

STATE OF OREGON
DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES
PORTLAND, OREGON

THE ORE.-BIN

VOL. 5 NO. 5 PORTLAND, OREGON May 1943



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TWO PROSPECTORS

The old time type of prospector who packed his singlejack, steel, pick, and muckstick, his bacon and beans, and his box of powder on a couple of burros and went into the mountains or desert to find a Goldfield, a Tonapah, or a Cripple Creek, is becoming extinct. That sort of prospecting meant back-breaking work, hardship and privation, but all these were accepted as a matter of course by this hardy soul. He wanted wealth, yes, but that was really secondary. He was obsessed primarily with the passion to discover a rich vein of ore, and the joy of discovery was the impelling force behind his search.

Only a person who has dug into a bunch of high-grade ore on his own can fully appreciate the motive force behind the prospector's search, or the intense satisfaction of accomplishment in his very rare successes. Bear in mind that we are describing the real prospector, not the bogus variety who did and does his prospecting in town, in hotel lobbies and in drink emporiums.

If you ever knew one of the old time prospectors, you knew a real, one hundred-percent individualist. He wanted no part of sham or deceit in his discoveries. He sometimes made mistakes in his judgment of mineral deposits and perhaps passed up valuable ones. He may have located and worked unprofitable deposits, but he worked the ground and not the public. He did his best to find a real mine and to make it pay.

In searching mountains and deserts for something real, something that would stand squarely on its own unassailable merit, he was sadly old-fashioned in his technique. If he had realized the value of publicity, his life work would have been so much easier. He needn't have toiled in the hills with a pick and shovel or battled the heat of the desert, or the snow of the mountains. The alternative would have been as sure then as it is now. Of course, in the old days he didn't have the radio and, of course, too he didn't know about lithium, beryllium, gallium, tantalum, columbium, ruthenium, zirconium, and other rare and somewhat mysterious elements now in great demand for war use. But he could have made out with gold, silver, and copper if he had only known the proper technique.

What he needed was a publicity agent.

For anyone who wishes to use the new prospecting method, the outline of procedure is simple. Variations in the method may be made according to the personal predilection of the "prospector" for some particular element, but it must be one in which the domestic supply is deficient. Preferably it should be one which is quite uncommon if not decidedly rare. Also the element should be relatively difficult to analyze.

The element is selected, the location, preferably rather inaccessible, is determined and the "discovery" is made. Some gullible person who has an entré into a newspaper office

and likes to see his name in print is allowed to "scoop" the story. It would be well to promise him some share in the "discovery" so that his interest will not be altogether altruistic. Now the stage is set.

The newspaper announcement is made that an enormous new deposit of "promethium", or element "x", or U-237 is found in a not too definite locality. Minerals are the life-blood of war production and this is news because of its relation to the war. Modesty is out of place in the statements of metal content and size of deposit. The bigger and richer the better, and the more "newsy" it is. Radio commentators who are always hungry for something startling to announce will seize upon the news item and the deed is done. Almost instantaneously people in San Francisco, Denver, New York, and Washington, in fact every city and hamlet, read and hear the news. It goes without saying a great many of them, even if they don't know the difference between "promethium" and Betelgeuse, will believe the story and the "discoverer" becomes a personage. People in far off places hear his name. He becomes front page stuff and may even get his picture in LIFE.

In the subsequent interviews, there should be hints of the insidious work of the "promethium trust" which is trying to block efforts to get the much-needed "promethium" onto the market. Also there should be included hints of the successful machinations of the "trust" in buying Federal and State agencies who have to do with investigating such deposits. It can be averred that the trust and said agencies do not care if we lose the war so long as they can prevent the "promethium" from breaking their market control.

The "discoverer" is safe for a long while from the natural pointed inquiries as to why production from such a rich deposit is not started in order to supply Government needs, because people will be indignant at the "trust" and will not analyze the whys and the wherefores too closely. If a radio commentator or a magazine or both can be interested to go to bat in assailing the "trust" and its tools - and this is not difficult - the "discoverer" will ride the wave.

It takes time, money, and hard work to check on statements having to do with evaluation of mineral deposits, and as long as the public interest can be held, it is perfectly safe to make any claims.

The procedure looks "fool proof" but care should be exercised. If two or three "prospectors" succeed in making their "discoveries" at the same time, there will be too much competition for publicity and efforts may fail of that blight of publicity - monotony. That is the pitfall to be avoided. Specifically a certain quantity of gas will keep one balloon in the air, but if that same amount of gas is used for two or three balloons, they cannot get off the ground.

