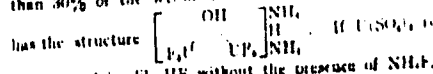
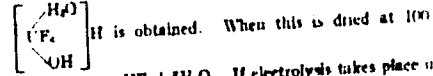


SOME PHYSICAL PROPERTIES OF URANOUS NITRATE

the possibility of the determination of uranium as the fluoride. V. G. Khlopov and E. K. Gerling. *J. Gen. Chem. (U. S. S. R.)* 6, 1701-14(1930). $UO_2(NO_3)_2 \cdot 6H_2O$ is electrolyzed in HF soln. in the presence of NH_4F , quant. pptn. of $UF_4 \cdot 0.5H_2O$ occurs. The method can be used for the quant. sepn. of quadrivalent U from semi-valent U, trivalent Fe and V in mixts. contg. not more than 30% of the wt. of U as V. The ppt. probably



electrolyzed in dil. HF without the presence of NH_4F .



it becomes $UF_4 \cdot 1.5H_2O$. If electrolysis takes place in 1:1 HF, $UF_4 \cdot 0.5H_2O$ is obtained. H. M. Leicester

Mercury vanadates and selenates. H. Montignie *Bull. soc. chim. [A]*, 3, 2322-4(1930). Methods of prepn and properties of 2 Hg^{2+} salts and 2 Hg^{+} salts are given. The mercurous salts are normal, the mercuric are basic. H. R. van Vlieland

