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RESEARCH ARTICLE

THE WORLD'S RİCHEST METABLASTİC ORE DEPOSİTS ARE ASSOCİATED WİTH CARBONATOBLASTİC ROCKS OF METAMORPHİC ORİGİN (KNOWN AS CARBONATİTES)

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Abstract

In the Geology/Earth Sciences literature, carbonatites are accepted as rocks of magmatic origin that are rarely seen in nature as intrusions, carbonatite dykes, veins, pegmatitics, stocks, sills and lenses. The view that carbonatites are of magmatic origin and rarely seen in nature is definitely not true. On the contrary; Carbonatites are rootless, metamorphic origin, a new type of modern metamorphic rocks, pure-impure leucocratoblastic (light colored, rock composed of different carbonate origin/based crystalloblast neominerals) carbonatoblastic rocks / carbonatoblastites / carbonatoblastic rock series and their derivatives. Pure-impure leucocratoblastic carbonatoblastic rocks / carbonatoblastites, whose primary source rocks are different (pure-impure carbonate/limestone); They form a type of leucocratoblastic metablastic rocks, which are of metamorphic origin, rootless, a type of new modern metamorphic rocks, with a granite mineralogical composition and composed of silicate origin/based crystalloblast neominerals. Carbonatoblastic rocks (known as carbonatites, rarely seen in nature, which are of magmatic origin until today); They developed in the last/second closing stage of the regional dynamothermal Tarhan metamorphism cycle, and they developed in the changing physical conditions (P/T) of the facies and sub-facies of Abukuma type reversed regional regressive dynamothermal metamorphism, where temperatures are effective in proportion to/compared to pressures (T>P, P, Pressure; T, Temperature; Temperatures put their stamp on the metamorphism). Previously existing primary source rock units pure-impure carbonate/limestones; They developed in the first initial phase of the regional dynamothermal Tarhan metamorphism cycle, within pure and impure classical marbles, which are the metamorphic equivalents of Barrow type regional progressive dynamothermal metamorphism, where pressures are effective compared to/in proportion to temperatures (P>T, pressures put their stamp/mark on the metamorphism). Carbonatoblastic rocks/carbonatoblastites were derived in solid phase and in-situ (autochthonous) from the pure-impure classical marbles in the Abukuma type inverted regional regressive dynamothermal metamorphism type/phase that developed in the second/last closing phase of the metamorphism cycle. Metamorphic origin leucocratoblastic pure-impure carbonatoblastic rocks derived from

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pure-impure carbonate/limestones of different primary rocks; They constitute a new type of modern metamorphic rocks of metamorphic origin, rootless, leucocratoblastic metablastites / metablastic rocks / metablastic rock series and their derivatives, defined for the first time under the general name, named and different types. Pure-impure carbonatoblastic rocks / carbonatoblastites / carbonatoblastic rock series and derivatives under the name of many carbonatoblastite type metablastic rocks (alkali metablastites, syenitoblastite, monzonitoblastite, calcitoblastite, calcito-dolomitoblastite, dolomitoblastite, sideritoblastite, stroncianitoblastite etc.) and carbonate origin / based rock forming main-secondary-trace crystalloblast neominerals (calcitoblast, dolomitoblast, witheritoblast, stroncianitoblast etc.) etymologically redefined for the first time, named, classified, physical-chemical properties determined. Carbonatoblastic rocks / Carbonatoblastites / Carbonatoblastic rock series and their derivatives; It has been determined for the first time that they have very rich and widespread potential in terms of **metablastic ore/mine deposits** of metamorphic origin, defined and named for the first time. Different carbonatoblastic rock types develop depending on the composition and contents of pure-impure carbonate/limestones, which are pre-existing primary origin rock units. In the changing physical conditions (P/T) of the facies and sub-facies of the Abukuma type reversed regional regressive dynamothermal metamorphism, which developed in the last/second/closing phase of the regional dynamothermal Tarhan metamorphism cycle, where temperatures are effective compared to pressures (T>P, temperatures put their stamp on the metamorphism), protominerals (minerals of primary source rocks) - metaprotominerals (classical metamorphic minerals of metamorphic equivalent rocks of primary source rocks) lose their stability and are partially and completely gradually dissolved in the solid phase and in-situ. With dissolution in the solid phase; solid neo-solutions with different chemical compositions, anhydrous, unstable and disordered structures, consisting of free and unstable ions (cation, anion) of different elements with increased electrically charged and atomic diffusion rates are widely developed. In the current physicochemical conditions of the facies and subfacies of the abukuma type inverted regional regressive dynamothermal metamorphism, recrystallization by metablastization commonly develops from unstable solid neo-solutions with different chemical compositions due to the temperatures effective in the environment. With the recrystallization developing by metablastation from solid neo-solutions; rock-forming main-secondary-trace element cations, metallic-non-metallic ore cations, radioactive and rare earth elements/REE, which are incompatible elements with large ionic radii, are electrically charged, have increased atomic diffusion rates, and are free and unstable cations; They combine with root carbonate anion $(CO_3)^{2-}$, root silicate anion (smooth surface silicon tetrahedral) $(SiO_4)^{4-}$ / or $[(Si, Al)O_4]^{4-}$ and oxygen (O^{2-}) anions (due to polarization, solid-solid chemical reactions) and develop free blast/embryo/nucleus/bud and blast/embryo aggregates of their own unique/belonging minerals. In this way, the ions become electrically neutral and become stable. Blast/embryo, blast/embryo aggregates with the same and similar geochemical properties formed in the current/setting physicochemical conditions of Abukuma type reversed regional regressive dynamo-thermal metamorphism where temperatures are effective compared to pressures

(T>P, temperatures put their stamp on the metamorphism) group among themselves and add to each other, and gradually grow as crystalloblast, porphyroblast and megacrystalloblast type rock-forming main-secondary-trace, metallic-non-metallic ore-forming, strategic, radioactive and light-heavy rare earth elements/REE free/independent crystalloblast neominerals. In this way, metallic-non-metallic ore crystalloblast neominerals, strategic crystalloblast neominerals, radioactive-rare earth elements/REE from incompatible elements with large ionic radii that cannot easily enter the crystal structures of rock-forming main-secondary-trace crystalloblast neominerals are naturally produced by their own crystalloblast neominerals. They become enriched and visible in the environment/setting. They are naturally enriched and become visible in the form of crystalloblast neominerals in leucocratoblastic carbonatoblastic rocks, which are rootless and a type of new modern metamorphic rocks of metamorphic origin. It has been determined and suggested for the first time that they develop the richest metamorphic-origin **metablastic ore/mine deposits** in the world by growing freely in the form of metallic-non-metallic crystalloblast neominerals that are unique/belonging to them. Carbonatoblastic rocks / Carbonatoblastites / Carbonatoblastic rock series and their derivatives; are also very rich in terms of their contents of precious and semi-precious stones, ornamental stones (Gemology) and natural colored-patterned building stones (natural ceramic stones). Carbonatoblastic rocks; They form the 2nd generation metamorphic rocks, the 3rd generation rocks, allotropic superionic metablastic matter / mine / rock / minerals and the 5th classical state of matter. All these geological phenomena; appear before us as the products of the metamorphic view that constitutes the regional dynamo-thermal Tarhan metamorphism cycle that has been determined and suggested for the first time. They are not the products of the magmatic view. They are not the products of logical imagination models either. Therefore, if material, moral and temporal losses are not desired for scientific studies on similar topics, but reversible economic gains are desired, **the magmatic view** should be rejected. In contrast, **the metamorphic view** should be accepted.

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Introduction:-

Definition and Naming of Carbonatoblastic Rocks

Metamorphic belts develop and evolve as a result of the regional dynamothermal Tarhan metamorphism cycle. The regional dynamothermal Tarhan metamorphism cycle completes its evolution with two separate regional dynamothermal metamorphism types that have different physical conditions (P/T; P: Pressure, T: Temperature), physical parameters (P, T) and physical activities (P>T; T>P) but are directly connected to each other (Tarhan, 2018, Volume 1, Figure 8.1). The metamorphism cycle also evolves in different thermodynamic systems (open, transitional and closed systems. A fourth thermodynamic system, transitional/semi open-semi closed, has been added to the three known closed, open and isolated thermodynamic systems, Tarhan, 2018, Volume 1). The metamorphism cycle; It begins with Barrow type regional progressive dynamothermal metamorphism, which is developed from low-grade areas to high-grade areas, and where pressures are effective in comparison to temperatures (P>T; P: Pressure, T: Temperature; Pressures put their stamp on the metamorphism). In this regional metamorphism type, known classical metamorphic rocks (metasediment, schist, calcschist, micaschist, marble and amphibolite etc.) develop. When a decrease in pressures (regression, decompression etc.) develops in Barrow type regional progressive dynamothermal metamorphism, the effectiveness of temperature gradually increases and a change and transformation occurs into Abukuma type reversed regional regressive dynamothermal metamorphism, where temperature is effective in comparison to pressures (T>P; Temperatures stamp on the metamorphism). Abukuma type inverted regional regressive dynamothermal metamorphism, which constitutes the second/last

closing phase of the metamorphism cycle, overlaps with the metamorphic equivalent rocks of Barrow type regional progressive dynamothermal metamorphism within the metamorphic system. It close the metamorphic system by leaving its stamp on it.

In different regional dynamothermal metamorphism types, in addition to different thermodynamic systems, different chemical compositions and different time processes, pressure and temperature parameters have undertaken very important functions. In regional metamorphism events, pressure and temperature parameters are never separated from each other. However, they never act together in the same direction. For example, when it is said that the degree of metamorphism increases, the view that temperature and pressure increase together in that direction is not correct. One of the pressure and temperature parameters is definitely more effective than the other. Why? Because when pressure increases, the effectiveness of temperature decreases. When temperature increases, the effectiveness of pressure decreases. These two parameters can never act together at the same degree and in the same direction. If it were not for these inverse conjugate processes between pressure and temperature, metamorphic systems and matter/rock/minerals would never be balanced. If these features did not exist; This would be contrary to the nature of matter, the first prototype Constitution of the mine, and the laws of physics and chemistry (Tarhan, 2018, 2024a, 204b, 2024c, 2024d, 2024e).

Abukuma type reversed regional regressive dynamothermal metamorphism; It is the reversed equivalent of Barrow type regional progressive dynamothermal metamorphism and develops from high-grade area to low-grade area. In Abukuma type reversed regional regressive dynamothermal metamorphism, temperatures are effective in proportion to pressures (T>P, temperatures put their stamp on the metamorphism). In other words; Abukuma type reversed regional regressive dynamothermal metamorphism develops in the second and last closing stage of Tarhan metamorphism cycle. It completes the evolution of regional dynamothermal Tarhan metamorphism cycle by putting its final stamp on the metamorphism cycle. Since temperatures are effective in Abukuma type reversed regional regressive dynamothermal metamorphism, there is never greenschist facies. Water-containing minerals do not develop. Anhydrous light-colored crystalloblast neominerals develop widely. The facies, sub-facies series, physical conditions (P/T), metamorphic index and different metamorphic rock types (leucocratoblastic metablastic rocks and carbonatoblastic rocks) formed by the main-secondary-trace felsicoblast (light-colored crystalloblast neominerals), anhydrous crystalloblast neominerals, silicateblast and carbonatoblast based felsicoblast anhydrous crystalloblast neominerals of this metamorphism were defined, named, classified and metamorphism reconstructed for the first time (for more detailed information, see Tarhan, 2018, Volume 1, Volume 2, Volume 3 and Volume 4).

Until today, in the Geology/Earth Sciences literature, Abukuma and Barrow type regional metamorphisms were known as separate metamorphisms that were independent of each other. Abukuma type metamorphism was almost never mentioned. They knew it as a separate and independent metamorphism that progressed regionally. It was only known that the pressures were lower in this type of metamorphism. It was known that metamorphic belts developed only as a result of Barrow type regional metamorphism. Barrow type metamorphism was not mentioned either. They tried to explain the geodynamic evolution of metamorphic belts by referring to the metamorphic belts as a result of a single regional metamorphism and briefly as "**regional metamorphism**".

However, Abukuma type inverted regional regressive dynamothermal metamorphism; Very different from the classical Barrow type regionally progressive dynamothermal metamorphism type, which is known as the linear, unidirectional and single regional metamorphism that forms metamorphic belts to date, it has its own unique rock-forming main-secondry-trace metamorphic crystalloblast neominerals, index metamorphic minerals, different metamorphic rock types. There are textures and structures. It consists of free crystalloblast neominerals of radioactive and heavy-light rare earth elements/REE, metallic-non-metallic and strategic elements, which are incompatible elements with large ionic radii, which form the world's richest metamorphic origin metablastic ore/mine deposits. Until today, these and similar features of Abukuma type reversed regional regressive dynamothermal metamorphism were never known. In short, in the changing physical conditions of facies and sub-facies of Abukuma type reversed regional regressive dynamothermal metamorphism (P/T), the suffix **"-oblast"** was added to the end of the known rock-forming main-secondary-trace and ore-forming mineral names, and etymologically, for the first time, metamorphic origin crystalloblast neomineral names were made. For example, quartz/quartzoblast, orthoclase / orthoclasoblast, calcite / calcitoblast, dolomite / dolomitoblast, stransionite / stransitionitoblast, witherite / witheritoblast etc.