But, in any case, one effect seems assured. A certain "kick" may be derived from the technique, for after reading and telling about the discovery for a while, the "discoverer" begins to believe the story himself.

Any resemblance of persons or situations in this article to persons living or dead, or situations past or present, is, of course, purely coincidental. F.W.L.

SUSPENSION ANNUAL ASSESSMENT WORK

H. R. 2370, approved by the President, May 3, 1943, suspends annual assessment work on mining claims in the United States and Alaska for the duration of the war. A claim owner is required to file an annual notice of his desire to hold his claims with the county recorder of the county in which his claim is located. There is no limitation placed on the number of claims, either lode or placer, to which exemption of assessment work may apply. It should be noticed that "desire to hold" should be filed each year.

THE RARE ALKALIES

Introduction

The elements lithium (Li), rubidium (Rb), and caesium (Cs) together with the elements sodium (Na) and potassium (K) form a group called the alkali metals. They show a remarkable affinity for oxygen and do not occur in nature in the metallic state. All of these elements are silvery-white metals and are soft enough to cut with a knife. They tarnish rapidly in air and decompose water, some of them violently, at ordinary temperatures. Rubidium and caesium oxidize spontaneously if placed in dry oxygen at room temperature and this property is utilized in certain types of vacuum tubes. Lithium, rubidium, and caesium are classed as "rare alkalies" because they occur less abundantly than sodium and potassium.

Lithium is the lightest of all metals and caesium is the most electro-positive of all the elements. Many of the properties of lithium more closely resemble those of magnesium than the properties of the other members of the alkali group. This is particularly true with respect to the facility of lithium in forming alloys with a number of other metals. Rubidium salts are absorbed from the soils by plants but rubidium cannot replace potassium in the plants. Plants do not absorb caesium, in fact, caesium acts as a vegetable poison.

The demand for the rare alkalies, particularly lithium, has risen sharply in the past few months and additional supplies of these minerals are needed. It is hoped that new sources will be found as the need for these elements becomes more generally recognized.

Discovery

LITHIUM was discovered by Arfvedson in 1817 while analyzing the mineral petalite. Arfvedson determined 5.76% lithia (lithium oxide, Li_2O) in petalite and also found 8.85% lithia in spodumene, and 4.30% lithia in lepidolite. At about the same time Berzelius showed that rubellite (pink or red tourmaline) contained lithium but black tourmaline did not. The name lithium is derived from the Greek, litheos, meaning stony, because it was believed that the presence of this element was confined to the mineral kingdom. It has since been found, however, not only in the mineral kingdom, but in the vegetable and animal kingdoms also. Metallic lithium was isolated by Bunsen and Mattheissen in 1855 by the electrolysis of the fused chloride.

RUBIDIUM AND CAESIUM were the first two elements to be discovered by means of the spectroscope. Bunsen and Kirchhoff (1860) while investigating the mineral waters of Durkheim evaporated about 40 tons of water and studied the concentrate, using a spectroscope. They noticed two blue spectral lines not produced by any other known element. The name caesium from the Latin, caesius, meaning the blue of the sky, was given to the element producing these two spectral lines. Later these two investigators obtained the spectrum of an extract obtained from a sample of lepidolite and noticed two violet spectral lines not previously recorded. The element that produced these spectral lines was named rubidium from the Latin, rubidus, meaning darkest red. Compounds of these two elements are so like those of potassium that they cannot be distinguished from that element by ordinary tests. The most satisfactory means of detecting rubidium and caesium is by spectrum analysis. Metallic rubidium was first prepared by heating an intimate mixture of the carbonate with finely divided carbon. Metallic caesium was first prepared by heating the hydroxide with magnesium.

Mineralogical Occurrence

The habitat of the rare alkalies is usually pegmatitic minerals. Pegmatites are usually found where granites are not deeply eroded. Many pegmatites contain rare alkalies but the distribution of the rare alkali minerals is sporadic.