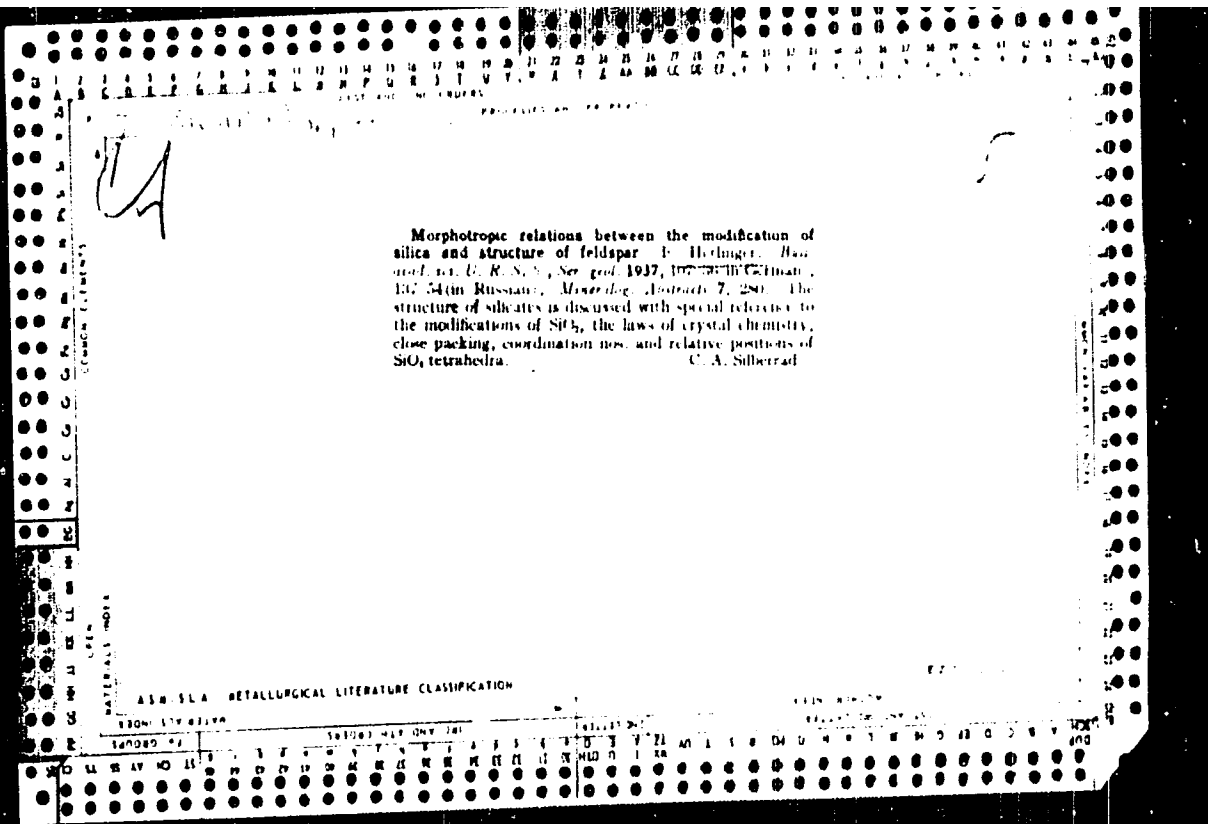
AS & SLA METALLURGICAL LITERATURE CLASSIFICATION

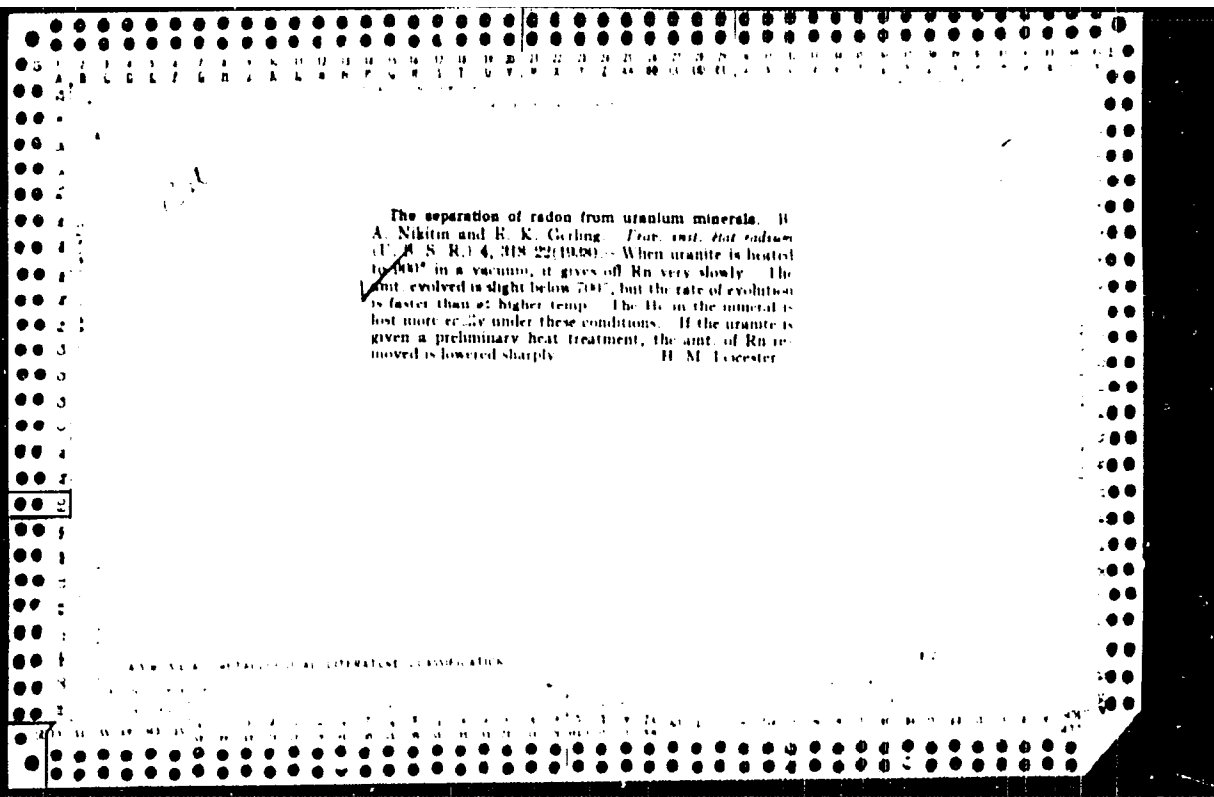
ca

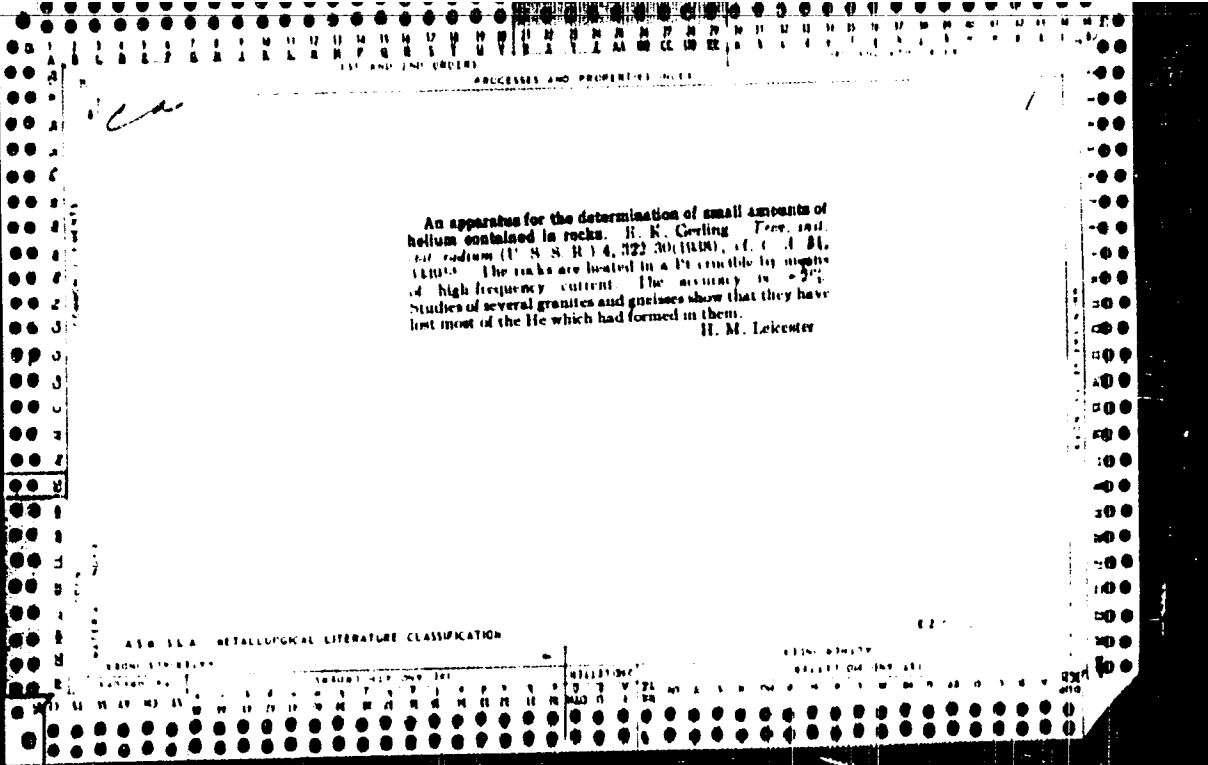
Separation of helium from rocks and minerals. I
Effect of various factors on the separation of helium from
minerals. V. G. Khlopov, B. K. Getling and B. M.
 Ioffe. *Natural Gases I*, S. S. R. No. 11, 105-42(1936).
 The obtained He sepn. isotherms are similar to those
 obtained by other workers, the difference being that it
 is now possible to state that at each given temp. only a
 definite amt. of He can be sepd., independently of the
 duration of heating. At 500° for uraninite, allanite and
 monazite, He diffuses through the lattice of the mineral
 with a noticeable (measurable) velocity until the differ-
 ence in the concns. of He in the mineral and the surround-
 ing atm. approaches zero. An investigation of isotherm
 curves for the sepn. of He from uraninite shows the exist-
 ence of at least 2 overlapping processes according to the
 exponential law, though of different velocities. In all
 cases H₂ is evolved together with He from minerals
 contg. H₂O, independently of the temp. and oxidation
 reduction properties of the medium. The velocity and
 amt. of evolved He from the mineral depend upon the
 compn. of the surrounding gas phase. The evolution of
 He from the mineral in an inert gas (with respect to the
 mineral) atm. is lower than *in vacuo*. Gases (H₂, CO,
 CH₄ and C₂H₆, ...) reacting with the above minerals
 without changing their structure promote the sepn. of

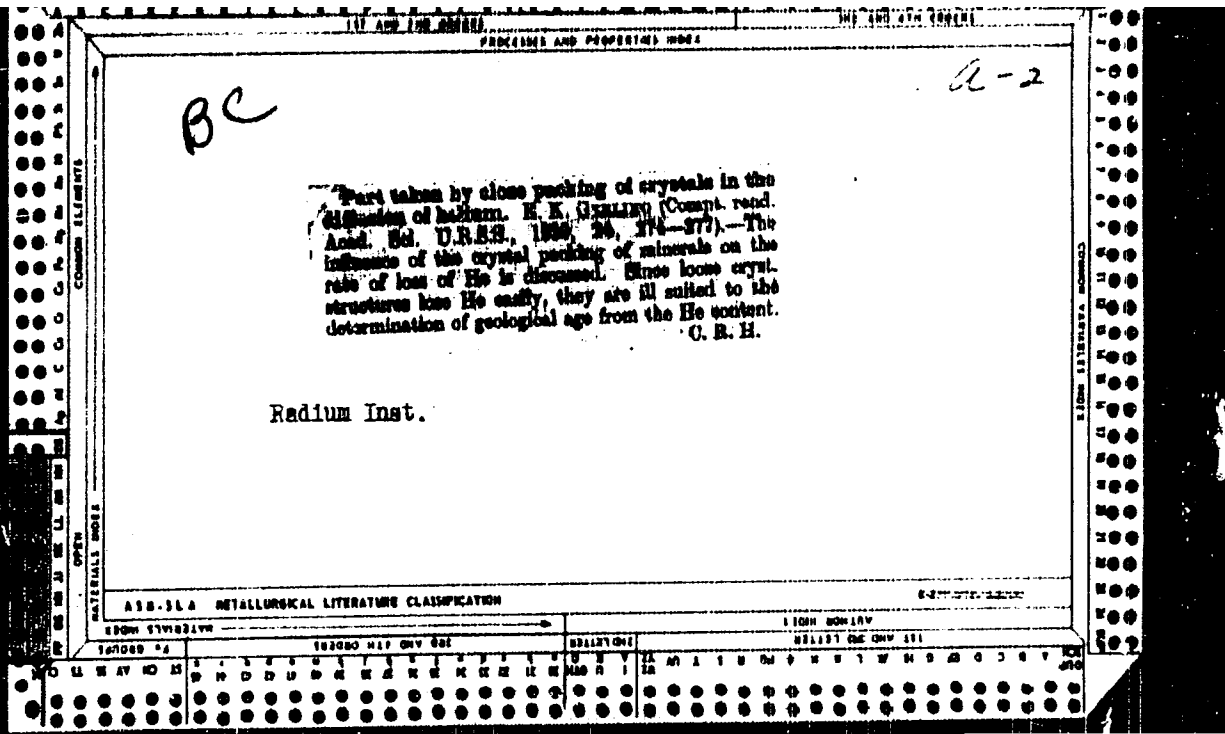
He without a change of the general character of the
 phenomenon, and the sepn. isotherms are similar to those
 obtained *in vacuo*. Gases reacting with a change of the
 mineral structure cause a rapid loss of He by the mineral
 with a sharp change of the process. H₂ promotes He
 sepn., the former penetrating the mineral, while it is
 adsorbed by the latter so strongly that it can be removed
 only by heating *in vacuo*. In the same reduction effect,
 the amt. of He sepd. under the influence of the gas phase
 depends on the nature of the latter, increasing inversely
 proportional to the diam. of the gas mol., i. e., from H₂ to
 the heavier hydrocarbons, H₂ < CO < CH₄ < C₂H₆ <
 C₂H₄, ... The probable mechanism of the stimulating
 action of gases on the sepn. of He consists in an (a)
 increase of the inner surface of the mineral as a result
 of the reduction process, and (b) the phenomenon of dis-
 placing adsorbed (on active centers of the inner surface)
 He by mol. and atoms of other gases. Allanite is trans-
 formed at 510° with the evolution of heat into another
 modification which retains He better than the first modifi-
 cation. The age of monazite from the Chernaya Salma
 (Kareliya), calcd. by the ratio of He to Th, is 1,230,000,
 000 years, but the actual age of this mineral is considerably
 higher because of the ease with which monazite loses He
 in heating. Thirteen references. A. A. Polesov