Leucocratoblastic metablastic rocks, which are a type of new modern metamorphic rocks of Abukuma type reverse regional regressive dynamothermal metamorphism, also have their own unique/belonging granoblastic-holoblastic metamorphic rock textures and structures. Leucocratoblastic metablastic rocks of metamorphic origin have their own unique/belonging different rock types and main-secondary-trace different crystalloblast neominerals forming the metamorphic origin rocks. It has been determined for the first time that different leucocratoblastic metablastic rocks (known as magmatic origin, granite / granitoid, gabbro / gabroid, diorite / dioritoid, charnosite / charnockitoid, carbonatite / carbonatoid intrusion, pluton and batholith type depth/plutonic rocks) developed in the Abukuma type reverse regional regressive dynamothermal metamorphism type/phase, where temperatures are effective compared to pressures (T>P, temperatures put their stamp on the metamorphism) in the last/second/closing phase of the regional dynamothermal Tarhan metamorphism cycle.

Different leucocratoblastic metablastic rocks/metablastic rock series and their derivatives/metablastites of metamorphic origin (known as magmatic origin granite/granitoid, gabro/gabroid, diorite/dioritoid, charnoite/charnokitoid intrusion, pluton and batholith type plutonic/depth rocks) are developed as a result of metamorphism, crystalloblast neominerals since they are formed as a result of blast/embryo (embryoization)/bud (budding)/nucleus (nucleation), they are etymologically defined by adding the **"Meta-"** prefix, the root **"blast"** and the suffixes **"it"** or **"ic"** used to produce technical terms in English. The name **"metablastic"** is derived. In this way, the name metablastic substance / metablastic rock / metablastite / metablastic rock series and its derivatives, which are the first modern names of metamorphic rocks of metamorphic origin, rootless and new, were derived. metablastic rocks, a new modern metamorphic rock type defined, named and classified for the first time, have different metamorphic origin leucocratoblastic metablastic rock types according to their primary origin rock units (cosmic upper mantle peridotites / mantle, terrestrial igneous rock series / oceanic crust series / ophiolite series rock units, ensimatic island arc origin volcanosedimentary series rock units, different volcanic rock units and different sedimentary rock units etc.). In the Abukuma type inverted regional regressive dynamothermal metamorphism type/phase, pure-impure carbonate/limestones, which are different from the previously existing primary source rock units, and the metamorphic equivalents of Barrow type regional progressive dynamothermal metamorphism of the primary source rock units are pure-impure classical marbles in solid phase and derived in situ pure impure leucocratoblastic carbonatoblastic rock / carbonatoblastite / carbonatoblastic rock series and its derivatives (known as carbonatites of magmatic origin, rare in nature) type/type leucocratoblastic metablastic rocks are formed. These three names refer to the same metamorphic rock type. However, in the article, it is generally preferred to use the name ‘carbonatoblastic rock’.

Different leucocratoblastic metablastic rocks are formed from metamorphic, rootless, silicateoblast based/origin crystalloblast neominerals formed in the Abukuma type reversed regional regressive dynamothermal metamorphism phase developed in the second/last closing phase of the regional dynamothermal Tarhan metamorphism cycle. Ore deposits of metamorphic origin within metablastic rocks were defined and named for the first time as **metablastic ore/mine deposits**. Especially, pure-impure leucocratoblastic carbonatoblastic rocks, which are enriched in carbonatoblast-oxytoblast based/origin crystalloblast neominerals derived from pure-impure carbonate/limestones and pure-impure classical marbles, which are metamorphic equivalents of the primary source rock units that were previously present, are widely developed. It has been determined that metamorphic origin metablastic ore deposits and/or carbonatoblastic metablastic ore deposits within carbonatoblastic rocks have much richer potentials. Metablastic ore deposits are developed and naturally enriched in the changing physical conditions (P/T) of the facies and sub-facies of the Abukuma type reversed regional regressive dynamothermal metamorphism, where temperatures are effective in proportion to/compared to pressures (T>P, temperatures put their stamp on the metamorphism).

Metamorphic origin metablastic ore deposits; are composed of rock-forming main-secondary-trace, radioactive-rare earth elements/REE, metallic-non-metallic and strategic carbonatoblast blast/blast/embryo, oxytoblast blast/blast/embryo, silicate blast/blast/embryo, crystalloblast, porphyroblast and megacrystalloblast neominerals. Pure-impure carbonatoblastic rock type leucocratoblastic metablastic rocks are much more naturally enriched and have developed the richest ore deposits in the world. For this reason, metablastic ore deposits/or carbonatoblastic metablastic mine/ore deposits of metamorphic origin, which are related to pure-impure carbonatoblastic rocks of metamorphic origin (known as carbonatites of magmatic origin, rare in nature), create much richer potentials and gain importance economically.

The ore minerals of metablastic ore deposits consist of different ore crystalloblast neominerals that have grown and naturally enriched by recrystallization and are naturally enriched. For example, radioactive and rare earth elements/REE, which are incompatible elements with large ionic radii, are found in different primary source rock units (especially in pure-impure carbonate/limestones) as free elements/forms. However, in different metablastic rocks and especially in carbonatoblastic rock type metablastic rocks, the elements in question are formed as silicatoblast-oxytoblast-carbonatoblast origin/based, unique/belonging free ore/mineral crystalloblast neominerals. They grow in the environment/setting and become naturally enriched and visible. In short; Different leucocratoblastic metablastic rocks composed of silicatoblast based/origin crystalloblast neominerals, which are a type of new modern metamorphic rocks with no roots/rootless and metamorphic origin, and ore deposits composed of carbonatoblast-oxytoblast-silicatoblast-based/origin ore/mine crystalloblast neominerals within the pure-impure carbonatoblastic rock type metablastic rock, which is generally dominated by carbonatoblast crystalloblast neominerals, were defined and named for the first time as metablastic ore/mine deposits, which are a new type of modern ore/mine deposits with metamorphic origin.

Radioactive and rare earth elements/REE are among the incompatible elements with large ionic radii that do not have their own free minerals; They grow in the form of free crystalloblast neominerals of silicatoblast-oxytoblast-carbonatoblast origin/based, unique to them within leucocratoblastic carbonatoblastic rocks, and become naturally enriched and visible. Therefore, metamorphic-origin metablastic ore deposits in metamorphic belts are very important. The formation and origins of metablastic ore/mine deposits have absolutely no relation with any magmatism (orthomagmatogenous, pneumatologic, pegmatitic and hydrothermal stage), metasomatism and hydrothermal formations. In other words, they have absolutely no relationship with magmatic origin granite/granitoid, gabbro/gabbroid, diorite/dioritoid, charnockite/charnockitoid, carbonatite/carbonatoid intrusion, pluton, batholith type depth/plutonic rocks and related magmatic origin ore deposits (orthomagmatic, pinomatolitic, pegmatitic, hydrothermal magmatic stage) and metasomatism. They are directly related to metablastic rocks which are a completely new type of modern metamorphic rocks, rootless, metablastic and carbonatoblastic rock type. They form metamorphic origin metablastic ore/mine deposits.

It is different from the metamorphic origin ore/mine deposits in the classical metamorphic rocks known to date (metasediment, metagabbro, schist, micaschist, marble, amphibolite etc.). Therefore, in order to distinguish it from the "**classical metamorphic ore/mine deposits**", the name **modern metablastic ore/mine deposits** was given for the first time. Because, classical metamorphic ore/mine deposits consist of classical metamorphic ore minerals formed in the Barrow type regional progressive dynamothermal metamorphism stage where pressures are effective compared to temperatures (P>T, pressures put their stamp on the metamorphism). On the other hand, modern metablastic and carbonatoblastic metablastic ore deposits are formed in the changing physical conditions (P/T) of the Abukuma type reversed regional regressive dynamothermal metamorphism facies and sub-facies, where temperatures are effective compared to pressures (T>P, temperatures put their stamp on the metamorphism), and are composed of ore crystalloblast neominerals of metamorphic origin. Two different regional dynamothermal metamorphisms developed within the regional dynamothermal Tarhan metamorphism cycle and have two different metamorphic origin ore/mine deposits (metamorphic and metablastic ore deposits) that are unique to them.

Similarly; carbonatite intrusions, carbonatite dykes, pegmatite, stocks, sills and lenses, which are rarely seen in nature and have magmatic origin in Geology/Earth Sciences literature, are definitely not magmatic in origin. However, unstable anatexitic carbonate magmas of partially melted carbonate origin at depth along the weakness zones (different fault systems, opening cracks, rift systems etc.) cutting thick and widespread carbonate/limestone platforms, have developed carbonate volcanism and carbonatitic lavas by coming to the surface along the weakness zones. Carbonate volcanism and carbonatitic lavas are limited by the **tectonism-magmatism-volcanism cycle**. Because unstable anatexitic magmas developed as a result of partial melting are evidence and indicators of a destruction, a collapse and a wreck developed as a result of natural disasters. Especially the views of separation/formation of carbonate/calcite magmas from ferromagnesian anatexitic basic-ultrabasic magmas formed by partial melting (anatexis event) of cosmic upper mantle peridotites are definitely not correct. All terrestrial-rocky planets and satellites (Moons) in the universe have mantles formed by peridotites. Neither volcanism-carbonate lavas nor any carbonate intrusion of carbonate origin formed and separated by partial melting of upper mantle peridotites have developed and will not develop.

In terrestrial-rocky planets and satellites with a modern atmosphere, such as the Earth, where the chemical rock cycle is developed, regional dynamothermal Tarhan metamorphism cycle, as a result of this metamorphism cycle,

classical metamorphic rocks - classical mine/ore deposits and metamorphic origin, rootless, new type of modern metamorphic rocks, leucocratoblastic modern metablastic rock types and modern metablastic ore/mine deposits have developed and will develop. Therefore, in continental plates / shields where thick and widespread outcrops of carbonate series platforms / rocks are seen, carbonate volcanism and carbonate lavas of magmatic origin formed by partial melting of carbonate rocks / platforms have developed along open systems developed along different fault systems, opening cracks and rift systems cutting carbonate platforms (Southern Afghanistan, Tanzania, Canada etc.). However, in metamorphic belts, magmatic carbonatite intrusions, carbonatite dykes, pegmatite, stock, sills and lens type depth/plutonic carbonatites formed and separated from the partial melting of upper mantle peridotites have definitely not developed and will not develop.

As a result; granite/granitoid, gabbro/gabbroid, diorite/diorite, charnockite/charnockitoid, carbonatite/carbonatoid intrusions, plutons and batholiths of magmatic origin accepted in the Geology/Earth Sciences literature are definitely not of magmatic origin. On the contrary, as a result of the regional dynamothermal Tarhan metamorphism cycle of previously existing primary rock units (cosmic upper mantle peridotites, terrestrial igneous rock sequence/oceanic crust sequence/ophiolite series rock units, volcano-sedimentary rock series, different volcanic rocks, different sedimentary/sedimentary rock units and pure-impure carbonate-limestone rock units etc.), different metamorphic rocks (classical metamorphic rocks, modern metablastic rocks) and metamorphic ore/mine deposits (classical metamorphic ore/mine deposits, modern metablastic ore/mine deposits) develop as thick and widespread outcrops in solid phase and in-situ. Therefore, as a result of the metamorphism cycle of previously existing primary source rock units, metamorphic origin, rootless, solid state and in-situ phase change, 1st and 2nd generation metamorphic rocks (classical metamorphic and modern metablastic rocks) and different ore/mine deposits associated with them (classical metamorphic and modern metablastic ore/mine deposits) correspond to the 3rd generation rocks (primary source rock units, metamorphic origin metamorphic and metablastic rocks), minerals (protominerals, metaprotominerals and crystalloblast neominerals) and ore deposits (primary volcanosedimentary-sedimentary ore/mine deposits, classical metamorphic and modern metablastic ore deposits) in terms of rock,ore/mine/mineral and substance. In the last/second/closing phase of the metamorphism cycle, they allotropically form the 5th classical state/phase/form of the substance.

The second/last closing phase of the metamorphic cycle, which is the Abukuma type reversed regional regressive dynamothermal metamorphism where temperatures are effective in proportion to pressures (T>P; temperatures put their stamp on the metamorphism), developed under the changing physical conditions (P/T) of facies and sub-facies, and caused the evolution and balancing of metamorphic systems with the completion of the metamorphic cycle, and the metamorphic system ends with the changes and transformations of a new type of modern metamorphic rocks, which are determined for the first time to be metablastic rock series and their derivatives/metablastites/metablastic rocks and a new type of modern metablastic ore deposits of metamorphic origin, in solid phase and in-situ allotropically into **superionic metablastic solids/ores-mines/rocks/minerals**. Similarly, carbonatites, which are rarely seen in nature with magmatic origin, are definitely not of cosmic upper mantle/mantle peridotite origin. On the contrary, carbonatites; Carbonatoblastic rocks, which are 2nd generation metamorphic rocks, which are a type of modern metamorphic rocks of rootless metamorphic origin, derived in solid phase and in situ from pure-impure carbonate/limestones, which are primary origin rock units, and pure-impure classical marbles, which are metamorphic equivalents of primary origin rock units, correspond to the 5th classical state/form of matter that has allotropically changed phase. As rocks, matters/mines-ores and minerals, they correspond to the 3rd generation rocks, subtances, ores and minerals. In the second/last closing phase of the metamorphism cycle, they undergo changes and transformations in solid phase and in-situ into leucocratoblastic pure-impure carbonatoblastites/carbonatoblastic rock series and derivatives/carbonatoblastic rocks, which are determined for the first time to be a type of new modern metamorphic rocks of metamorphic origin, rootless; into a new type of modern carbonatoblastic metablastic ore deposits and a new type of carbonatoblast dominant/oxytoblast/silicatoblast based/origin crystalloblast neominerals.