LITHIUM occurs in nature more abundantly than rubidium and caesium. Although lithium minerals are relatively rare, lithium is rather widely distributed in small amounts. It occurs in appreciable amounts only in a few minerals. L. Dieulafait lists 140 minerals containing lithium in Compt. rend. 98. 1545, 1884. Traces of lithium are found in milk, human blood, muscular tissue, soil, some plants (tobacco, seaweed, cocoa, coffee, sugar cane, etc.), certain mineral springs, seawater, and some meteorites. A list of minerals which contain lithium should include the following:

| Mineral Name | Composition | Lithia (Li ₂ O) Content |
|--------------------------------|---|------------------------------------|
| Lepidolite | KLi (Al(OH,F) ₂) Al(SiO ₃) ₃ | 4 - 6% |
| Petalite (Castorite) | Li ₂ O·Al ₂ O ₃ ·8SiO ₂ | 2 - 5% |
| Spodumene | Li ₂ O·Al ₂ O ₃ ·4SiO ₂ (traces Rb,Cs) | 4 - 8% |
| Zinnwaldite | (K,Li) ₃ FeAl ₃ Si ₅ O ₁₆ (OH,F) ₂ | 3 - 4% |
| Cryophyllite | (LiNaK) ₁₆ F ₁₆ Al ₄ Si ₁₆ O ₄₃ | 4 - 5% |
| Cryolithionite | Li ₃ Na ₃ Al ₂ F ₁₂ | 5 - 6% |
| Sikerite | Complex silicate | 3 - 4% |
| Irvingite | Complex silicate | 4 - 5% |
| Polyolithionite | (LiNaK) ₁₆ Fe ₆ Al ₄ Si ₁₆ O ₄₃ | 9% |
| Beryl | Be ₃ Al ₂ (SiO ₃) ₆ | 0 - 1% |
| Triphylite | Li(Fe,Mn)PO ₄ | 8 - 9% |
| Lithiophilite | Li(Mn,Fe)PO ₄ | 8 - 9% |
| Amblygonite | Li(AlF)PO ₄ | 8 - 10% |
| Natramblygonite | Na,Al(OH)PO ₄ | 3 - 4% |
| Rabenglimmer | Form of zinnwaldite | 3% |
| Microcline | K ₂ O·Al ₂ O ₃ ·6SiO ₂ | traces by replacement |
| Colored tourmalines | 4H ₂ O·2(Na,Li) ₂₀ ·3B ₂ O ₃ ·8Al ₂ O ₃ ·12SiO ₂ | up to 2% |
| Cookeite | Hydrated lithium mica | up to 4% |
| Protolithionite | Lithium, iron mica | up to 4% |

Small amounts of lithium are found also in epidote, muscovite, orthoclase, and psilomelane.

RUBIDIUM AND CAESIUM occur together in some lepidolites, carnallite, certain mineral waters and as a trace element in a number of minerals. Rubidium salts are widely distributed in small amounts in substances such as ashes of beet-root, coffee, tea, oak and beech, in crude tartar, potashes, and mother-liquor from some potassium salt works. Caesium minerals and salts are less widely distributed than those of rubidium but traces of caesium are usually found in minerals which contain rubidium. An important source of rubidium is in the mother-liquor remaining after the extraction of potassium chloride (KCl) from carnallite. A list of minerals containing rubidium or caesium should include the following (in addition to lepidolite, spodumene, tourmaline, microcline, and beryl given under lithium minerals):

| Mineral Name | Composition | Rubidia (Rb ₂ O) or Caesia (Cs ₂ O) Content |
|-------------------------------|---|--|
| Leucite | KAl(SiO ₃) ₂ | traces of Rb ₂ O |
| Triphylite | Li(Fe,Mn)PO ₄ | " " " |
| Lithiophilite | Li(Mn,Fe)PO ₄ | " " " |
| Carnallite | KMgCl ₃ ·6H ₂ O | " " " |
| Mica and Orthoclase | | " " " |
| Petalite | Li ₂ O·Al ₂ O ₃ ·8SiO ₂ | contain traces Rb ₂ O and Cs ₂ O |
| Rhodazite | R ₂ O·2Al ₂ O ₃ ·3B ₂ O ₃ | R=K with some Rb and Cs replacement |
| Biotite | (H,K) ₂ (Mg,Fe) ₂ Al ₂ Si ₃ O ₁₂ | Cs and Rb occasionally replace K |
| Pollucite | H ₂ Cs ₄ Al ₄ (SiO ₃) ₉ | 31 - 37% Cs ₂ O |
| Pollux | H ₂ O·(Cs,Na) ₂₀ ·Al ₂ O ₃ ·5SiO ₂ | 34% Cs ₂ O |

LOCALITIES. Minerals containing the rare alkalis have been found in Maine, California, South Dakota, North Carolina, Oregon, Massachusetts, Connecticut, New Mexico, Colorado, Wyoming, Missouri, and Virginia. Due to difficulty of analysis of rare alkalis it is probable that a number of occurrences have not been recognized.

