocks indicates the formation of quartz, and therefore of the granitoids, in the solid state due to the metasomatic transformation of the source supracrustal rocks western azov (kayinkulaskaya and kosivtsevskaya strata) and central azov series (temryuk strata), and osipenkvskaya series.

Granitoids with aluminium-titanium specialization of quartz are included into the second group and represented by biotite gneisses, granite-gneisses and granites of saltychia complex and the gneiss and granite of the temryuk strata. They contain quartz with inclusions of sillimanite, rutile and titanit. The secondary inclusions (hornblende, biotite, apatite prismatic zircon of two generations) are observed in quartz in significant quantities. Protogenetic nature of these inclusions indicates the formation of quartz from metamorphic rocks.

The same pattern is observed in the study of pegmatite formations of West Azov region.

Pegmatite veins of "Balka Bolshogo Lagerya" are deposited among metamorphic rocks represented by diorite and granodiorite migmatites, amphibolites, biotite and amphibole-biotite gneisses and actinolites of AR age and are mainly represented by unclear graphic (51.1%) and graphic (33%) pegmatites.

As a result of a detailed microscopic study of thin sections several petrographic varieties of pegmatites have been discovered.

The first variation is presented by the quartz-microcline graphic pegmatites with homogeneous texture and graphic, perthitic structure.

Mineral composition ranges within the scope of: microcline − 60−70%, quartz − 25−35%, plagioclase 0−5%, muscovite 0−1%.

The second type is represented by the two-feldspar unclear graphic pegmatite with massive, sometimes spotted, and a coarse texture, graphics, perthitic structure.

Mineral composition ranges within the scope of: microcline − 20−60%, quartz 5−50%, plagioclase 30−35%, muscovite − 1%.

It should be noted that the quartz of the pegmatites occurs in the form of several generations: 1) quartz ichtyogliptes in lattice-shaped microcline or microcline-perthite; 2) monolithic coarse aggregates of quartz; 3) fine-grained quartz, in the form of streaks, filling cracks in the feldspar.

According to classical ideas about the formation of pegmatites from residual magmatic melt, enriched by volatile components, presence of graphical structures of pegmatites - regular intergrowths of feldspar and quartz from granitic pegmatites, testifies to the simultaneous growth of these minerals at a certain stage of pegmatite formation [2].

Therefore, special attention was given to the study of quartz of the first generation, as a direct "witness" of this process. As a result, in the quartz of ichtyogliptes inclusions of solid and volatile components were discovered, typical for granitoids of the studied area. The presence of solid inclusions of rutile, ilmenite, biotite, feldspar of an older generation and a significant saturation of quartz with the fluid carbon-dioxide and water inclusions indicates the formation of quartz of pegmatites, and, consequently, the pegmatites in solid system by metasomatic replacement of source metamorphic rocks of west azov, central azov and and osipenkvskaya series. This statement does not contradict one of the existing hypotheses about the metamorphic genesis of pegmatites developed by V.N. Marahovsky: the metamorphic pegmatites were formed on the regressive stages of high-facies of regional metamorphism; they are not associated with magmatic complexes; they are developing within granitogneisy blocks of ancient cratons and controlled by discontinuous structures zones of protoactivization.

Thus, by analyzing the results obtained identical inclusions of solids and volatile components for the quartz of pegmatite have been discovered. They unequivocally testify to the formation of quartz in a solid medium due to metamorphic recrystallization and metasomatic replacement of primary rocks - precambrian granite-gneiss strata of the eastern part of the Ukrainian shield, that confirms genetic link of gra-

nites and pegmatites of the studied area. In addition, the specialization of the mineral formation environment of quartz granitoids clearly correlates with the composition of metamorphic rocks.

This pattern has been repeatedly noted by many researchers of Ukrainian Precambrian [3, 4] age, and is determined by the process of granitisation of source rocks, i.e. if granitization occurs due to amphibolites, the quartz of granitoids characterizes by titanium specialization of mineral-forming medium, and if due to biotite gneisses, then by aluminum. Thus, the granitoids with aluminum-titanium specialization are formed by volcanic-sedimentary rocks on the basis of the classical theory of gneisses formation.

The model of formation of pegmatites. The development of geological processes discussed above fit into the classical scheme of development of the regional metamorphism, which includes several main stages.

The accumulation of volcanogenic-terrigenous material in geosynclinal areas occurred on the background of general lowering of the region to a greater depth. As a result of the subsequent metamorphism the redistribution of the starting material of accumulated strata was carried out, as well as their recrystallization and the formation of gneiss, amphibolite, serpentinite, talc schists.