ASB 314 METALLURGICAL LITERATURE CLASSIFICATION










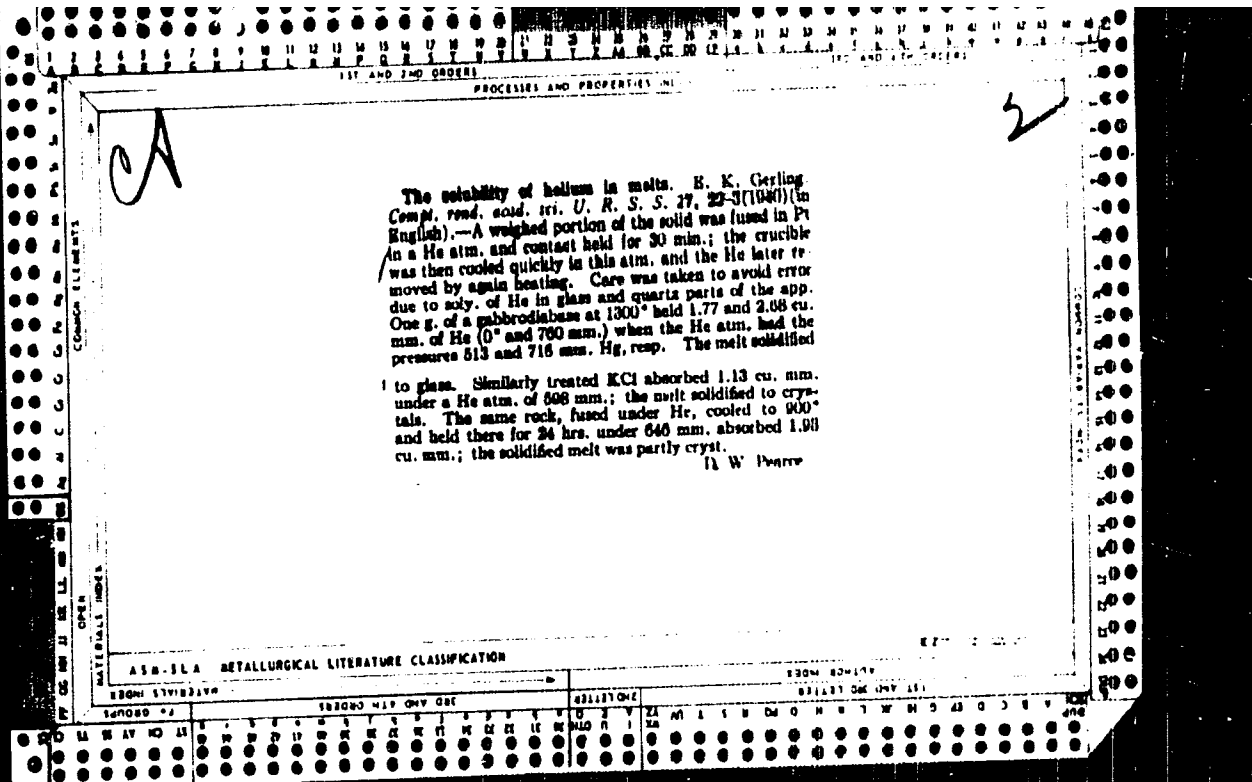
Heat of diffusion of helium as a criterion of the utility of minerals for the determination of age by the helium method. E. K. Gerling. *Compt. rend. acad. sci. U. R. S. S. N. 24, 570-3* (1939) (in German). A value of 31,000 cal. g. atom, calcd. for the heat of diffusion of He in a mineral, guarantees the complete preservation of the original quantity of He in the mineral and indicates that the mineral lattice is free from appreciable disengagement. The method of calcul. of the heat of diffusion from exper. data is described and values of the heat of diffusion of He for 5 minerals are listed.

Radium Inst., Acad. Sci. USSR


 The age of Khibin tundra. L. V. Komlev and E. K. Herling. *Compt. rend. acad. sci. U. R. S. S.* 26, 959-61 (1940) (in English). — Loparite, a rare earth titanocolumbate of the perovskite type, proved to be suitable for age calculation by the He method. The mineral occurred in a pegmatite among foyaites in the S.E. part of the massif. The most He was in the compact pure crystals from the high temp. feldspathic nephelitic material in the marginal positions of the vein; smaller He contents were observed in loparite from central (albitic) parts of the vein where much poikilitic intergrowth of feldspar, etc., was present to disturb the lattice of the loparite and to allow escape of He. Hoparite and loschorite are contaminated with common Pb, so methods using the latter are unreliable. Age detms on knopite may be satisfactory. From the loparite detms age = $8.8 \times 10^8 \times \text{He} / (\text{U} + 0.27\text{Th}) = 280$ to 300×10^6 yrs.



Radium Inst., Acad. Sci. USSR



2000

Age of Lovozero tundra

Age of Lovozero tundra. E. K. Gerling, I. V. Komlev, K. N. Sokolova, and V. G. Barkan (*Compt rend Acad. Sci. U.R.S.S.*, 1941, **31**, 135-136). Determinations by the He method using loparite and a loparite concentrate give an age of $231 \pm 266 \times 10^6$ years, and indicate that the Lovozero massif was formed in the same epoch as the Chibiny massif, and was complete not later than the Lower Carboniferous. U.S.S.R.

Age of Afrikanid pyroxenite intrusion of the Kola Peninsula. E. K. Gerling, I. V. Komlev, V. G. Barkan, and M. F. Ermolova (*Compt rend Acad. Sci. U.R.S.S.*, 1941, **31**, 769-770). The age calc. by the He method for klapite from the pyroxenite intrusion is $358 \pm 385 \times 10^6$ years. That of klapite from a nepheline vein was calc. to be 249×10^6 years but this is regarded as an underestimate. U.S.S.R.

Separation of helium from neon. E. K. Gerling and G. M. Franklin
(*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **22**, 641-643) He and Ne
are quantitatively separated by adsorbing Ne on coal at -225°. The
amount of He adsorbed is not great. W. K. A.

Radium Inst., Acad. Sci. USSR

Age of the earth according to radioactivity data. F. K. Geyding,
Abstract read. Acad. Sci. U.S.S.R., 1942, 24, 250-261. Previous
calculations of the age of the earth from the relative abundance of
U, Th, and Pb are probably in error owing to the assumption that
all Pb is of radioactive origin. The observed isotope ratio for Pb is
not in accord with this view. By assuming the galena from Isigunt
Greenland, which is of relatively low ²⁰⁶Pb, ²⁰⁷Pb, and ²⁰⁸Pb content
to be almost entirely of non-radioactive origin, the admixtures of the
various isotopes from radioactive sources in other sources of Pb are
calculated. From these data the average age of the Pb samples is calcu-
lated to be 130×10^6 years and the age of the earth $3-4 \times 10^9$ years.
J. W. S.

Radium Inst., Acad. Sci. USSR

Dr. A. G.

-B, 1968, 1969

Age of gabbroite intrusions of Arica and Osmanga Varzea in the Aola Peninsula. A. G. Gerlin, and I. E. Starik (Copt. rend. Ak. N. S. S. S. U. S. S. R., 1962, 35, 153-154).--Two shorlowite specimens from the above intrusions were investigated, their content of He, La, and Tm being determined. The two intrusions are formed simultaneously $\sim 340 \times 10^6$ years ago. A. G. G.