Chemistry of Recovery

LITHIUM salts are usually extracted from lithium minerals by any one of a number of processes depending upon the mineral source. Most lithium ores are mined selectively from workings at or near the surface, and are brought to commercial grade by hand sorting. Some lithium ores have been concentrated by froth flotation. Lithium chloride may be obtained directly by heating spodumene with a calculated quantity of lime and calcium chloride. Another chlorination process yields portland cement clinker and lithium chloride fume which is recovered in a Cottrell precipitator. Lepidolite has been successfully chlorinated by treatment with gaseous hydrogen chloride at about 935° C. for 13 hours. Two older, laboratory methods of obtaining lithium salts from the minerals are as follows: (a) The finely-powdered mineral is digested with hydrochloric or sulfuric acid and the solution is evaporated to eliminate the silica. Water is added and a calculated amount of sodium carbonate is added to the solution obtained by filtration to remove the iron, alumina, magnesia, etc. After filtering, the solution is concentrated by evaporation; excess of sodium carbonate is added, and lithium carbonate precipitates as it is only sparingly soluble in water. (b) Another procedure is to fuse the mineral with a mixture of barium carbonate and barium sulfate. The fusion mixture is taken up in water, filtered, and when barium chloride is added a precipitate forms. The precipitate and solution are evaporated to dryness. The dried residue contains the chlorides of the alkali metals present. When a mixture of absolute alcohol and ether is added to the dried chlorides, lithium chloride alone dissolves. Metallic lithium is obtained by the electrolysis of the fused chloride or by electrolysis of lithium bromide containing 10 percent of lithium chloride.

RUBIDIUM AND CAESIUM are usually extracted from minerals together. These two elements can be recovered from a silicate by the following procedure: The mineral is heated with a mixture of calcium carbonate and ammonium chloride, and the fused mass is cooled and extracted with water. The liquid is then evaporated to a small volume, and sulfuric acid is added to precipitate the calcium as the sulfate. After filtration, evaporation is continued until the greater part of the hydrochloric acid has been expelled. Sodium or ammonium carbonate is then added to complete the removal of the calcium salt. Upon the addition of chloroplatinic acid the caesium and rubidium are precipitated as the salts of that acid. By the action of hydrogen upon these salts the platinum is precipitated, while the caesium and rubidium chlorides are left in solution. Rubidium and caesium may be separated from the other alkalies and from each other by utilizing the different solubilities of the chloroplatinates, the chlorostannates, and of the alums.

Caesium and rubidium may also be separated from each other by employing the difference in solubilities of their carbonates in alcohol. Caesium carbonate is soluble in alcohol while rubidium carbonate is practically insoluble. Caesium can be separated from rubidium by treatment with antimony trichloride. The caesium salt 2CsClSbCl_3 is precipitated while the corresponding rubidium salt is soluble in water. Metallic rubidium may be obtained by (1) heating the charred tartrates to a white heat; (2) by reducing the hydroxide or the carbonate with magnesium; (3) by reducing the hydroxide with aluminum; (4) by heating the chloride with calcium. Metallic caesium may be prepared by (1) heating caesium hydroxide with aluminum to redness in a nickel retort; (2) by heating caesium hydroxide with magnesium in a current of hydrogen; (3) by heating caesium carbonate with magnesium in a current of hydrogen; (4) by heating the chloride with calcium.

Uses

LITHIUM. The powerful fluxing action of lithia is one of the reasons for the use of lithium minerals and compounds in ceramics. The addition of certain minerals and compounds containing lithium lowers their fusion point, increases the fluidity, and decreases heating time and costs of ceramic batches. Shrinkage is neutralized and some of the qualities of the finished products are improved. Certain types of glass containing lithium possess the

property of being transparent to ultraviolet and x-rays. Other lithia glasses have highly desirable optical characteristics. Synthetic lithium fluoride crystals have important optical properties.