The further transformation took place under *K-Na* metasomatic fluids. The composition of the metasomatic fluids and specialization of granitoid rocks are determined by material composition of the source rocks and volume of water in them. The igneous formations are "dry" rocks, a terrigenous rocks are "wet" ones. In the latter species, the water content can reach 30%, which gives the opportunity to create aggressive fluids, which being in a nonequilibrium state with the host rocks (gneisses) and form arrays of metasomatic granites and same complexes of the ultrametamorphic granitoid rocks.

The results of our research prove that the geochemical specialization of granites (titanium, aluminum, aluminum-titanium) depended on the composition of the original igneous or magmatic rocks, terrigenous formations or their alternation with a predominance of ones or the others. It determined the different composition of mineral inclusions in quartz of granitoids.

Metasomatic process contributed to the formation and removal of fluids in the weakened areas of the crust. Such were the trough structures, unaffected by the processes of granitization. These were the tectonic zones (the weakened ones) which were characterized by the lowest PT-conditions which are clearly recorded due to mineral and petrographic composition of the studied strata, compared with the surro-unding structures. The unloading of pegmatite fluids and formation of pegmatite fields took place here.

Conclusions.

1. Both pegmatites of the Azov block Ukrainian shield and the slates of trough structures which include them, as well as gneisses and granites are the products of a single metamorphic process which are combined by chemical, mineralogical and petrographic composition, structural position, long period of time, a natural decrease in mafic minerals from the gneiss to granite and pegmatite.

2. Pegmatites were formed in pneumatolit-hydrothermal stage, which was preceded by the processes of accumulation of volcanic and sedimentary formations and their recrystallization (metamorphism) into gneiss, followed by their metasomatic transformation into granites and pegmatites.

References/ Список літератури

1. Slivnaya, Ye.V. (2000), "The dismemberment of granitoids in the junction zone of the Srednepridneprovsk and Azov blocks of the Ukrainian shield", *Naukovyi Visnyk Natsionalnoi Hirnychoi Akademii*, no. 4, pp. 44–46.

Сливная Е.В. Расчленение гранитоидов зоны сочленения Среднеприднепровского и Приазовского блоков УЩ / Е.В. Сливная // Науковий вісник НГАУ. − 2000. – №4. – С.44−46.

2. Zagorsky, V.Ye., Peretyazhko, I.S. and Shmakin, B.M. (1999), Granitnye pegmatity. Tom 3. Miarolovye pegmatity [Granitic Pegmatites. Vol. 3. Miarolitic Pegmatites], Nauka, Novosibirsk, Russia.

Гранитные пегматиты: Миароловые пегматиты / [Загорский В.Е., Перетяжко И.С., Шмакин Б.М. и др.]. − Новосибирск: Наука, 1999. − Т.3. − 488 с.

3. Shcherbak, D.N. and Grinchenko, A.V. (1999), "Metallogenic epoch of the Precambrian Structures of the Ukrainian shield", Mineral. Zhurnal, no.2, pp. 22–38.

Щербак Д.Н. Металлогенические эпохи докембрия Украинского щита / Д.Н. Щербак, А.В. Гринченко // Минер. журнал. – 1999. – №2. – С.22–38.

4. Sheremet, Ye.M. (2012), "Geochemistry and metallogeny of granitoids in terms of the Ukrainian Shield subduction zone tectonotype position", Proc. of the 29th Int. Conf. "Ore potential of alkaline, kimberlite and carbonatite magmatism", School "Alkaline magmatism of the Earth", Sudak-Moscow, September 14-22, 2012, pp. 99−100.

Шеремет Е.М. Геохимия и металлогения гранитоидов в зависимости от положения тектонотипа области субдукции Украинского щита: материалы 29 Международной конференции „Рудный потенциал щелочного, кимберлитового и карбонатитового магматизма", Школа „Щелочной магматизм Земли". Судак−Москва, 14−22 сентября 2012. – 2012. − С.99−100.

Мета. Дослідження речовинного складу гранітоїдних утворень Західного Приазов'я та встановлення закономірностей формування пегматитових полів, просторово пов'язаних з ослабленими зонами головних геологічних структур східної частини Українського щита (УЩ).

Методика. Для вирішення головних завдань досліджень, що перебувають у вивченні петрології та умов формування пегматитових утворень району, були використані оптичні, петрографічні, мінералогічні та термобарогеохімічні методи дослідження.