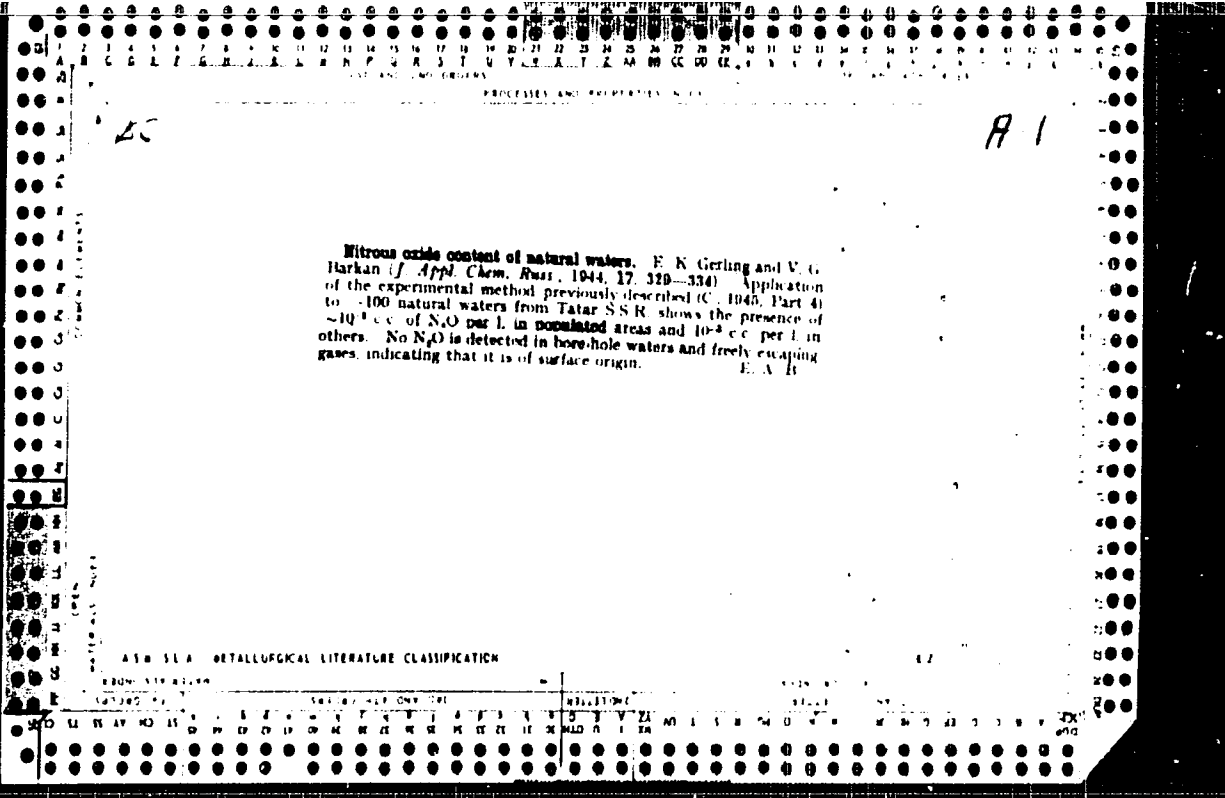
12/10

Age of pegmatite veins of the Ilmen Reserve in the Urals. E. K. Gerling and M. E. Vladimirova (*Compt. rend. Acad. Sci. U.R.S.S.*, 1942, 27, 179-184).—The age of the granite intrusions and their pegmatites has been obtained from samarskite (I) and eschinite (II) by the He method. (I) from the Blumovskaya mine has He 3.61 mg. per g., U 0.1038 g. per g., and Th 0.0603 g. per g. The corresponding figures for (II) are 0.691, —, 0.090. The ages are 248×10^4 and 218×10^4 years, respectively. Curves showing the He evolved by heating (I) at different temp. are reproduced. (II) retains He when heated, only 20% of its total amount being liberated by heating to 1200°. L. S. T.

Dr. U.S.

... see notes 1/7

Determination of nitrous oxide in natural waters. E. K. Gerling, G. M. Ermolin, and N. V. Baranovskaja (*J. Appl. Chem. Russ.*, 1944, 17, 213--218).--Analysis of gases contained in natural waters by combustion, hydrogenation, decomposition over Pt and in the glow discharge, and subsequent condensation with liquid air, spectral analysis, etc., in a special all glass apparatus is described. The presence of 0.02-1% of N_2O , considerably in excess of the quantity of petroleum hydrocarbons present, is reported. E. A. B.



CD

20-58

2

The absolute age scale of the earth's geological history
A. A. Polkanov and E. K. Herling *Izvest. Akad. Nauk
S.S.S.R., Ser. Geol.* 1940, 20-58; English summary --
Possible applications of the He and Pb methods are dis-
cussed. Michael Fleischer

Cat

Natural occurrence of some stable products of spontaneous fission of uranium. V. G. Khlopov, B. K. Gorbunov, and N. V. Baranovskaya. *Dokl. Akad. Nauk S.S.S.R.*, *Class. in. chim.* 1947, 599-600 (in Russian).— On the assumption that the products of spontaneous fission of U are identical with those produced under the action of slow neutrons and, in particular, that, according to Fermi, Anderson, and Grosse (C.A. 35, 1311⁹), 14% of the fissions result in formation of stable Xe, the age of natural uraninite minerals was determined by means of their Xe content. Samples of uraninite (from Chernaya Sal'ma) containing 63.0% U (350-300 g) preliminarily heated at 200°, were dissolved in 2.5 l. boiling HCl (d. 1.12) and preliminarily freed from dissolved gases by repeated flushing with H₂ and boiling *in vacuo*. The gas evolved during the soln. of the mineral was led through active C at -100° to adsorb the heavy noble gases, then He was collected. Desorption from the C was done by pumping off at 350°; the gas was then led over Ca at 0° to adsorb all chemically active gases. To isolate Xe, the gas was then kept over 0.1 g. C at -120° for 20 min. and pumped off (by means of a McLeod gage used as pump); 10 times repeated pumping resulted in the removal of 90% of the A. To remove the remaining 10%, the gas was desorbed again by heating to 200° and then re-adsorbed on C at -120°; now, with 8-10 pumpings, all of the A could be removed, after which the Xe was desorbed by heating to 200°. As the av. of 2 expts., there was found per 1 kg. uraninite: A 39 cu. mm. (at 0° and 760 mm. Hg), Xe 0.77 cu. mm., Xe/A = 0.020 as against 0.00011 in air. The age τ of the mineral (in years)

is calculated on the assumption that all U isotopes undergo spontaneous fission to the same extent, with N_1 = no. of U atoms in 1 kg. mineral ($N_1 = 1.35 \times 10^{24}$) and N_2 = no. of Xe atoms in 0.77 cu. mm. Xe ($N_2 = 2.1 \times 10^{19}$), $\tau = (1/\lambda_2) [2.3 \log_{10} (N_1/0.14 N_2 \lambda_2 / \lambda_1) + 1]$, where λ_2 = const. of disintegration of U = 1.52×10^{-10} year, λ_1 = const. of spontaneous fission = 5.1×10^{-11} year, giving $\tau = 1.08 \times 10^9$ years, in good agreement with $\tau = 1.85 \times 10^9$ obtained by the Pb method. If the figure 0.14 is replaced by the recent 0.10 according to Grinnitt and Wilkinson (C.A. 40, 638⁹), one finds $\tau = 1.20 \times 10^9$ years; it means that part of the Xe accumulated in the mineral is lost over geol. periods, the loss of Xe is less than that of He but still significant. If the age of the earth crust is 2×10^9 years, and for N_1 in the above formula is substituted the total amt. of U in the earth crust, one finds for the amt. of Xe accumulated through spontaneous fission something of the order of 10^9 cu. m. In principle, another source of Xe might be the spontaneous fission of Th but no direct expl. evidence can be supplied as yet.