In this way, in the last/second closing stage of the metamorphic cycle; allotropically superionic leukocratoblastic pure-impure carbonatoblastic type metablastic solids-rocks / pure-impure carbonatoblastic type metablastic ores deposits / pure-impure carbonatoblast predominantly-oxytoblast-silicatoblast origin/based crystalloblast, porphyroblast and megacrystalloblast metamorphic system with change and transformation with neominerals. It is closed by completing its evolution and being stamped/sealed. Pure-impure carbonatoblastic rocks (known as carbonatites of magmatic origin, rarely seen in nature) form a type of metablastic rocks with different primary source rocks (pure-impure carbonate/limestone). It has very thick and widespread outcrops in nature and

metamorphic belts (Tarhan, 1987, 1992a, 1992b, 2018, 2019a, 2019b, 2021, 2024a, 2024b, 2024c, 2024d, 2024e, 2024f).

Prior Researchers of the Origins of Carbonatoblastic Rocks

Before the concept of carbonatite was introduced; the first carbonatite formations were studied by Brögger (1895) near the city of Sundsval on the island of Alnö in Sweden. However, the concept of "carbonatite" was first introduced by Brögger (1921). Daly (1910) and Shand (1922, 1930) suggested that silica-unsaturated foids, silica-poor melilite and carbonatites were formed in the reactions of magmas with limestone (limestone syntexis). Carbonatites were interpreted and accepted as magmatic plutonic/depth rocks formed as a single calcite mineral from compression, percolation and magma separation.

Carbonatites are defined by the International Union of Geological Sciences (IUGS) as igneous rocks containing more than 50% modal/major primary carbonate (Le Maitre, 2002). Depending on the dominant carbonate mineral, a carbonatite is called 'calcite carbonatite', 'dolomite carbonatite' or 'ferrocarbonatite' where the major carbonate is rich in iron.

Tarhan (1987, 1992a, 1992b, 2018, 2019a, 2019b, 2021, 2024a, 2024b, 2024c, 2024d, 2024e), magmatic origin of carbonatites such as intrusion, pluton, batholith, pneomatolic-pegmatitic dyke, lens, sill and stock etc. He claimed that it was not. On the other hand, carbonatites developed in the second/last closing phase of the regional dynamothermal Tarhan metamorphism cycle within metamorphic belts, and were formed in the Abakuma type inverted regional regressive dynamothermal metamorphism phase/type, where temperatures were effective compared to pressures (T>P, temperatures put their stamp on the metamorphism). These are metamorphic in origin, rootless and new modern pure-impure leucocratoblastic carbonatoblastic rock types, corresponding to metablastic rocks. These are metamorphic in origin, rootless and new modern pure-impure leucocratoblastic carbonatoblastic rock types, corresponding to metablastic rocks. In the mentioned metamorphism type/stage, previously existing pure-impure carbonate/limestone primary source rock units and primary source rock units developed in the first/initial stage of the regional dynamothermal Tarhan metamorphism cycle, and were derived in solid phase and in-situ (autochthonous in situ) from pure-impure classical marbles, which are metamorphic equivalent rocks of Barrow type regional progressive dynamothermal metamorphism, where pressures are effective compared to temperatures (P>T, pressures put their stamp on the metamorphism).

Tarhan (2024f), in calcitoblastite-dolomitoblastite type carbonatoblastic rocks formed by main carbonate dominant/based calcitoblast and dolomitoblast crystalloblast neominerals, rock sections formed by coarse-grained rock-forming main calcitoblast crystalloblast neominerals are easily melted and dissolved by snow-rain waters. They are easily dissociated, dissolved and eroded by wind. In contrast, rock sections formed by main rock-forming dolomitoblast crystalloblast neominerals of calcitoblastite-dolomitoblastite type carbonatoblastic rocks are relatively less dissolved and melted by snow-rain waters compared to/compared to calcitoblast crystalloblast neominerals. They are less decomposed, dissolved and eroded by winds. Therefore, due to the difference in the physical properties (texture, structure, calcitoblast-dolomitoblast crystalloblast neomineral compositions) of the rock sections formed by calcitoblast and dolomitoblast crystalloblast neominerals forming the calcitoblastite-dolomitoblastite type carbonatoblastic rocks, different eroded rock sections develop (different sections of rock that have been eroded) in the rocks in question due to different dissolution, melting and abrasions. Different karstic formations develop within carbonatoblastic rock units of the calcitoblastite-dolomitoblastite type. As rock sections containing calcitoblast crystalloblast neominerals are easily melted, dissolved and eroded by snow-rain water, karstic shapes such as caves, cavities and voids develop. On the other hand, in the rock sections formed by dolomitoblast crystalloblast neominerals, due to their physical properties that are more resistant to wind abrasions and not melting-dissolving easily by snow-rain waters, conical, steep and spiky rock sections with different skeletons, such as fairy chimneys, are widely developed. Therefore, due to the differences in the physical properties of the main rock-forming calcitoblast and dolomitoblast crystalloblast neominerals that form the calcitoblastite-dolomitoblastite rock types, which are a type of carbonatoblastic rocks, and because of the different melting-dissolving properties of snow-rain waters and the development of different erosion forms against wind erosion, the dolomitoblastite rock sections develop strange karstic forms such as stalagmites, cone stalagmites, fairy chimneys and skeletons in morphology, and as a result, **"rock forests"** develop and will develop widely.

Opinions on the Origin of Carbonatoblastic Rocks

There are more than 500 known carbonatite provinces on Earth (Woolley & Kjarsgaard, 2008). Most carbonatites (~90%) formed in plutonic or hypabyssal environments. Only a small fraction (~10%) is extrusive and associated with volcanic eruptions (Woolley 2001; Woolley & Church, 2005; Potter, 2019). It has been suggested that calcitic and dolomitic carbonatite magmas are derived from primary carbonatite magmas formed in the mantle by partial melting of carbonated peridotites (anatexis event) (Harmer & Gittings, 1998; Kamenetsky et al., 2015). In other words, the view that carbonatites formed by partial melting of mantle-derived peridotites is accepted in the Geology/Earth Science literature. Additionally, there are volcanoes in many parts of the world that erupt carbonate lavas (Southern Afghanistan, Horton, 2021; carbonatite/gregoryite lavas at Ol Doinyo Lenga'i volcano in Tanzania, along Africa and the East African Rift System, Dawson, 1962; Potter, 2019; in the Canadian Shield, Kamenetsky et al., 2015, etc.).

There are different views on the geology and mineralization of the "Bayan Obo" supergiant carbonatite in the Mongolia Autonomous Region of China. Researchers have put forward controversial views such as sedimentary, magmatic origin resulting from partial melting of peridotites, metasomatism, submarine volcanosedimentary and fluid immiscibility. According to the latest accepted view, the supergiant carbonatite constitutes the Mesoproterozoic Bayan Obu Group in the Inner Mongolia Autonomous Region of China, which constitutes more than two-thirds of the world's total rare earth element/REE reserves and is also the largest rare earth element/REE ore deposit in the world. The formation of dolomite carbonatites in the Bayan Obo supergiant carbonatite-type REE-Nb-Fe deposit within the Bayan Obu Group has been associated with metasomatism and carbonatite magma intrusion of magmatic origin (Yang et al., 2011; Fan et al., 2016; Yang et al., 2016; Li et al., 2023).

To date, there are three main hypotheses/views explaining the origin of unstable anatexitic magmas of carbonatite origin: (1) Immiscibility/fluid immiscibility separation of parental carbonate silicate magmas at crustal or mantle pressures (Kjarsgaard & Hamilton, 1989; Wyllie, 1989; Wyllie et al., 1990; Lee & Wyllie, 1994, 1998); (2) Crystal fractionation of parental carbonate silicate magmas such as olivine melilitites or kamafugites (Veksler & Lentz, 2006); (3) Low-grade partial melting of carbonate mantle peridotite below 70 km depth (Wyllie & Huang, 1976a, 1976b; Eggler, 1978; Bell, 1989; Dalton & Presnal, 1998; Harmer & Gittings, 1998; Bell & Rukhlov, 2004; Rukhlov et al., 2015). Hypotheses suggesting or supporting that carbonatites are derived from the Earth's crust (Lentz, 1999; Ferrero et al., 2016) or from the Earth's mantle with some crustal contributions (Cheng et al., 2017; Song et al., 2017) have also been proposed.

In contrast to these three different magmatic views on the origin and formation of carbonatites, the fourth view is (4) metamorphic view (Tarhan, 1987, 2018, 2019a, 2019b, 2021, 2024a, 2024b, 2024c, 2024d, 2024e, 2024f). They developed in the last/second closing stage of the regional dynamothermal Tarhan metamorphism cycle, which plays a very important role in the evolution and balancing of metamorphic belts, and in the Abukuma type reversed regional regressive dynamothermal metamorphism type/stage, where temperatures are effective compared to pressures (T>P; temperatures put their stamp on the metamorphism). Carbonatites; In the changing physical conditions (P/T) of facies and sub-facies of Abukuma type reversed regional regressive dynamothermal metamorphism, previously existing pure-impure carbonate/limestone primary source rock units and the pressures in proportion to the temperatures developed in the initial phase of regional dynamothermal Tarhan metamorphism cycle of the mentioned primary source rock units were effective (P>T; Pressures put their stamp on the metamorphism) and derived as solid phase and in-situ (autochthonous where present) from pure-impure classical marbles which are metamorphic equivalents of Barrow type regional progressive dynamothermal metamorphism. In other words, carbonatites of magmatic origin correspond to pure-impure carbonate/limestone-based/originated, rootless and new type of modern metamorphic rocks of pure-impure carbonatoblastic rock type leucocratoblastic metablastic rocks with different primary source rock units.

Carbonatites are of magmatic origin, rarely seen in nature and contrary to the views on their origin; it has been suggested and proposed that they are pure-impure leucocratoblastic carbonatoblastic rocks, which are of metamorphic origin, rootless and a new type of modern metamorphic rocks. It has been determined that carbonatites, which are known to be of magmatic origin and rarely seen in nature; are of metamorphic origin for the first time, rootless, have very thick and widespread outcrops in metamorphic belts, have changed phase in solid state/phase and in-situ, correspond to 2nd generation metamorphic rocks, 3rd generation rocks as a rock type, correspond to the 5th classical state of matter, are allotropic superionic metablastic solids/rocks/minerals, and correspond to a new type of modern metamorphic rocks, carbonatoblastic rock series and their derivatives / carbonatoblastites / carbonatoblastic

rocks. They form leucocratoblastic metablastic rocks, which are a new type of modern metamorphic rocks, pure-impure carbonatoblastic rock type, consisting of rock-forming main-secondry-trace carbonatoblast dominated-silicatoblast-oxytoblast origin/based crystalloblast neominerals (Tarhan, 1987, 2018, 2019a, 2019b, 2021). 2024a, 2024b, 2024c, 2024d, 2024e, 2024f).

Formation Mechanism of Carbonatoblastic Rocks of Metamorphic Origin and the Rich Metablastic Ore/Mine Deposits Within Them:-

In metamorphic belts, outcrops of very thick and widespread metamorphic origin leucocratoblastic metablastic rocks (known as magmatic origin granite/granitoid, gabbro/gabroid, diorite/dioritoid, charnocite/charnochitoid intrusion, pluton and batholiths, etc.) are seen. Carbonatoblastic rocks of metamorphic origin, which are derived in the solid phase and in-situ from the previously existing primary source rocks, pure-impure carbonate/limestones, and pure-impure classical marbles, which are the metamorphic equivalents of the primary source rock units in question, and form a type of leucocratoblastic metablastic rocks (They are known as carbonatites, which are of magmatic origin and rare in nature) and have very thick and widespread outcrops. In metamorphic belts, as a result of the exposure of previously existing (pre-existing) very thick and widespread pure-impure carbonate/limestone primary source rock units to the regional dynamothermal Tarhan metamorphism cycle; there are thick and widespread outcrops of pure-impure leucocratoblastic carbonatoblastic rocks, which form a type of leucocratoblastic metablastic rocks, which are very thick and widespread, rootless, metamorphic-origin, new type of modern metamorphic rocks (Tarhan, 1987, 2018, 2019a, 2019b, 2021, 2024a, 2024b, 2024c, 2024d, 2024e, 2024f). There are very thick and widespread outcrops of pure-impure leucocratoblastic carbonatoblastic rocks in metamorphic belts of all countries. However, previous researchers generally defined, named and mapped them as carbonate/limestone, recrystallized limestone/carbonates and marbles.