Результати. Пегматити Приазовського геоблоку УЩ, як і вміщуючі їх сланці трогових структур, а також гнейси та граніти − є продуктами єдиного метаморфічного процесу, характерного для докембрійських кристалічних щитів. Вони об'єднані хімічним, мінералогічним та петрографічним складом, структурним положенням, тривалим часом формування, а також законо-

мірною послідовністю формування. Пегматити формуються в результаті тривалої еволюції мінералоутворюючого процесу, що чітко підтверджується наявністю характерних твердих та флюїдних включень у кварці цих порід. Встановлені включення мають практичну й генетичну інформативність: вони є критеріями розчленування гранітоїдних утворень району та вказують на утворення цих порід за рахунок багаторазового метаморфогенно-метасоматичного перетворення первинних супракрустальних товщ. Результати досліджень доводять, що геохімічна спеціалізація гранітів і пегматитів (титаниста, алюмінієва, алюмінієво-титаниста) залежала від складу первинних порід: магматичних, теригенних або їх чергування з перевагою тих або інших. Наступні прояви геологічних процесів, що призвели до формування пегматитових полів Західного Приазов'я, укладаються до класичної схеми розвитку регіонального метаморфізму.

Наукова новизна. Встановлена геохімічна спеціалізація гранітів і пегматитів Західного Приазов'я УЩ. Виявлені закономірності просторової приуроченості пегматитових полів до ослаблених зон, що визначаються мінімальними проявами гранітизації, запропонована модель формування письмових пегматитів у межах Приазовського геоблоку УЩ.

Практична значимість. Встановлено, що пегматити Приазовського геоблоку УЩ сформувалися у пневматолит-гідротермальну стадію, чому передували процеси накопичення вулканогенно-осадових товщ і перекристалізація (метаморфізм) їх у гнейси, з подальшим метасоматичним перетворенням у граніти й пегматити. Отримані дані можуть бути використані при розробці коректної схеми розчленування вулканогенних та плутонічних утворень з метою проведення геологозйомних, прогнозно-металогенічних та пошукових робіт.

Ключові слова: *граніт, письмовий пегматит, модель формування, Західне Приазов'я, Український щит*

Цель. Исследование вещественного состава гранитоидных образований Западного Приазовья и установление закономерностей формирования пегматитовых полей, пространственно связанных с ослабленными зонами главных геологических структур восточной части Украинского щита (УЩ).

Методика. Для решения главных задач исследований, состоящих в изучении петрологии и условий формирования пегматитовых образований района, были использованы оптические, петрографические, минералогические и термобарогеохимические методы исследования.

Результаты. Пегматиты Приазовского геоблока УЩ, как и вмещающие их сланцы троговых структур, а также гнейсы и граниты – продукты единого метаморфического процесса, характерного для докембрийских кристаллических щитов. Они объединены химическим, минералогическим и петрографическим составом, структурным положением, длительным временем становления, а также закономерной временной последовательностью формирования. Пегматиты формируются в результате длительной эволюции минералообразующего процесса, что четко подтверждается наличием характерных твердых и флюидных включений из кварца этих пород. Установленные включения имеют практическую и генетическую информативность: являются критериями расчленения гранитоидных образований района и указывают на образование этих пород за счет многократного метаморфогенно-метасоматического преобразования исходных супракрустальных толщ. Результаты исследований доказывают, что геохимическая специализация гранитов и пегматитов (титанистая, алюминиевая, алюминиево-титанистая) зависела от состава исходных пород: магматических, терригенных или их чередования с преобладанием тех или других. Последующие проявления геологических процессов, приведших к формированию пегматитовых полей Западного Приазовья, укладываются в классическую схему развития регионального метаморфизма.

Научная новизна. Установлена геохимическая специализация гранитов и пегматитов Западного Приазовья УЩ. Выявлены закономерности пространственной приуроченности пегматитовых полей к ослабленным зонам, которые определяются минимальными проявлениями гранитизации, и предложена модель формирования письменных пегматитов в пределах Приазовского геоблока УЩ.

Практическая значимость. Установлено, что пегматиты Приазовского геоблока УЩ сформировались в пневматолит-гидротермальную стадию, чему предшествовали процессы накопления вулканогенно-осадочных толщ и перекристаллизация (метаморфизм) их в гнейсы, с последующим метасоматическим преобразованием в граниты и пегматиты. Полученные данные могут быть использованы при разработке корректной схемы расчленения вулканогенных и плутонических образований для проведения геолого-съемочных, прогнозно-металлогенических и поисковых работ.

Ключевые слова: *гранит, письменный пегматит, модель формирования, Западное Приазовье, Украинский щит*

Рекомендовано до публікації докт. техн. наук В.Ф. Приходченком. Дата надходження рукопису 18.11.14.