Lithium forms important alloys with aluminum, magnesium, copper and other metals except those in the iron group. Lithium alloys are used as degasifiers in the manufacture of many alloys such as high-conductivity bronzes, copper-chrome-lithium alloys, copper castings, cast iron, and steel. The purified alloys thus obtained have superior qualities to similar alloys not degasified by the lithium alloys. The two most important of these degasifiers are 50-50 lithium-calcium and 98-2 copper-lithium.

Saturated solutions of lithium chloride are utilized in air conditioning and industrial drying plants where the removal of dust, odors, water vapor and other gases is required. A method for the purification of helium is based on the affinity of lithium for nitrogen.

In the chemical industry, lithium or lithium compounds are used in medicines and dental cements; for treating citrus fruits; for the treatment of cloth and paper; in the manufacture of luminous paint, photographic paper, and pyrotechnics; in curing meat; as an insecticide, in beverages, and as a constituent in special lubricants.

RUBIDIUM AND CAESIUM have rather limited use at the present time. Either rubidium or caesium is the active element in one type of photo-electric cell and both of the elements are used in various types of vacuum tubes where it is important that the last trace of oxygen gas be removed from the atmosphere inside the tube.

Identification

The three rare alkalies can be easily identified by means of their characteristic spectra. Each produces lines in the visible region of the spectrum and a spectroscope may be used, but for the identification of traces it is necessary to employ a spectrograph and utilize the red end of the spectrum beyond the visible range. For best results using a spectroscope it is desirable to convert these elements into chlorides before testing.

LITHIUM. The flame test method may be used to detect the presence of lithium in minerals and compounds. Both lithium and strontium color the flame crimson but the color due to lithium is not as persistent. A few drops of barium chloride added to the lithium salt in solution and tested in the flame gives successively the crimson due to lithium, green due to barium and then crimson due to strontium. Powdered gypsum should be added to the silicates in order to make the test. Lithium minerals do not become alkaline upon ignition, as do strontium minerals.¹

Production

DOMESTIC PRODUCTION of lithium began in 1898 in South Dakota, and according to the U.S. Bureau of Mines the total domestic production through 1940 was about 77,000 tons valued at \$1,400,000. The three states South Dakota, California, and New Mexico supplied most of this production. Of this total production about 30 percent was spodumene, 10 percent amblygonite and 60 percent lepidolite. In 1938 dilithium sodium phosphate (Li_2NaPO_4) production was started at Searles Lake. This compound was recovered from the brines and the lithia content of these compounds reached as much as 20 percent. This source has provided nearly half the raw lithium product needed for refined lithium salts in recent years.

WORLD PRODUCTION. The United States produces more than 50 percent of the world output of lithium ores. Southwestern Africa, Australia, Sweden, and Germany produce most of the remainder, and Canada, Portugal, Southern Rhodesia, and Spain contribute minor quantities. Commercial lithium deposits have been reported in India, Brazil, Madagascar and Russia.

¹ U.S. Bureau of Mines Information Circular 7225.

Bohemia and Saxony ores were utilized in making lithium alloy metal used in bearing metal and hard aluminum alloy, "scleron."

Markets and Prices

Most of the mines containing lithium ore are owned by manufacturers and thus these ores seldom enter the open market. Prices quoted by Engineering and Mining Journal Metal and Mineral Markets were stable during 1941 and were as follows: spodumene \$5 per 20 pounds of contained lithia, 6 percent minimum, relatively free from iron, tourmaline and quartz; lepidolite, ordinary grade (3 percent), lump, was quoted at \$24-\$25 a short ton f.o.b. mine; amblygonite, 8 to 9 percent lithia, \$40 a ton f.o.b. mine. Prospective producers are advised to negotiate directly with buyers. Complete summaries of current prices for lithium ores and compounds with required specifications are published in U.S. Bureau of Mines Information Circular 7225.

Price per gram of metallic caesium is \$14; of rubidium, \$15.

Producers, Buyers, and Consumers

Lithium Producers, 1941²

American Potash & Chemical Co., Trena, Calif.
Black Hills Keystone Corporation, Keystone, S. Dak.
Black Hills Tin Co., Tinton, S. Dak.
B. M. Dilley, Custer, S. Dak.
Lawrence Judson, Keystone, S. Dak.
Maywood Chemical Co., Keystone, S. Dak.
United Feldspar & Mineral Corporation, Kings Mountain, N.C.