The previously existing pure-impure carbonate/limestone primary source rock units (50%> more carbonate minerals/protominerals are dominant) and the metamorphic equivalents of the regional progressive dynamothermal metamorphism of the Barrow type developed in the first/initial phase of the regional dynamothermal Tarhan metamorphism cycle of the mentioned primary source rock units contain pure-impure classical marbles (50%> more metamorphic carbonate minerals/metaprotominerals are dominant) and rock-forming main-secondary-trace carbonate dominated-silicate based/originated light-dark colored mixed crystalline solid solution protominerals-metaprotominerals (Tarhan, 2018) and free elements. Carbonate-based mineral species contained in the rock units in question, other rock-forming main-secondary-trace silicate minerals, atomic building blocks (atom, ion, molecule) of radioactive and heavy-light rare earth elements/REE, which are incompatible elements with large ionic radii; In the second/last closing phase of the regional dynamothermal Tarhan metamorphism cycle, in which temperatures are effective compared to the developed pressures (T>P; temperatures put their stamp on the metamorphism) in the Abukuma type reversed regional regressive dynamothermal metamorphism, the facies and sub-facies of the changing physical conditions (P/T) (the characteristics of the mentioned metamorphism, facies and sub-facies names, facies and sub-facies series, index metamorphic and metamorphic origin rock-forming main-secondary-trace crystalloblast neominerals, textures-structures, metamorphic origin metablastic ore deposits were defined, determined and reconstructed for the first time; Tarhan, 2018), they lose their stability due to the temperatures effective within closed and transitional thermodynamic systems.

The light-dark colored mixed crystalline solid solution protominerals-metaprotominerals that have lost their stability and the radioactive, heavy-light rare earth elements/REE and metallic-non-metallic elements that are in the form of free elements that do not have their own minerals because their ionic radii are large are gradually dissolved partially or completely in the solid phase and in-situ. In the dissolutions that gradually develop in the solid phase and in-situ (orochthonous where it exists) (due to the loosening, dissolution and rupture of the chemical bonds between the atomic building blocks of the minerals and free elements due to increasing temperatures), respectively, anhydrous, unstable and disordered solid neo-solutions with different chemical compositions (alkali aluminum carbonate silicate, calcium carbonate silicate and ferromagnesian carbonate silicate) are developed. Solid neo-solutions consist of free and unstable ions (cations, anions) that are electrically charged due to increased atomic diffusion rates of atomic building blocks (atoms, ions, molecules) of different elements (atomic motion/vibration; since the number of electrons in the last orbitals/layers of different elements is less than 8 electrons, an increase in kinetic energy levels develops) and effective temperatures. Unstable free ions (cations and anions) widely develop unstable, anhydrous and disordered solid neo-solutions (solid neo-solutions consisting of electrically charged free unstable ions that are not in liquid-melt phase, formed in solid phase and in-situ were first defined and named, Tarhan, 2018).

In the type/stage of Abukuma type reversed regional regressive dynamothermal metamorphism, with the dissolution in solid phase and in-situ developing solid phase, depending on the types and contents of pure-impure carbonate/limestones containing protominerals (primary source rocks/carbonate minerals) and pure-impure classical marbles containing metaprotominerals (minerals of known classical metamorphic rocks/marbles), anhydrous, unstable and irregularly structured solid neo-solutions with different chemical compositions are widely develop (respectively first alkali aluminum carbonate silicate/K^+, Na^+, Ca^{2+}, Al^{3+}, Si^{4+}, $(CO_3)^{2-}$, O^{2-}; calcium carbonate silicate/Ca^{2+}, Al^{3+}, Si^{4+}, $(CO_3)^{2-}$, O^{2-}; ferromagnesium carbonate silicate/Mg^{2+}, Fe^{2+}, Ca^{2+}, Al^{3+}, Si^{4+}, $(CO_3)^{2-}$, O^{2-} etc.).

In the Abukuma type reversed regional regressive dynamothermal metamorphism in the type/stage, which developed in the second/last closing type/stage of the regional dynamothermal Tarhan metamorphism cycle, where temperatures were effective in proportion to pressures (T>P, temperatures put their stamp on the metamorphism), light-dark colored mixed crystalline solid solution rock-forming main-secondary-trace protominal-metaprotominals lost their stability and gradually dissolves in the solid phase and in-situ. With dissolution in the solid phase, anhydrous, unstable and disordered solid neo-solutions, which are composed of electrically charged free atomic building blocks (atoms, ions, molecules) and whose atomic diffusion rates increased due to the effective temperatures (atomic motion/vibration), are not stable. In addition, the free ions of rock-forming main-secondary-trace elements, which have increased atomic diffusion rates and are electrically charged, forming anhydrous, unstable and disordered solid neo-solutions, are also unstable (according to the first article of the first prototype constitution of the Matter, Tarhan, 2024e). Electrically charged free cations of different elements; $(SiO_4)^{4-}$ or $[(Si, Al)O_4]^{4-}$ tetrahedron/root silicate anion, oxygen anion (O^{2-}) and root carbonate anion $(CO_3)^{2-}$ combine (due to polarization, solid-solid chemical reactions) and become electrically neutral. They stabilize by developing oxytoblast blasts/embryos, carbonatoblast blasts/embryos (embryo/embryoization, nucleus/nucleation, bud/budding etc.) and blast/embryo aggregates (K_2O, K_2CO_3; Na_2O, Na_2CO_3; CaO, $CaCO_3$; MgO, $MgCO_3$; FeO, Fe_2O_3, Fe_3O_4, $FeCO_3$; Fe_2SiO_4, Mg_2SiO_4; Al_2O_3 and SiO_2 etc.).

Because, $(SiO_4)^{4-}$ or $[(Si, Al)O_4]^{4-}$ tetrahedron/root silicate anion/smooth surface silicon tetrahedron plays an active role in the development of crystal structures of rock-forming main-secondary-trace carbonatoblast-silicatoblast-oxytoblast origin/based crystalloblast neominerals and metallic-non-metallic carbonatoblast-silicatoblast-oxytoblast origin/based crystalloblast neominerals, depending on the oxygen anion (O^{2-}) and root carbonate anion $(CO_3)^{2-}$ (Tarhan, 2024e). If the anions in question did not exist, rock-forming main-secondary-trace crystalloblast neominerals, metallic-non-metallic ores, radioactive and rare earth elements/REEs would not have formed with their unique/original free crystalloblast neominerals (according to the first prototype constitution of the Matter, Tarhan, 2024e).

In the current physicochemical conditions of Abukuma type reversed regional regressive dynamothermal metamorphism, oxytoblast blast/blast/embryo, carbonatoblast blast/blast/embryo, blast/embryo aggregates with the same and similar geochemical properties group among themselves and add to each other; They grow gradually as crystalloblast, porphyroblast and megacrystalloblast rock-forming main-secondary-trace different crystalloblast neominerals [(calcitoblast/$CaCO_3$, calcito-dolomitoblast/$CaCO_3$-$CaMg(CO_3)_2$, dolomitoblast/$CaMg(CO_3)_2$ etc.)]. In this way, with the recrystallization developing from solid neo-solutions by metablastization (oxytoblast blast/blast/embryo, carbonatoblast blast/blast/embryo formation by metamorphism etc.); Pure-impure carbonate/limestones, which are previously existing primary rock units, and carbonatoblast and silicatoblast crystalloblast neominerals of pure-impure classical marbles, which are the metamorphic equivalents of the Barrow-type regionally progressive dynamothermal metamorphism of these primary origin rock units, become dominant. In this way, they gradually change and transform into different carbonatoblastic rocks which are impure-pure in solid phase, in-situ and allotropically.

In this way, in metamorphic belts, the rock-forming main-secondary-trace are become enriched and dominated by different carbonatoblast and silicatoblast origin/based crystalloblast neominerals; Thick and widespread outcrops of pure-impure carbonatoblastic rock type leucocratoblastic metablastic rocks (calcitoblastite, calcitoblastite-dolomitoblastite, dolomitoblastite, aragonitoblastite, witheritoblastite, ankeritoblastite, syenitoblastite, alkaline metablastite, monzonitoblastite, etc.), which are a new type of modern metamorphic rocks of metamorphic origin, rootless. develop. Pure-impure carbonatoblastic rocks, which are rootless, a new type of modern metamorphic rocks of metamorphic origin, were known as carbonatite intrusion, carbonatite dyke, pegmatitic vein, head, stock, sills and lenses of magmatic origin, which are rarely seen in nature, until now. Pure-impure carbonate/limestones, which are

primary rock units, and pure-impure classical marbles, which are the metamorphic equivalents of primary rock units; They become dominated by crystalloblast neominerals of carbonatoblast-silicatoblast origin/based rock-forming main-secondary-trace-metamorphic origin. In this way, gradual changes and transformations occur into rootless, pure-impure carbonatoblastic rocks of metamorphic origin (to date, known as magmatic carbonatites, which are rare in nature).

On the other hand, the primary source rocks (cosmic upper mantle peridotites, terrestrial igneous rock sequence/ocean crust sequence/ophiolite series, volcanosedimentary series, different volcanic rocks, different clastic sediments etc.) and their metamorphic equivalent classical metamorphic rocks (schist, micaschist, amphibolite schist, amphibolite etc.) are gradually changes and transformations into leucocratoblastic metablastic rocks (to date known as igneous origin granite/granitoid, gabbro/gabbroid, diorite/dioritoid, charnockite/charnockitoid intrusion, pluton and batholith type plutonic/depth rocks) by becoming enriched and dominated by crystalloblast neominerals of silicatoblast origin/base with granite mineralogy composition.

In other words, in the physicochemical conditions of Abukuma type reversed regional regressive dynamothermal metamorphism where temperatures are effective in proportion to/compared to pressures (T>P, temperatures put their stamp on the metamorphism), anhydrous, unstable and disordered solid neo-solutions with different chemical compositions are widely developed. Cations that form solid neo-solutions and develop the crystal structures of rock-forming main-secondary-trace, metallic-non-metallic ore and radioactive-rare earth elements/REE carbonatoblast-silicatoblast-oxytoblast origin/based crystalloblast neominerals; They stabilize by combining with root carbonate anion $(CO_3)^{2-}$, oxygen anion (O^{2-}) and root silicate anion / smooth surface silicon tetrahedron $(SiO4)^{4-}$ / $[(Si, Al)O_4]^{4-}$ (due to polarization, solid-solid chemical reactions) and becoming electrically neutral, developing free oxytoblast blast/embryo, siliatoblast blast/embryo and carbonatoblast blasts / embryos. Gradual growth of oxytoblast blast/embryo, silicatoblast blast/embryo, carbonatoblast blast/embryo and blast/embryo aggregates into crystalloblast neominerals in the form of rock-forming main-secondary-trace and ore-forming crystalloblasts, porphyroblasts and megacrystalloblasts occurs in two ways.

1. In the current physicochemical conditions of Abukuma type reverse regional regressive dynamothermal metamorphism, anion groups with the same and similar geochemical properties come together, add to each other and are arranged in different ways and develop the structures of regular crystalloblast neominerals (Tarhan, 2024e). In the current physicochemical conditions and effective temperatures of metamorphism, unstable, anhydrous and disordered solid neo-solutions consist of electrically charged, free and unstable cations with increased atomic diffusion rates of rock-forming main-secondary-trace, metallic-non-metallic, radiogenic-rare earth elements/REE, and different elements forming strategic minerals. Electrically charged unstable cations of different elements forming solid neo-solutions gradually grow in the form of different types of crystalloblasts, porphyroblasts and megacrystalloblasts by binding to carbonate-silicate-oxide based/origin anion groups and corners of regularly arranged chains/structures forming crystalloblast neominerals [(calcitoblast / $CaCO_3$, calcitoblast-dolomitoblast / $CaCO_3$ - $CaMg(CO_3)_2$, dolomitoblast / $CaMg(CO_3)_2$, sideritoblast / $FeCO_3$, corundoblast / Al_2O_3, viteritoblast / $BaCO_3$, strontyanitoblast / $SrCO_3$, potassium carbonate / K_2CO_3, sodium carbonate / Na_2CO_3, cerustoblast / $PbCO_3$, quartzoblast / SiO_2, albitoblast / $NaAlSi_3O_8$ and orthoclasoblast / $KAlSi_3O_8$ etc.)].
2. Unstable cations of different elements that develop under in the current physicochemical metamorphism conditions and form unstable solid neo-solutions with different chemical compositions are electrically charged due to the effective temperatures in the environment/setting and their atomic diffusion rates increase, they combine with unstable different anions and share electrons (due to polarization), they become electrically neutral and stable by forming carbonatoblast blast/blast/embryo, silicatablast blast/blast/embryo and oxytoblast blast/blast/embryo (*see the first and other laws of the first prototype constitution of the Matter*, Tarhan, 2024e). In this way, the ones with the same and similar geochemical properties among the electrically neutral and stable carbonatoblast blast/blast/embryo, oxytoblast blast/blast/embryo, silicatoblast blast/blast/embryo and blast/embryo aggregates are grouped and added to each other and gradually grow as felsicoblast/light and maficoblast/dark colored free crystalloblast neominerals of rock-ore-minerals forming carbonatoblast-silicatablast-oxytoblast origin/based crystalloblast, porphyroblast and megacrystalloblast types and become visible in the environment/setting. They naturally enrich in the environment/setting (Tarhan, 1992a, 1992b).