N. Thon

558 514 METALLURGICAL LITERATURE CLASSIFICATION

USSR/Nuclear Physics - Uranium
Nuclear Physics - Xenon

Dec 1947

"Some New Methods of Determining Absolute Geological Age of Minerals," V. G. Khlopov,
Academician; E. K. Gerling, 4 pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LVIII, no 7

Describes new method of determining absolute geological age of uranium minerals according to ratio of xenon, included in mineral, to the uranium. Basis of new method is process of voluntary separation of uranium which, like radioactive disintegration, must take place at a constant and unchangeable speed in thermodynamical conditions of earth's crust. In order to calculate absolute geological age in years on basis of ratio of xenon to uranium, following formula is used:

$$t = 1/n_x \cdot 2.30 \log_{10} \frac{\frac{Xe}{Nd}}{\frac{Xe}{Nd}}_{N1 + 17}$$

PA 60T82

1ST AND 2ND ORDERS PROCESSES AND PROPERTIES INDEX

5

167 New Data on the Geochemistry of Inert or Noble Gases. V. G. Khlopin and E. K. Gerling. Radium Institute, Academy of Science, USSR, May 20, 1948. 6p. (NP-928)

A new method and formula for determining the age of uranium minerals by the ratio of xenon to uranium in them has been proposed and verified experimentally. Conversely, the same formula can be used to estimate how much xenon can accumulate in the earth's crust during the geological time of its existence. A calculation shows that the quantity of xenon formed by spontaneous uranium in the earth's crust during the geological period of its existence is considerable and amounts to about 0.5% of its total xenon content. The origin and occurrence of other noble gases (krypton, argon, helium) is discussed with particular emphasis on the radioactive and astrophysical origin of subterranean helium. The nuclear reactions of argon are briefly discussed.

ASB-51A METALLURGICAL LITERATURE CLASSIFICATION

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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GERRING, E. K.

DA 11/49781

USSR/Nuclear Physics - Uranium,
Decomposition Products of
Chemistry - Helium Group Gases
Jul 48

"New Data in the Geochemistry of Inert Gases,"
Acad V. G. Khlopina, E. K. Gerring, Radium Inst,
Acad Sci USSR, 4 pp

"Dok Ak Nauk SSSR" Vol LXI, No 2

Authors previously established accumulation of
Xenon heavy isotopes in ancient uranium minerals,
and determined xenon content of uranite from
Chernaya Sel'ma deposits in North Karelia. (Iz Ak
Nauk SSSR, Otdel Khim Nauk, No 6, 600, 1947).

11/49781

Gives formula expressing age of uranium minerals in
terms of their xenon/uranium ratio and explains its
uses. Crypton also accumulates in the earth's crust,
but in smaller quantities than xenon. Suggests that
both these gases may also be formed during spon-
taneous fission of thorium; however, as yet there is
insufficient theoretical and practical data on this
point. Stresses that underground isotopes differ
from atmospheric ones. Similarly, underground and
radioactive helium have different isotopic compo-
sitions. Discusses bearing of this on Moureu's
hypothesis. Explains absence of large quantities of
underground argon by saying that Thomson and Bow-
lands overestimated probability of its formation from
potassium. Work on this point continues. Submitted
20 Jun 48.

11/49781

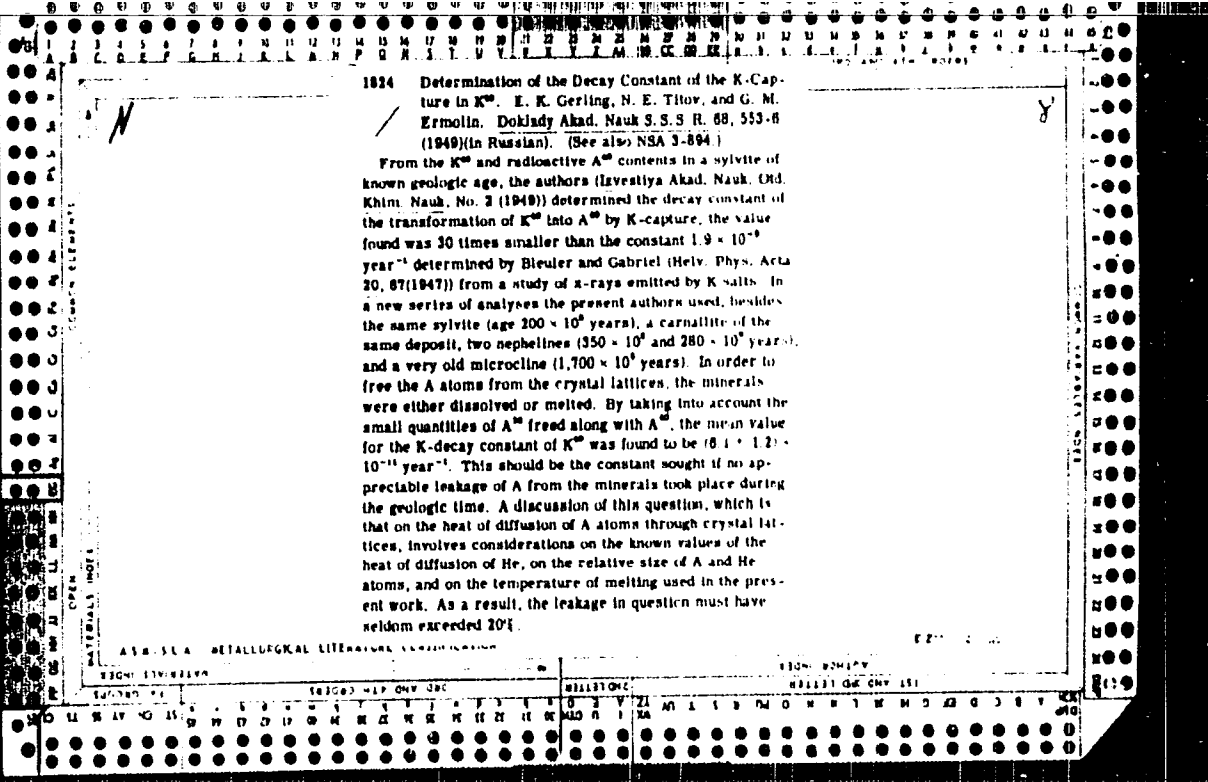
approximately 8000

METALLURGICAL LITERATURE CLASSIFICATION

GERLING, E. K.

894. On the disintegration of potassium by K-capture. E. K. Gerling and N. E. Titov, Izvest. Akad. Nauk, Otdelenie Khimicheskaya, 128-32 (1949) Mar.-Apr. (in Russian).

The existence of a K-capture in radioactive $^{19}\text{K}^{40}$, transforming the latter into $^{18}\text{A}^{40}$, which is to be expected according to the rules given by Sisco (Physica 2, 467(1937)), has been confirmed by Bleuler and Gabriel (Helv. Phys. Acta 20, 67(1947)) by the x-ray method. The present authors found another confirmation of the existence of this process by analysing, with a mass-spectroscope, the isotopic content of argon occluded in minerals containing potassium. Results are given of measurements made on sylvite from the Solikamsk deposits, 200 x 10^6 years old. The occluded gases were removed from the water solution of the mineral by boiling, then successively separated by sorption on copper oxide, charcoal, and calcium; argon remained free, and its content was found to be 0.507 cm^3 in 1,000 g KCl. The mass-spectrographical investigation showed that, whereas in air ^{36}A accounts for 0.30% of the total amount of argon, in sylvite only ^{40}A is present. Therefore, air is not the source ~~of~~ of ^{40}A .