Lithium-Ore Buyers

Associated Metals & Mineral Corporation, 40 Rector St., New York, N.Y.
Bergstrom Trading Co., Inc., Woolworth Bldg., New York, N.Y. (exporter).
Consolidated Feldspar Corporation, Trenton, N. J.
Corning-Glass Works, Corning, N.Y., (lepidolite)
Foote Mineral Co., 16th and Summer St., Philadelphia, Pa.
Harshaw Chemical Co., 1945 E. 97th St., Cleveland, Ohio.
E. J. Lavino & Co., 1528 Walnut St., Philadelphia, Pa.
Maywood Chemical Co., Maywood, N.J.
R. T. Vanderbilt Co., 230 Park Ave., New York, N.Y.
Varlacoid Chemical Co., 116 Broad St., New York, N.Y.

Consumers and Manufacturers

Abbott Laboratories, North Chicago, Ill.
American Fluoride Corporation, 151 W. 19th St., New York, N.Y.
Dow Chemical Co., 919 Jefferson Ave., Midland, Mich.
B. F. Drakenfeld & Co., 45 Park Place, New York, N.Y.
Foote Mineral Co., 16th and Summer Sts., Philadelphia, Pa.
General Electric Co., Lamp Department, 1133 East 152 St., Cleveland, Ohio.
Harshaw Chemical Co., 1945 East 97th St., Cleveland, Ohio.
Lithalloys Corporation, 444 Madison Ave., New York, N.Y.
Mallinckrodt Chemical Works, Second and Mallinckrodt St., St. Louis, Mo.
Maywood Chemical Co., Maywood, N.J.
Vitro Manufacturing Co., Corliss Station, Pittsburgh, Pa.
Lithium Corporation of America, Raymond and Commerce Bldg., Newark, N.J.
Metalloys Corporation, 730 Rand Tower, Minneapolis, Minn.

²U.S. Bureau of Mines Information Circular 7225.

References

Bureau of Mines Information Circular 7225
Bureau of Mines Information Circular 7232
Mellor, A Comprehensive Treatise on Inorganic and Theoretical Chemistry
Pactington, A Text-Book of Inorganic Chemistry
Browning, Introduction to the Rarer Elements

SPECIAL PREMIUM PRICE FOR COPPER

On May 1, Mr. Jesse Jones announced that a Special Additional Premium is now available under the premium price program, limited to small copper mines which produced less than 2,000 tons of copper during 1942 and which require increased revenue to obtain maximum production. Each individual case will be considered independently by the Quota Committee, Premium Price Plan for Copper, Lead and Zinc; and payment of a Special Additional Premium at a rate to be fixed for each mine on production in excess of a special quota will be made by Metals Reserve Company on the basis of recommendations made by the Quota Committee and approved by Metals Reserve Company.

The special quota and the special premium rate established for any mine may be increased or decreased at any time, or may be revoked at any time upon thirty (30) days' notice. Metals Reserve Company will not effect any settlement with producers based on the Special Additional Premium, in the event of termination of the program prior to July 31, 1945.

Payment of the Special Additional Premium for copper will be handled by Metals Reserve Company through the same channels and under the same procedure as heretofore followed in the program. Inquiries concerning eligibility for this Special Additional Premium on small copper mine production should be directed to Mr. Landon F. Strobel, Executive Secretary, Quota Committee, Premium Price Plan for Copper, Lead and Zinc, War Production Board, Room 2047, Temporary "R" Building, Washington, D.C.

NO BERYLLIUM FOUND BY STATE DEPARTMENT IN THE JACKSON COUNTY DEPOSIT

No significant amount of beryllium was found by the State Department of Geology and Mineral Industries in representative samples obtained from the deposit reported recently as a new discovery of beryllium ore in Jackson County, Oregon. Spectrographic and chemical analyses of several samples of the rock gave results ranging from 0.001 to 0.002% beryllium oxide - an amount too small to be classed other than as a trace.

The rock is classified as an altered volcanic tuff or breccia, made up of fragments thrown out by volcanic activity. Some samples contain secondary quartz and chalcedony. No beryllium minerals could be found microscopically.

Beryllium is highly important in forming alloys useful in certain war equipment, and after the discovery was announced over a week ago, the Department received many requests for information concerning the deposit.

NOTICE

Multigraphed forms which may be used as a guide for filing notice of desire to hold mining claims under the recent bill suspending annual assessment work on mining claims for the duration of the war may be obtained at the Portland office of the Department.

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