In the changing physical conditions (P/T) of the facies and sub-facies of the Abukuma type reversed regional regressive dynamothermal metamorphism developed in the last/second closing phase of the regional dynamothermal Tarhan metamorphism cycle, depending on the contents of the previously existing pure-impure carbonate/limestones (metallic-non-metallic elements, rare earth elements/REE and radioactive element contents etc.) and the primary

source rock units, the light-dark colored mixed crystalline solid solution protominerals-metaprotominerals of the pure-impure classical marbles (mica-quartz marbles etc.), which are the metamorphic equivalent of the Barrow type regional regressive dynamothermal metamorphism developed in the initial phase of the regional dynamothermal Tarhan metamorphism cycle, lose their stability and gradually dissolve partially-completely in the solid phase and in-situ. Since the incompatible elements (heavy-light rare earth elements/REE, radioactive elements etc.) cannot enter the crystal structures of protominal-metaprotomirals due to their large ionic radii, they are generally seen as free elements (incompatible elements include elements such as K, Rb, Cs, Ta, Nb, U, Th, Y, Hf, Zr and heavy-light rare earth elements/REE La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu etc.).

Incompatible elements do not have their own free minerals. However, since temperatures are effective in the Abukuma type reversed regional regressive dynamo-thermal metamorphism type/stage where temperatures are effective in proportion to/compared to pressures (T>P, temperatures put their stamp on the metamorphism), pure-impure carbonate/limestones and metamorphic equivalent pure-impure marbles light-dark colored mixed crystalline solid solution carbonate-silicate-oxide based/originated protominerals-metaprotominerals, free metallic-non-metallic ore elements curent in the environment/setting and incompatible free elements with large ionic radii, rare earth elements/REE and atomic building blocks of radioactive elements (atoms, ions, molecules) lose their stability (elements such as K, Rb, Cs, Ta, Nb, U, Th, Y, Hf, Zr and heavy-light rare earth elements/REE La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu etc.). Different protominal-metaprotominals that lose their stability and different elements in the free state in the environment/setting gradually dissolve in the solid phase and in-situ, and respectively, different chemically composed anhydrous, unstable and disordered solid neo-solutions develop widely. Unstable, anhydrous and disordered solid neo-solutions; are not stable because they are formed from free ions of main-secondary-trace, metallic-non-metallic, radioactive, rare earth elements/REE and strategic different elements that form rocks due to the effective temperatures of metamorphism and have increased electrical charges and atomic diffusion rates (atomic motion/vibration). In other words, the unstable free ions in question develop anhydrous, unstable and disordered solid neo-solutions with different chemical compositions.

However, in the changing physical conditions (P/T) of the facies and sub-facies of the Abukuma type reversed regional regressive dynamothermal metamorphism, which developed in the last/second closing phase of the regional dynamothermal Tarhan metamorphism cycle, where temperatures are effective in proportion to/compared to pressures (T>P; temperatures put their stamp on the metamorphism), the chemical bonds (electrical repulsion-attraction force) between the atomic building blocks (atoms, ions, molecules) of both light-dark colored mixed crystalline solid solution protominerals-metaprotominerals and different elements in free state are weakened, loosened, dissolved and broken due to the effective temperatures. By gradually dissolving in the solid phase and in-situ, solid neo-solutions with different chemical compositions, anhydrous, unstable and irregular structures (they consist of electrically charged, free and unstable ions of different elements with increased atomic diffusions in the solid phase and in-situ, without passing to the melting-liquid phase) are widely develop. The atomic building blocks (atom, ion, molecule) of metallic-non-metallic elements, strategic elements, rare earth elements/REE and radioactive elements with large ionic radii are electrically charg, their atomic diffusions increase and they become unstable ions. The unstable ions (cations) of the elements in question and the ions (cations, anions) that form the unstable, anhydrous and irregularly structured solid neo-solutions with different chemical compositions are not stable. In the changing physical conditions (P/T) of the facies and sub-facies of the Abukuma type reversed regional regressive dynamothermal metamorphism where temperatures are effective, in the current/existing physicochemical conditions of metamorphism, especially in the environment/setting closed and transitional thermodynamic systems, the ions in question have the necessity and tendency to become stable by performing solid-solid chemical reactions with each other (due to polarization, electron sharing, etc.) as soon as possible (Tarhan, 2024e).

Therefore, the electrically charged and atomic diffusion rate increased cations of different elements in solid neo-solutions (atomic movement/vibration etc. due to the increase in kinetic energy of atoms in their last orbits due to increasing and effective temperatures) combine with radical carbonate anion $(CO_3)^{2-}$, oxygen anion (O^{2-}), radical anion/flat surface silicon tetrahedron $(SiO_4)^{4-}$ / $[(Si, Al)O_4]^{4-}$ in the environment and develop their own and free carbonatoblast explosion/explosion/embryo, oxytoblast explosion/explosion/embryo (felsicoblast explosion/embryo and maficoblast explosion/embryo etc.) and silicatablast explosion/explosion/embryo and become electrically neutral (neutral) (by sharing electrons due to polarization). In this way, they become stable. Because according to the substances of the first prototype constitution of the matter (Tarhan, 2024e); There is a necessity and tendency to become stable as soon as possible (according to the magmatic view, the view of slow cooling, gradual/fractional crystallization and magmatic differentiation is not and will not be valid in nature and the universe). The first

prototype of the article rejects the igneous view according to the Constitution articles. She accepts the metamorphic view. Because, unstable substances/rocks/minerals; anhydrous-unstable solid neo-solutions containing electrically charged and atomic diffusion speeds increased atomic building blocks (atoms, ions, molecules) and unstable-disordered anatexitic magmas cannot remain unstable for a long time. There is a necessity and tendency to find a solution to become stable as soon as possible (Tarhan, 2024e). They tend to become stable, similar to noble gases.

For this reason, solid neo-solutions are not stable because they consist of free ions with electrical charge and increased atomic diffusion rates of rock-forming main-secondary-trace, metallic-non-metallic, radioactive-rare earth elements and strategic elements. In the changing physical conditions (P/T) of the facies and sub-facies of the Abukuma type reversed regional regressive dynamothermal metamorphism where temperatures are effective in proportion to/compared to pressures (T>P; temperatures put their stamp seal on the metamorphism), unstable, anhydrous and irregularly structured solid neo-solutions with different chemical compositions (liquid and melt phases are not developed) develop in the solid phase and in-situ with metablastation (formation of blasts/embryos by recrystallization/solid-solid chemical reactions with metamorphism event) and with recrystallization, silicatoblast blast/blast/embryo, oxytoblast blast/blast/embryo and carbonatoblast blast/blast/embryos (embryo/embryoization, nucleus/nucleation, bud/budding etc.) and blast/embryo aggregates develop and become stable. In the Abukuma type reversed regional regressive dynamothermal metamorphism where temperatures are effective, water-containing greenschist facies and minerals do not develop. On the contrary, anhydrous, carbonate-silicate-oxide origin/based felsicoblast-maphicoblast carbonate and crystalloblast, porphyroblast and megacrystalloblast neominerals with granite mineralogical composition commonly develop from the anhydrous and unstable solid neo-solutions with different chemical composition developed during the metamorphism in question. The unstable cations of different elements that form the anhydrous, unstable and disordered solid neo-solution with different chemical compositions, which are electrically charged and have increased atomic diffusion rates, become electrically neutral by combining with the unstable root carbonate anion $(CO_3)^{2-}$, root silicate anion/smooth-surfaced silicon tetrahedron/silicate tetrahedron $[(SiO_4)^{4-}$ / or Al atoms instead of Si atoms $((Si, Al)O_4)^{4-}]$ and oxygen anions (O^{2-}) (due to polarization, solid-solid chemical reactions, electron sharing/exchange, etc.).

They become stable by forming carbonatoblast blast/blast/embryo, silicatoblast blast/blast/embryo, oxytoblast blast/blast/embryo and blast/embryo aggregates, becoming electrically neutral. The electrically charged unstable cations of the different elements that make up the solid neo-solution, which have increased diffusion rates, combine with different anions in the solid neo-solution, and by sharing (exchanging) electrons, they become stable, completing the number of electrons in their final orbits/layers to eight, minimizing their atomic diffusion rates. In this way, under the current physicochemical conditions of metamorphism, stable rock-forming main-secondary-trace, metallic-non-metallic, radioactive and rare earth elements/REE grow as their own unique/free crystalloblast, porphyroblast and megacrystalloblast neominerals and become visible in the environment/setting. They naturally become richer (Tarhan, 1992a, 1992b).

In other words, free ions of rock-forming main-secondary-trace elements $[(K^+, Na^+, Ca^{2+}, Mg^{2+}, Fe^{2+}, (CO_3)^{2-}, (SiO_4)^{4-}$ and O^{2-} etc.)] that form solid neo-solutions with different chemical compositions, anhydrous, unstable and disordered structures, and electrically charged and increased atomic diffusion rates (atomic movement/vibration), and metallic-non-metallic free ore ions $[(Ba^{2+}, Cu^{2+}, Sr^{2+}, Mn^{2+}, (CO_3)^{2-}, (SiO_4)^{4-}$ and O^{2-} etc.)] due to effective heat, and increased atomic diffusion rates; heavy-light rare earth elements/REE and free ions of radioactive elements (Ce^{3+}, Nd^{2+}, Sc^{2+}, Y^{3+}, Eu^{2+} and Rb^+ etc.) that cannot easily enter into mineral crystal structures with large ionic radii, do not have their own specific free minerals, are electrically charged due to the effective temperatures and have increased atomic diffusion rates are in an unstable phase. The atomic building blocks (atom, ion, molecule) of incompatible elements with large ionic radii that cannot easily enter into the crystal structures of rock-forming main-secondary-trace crystalloblast neominerals, do not have their own specific free minerals and are therefore in a free state, become unstable by becoming electrically charged due to the effective temperatures and their atomic diffusion rates increase, becoming ions. At the effective temperatures of metamorphism and under the current physicochemical conditions, the diffusion rates (atomic motion/vibration) of free unstable ions/atoms increase. For this reason, they become unstable ions with electrical charge.

Because, atoms gain, lose and share electrons to fill the kinetic energy level of their last shells/orbitals with 8 electrons (Octet Rule). When elements form compounds, there is a rule that they should bring the number of electrons in their last shells (orbitals) to eight in order to make them similar to those of Noble/Inert gases and to become stable. Atoms become stable/stable by taking and giving electrons (ionization/ionization energy). In other

words, Octet Rule: **This law of matter that cannot be changed, and is not even suggested to be changed,** constitutes the first article of the first prototype Constitution of matter written by the author. Atoms of different elements have to minimize their kinetic energy in their final orbitals/layers/orbitals. For this, electrons are exchanged between them. **According to this 1st law of matter, atoms of different elements that form matter have to move together.** Apart from this, they have no choice or chance (Tarhan, 2024e). However, noble gases and atoms of other similar elements, which have 8 electrons in their final orbits, are not obliged to comply with this article of the Constitution, except under extraordinary circumstances. They do not tend to spontaneously form compounds with other elements.

We can draw the following conclusions from this law: An unstable and disordered anatexitic magma formed as a result of partial melting (anatexi event) does not develop in a closed thermodynamic system. For an anatexitic magma to develop, an open system must definitely form. Pressure release must develop across this open system. In addition, a differentiation from basic magma to acidic magma does not develop from unstable primary magma and unstable anatexitic magma with slow cooling, fractional crystallization and magmatic differentiation. For this reason, different rock-forming primary-secondary-trace minerals and different igneous rocks do not develop; magmas do not differentiate. Magmas with acidic-basic-carbonate compositions cannot mix homogeneously with each other (immiscibility of liquids); In a closed thermodynamic system, primary-anatexitic magmas in the liquid melt phase and solid neo-solutions in the solid phase do not migrate; The atomic building blocks (atoms, ions, molecules) that form unstable anatexitic and primary magmas in the molten liquid phase show that the unstable, anhydrous and disordered solid neo-solutions (consisting of ions of different electrically charged, unstable elements with increased atomic diffusion rates) formed in the solid phase and in-situ tend to solidify and recrystallize as a whole **in the shortest time period** in order to reach a stable state/phase. The atomic building blocks (atoms, ions, molecules) of different electrically charged, unstable elements with increased atomic diffusion rates (atomic motion/vibration) cannot remain in an unstable phase for a long time due to the effective temperatures in the environment. They tend to reach a stable phase in the shortest time period. Therefore, they have **the obligation/requirement to change phase** (According to the first prototype Constitution of the Matter; Tarhan, 2024e).