USSR/Nuclear Physics - Krypton, Radio- 21 Feb 51
Genic

"Search for Radiogenetic Krypton," E. K. Gerling,
N. V. Baranovskaya

"Dok Ak Nauk SSSR" Vol LXXVI, No 6, pp 825, 826

Leipidolite contg Rb isotopes (0.77%) and heavy inert
gases (0.0957 cc/1,000 g) is found in deposits in the
Altay and Kalbinsk Mountain Range; and amazonite
contg Rb isotopes (0.44%) and heavy inert gases
(0.371 cc/5,000 g) is found in deposits in Kanozero
(Kan Lake) and Kislaya Varaka. Both of these min-
erals contain less than 5/10⁵ cc of Krypton per 1,000

185T100

USSR/Nuclear Physics - Krypton, Radio- 21 Feb 51
Genic (Contd)

G. Concerning the Rb method, cf. H. E. Suess, "Phy
Rev" 73, 1209, 1948 and Haxel and Houtermans, "ZS
fur Phys" 124, 705, 1948. Submitted 28 Dec 50 by
Acad P. I. Lukirskiy.

185T100

GERLING, YE. K.; RIK, K. G., Profs.

Meteorites

Age of stone meteorites by the argon method. Meteoritika No. 10, 1952.

Monthly List of Russian Accessions, Library of Congress, June 1953. Unclassified.

USSR.

The age of tektites, G. K. Gostin and M. I. Vinogradov, Doklady Akad. Nauk SSSR, 1953, 107 (1953) - *Mineralog. Zhurn.* 30, 107 (1953) - Determinations by the A method gave high K with very little A, giving results of the same order as previously cited for australites and philippinites and very much less than for meteoritic stones; this suggests that tektites are not of cosmic origin. The percentage of K, percentage of K²⁰, e.g. A/A+K²⁰ ratio, and age in years, resp. were: australite 0.617, 2.0 x 10⁶, 6.0 x 10⁶, 7.3 x 10⁶, 1.2 x 10⁶, indochinite 0.1228, 3.7 x 10⁶, 9.8 x 10⁶, 2.0 x 10⁶, 4.6 x 10⁶, philippinite 0.314, 3.8 x 10⁶, 4.2 x 10⁶, 2.1 x 10⁶, 3.1 x 10⁶ K L C

DC

~~Herling~~
Herling

E. K.

62

First experiment on the application of the argon method of determination of the age of minerals. P. K. Giffing, C. M. Ermolin, N. V. Barsnovskaya, and E. P. Titor. *Doklady Akad. Nauk S.S.S.R.* 56, 103-104 (1952).—When the λ -decay of K^{40} was completely demonstrated and the λ -capture const. of K^{40} was det'd. by 2 essentially different methods, an attempt could be made to apply this new method of radioactivity to detn. of the age of K minerals from the radiogenic argon accumulating in them during geol. time. A series of K minerals was studied, including microcline, amazonite, and lepidolite. The age of the intrusions with which the minerals were associated was known on the basis of the He or Pb method. This made possible a comparison of data obtained by the argon method with data from the other methods. In order to det. the age by the λ method, it was necessary to know the λ content and the K content. The K content was det'd. by ordinary chemical methods. To measure the λ content a weighed sample of the mineral was heated at 1200° in a quartz tube connected to the measuring part of the app. Heating was continued until evolution of λ ceased, from which 8 to 20 hrs. were required. Some of the minerals melted at this temp. Preliminary expts. showed that λ from the air did not diffuse in appreciable quantities through the quartz glass heated to 1300°. The λ was purified and was then measured in a MacLeod manometer. A mass-spectrometric detn. was made of the isotopic compn. of λ samples of the λ . Mass spectrograms are provided for the λ from lepidolite and amazonite, and the data from the λ detns. are tabulated.

Gladys S. Macy

3

GERLING, E. K., and YASHENKO, M. L.

"Age and Origin of Tectites," Tr. Labor. geologii dokembriya AN SSSR, No 2, 232-246, 1953

The authors critically consider the numerous hypotheses of the origin of tectites. All the hypotheses of the cosmic origin of tectites explain sufficiently well their wide distribution on earth; however, they do not convincingly describe the mechanism governing the formation of tectites. Deserving of attention is the hypothesis of the formation of tectites during the collision of meteorites on earth and of the explosion and melting of the meteoritic substance. From the hypotheses of the terrestrial origin of tectites, the authors pick out the volcanic hypothesis, which explains well the age of tectites, as determined by the authors according to the potassium-argon method and not exceeding 3-12 million years (consequently this hypothesis explains the cause for the tectites' being found in quaternary rocks.) The ratio $^{18}O/^{16}O$ found here in tectites can be explained by the remelting of the sedimentary rocks of clay composition. If the future demonstrates the possibility of the transfer of tectites by air or other ways to considerable distances

from the volcanoes, then the principal objection against the hypothesis of the volcanic origin of tectites falls away.

RZhGeol, No 1, 1955

STARIK, I.Ye.,

STARIK, I.Ye., otvetstvennyy redaktor; SHCHERBAKOV, D.I., akademik, redaktor; VINOGRADOV, A.P., akademik, redaktor; BARANOV, B.I., professor, redaktor; GERLING, E.K., professor, redaktor; LEVIN, B.K., kandidat fiziko-matematicheskikh nauk, redaktor; KRYLOV, A.Ya., redaktor; PEKARSKAYA, T.B., kandidat geologo-mineralogicheskikh nauk; MYASNIKOV, I.A., redaktor; POLYAKOVA, T.V., tekhnicheskii redaktor.

[Transactions of the first session of the Commission on Determining the Absolute Age of Geologic Formations] Trudy pervoi sessii komissii po opredeleniiu absolutnogo vozrasta geologicheskikh formatatsii; 12-15 aprelya 1952 g. Moskva, Izd-vo Akademii nauk SSSR, 1954. 231 p.(MIRA 8:1)

1. Chlen-korrespondent Akademii nauk SSSR (for Starik). 2. Akademiya nauk SSSR. Otdeleniye geologo-geograficheskikh nauk.
(Earth--Age)

4/7/55
LM

GERLING, E.K.

Age relationships of granite intrusions of the Ukraine on the basis
of argon method data. *Biul.Kom.po opr.abs.vosr.geol.form. no.1:5-8*
'55. (MLRA 9:10)

1. Laboratoriya geologii dokembriya AN SSSR.
(Ukraine--Granite) (Radioargon dating)

USSR/Physics of the Earth.- Origin and Structure of the Earth, 0-2

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 36318

Author: Gerling, E. K.

Institution: Laboratory for Geology of the Precambrian Period, Academy of Sciences USSR

Title: Inert Gases Found in Meteorites and Their Isotope Content

Original

Periodical: Byul. Komis. po opredeleniyu absolyut. vozrasta geol. formatsiy AN SSSR, 1955, No 1, 57-60

Abstract: Meteorites are irradiated for a long time by cosmic particles of very high energies, reaching 10^{16} - 10^{18} ev in the absence of any protective shielding. It is known that as a result of such irradiation iron meteorites accumulate large amounts of helium with a mass 3 and 4, formed as a result of interaction between the cosmic particles and the material of the meteorites. An investigation of the contents of other inert gases, namely neon and argon, in 5 meteorites, and also a study of their isotopic

Card 1/2

USSR/Physics of the Earth - Origin and Structure of the Earth, 0-2

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 36318

Abstract: composition, has led to the conclusion that the isotopic composition of neon and argon in meteorites differs sharply from the isotopic contents of these gases in air. The presence of neon isotopes with masses 20, 21, and 22 and of argon isotopes with masses 36 and 38 in meteorites is caused by deep splitting reactions, produced by cosmic particles of high energy.

Card 2/2

GERLING, E.K.

Discovery of inert gases in meteorites and their isotopic composition.
Biul.Kompo opr.abs.vozr.geol.form. no.1:61-63 '55. (MLRA 9:10)

1. Laboratoriya geologii dokembriya AN SSSR.
(Gases, Rare) (Meteorites)

GERLING, E.K.; RIX, K.G.

Forms of argon occurrence in meteorites. *Meteoritika* no.13:15-18 '55.
(Argon) (Meteorites) (MLBA 9:2)

GERLING, E. K.

USSR/ Astronomy - Argon method

Card 1/1 Pub. 22 - 10/49

Authors : Gerling, E. K., and Rik. K. G.

Title : Determining the age of stony meteorites by the argon method

Periodical : Dok. AN SSSR 101/3, 453-455, Mar 21, 1955

Abstract : Results of determining the age of 18 stony meteorites by the argon method are presented. Five references: 3 USSR and 2 English (1951-1954). Table.

Institution : Academy of Sc., USSR, The Laboratory of Pre-Cambrian Geology

Presented by : Academician A. G. Betekhtin, December 20, 1954

"APPROVED FOR RELEASE: 09/24/2001

CIA-RDP86-00513R000514910004-7

APPROVED FOR RELEASE: 09/24/2001

CIA-RDP86-00513R000514910004-7"

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42

GERLING, E.K.; RIK, K.G.

Recent aspects of determining the age of meteorites. *Meteoritika*
no.14:54-61 '56. (MLRA 10:1)
(Meteorites)

GERLING, E.K., professor; BARANOVSKAYA, N.V.

Abundance of xenon and krypton in meteorites. Meteoritika no.14:113-
117 '56. (MLRA 10:1)

(Meteorites) (Xenon) (Krypton)

GERLING, E.K.

Occurrence of noble gases in meteorites, and their isotopic composition.
Dokl.AN SSSR 107 no.4:559-561 Ap. '56. (MLRA 9:7)

1.Laboratoriya geologii dokembriya Akademii nauk SSSR. Predstavleno
akademikom A.A.Polkanovym.
(Gases, Rare--Isotopes) (Meteorites)

STARIK, I.Ye., otvetstvennyy red. SHCHENBAKOV, D.I., akademik, red.;
BARANOV, V.I., prof., red.; SHATSKIY, N.S., akademik, red.;
POLKANOV, A.A., akademik, red.; VINOGRADOV, A.P., akademik, red.;
AFANAS'YEV, G.D., red.; GERLING, E.K. prof., red.; PEKARSKAYA,
T.B., kand.geol.-min.nauk, red.; TUGARINOV, A.I., red.;
CHERDYNTSEV, V.V., red.; POLYAKOVA, T.V., tekhn.red.

[Proceedings of the fourth session of the Commission for the
Determination of the Absolute Age of Geological Formations,
May 12-14, 1956] Trudy chetvertoi sessii Komissii po opredeleniiu
absoliutnogo vozrasta geologicheskikh formatsii; 12-14 maia 1955 g.
Moskva, 1957. 297 p. (MIRA 11:1)

1. Akademiya nauk SSSR. Komissiya po opredeleniyu absolyutnogo
vozrasta geologicheskikh formatsiy. 2. Chlen-korrespondent
AN SSSR (for Starik, Afanas'yev).
(Geology, Stratigraphic)

GERLING, E. K.,

Gerling, E. K., Zhirov, K. K. - The Age of the Akchatau Rare Metal Intrusion According to Data Obtained by the Helium Method for Monazites.

The Sixth Session of the Committee for Determining the Absolute Age of Geologic Formations at the Department of Geologic-Geographical Sciences (OGGN) of the USSR Academy of Sciences at Sverdlovsk in May 1957.

Distr: $hE3d/hEh3$

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Determination of absolute age from the strontium-87/
strontium-86 isotope ratio in sedimentary rocks
 Department of Geology, University of Toronto, Canada
 M5S 1A5, Toronto, Ontario, Canada
 Report of a study of the isotopic composition of Sr
 from 3 samples, viz., from a young celestite from the North
 Devon River basin, a coarse-grained calcitic marble from
 Southern Karelia, and a marble from Marmoros Island.
 From the weighed portion of marble Sr was sepd. by means
 of an ion-exchange column. HCl (2.5N) was used as the
 wash liquid. Before use the HCl and the water were distd.
 First of all the position of the Pb, Rb, Ca, Sr, and Y peaks
 were detd. mass spectrometrically. Fe was detd. in the
 wash soln. colorimetrically. Ca was detd. nephelometrically
 and by means of radioactive indicators. Sr was converted
 to the sulfate for detn. mass spectrometrically. The Sr⁸⁷/
 Sr⁸⁶ ratio was the same in all 3 samples. During the course
 of the work it was noticed that appreciable isotopic frac-
 tionation occurred during evapn. or ionization of Sr atoms.
 This was undoubtedly a cause of the unexpectedly large
 fluctuations in the isotopic compn. of Sr from natural ob-
 jects. Detn. of isotopic compn. of Sr under the described
 conditions was not for this reason made with an accuracy
 greater than 1.5-2%. Results obtained show that use of
 the Sr⁸⁷/Sr⁸⁶ isotope ratio as a criterion of age of sedimentary
 formation is at present not feasible. 17 referenc.

Claude S. Macy

MM 111

GERLING, E.K.; MOROZOVA, I.M.

Determining the activation energy of the isolation of argon from micas.
Geokhimiia no.4:304-311 '57. (MIRA 12:3)

1. Laboratory of Precambrian Geology, Academy of Sciences, U.S.S.R.,
Leningrad.

(Argon--Isotopes) (Mica)

15-1957-10-14188

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 10, p 132 (USSR)

AUTHOR: Gerling, E. K.

TITLE: The Heat of Diffusion of Helium as a Criterion for the Suitability of Minerals for Age Determination by the Helium Method (Replota diffuzii geliya kak kriteriy prigodnosti mineralov dlya opredeleniya vozrasta po geliyevomu metodu)

PERIODICAL: Tr. Radiyev. in-ta AN SSSR, 1957, vol 5, Nr 2, pp 155-183

ABSTRACT: The driving off of He with time from different minerals heated to various temperatures was studied by the use of a specially constructed apparatus. The minerals used were uraninite, monazite, and poikilitic loparite. The heat of diffusion of He was computed from analysis of the curves of $\log (dQ/dt) - t$, where Q is the quantity of expelled He and t is time. It was ascertained that He occurs in different positions in different minerals and

Card 1/2

15-1957-10-14188

The Heat of Diffusion of Helium as a Criterion for the Suitability of Minerals for Age Determination by the Helium Method

that its expulsion is related to the heat of diffusion. There are at least five different positions in monazite. The heat of diffusion was determined for four of these: 6300, 27,800, 41,400, and 50,300 cal/gram atom of He. The author relates the first value to the transfer of He along fractures 1 to 2 A wide, the second to diffusion along cleavage fractures, and the third and fourth to the expulsion of He from several different "cells" of the crystal, situated between two neighboring intersecting cleavages. The heat of diffusion marks the facility of expelling He from minerals. With lower heats of diffusion, the loss of He by minerals increases. As shown by theoretical computations and confirmed by experimental data, when the value of heat of diffusion is 34,000 to 35,000 cal/gram atom of He, He is completely retained by the mineral. Thus the heat of diffusion may be used as a criterion for judging the suitability of a mineral for use in determining age by the helium method.

Card 2/2

L. I. Afanas'yeva

"The New Constant for the K Capture of K^{40} ; When the New Value is Used In the Calculation Higher Values for the Age are Obtained."

report presented at the 7th Session of the Commission for Determination of the Absolute Age of Geological Formations, at the Dept. Geological-Geographical Sciences, AN USSR, Moscow, 8-12 May 1958.

PHASE I BOOK EXPLOITATION

SOV/3887
SOV/37-M-16

Академия наук СССР. Комитет по метеоритам

Meteoritika; sbornik statey, vyp. 16 (Meteoritics; Collection of Articles, No. 16)
Moscow, 1958. 209 p. Errata slip inserted. Errata slip inserted for No. 15.
1,300 copies printed.

Ed.: V.G. Fesenkov, Academician; Deputy Resp. Ed.: Ye.L. Krinov; Ed. of Publish-
ing House: L.K. Nikolayeva; Tech. Ed.: T.V. Polyakova.

PURPOSE: This publication is intended for astronomers, geophysicists, astro-
physicists, and other specialists concerned with meteoritic phenomena.