The different elements that make up matter tend to crystallize and solidify **together** (completely, as a whole) and come to a stable state/phase. In other words, matter does not differentiate and migrate with slow cooling, fractional crystallization and magmatic differentiation. Anatexitic magma (substances) in solid neo-solution and liquid-melt phases do not migrate and differentiate/separate on their own. All of these correspond to the 2nd law of matter. According to the 2nd law of matter; **the atomic building blocks (atom, ion, molecule) of the different elements that make up matter have a tendency and desire to come from an unstable/unstable phase/state to a stable solid phase/state/form in the shortest time period/period.** Because they have to move together in order to complete the missing electrons in their last orbits/layers to 8 electrons and to be able to share electrons. Within this, unstable/unstable substances/rocks/minerals definitely have to and tend to change phases in order to become stable/stable. They tend to resemble/want to resemble Noble/Inert gases. However, Noble/Inert gases can move freely on their own. These two laws of matter (1st and 2nd laws of matter, and other laws, Tarhan, 2024e) they play a very active role in the transition of matter/rocks/minerals from an unstable phase to another stable solid phase (necessity of phase change), their formation/solidification/recrystallization, and their changes and transformations in the solid phase and in-situ (where they are) (Tarhan, 2024a, 2024c, 2024e, 2024f).

Therefore, in the second/last closing phase of the regional dynamothermal Tarhan metamorphism cycle, in which temperatures are effective compared to the developed pressures (T>P, temperatures put their stamp on the metamorphism), under the changing physical conditions (P/T) of the facies and sub-facies of the Abukuma type reversed regional regressive dynamothermal metamorphism, solid neo-solutions with different chemical compositions (alkali aluminum silicate/carbonate, calcium silicate/carbonate, ferromagnesian silicate/carbonate etc.) develop, respectively. The rock-forming main-secondary-trace element cations, metallic-non-metallic ore cations, incompatible elements with large ionic radii such as rare earth elements/REE and radioactive elements cations that form anhydrous, unstable and disordered solid neo-solutions combine with root carbonate anion $(CO_3)^{2-}$, root silicate anion $(SiO_4)^{4-}$ /or $[(Si, Al)O_4]^{4-}$ and oxygen anions (O^{2-}) (due to solid-solid chemical reactions, polarization), become electrically neutral and pass to another stable solid phase/form/state (Tarhan, 2024a, 2024b, 2024c, 2024d).

In this way, the oxytoblast blast/blast/embryos (embryo/embryoization, nucleation, etc.) of the free, anhydrous and stable crystalloblast neominerals of the rock-forming main-secondary-trace, metallic-non-metallic ores, rare earth

elements/REE and radioactive elements present in the environment/setting and which are specific to themselves and have become anhydrous, stable and electrically neutral, are commonly formed [(K_2CO_3, Na_2CO_3, $CaCO_3$, $MgCO_3$, $FeCO_3$; K_2O, Na_2O, CaO, MgO, FeO, Fe_2O_3, Fe_3O_4; $BaCO_3$, $MnCO_3$, $SrCO_3$; BaO, MnO, SrO; SiO_2, Al_2O_3; U_2O, ThO_2, La_2O_3, $La_2(CO_3)_3$, GeO_2, $Ge(CO_3)_2$, CdO, $CdCO_3$, Ce_2CO_3, Ce_2O_3, $Nd_2(CO_3)_2$, Nd_2O_3, $Sc_2(CO_3)_2$, Sc_2O_2, $C_3O_9Y_2/Y_2O_3$, $Y_2(CO_3)_3$, $Eu_2(CO_3)_3$, Eu_2O_3, $Rb_2(CO_3)$ and Rb_2O etc.)].

In the current/environmental physicochemical conditions of Abukuma type reversed regional regressive dynamothermal metamorphism where temperatures are effective in proportion to/compared to pressures (T>P, temperatures put their stamp on the metamorphism), oxytoblast blast/blast/embryo, siliatoblast blast/blast/embryo, carbonatoblast blast/blast/embryo and blast/embryo/core/bud aggregates with the same-similar geochemical properties are grouped among themselves and added to each other; they gradually grow in the form of free crystalloblast, porphyroblast and megacrystalloblast type crystalloblast neominerals of rock-forming main-secondary-trace, metallic-non-metallic ore, heavy-light rare earth elements/REE and radioactive elements from incompatible elements with large ionic radii. They are naturally enriched in the environment/setting and become widely visible. Free rare earth elements/REE and radioactive elements in pure-impure carbonate/limestone, which are the previously existing primary source rock units, and pure-impure classical marbles, which are the metamorphic equivalents of the primary source rock units; By developing their own free crystalloblast neominerals within leucocratoblastic pure-impure carbonatoblastic rocks (known as carbonatites of magmatic origin, rare in nature), which are a type of new modern metamorphic rocks of metamorphic origin, rootless, they become naturally enriched and become visible in the environment/setting. (Tarhan, 1992a, 1992b).

In addition, the rich metallic-nonmetallic ore, strategic, radioactive and rare earth elements/REE rich ore/mine deposits located in the pure-impure carbonatoblastic rocks of metamorphic origin seen as thick and widespread outcrops in metamorphic belts were defined and named as metamorphic origin **metablastic ore/mine deposits** for the first time. Metablastic ore/mine deposits of metamorphic origin constitute the richest mine deposits in the world. In metamorphic belts where leucocratoblastic metablastic rocks of metamorphic origin are observed, depending on the composition of pure-impure carbonate/limestones, which are the primary source rock units, and the composition and content of pure-impure classical marbles, which are the metamorphic equivalents of the primary source rock units, the potential for naturally enriched metamorphic-origin metablastic ore deposits in leucocratoblastic pure-impure carbonatoblastic rocks (known as carbonatites, which are rarely seen in the nature, of magmatic origin), which are a type of leucocratoblastic metablastic rocks of metamorphic origin, rootless and a type of new modern metamorphic rocks, may be quite high.

Pure-impure carbonatoblastic rocks, which are a type of leucocratoblastic metablastic rocks enriched in silicatoblast crystalloblast neominerals with granite mineralogy composition, which are rootless and a type of new modern metamorphic rocks of metamorphic origin, are derived in solid phase and in-situ from different pure-impure carbonate/limestones of primary source rock units and pure-impure classical marbles which are metamorphic equivalents of primary source rock units. Metablastic ore deposits within leucocratoblastic pure-impure carbonatoblastic rocks of metamorphic origin, which are enriched in carbonatoblast crystalloblast neominerals, are definitely not magmatic origin carbonatites and magmatic origin granites/granitoids related magmatic origin ore/mine deposits (orthomagmacal, pegmatitic, pneumatolytic, hydrothermal stage). In other words, in nature (on our planet Earth) and in all galaxies in the Universe, whether they have a modern atmosphere or not, whether the chemical rock cycle is developed or not, magmatic origin carbonatite/carbonatoid and magmatic origin granite/granitoid, gabbro/gabbroid, diorite/dioritoid, charnockite/charnockitoid intrusion, pluton, batholith type depth/plutonic rocks and related magmatic origin ore/mine deposits (orthomagmacal, pegmatitic, pneumatolytic, hydrothermal stage) have not developed and will not develop on all terrestrial-rocky planets and their satellites (Moons).

The supergiant carbonatite, which forms the Mesoproterozoic "Bayan Obu Group" in Inner Mongolia Autonomous Region, China, and accounts for more than two-thirds of the world's total rare earth element/REE reserves and also the largest rare earth element/REE ore deposit in the world, has been suggested to be of metasomatic-magmatic origin. The formation of Bayan Obo supergiant carbonatite, REE-Nb-Fe deposit and dolomite carbonatites in the Bayan Obu Group has been associated with metasomatism and magmatic carbonatite magma intrusion (Yang et al., 2011; Fan et al., 2016; Yang et al., 2016; Li et al., 2023). However, in this article, Bayan Obu supergiant carbonatite; It has been suggested that they are equivalent to pure-impure carbonatoblastic rock series and their derivatives/carbonatoblastites/carbonatoblastic rocks and alkali metablastic rocks, which are new modern

metamorphic rock types of metamorphic origin, rootless and probably Upper Cretaceous (Lower Maastrichtian-Upper Maastrichtian?/Middle Maastrichtian?) age. Volcanism and carbonatite/gregorite lavas formed by unstable anatexitic lavas with carbonatite composition formed by partial melting of pure-impure carbonate/limestone platforms are also common (Southern Afghanistan, Horton, 2021; carbonatite/gregorite lavas at Ol Doinyo Lenga'i volcano in Tanzania along the African and East African Rift System, Dawson, 1962; Potter, 2019; Canadian Shield, Kamenetsky et al., 2015 etc.). However, in nature (our planet) and on all rocky-terrestrial planets and satellites (Satellites) in the Universe, any carbonatite/carbonatoid intrusions, plutons, batholiths, carbonatite dykes, sills, stocks, pegmatitic rocks and lenses formed by magmatic differentiation from any unstable anatexitic magma of cosmic mantle/upper mantle peridotite origin or carbonate/limestone origin and primary magma have not developed and will not develop (metasomatic and intrusive rocks of carbonatite origin).

Therefore, carbonatites/carbonatoids, which are rarely seen in nature and accepted to be of magmatic origin; on the contrary, they are allotropic leucocratoblastic carbonatoblastic rocks/carbonatoblastites/carbonatoblastic rock series and their derivatives, which are determined for the first time to be a new type of modern metamorphic rock with very thick and widespread outcrops in nature. It has been suggested that they are the host rock of the world's richest metallic-nonmetallic, radioactive and rare earth element/REE-Nb-Fe ore deposits. Examples of metamorphic-origin metablastic ore/mineral deposits are "Bayan Obo", "Maoniuping" and "Dalucao" deposits in China and "Mountain Pass" deposit in the US state of California. These ore/mine deposits are probably locates within pure-impure leucocratoblastic carbonatoblastic rocks of metamorphic origin (known as carbonatites of magmatic origin, which are rarely seen in nature). It has been suggested that they are metamorphic metablastic mine/ore deposits of carbonatoblastic rock origin.

Discussion:-

Carbonatites; Since they contain metamorphic-origin metablastic ore/mine deposits such as metallic-non-metallic ore deposits, radiogenic, rare earth elements/REE, precious and semi-precious stones, gemstones (Gemology), their origin, formation, thickness and distribution are very important. To date, it has been suggested that carbonatites are magmatic-origin depth/plutonic rocks resulting from the differentiation of unstable anatexitic magmas of mantle origin (cosmic upper mantle peridotites) into ferromagnesium and carbonate magmas. It has been suggested and accepted that they are small, rare and rarely seen in nature; intrusions/intrusives in the form of stocks, heads, veins, lenses.

Peridotites, which form the mantles of all terrestrial and rocky planets and satellites (Moons) in all galaxies in the Universe, are cosmic rocks. It is not known how they were formed. Whether they have modern atmospheres and chemical rock cycles or not, the mantles of all terrestrial and rocky planets and satellites (Moons) in the Universe are formed from cosmic peridotites. It has been suggested that calcite and dolomite carbonate magmas did not develop from the partial melting of peridotites (anatexis event). Because the element carbon (C) is an indicator and marker of life. Is it possible to say that there was life before the formation of rocky-terrestrial planets and satellites? There are no chemical components in the composition of peridotites that would give rise to carbonate magma. The mineralogical and chemical compositions of peridotites are very well known. Do they contain carbon (C) and carbonate ($CaCO_3$)? It has been thought that solving the existence of carbonatites, which are very thick and widespread in nature and metamorphic belts, with logical imagination models is a view contrary to the nature of matter, the first prototype Constitution of the Article (Tarhan, 2024f), and the laws of chemistry and physics. Pure-impure carbonate/limestones, which are the primary origin rock units developed in terrestrial-rocky planets and satellites in the Universe with a modern atmosphere and a developed chemical rock cycle; As a result of the regional dynamothermal Tarhan metamorphism cycle, thick and widespread carbonatoblastic rocks develop in solid phase and in-situ. For example: It is the first time that the depth rocks known as carbonatites of magmatic origin in the metamorphic belts on our planet Earth correspond to pure-impure leucocratoblastic carbonatoblastic rocks, which are, on the contrary, very thick and widespread outcrops, rootless and a type of new modern metamorphic rocks were determined and recommended. It has been suggested that the magmatic origin depth/plutonic rocks known as carbonatites do not have any close or distant relationship with mantle peridotites. It is also impossible for them to have any. These views cannot go beyond stereotyped assumptions due to lack of solutions.

However, there are volcanoes of carbonate origin. It is not correct to interpret that carbonate lavas originate from mantle peridotites. In regions where volcanoes erupting carbonate lavas exist, when the weakness zones (fault systems, rift systems, opening cracks, plate movements, etc.) cutting thick and widespread carbonate/limestone platforms of sedimentary origin reach the area where the temperature and pressure are high towards the depth, there

will be a pressure release due to the open thermodynamic systems developing along the weakness zones. Due to the decreasing pressures, the effectiveness of the temperature will suddenly increase and the existing sedimentary carbonate/limestone rocks will partially melt. Unstable anatexitic carbonate magmas formed from partially melted carbonate rocks will rise to the surface along the weakness zones that form them and develop carbonate volcanism and carbonate/gregoryite-Tanzania lavas. Carbonate/gregoryite lavas are initially white, but after a while they darken and turn black. When active, they produce thick black smoke and gas.

Why? Because unstable anatexitic carbonate magmas/lavas formed by partial melting of sedimentary carbonates contain organic forms (fossils, plant fragments-remains, fauna-flora and organic components etc.). In addition, in regions where carbonate volcanism occurs, continental crust-derived carbonate sedimentary/sedimentary rocks and upper mantle peridotites may partially melt together or separately. However, unstable anatexitic magmas with basic and ultrabasic compositions formed from mantle-derived peridotites and unstable anatexitic carbonate magmas formed by partial melting of carbonate sedimentary rocks never develop a homogeneous magma due to density differences (liquid immiscibility). Claiming that unstable, irregularly structured anatexitic carbonate magmas are formed by differentiating from perdidotite-derived ferromagnesium-derived unstable and irregularly structured magmas means ignoring oneself. How? If water and liquid olive oil do not mix homogeneously and olive oil accumulates on the water due to its density, there are similar relationships between basic magmas with ferromagnesium composition of peridotite origin and anatexitic carbonate magmas formed by partial melting of sedimentary carbanate rocks/limestones.

In addition, terrestrial-rocky planets and satellites that have primitive-thin-vacuum (void) atmospheres and where chemical rock cycles have not developed their modern atmospheres, were formed by the partial melting of their mantles (anatexis event) along the weakness zones cutting their mantles; Mantle-derived carbonatite intrusion within the thick and widespread olivine basalt lavas that form the first outer solid crust on their mantles, carbonate volcanism and carbonate lavas have not developed and will not develop on the olivine basalts that form the solid outer shell of the mantles with their lenses and dykes. Because carbonatite/carbonatoid and carbonate lavas known to be of magmatic origin have nothing to do with the partial melting of the mantle. However, in planets with a developed modern atmosphere, living life, and developed chemical rock cycles; The unstable and irregular structured anatexitic carbonate magma, which developed from partial melts formed along the weakness zones cutting thick and widespread carbonate/limestone platforms, erupted to the surface along the weakness zones and carbonate volcanisms and carbonate/gregoryite lavas developed on the carbonate/limestone platforms (South Afghanistan, along the East African Rift System, Tanzania and Canada, etc.). In addition, as a result of the Tarhan metamorphism cycle of the thick and widespread pure-impure limestones previously present in the metamorphic belts, thick and widespread outcrops/outcrops of Sc-type pure-impure carbonatoblastic rocks (known as carbonatites of magmatic origin, rarely seen in nature), which are new modern metamorphic rocks with rootless structure, have developed and will develop in solid phase and in-situ (Tarhan, 2018, 2021).

In other words, until today carbonatoblastic rocks; Developed as a result of the separation of carbonatite (calcite, dolomite etc.) magma from magmatic, mantle peridotite origin anatexitic ferromagnesian composition magmas; The magmatic view, which is considered to be intrusion, dyke, pegmatitic and lenses, known as carbonatites and rare in nature, is definitely not correct. Because pure-impure carbonatoblastic rocks whose primary source rock units are pure-impure carbonates/limestones; are enriched and dominated by metamorphic origin, rootless, rock-forming main-secondary-trace carbonatoblast dominant-silicateblast-oxytoblast based/originated crystalloblast neominerals and are a type of modern metamorphic rocks. Pure-impure leucocratoblastic carbonatoblastic rocks of metamorphic origin; They constitute a type/type of allotropic leucocratoblastic metablastites/metablastic rocks, a new type of modern metamorphic rock that is enriched and dominant with the mineralogic composition of granite with rootless, rock-forming main-secondary-trace silicatoblast origin/based. It has been determined and proposed for the first time that metablastic rocks, which are carbonatoblastic rock type (consisting of carbonatoblast-dominated crystalloblast neominerals) and metablastic rocks, which are silicate rock type (consisting of silicatoblast-dominated crystalloblast neominerals); correspond to allotropic superionic metablastic substances/minerals/rocks/minerals that have changed phase in solid phase and in situ (in situ), 2nd generation metamorphic rocks and 3rd generation rocks. It corresponds to allotropic superionic metablastic substances/minerals/rocks/minerals, which are the 5th classical state/phase/form of matter and have developed spontaneously in the natural environment (Tarhan, 2024a, 2024b, 2024c, 2024d, 2024f).

Regardless of its origin, age and sedimentation/deposition environments, it will undergo partial melting (anatexis) when there is a pressure release (open thermodynamic system) along the weakness zones (opening cracks, rift systems, different fault systems, along plate movements and boundaries, etc.) cutting any type of rock. It is not a correct view to claim and accept that granite/granitoid, gabbro/gabbroid, diorite/dioritoid, charnockite/charnockitoid and carbonatite/carbonatoid intrusion, pluton, batholith type depth/plutonic rocks were formed and developed as a result of slow cooling, fractional crystallization and magma separation from these different unstable anatexitic magmas and unstable anatexitic magmas with basic-ultrabasic composition formed by partial melting of cosmic upper mantle peridotites. In addition, due to the high temperatures in the environment that form unstable and irregularly structured anatexitic magmas, the atomic building blocks of different elements (atoms, ions, molecules) are electrically charged and since their atomic diffusion speeds increase (atomic motion/vibration; kinetic energy levels increase due to the presence of fewer than 8 electrons in the last orbits/layers of free atoms) they become ions, they are unstable. They have a tendency and necessity to become stable as soon as possible. According to the first prototype Constitution of matter (Tarhan, 2024e); the magmatic view that it develops with slow cooling over a long period of time, fractional crystallization and magmatic differentiation is definitely not true. It has not developed and will not develop in nature and the Universe. Because according to the first prototype Constitution of the matter (Tarhan, 2024e), the atomic building blocks (atoms, ions, molecules) of different elements that constitute the anatexitic magmas in the liquid-melt phase with an unstable and disordered structure and the solid neo-solutions with different chemical compositions (they are in the solid phase, not in the melt-liquid phase) that have developed in the solid phase and in-situ have been electrically charged due to the increasing temperatures and their atomic diffusion has increased (atomic motion/vibration; the kinetic energy level in the last orbits of the atoms has increased) and have become unstable ions. For this reason, they absolutely cannot remain in an unstable/unstable state/phase for a long time. They have the necessity and tendency to become stable in the shortest time period (according to the first prototype Constitution of the matter; Tarhan, 2024e).

Therefore, the author argued in his articles that the magmatic view should be rejected and the metamorphic view should be accepted. He stated that unstable and irregular anatexitic magmas are limited to the tectonism-magmatism-volcanism cycle that develops as a result of natural disasters (rift systems, opening cracks, fault systems, plate movements and along their boundaries, etc.). Magmatic vision is an indicator and signifier of destruction, collapse and debris as a result of natural disasters. Regardless of their origin, unstable/unstable and irregular anatexitic magmas express the remains of a collapse, a wreckage-destruction that developed as a result of natural tectonic events (Tarhan, 2024a, 2024b, 2024c, 2024d, 2024d, 2024f). However, the metamorphic view has left and will leave its mark/seal on nature and the Universe. The metamorphic view is an indicator and marker of change and transformation by evolving towards existence, unity-integrity, acting together, building, multiplying, enriching, beautifying and evolving towards perfection. Therefore, according to the magmatic view, the formation of terrestrial-rocky planets and satellites (Moons) with slow cooling of unstable and irregular structured magma oceans, fractional/phase crystallization and magmatic differentiation, natural geological events and geodynamic evolutions will not reach the goal of scientific studies and there will be material, spiritual and temporal losses in this regard. How, if it is not possible to build new buildings from the debris of collapsed buildings as a result of an earthquake that constitutes a natural disaster, similarly, it is not possible to form planets and moons (Moons) from anatexitic magma oceans in the form of debris formed as a result of a destruction-collapse. She also claimed that explaining all mines, rocks and mineral formations with magmatic views and logical imagination models related to magmatic views means not knowing or understanding matter.

It is not a correct view to explain cosmic peridotites, which form the mantle of terrestrial-rocky planets and satellites (Moons), with ocean magmas. It is not correct to compare unstable and disordered ocean magmas with stable and orderly water oceans. In water oceans, hydrogen and oxygen elements are not in the form of electrically charged ions (H^+, O^{2-}). They are in the form of H_2O, electrically neutral and stable. However, in an unstable and disordered anatexitic magma, which is a mixture of high-temperature silicate melt, the atomic building blocks of different elements (atoms, ions, molecules) are electrically charged due to high temperatures, their atomic diffusion speeds increase (atomic movement/vibration, kinetic energy levels in the last orbits of atoms increase) and they have become an unstable/unstable liquid-melt state/phase. Any unstable anatexitic magma consists of unstable/unstable ions of different elements with electrical charges and increased atomic diffusion rates (atomic movement/vibration). In such an unstable and disordered anatexitic magma, the electrically charged ions of different elements with increased atomic diffusion rates tend to solidify and become stable as soon as possible by exchanging/sharing electrons with each other. They do not intend to wait/tolerate slow cooling, fractional crystallization and magmatic differentiation over a long period of time. They tend to become Noble/Inert gases. Anatexitic magma with an

unstable and disordered structure tends to solidify completely and as a whole as soon as possible. In this way, the unstable ions of different elements it contains have the tendency and necessity to crystallize in the current physicochemical conditions and develop stable rock-forming main-secondary-trace, metallic-non-metallic and ore minerals in those conditions and pass into the stable solid phase. For this reason, it has been claimed and put forward that magmatic views are a view(s) contrary to the nature of matter, the laws of the first prototype Constitution of matter, and the laws of chemistry and physics (Tarhan, 1992a, 1992b, 2018, 2019a, 2019b, 2021, 2024a, 2024b, 2024c, 2024d, 2024d, 2024f).

Results:-

In the last/second closing phase of the regional dynamothermal Tarhan metamorphism cycle, in the Abukuma type reversed regional regressive metamorphism phase/type, where temperatures are effective compared to the developed pressures (T>P; temperatures put their stamp on the metamorphism); The previously existing primary source rock units (cosmic upper mantle peridotites, terrestrial magmatic rock sequence/ocean crust sequence/ophiolite series, volcanosedimentary series, different volcanic rocks, different sedimentary rocks) and the Barrow type regional progressive dynamothermal metamorphism in which the pressures are effective compared to the developed temperatures in the initial phase of the regional dynamothermal Tarhan metamorphism cycle (P>T, pressures put their stamp on the metamorphism) lose their stability in the light-dark colored mixed crystalline solid solution protominal-metaprotominal rocks of the metamorphic equivalent classical metamorphic rocks (metaperidotite, metagabbro, metasediment, metavolcanite, schist, slate, micaschist, calcschist, marble, amphibolite etc.). Protominerals-metaprotominerals, which lose their stability, gradually partially or completely dissolve in the solid phase and in-situ. By dissolution in the solid phase, solid neo-solutions commonly develop, initially consisting of alkaline aluminum silicate with a mineralogical composition of 90-95% major/modal granite. However, when the light-dark colored mixed crystalline solid solution protominerals (minerals of primary origin rocks)-metaprotominerals (metamorphic equivalent metamorphic minerals of primordial protominerals) are gradually completely dissolved in the solid phase and in-situ, the atomic building blocks (atoms, ions, molecules) of Mg and Fe elements are formed % It is less than 5-10 percent. Since the dark colored, 5-10% basic Fe^{2+} and Mg^{2+} electrically charged and unstable ions (cations) formed by complete dissolution in the solid phase remain in the solid state/phase; there is no possibility of darkening and basicization like color pigments in light colored solid neo-solutions with alkali aluminum silicate composition and 90-95% granite mineralogical composition. Because, solid neo-solution is not in the form of unstable anatexitic magma in the molten-liquid phase. Solid neo-solutions that are electrically charged, have increased atomic diffusion rates, are formed with unstable ions and have irregular structures are not in the position of dark colored, basic and unstable anatexitic magma in the molten-liquid phase. On the contrary, they have developed in the solid phase and in situ.

From such solid neo-solutions with alkaline aluminum silicate composition [(Solid neo-solution: First defined and named by Tarhan (2018)], crystalloblast neominerals with granite mineralogical composition (quartzoblast, feldspathoblast, etc.) grow preferentially and become dominant through recrystallization that develops with metablastization. and they become visible in the environment/setting. In this way, pre-existing primary source rock units of different ages, formed in different environments and of different origins, and the metamorphic equivalent classical metamorphic rocks of the primary source rock units are enriched with main-secondary-trace silicatoblast based/origin felsicoblast crystalloblast neominerals, forming a rock with granite mineralogical composition. and becomes dominant, changing phase in solid phase and in situ. The mineralogic composition of granite, which is a new type of rootless, modern metamorphic rocks of metamorphic origin, is enriched with crystalloblast neominerals and turns into leucocratoblastic metablastic rocks/metablastites/metablastic rock series and their derivatives (known as granite/granitoid, gabbro/gabroid, diorite/dioritoid, charnosite/charnockitoid intrusion, pluton, batholith type depth/plutonic rocks of magmatic origin until today), undergoes allotropic changes and transformations (transforms into different substances/rocks/minerals whose texture, structure, color and mineralogical compositions constituting their physical properties are different but their chemical compositions are the same). Similar changes also occur in pure-impure carbonate/limestones, which are a type of metablastic rocks but have different primary source rocks. Metamorphic equivalents of primary source rock units, pure or impure classical marbles, become enriched and dominated by crystalloblast neominerals of carbonatoblast dominant-silicate-oxytoblast origin. In this way, they undergo allotropic phase change and transformation into pure-impure leucocratoblastic carbonatoblastic rocks, which are rootless and a new type of modern metamorphic rocks of metamorphic origin (Tarhan, 2024a, 2024b, 2024c, 2024d, 2024f).

However, when Mg^{2+} and Fe^{2+} ions present at a rate of 5-10% in the unstable and disordered anatexitic magma formed as a result of partial melting (anatexitic event), melt and pass into the liquid phase, they darken the liquid molten/anatexitic magma with an alkali aluminum silicate composition of granite mineralogical composition of 90-95% like color pigments and make it basic. Therefore, these differences between the unstable and disordered anatexitic dark colored basic magmas in the liquid-molten phase and the solid neo-solutions (first defined and named by Tarhan (2018)), which have different chemical compositions, increased atomic diffusion rates, are composed of electrically charged ions (cations, anions), have a granite mineralogical composition of 90-95%, are formed in the solid phase and in-situ, and are not in the liquid melt phase, were unknown until now. Why? When dark and light colored rocks undergo partial melting (anatexitic event); During the metamorphism cycle, when the rock-forming dark-light colored mixed crystalline solid solution protominerals-metaprotominerals lose their stability and partially or completely dissolve in the solid phase, 90-95% light colored, alkali aluminum silicate composition, granite mineralogic composition liquid melt phase anatexitic magma and light colored, solid phase and in-situ solid neo-solution develop. Because in nature, the main rock-forming/modal elements are oxygen, silicon, aluminum, potassium, sodium and calcium elements, the total weight ratios are 90-95%. These elements form granite mineralogic composition minerals and rocks. However, the weight percentage of the dark colored and basic iron and magnesium elements that form rock-forming are 5-7% on average. Nature/matter acts fairly; It takes more from the abundant elements and less from the rare elements.

Therefore, the problems of granite/granitoid and carbonatite, which are known to be of magmatic origin, have not been solved yet. However, in the Abukuma type reverse regional regressive dynamothermal metamorphism stage/type, regardless of their origin, formation environment and age, pre-existing primary source rock units (cosmic upper mantle peridotites, terrestrial igneous rock sequence/ocean crust sequence/ophiolite series rock units, volcano-sedimentary rock units, different volcanic rocks, different sedimentary rock units etc.) and classical metamorphic rocks (metagabbro, metasheet dyke complex, metabasalt, metasediment, schist, micaschist, amphibolite etc.), which are metamorphic equivalents of primary source rock units, are enriched and dominated by anhydrous, stable, light-coloured crystalloblast, porphyroblast and megacrystalloblast neominerals of main-secondary-trace silicate-blast origin, which form rocks with granitic mineralogic composition in solid phase and in situ (autochthonous where they exist). In this way, there are changes and transformations in the solid phase and in-situ to leucocratoblastic metablastic rocks/metablastic rock series and derivatives/metablastites, which are of metamorphic origin, rootless and a kind of new modern metamorphic rock types with holoblastic texture and structure.

In this way, previously existing different primary source rock units and different classical metamorphic rocks which are metamorphic equivalent rocks of primary source rock units; The rock-forming main-secondary-trace felsicoblast (light-colored crystalloblast neominerals), which generally has granite mineralogical composition and carbonate mineralogical composition, is composed of anhydrous, stable crystalloblast neominerals (silicatoblast blast/blast/embryo, carbonatoblast blast/blast/embryo, depending on the primary rocks of origin, blast/embryo aggregates, crystalloblast, porphyroblast, megacrystalloblast type, etc.) They become rich and become dominant. In this way, by changing phase in solid phase and in-situ, they change and transform into leucocratoblastic metablastic rocks (known as granite/granitoid intrusion, pluton, batholith type depth/plutonic rocks of magmatic origin) which are rootless, metamorphic origin and a type of modern allotropic metamorphic rocks and pure-impure carbonatoblastic rocks (known as carbonatites of magmatic origin, which are rare in nature) which are a type of metablastic rocks but have different primary origin rock units. Therefore, leucocratoblastic metablastic rocks and pure-impure leucocratoblastic carbonatoblastic rocks correspond to 2nd generation metamorphic rocks, and as rocks, to 3rd generation rocks and to allotropic superionic metablastic solids/ores-mines/rocks/minerals which are the 5th classical state/phase of matter.

As a result of the regional dynamothermal Tarhan metamorphism cycle, it has been determined and proposed for the first time that the previously existing primary source rock units and the metamorphic equivalent classical metamorphic rocks of the primary source rock units have undergone allotropic changes and transformations in solid phase and in-situ into leucocratoblastic metablastic rocks / metablastites / metablastic rock series and their derivatives (to date they have been known as magmatic origin granite/granitoid, gabbro/gabbroid, diorite/dioritoid, charnockite/charnockitoid intrusion, pluton, batholith type depth/plutonic rocks). Similarly, previously existing pure-impure carbonate/limestone primary source rock units and pure-impure classical marbles which are metamorphic equivalents of primary source rock units undergo allotropic changes and transformations in solid phase and in-situ into leucocratoblastic pure-impure carbonatoblastic rocks/carbonatoblastic rock series and their derivatives/carbonatoblastite (known as carbonatites of magmatic origin, rarely seen in nature) type/type metablastic

rocks. A new type of modern metamorphic rocks, leucocratoblastic metablastic rocks and leucocratoblastic pure-impure carbonatoblastic rocks, which were unknown until now, have been introduced and proposed to the Geology/Earth Sciences literature for the first time. A new type of modern metamorphic rocks, leucocratoblastic metablastic rocks and leucocratoblastic pure-impure carbonatoblastic rocks; Until now, according to the magmatic view, they were known as granite/granitoid, gabbro/gabbroid, diorite/dioritoid, charnockite/charnockitoi, carbonatite/carbonatoid intrusion, pluton, batholith type depth/plutonic rocks of magmatic origin, formed by the partial melting of cosmic upper mantle peridotites (mantle/upper mantle origin), unstable and irregularly structured anatexitic magmas, by slow cooling, fractional/stage crystallization and magmatic differentiation.

The electrically charged, unstable and free cations of radioactive and rare earth elements/REE, which are incompatible elements with large ionic radii, increased atomic diffusion rates, within the unstable and disordered solid neo-solutions with different chemical compositions developed under the changing physical conditions (P/T) of the facies and sub-facies of the Abukuma type reversed regional regressive dynamothermal metamorphism, show two different geochemical behaviors.

1. They become stable by partially entering into large gaps in the crystal structures of carbonatoblast-silicatoblast-oxytoblast originated, expanded lattice structured, decreasing coordination numbers (decrease in neighboring atom numbers), decreasing density, increasing molecular volume and tectosilic (framework) structured crystalloblast neominerals formed in Abukuma type reversed regional regressive dynamothermal metamorphism stage/type. They are partially consumed from the environment/setting naturally. In this way, they make carbonatoblast-oxytoblast-silicatoblast based crystalloblast neominerals partially radiogenic. Generally, radiogenic crystalloblast neominerals (e.g. orthoclazoblast crystalloblast neominerals etc.) are used in the dating/aging of rocks by K/Ar method.
2. The second and most important geochemical behavior is the free unstable cations of rare earth elements/REE and radioactive elements, which are electrically charged, incompatible elements with large ion radii that have increased atomic diffusion rates and have become unstable, in solid neo-solutions with different chemical compositions, unstable and irregular structures, metablastization (formation of blast/nucleus/embryo, blast/embryo aggregates etc. with metamorphism event, Tarhan, 2018) with the developing recrystallization, unstable ions (cations) combine with the root carbonate anion $(CO_3)^{2-}$ and oxygen anions (O^{2-}) due to polarization (solid-solid chemical reactions, by sharing electrons, making the number of electrons in their last orbitals/layers 8), tendencies to become stable, etc.) become electrically neutral and become stable. In this way, they gradually grow as expanding cage structure, decreased coordination number, tectosilicate/framework structure, increased molecular volume, decreased density, unique/belonging to themselves, stable and free carbonatoblast blast/blast/embryo/nucleus, oxytoblast blast/blast/embryo/nucleus, blast/embryo aggregates, crystalloblast, porphyroblast and megacrystalloblast neominerals. They naturally enrich themselves in the environment and come to a visible state/phase.

Among the incompatible elements with large ionic radii, rare earth elements/REE and radioactive crystalloblast neominerals; They develop metamorphic origin metablastic ore/mine deposits with very rich potentials within a new type of modern metamorphic rocks, rootless and leucocratoblastic pure-impure carbonatoblastites/carbonatoblastic rock series and their derivatives/carbonatoblastic rocks (known as carbonatite intrusion, head, carbonatite dyke, stock and lenses of magmatic origin and rarely seen in nature). They also develop metamorphic origin **metablastic ore/mine deposits** within metablastic rocks formed by silicate and oxytoblast origin/based crystalloblast neominerals. However, due to the formation, physical and chemical properties and nature of carbonatoblastic rocks, the electrically charged, atomic diffusion rates of metallic-non-metallic, strategic, rare earth elements and radioactive elements have increased, and their unstable/unstable free ions (cations) easily bind to the radical carbonate anion $(CO_3)^{2-}$ and oxygen anions (O^{2-}). In addition, due to the fact that pure and impure carbonate/limestones and claystones, which are the previously existing primary rock units of carbonatoblastic rocks, are easily absorbed/captured and precipitated by carbonate-clay particles, the radioactive-rare earth elements/REE present in the basin waters have naturally become abundantly deposited in the form of free elements, making them a source rock.

Therefore, carbonatoblastic rock series and their derivatives / carbonatoblastites / carbonatoblastic rocks (known as carbonatites of magmatic origin, which are rare in nature) have very important potentials as the host rocks of the richest ore deposits in the world in terms of the content of rare earth elements/REE and radioactive ore crystalloblast neominerals, which are incompatible elements with metallic-non-metallic, strategic, large ionic radii.

In terms of their natural enrichment with their own free crystalloblast neominerals, leucocratoblastic carbonatoblastic rocks of metamorphic origin (known as carbonatites of magmatic origin) have a much richer

potential among metablastic rocks, due to the thickness and prevalence of metablastic ore deposits of metamorphic origin in metamorphic belts. In terms of their natural enrichment with radioactive, rare earth elements/REE, metallic-non-metallic and strategic crystalloblast neominerals in carbonatoblastic rocks, their easy processing and the fact that much easier and much more useful by-products are obtained compared to other metablastic rock type metablastic ore/mine deposits, they have the potential of being the richest metamorphic-origin metablastic ore/mine deposits in the world. In addition, the world's largest miner deposits containing radioactive and rare earth elements/REE ore deposits in carbonatoblastic rocks constitute carbonatoblastic-origin metablastic ore deposits. Examples include the "Bayan Obo", "Maoniuping" and "Dalucao" deposits in China and the "Mountain Pass" deposit in the US state of California.

Therefore, carbonatoblastic rock type leucocratoblastic metablastic rocks; It has been determined that they are thick and widespread like pure-impure carbonate/limestone rocks, which are very thick and widespread primary source rock units in nature, and pure-impure classical marbles, which are their metamorphic equivalents (Tarhan, 1992a, 1992b, 2021). They are seen intertwined and side by side with the pure-impure carbonate/limestone rocks, which are the primary source rocks in question, and pure-impure classical marbles, which are the metamorphic equivalents of the primary source rock units, from which they are derived in solid phase and in-situ, and with gradual transitions in vertical and lateral directions. They show the same structural relationship and location (stratigraphy, nappe, imbricate, thrusting, etc.) with the pure-impure carbonate/limestone primary source rock units from which they are derived and the pure-impure classical marbles, which are the metamorphic equivalent rocks of the said primary source rock units (Tarhan, 1987, 1992a, 1992b, 2018, 2019a, 2019b, 2021, 2024a, 2024b, 2024c, 2024d, 2024d, 2024f). However, some of the previous researchers in different countries defined, named and made geological maps of leucocratoblastic pure-impure carbonatoblastic rock series and their derivatives / carbonatoblastites / carbonatoblastic rocks of metamorphic origin, generally as recrystallized limestones and marbles, while some of the researchers defined carbonatites, which are rarely seen in nature and plutonic / depth rocks of magmatic origin. The origin and formation of the world's richest metamorphic-origin metablastic ore deposits, which are associated with leucocratoblastic metablastic rocks, which are rootless and a type of new modern metamorphic rocks, are generally interpreted and accepted by the previous researchers as magmatic-originated depth/plutonic rocks (known as carbonatites, which are rarely seen in nature, of magmatic origin) and the mineralizations associated with the rocks in question are interpreted and accepted as magmatic-originated mine/ore formations (orthomagmacal, pneumatolytic, pegmatitic, hydrothermal stage) opinions are definitely not correct...

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