COVERAGE: This collection contains 4 articles, a bibliographic index of material on
meteorites, and 23 abstracts and reports of papers presented at the Seventh Con-
ference on Meteorites organized by the Committee on Meteorites, Academy of
Sciences USSR, held in Moscow, November 14-16, 1956. The reports and articles
deal with the origin and composition of meteorites and their relation to other
elements in the solar system, the properties of stone meteorites, meteorite

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Meteoritics Collection of Articles, No. 16

SOV/3887

... on the earth and the moon, and specific meteorites such as those which fell in the Ukraine and in Mongolia. Several reports are devoted to the Sikhotealin' meteoric shower, its trajectory, chemical and mineral composition, structure, and the circumstances attending its fall. A brief note describes the activities of the Center for Meteorite Study, Division of Astronomy, Institute of Physics, Bulgarian Academy of Sciences. No personalities are mentioned.

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Meteoritics; Collection of Articles, No. 16

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Aaloe, A. Recent Data on Meteoritic Craters on the Island of Saaremaa in the Estonskaya SSR

Bonev, N. [Corresponding Member of the Bulgarian Academy of Sciences]. The Meteoritic Hypothesis of the Origin of Lunar Craters

Zotkin, I.T. The Popularization of Meteoritics (Abridged Report)

Pokshivnitskiy, G.S. The Morasko Meteorite

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Hatko, M.A. The Study of Minerals in Meteorites by the Method of Luminescence Analysis

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D'yakonova, M.I. Nickel Content in Samples of Iron Meteorites in the
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Massal'skaya, K.P. Bibliographic Index of Material on Meteoritics

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AVAILABLE: Library of Congress

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7-25-60

STANIK, I.Ye.; ~~LEBEDEV~~, I.I.; AFANAS'YEV, G.D.; GERLING, B.A.; KURILEV, I.I.;
PEKARSKAYA, T.B.; YUGANINOV, A.I.; POLEVAIA, E.I.

"Absolute geochronology of the U.S.S.R." *Biul.Kom. po opr.abs.vozr.geol.Sovm.*
no. 3+5-32 '58.

(Geological time)

AUTHOR: Gerling, E. K. 307/7-58-4-1/13

TITLE: The Influence of Metamorphism on the Results of Age Determination by Means of Lead (Vliyaniye metamorfizma na rezul'taty opredeleniya vozrasta po svintsu)

PERIODICAL: Geokhimiya, 1958, Nr 4, pp. 287-295 (USSR)

ABSTRACT: Fluctuations occur in the age determination of rocks from the ratio Pb^{206}/U^{238} ; Pb^{207}/U^{235} ; Pb^{207}/Pb^{206} and Pb^{208}/Th^{232} which hitherto have been explained by emanation. The author proves that the emanation is not sufficient for the explanation of the differences. The differences are caused by modifications in the metamorphosis, as is shown by the diagram according to Ahrens (Arens, Ref 16) and Wetherill (Wetherill, Ref 17). On this diagram the ratio Pb^{207}/U^{235} is plotted on the abscissa and the ratio Pb^{206}/U^{238} on the ordinate for various materials from the same deposit. The resulting points lie almost on a straight line; the formation time and the time of the last metamorphosis can be read off. The author gives 6 such diagrams. The investigation of the uranites of Belomore is especially interesting; an age of

Card 1/3

The Influence of Metamorphism on the Results of Age SOV/7-58-4-1/13
Determination by Means of Lead

$1950 \cdot 10^6$ years results instead of $1800 \cdot 10^6$ years which has been hitherto assumed. According to an age determination according to the potassium-argon method carried out parallelly on the basis of mica it is necessary to calculate anew the constant for the K-capture by K^{40} . The new value amounts to $5,49 \cdot 10^{-11} \text{ a}^{-1}$ and deviates by only 3% from the values obtained in the USA. In short, the author compiles the results of his paper, as follows:

- 1) The graphical method suggested by Ahrens - Wetherill (Ahrens - Wetherill) makes possible the computation of the real age of a mineral and the time of its last metamorphism.
- 2) This method can be used if the age t_1 which was computed from the ratio Pb^{207}/Pb^{206} is greater than that computed from the ratio Pb^{207}/U^{235} and Pb^{206}/U^{238} , i. e.
 $Pb^{207}/Pb^{206} > Pb^{207}/U^{235} > Pb^{206}/U^{238}$. There are 6 figures, 3 tables, and 30 references, 18 of which are Soviet.

Card 2/3

The Influence of Metamorphism on the Results of 30V/7-58-4-1/13
Age Determination by Means of Lead

ASSOCIATION: Laboratoriya geologii dokembriya AN SSSR, Leningrad
 (Leningrad Laboratory of the Geology of Precambrian
 of the AS USSR)

SUBMITTED: February 19, 1958

1. Rock--Geology
2. Rock--Age factors
3. Geological time
- Determination
4. Lead isotopes (Radioactive)--Applications

Card 3/3

GERLING, E. K.

with A. A. Polkanov "The potassium-argon method for the determination of the absolute age of rocks"

report presented at the Second All-Union Conf. on Petrography, Tashkent, 19-23 May 1956 (Geokhimiya, 3, '56, p507)

AUTHORS:

Gavling, E. K., Tschizhik, L. L.
Levskiy, L. K., Orshinnikova, G. V.

SOT/7-58-6-3/16

TITLE:

Age Determination of Some Micas According to the Rubidium-Strontium Method (Opredeleeniye vozrasta nekotorykh slyud po rubidyye-strontsiyevomu metodu)

PERIODICALS:

Gekkhimiya, 1958, Nr 6, pp 535 - 544 (USSR)

ABSTRACT:

At the beginning of the present paper problems of the rubidium-strontium age determination are discussed. The determination of micas allows to control the obtained values by means of the potassium argon method. Most of the 9 investigated samples come from the Kola peninsula. M. M. Yermolayev put them at the authors' disposal. They were not, as usual, decomposed with H_2F_2 and $HClO_4$, but according to Smith or in most cases according to Herzelius. Thus it was possible to avoid the formation of difficultly soluble potassium and rubidium difluorides. For the determination of the ratio of isotopes the method of isotope dilution by means of Rb^{85} and Sr^{84} was chosen. The analysis was carried out by means of the mass spectrometer MGA-30. The determinations lead to the following

Card 1/3

Age Determination of Some Micas According to
the Rubidium-Strontium Method

507/7-58-8-3/16

results: The age of the investigated pegmatite dikes of Kola is between 2 and 2.4 10^8 years. The results of Rb/Sr and R/Ar method agree best at the following constants are: decay constant of Rb^{87} $1.39 \cdot 10^{-11} a^{-1}$; K -capture of Rb^{87} $0.5 \cdot 10^{-10} a^{-1}$. The deviation in two cases may be explained by recrystallization of micas. By the comparison of the results it will perhaps be possible to determine the absolute age and the size of recrystallization. Mica from pegmatite of Mamkoy rayon, Sibir' is far younger than it could be assumed from geological data. There are 6 tables and 31 references, 6 of which are Soviet.

ASSOCIATION: Laboratoriya geologii dokembriya AN SSSR, Leningrad
(Laboratory of Geology of the Precambrian, AS USSR, Leningrad)

SUBMITTED: March 20, 1956

Card 2/3

3(3)

AUTHORS:

G. Ming, E. K., Morozov, I. M.

SNV/7-98-7-1/13

TITLE:

Investigation of the Kinetics of Argon Separation From Microcline-Perthite (Issledeniye kinetiki vydeleniya argona iz mikroklina-perlita)

PERIODICAL:

Geokhimiya, 1977, Nr 7, pp 615 - 620 (USSR)

ABSTRACT:

Microcline-perthite Parfilova Varzka was examined between 500 and 1000°. The argon content was determined according to 2 different methods: 1) Measurement by manometer following the method of Mak-Leod (McLeod) after the usual purification, and 2) Mass spectrometric determination. The mass spectrometric method turned out to be more advantageous. The curves of separation (Figs 1 and 2) were used to determine the energy of activation (Fig 3). The following values were obtained for the heat of diffusion: 15 000, 26 000, 42 000, 99 000, and 130 000 cal/g-atom. The first 3 of these values correspond to the diffusion of argon from the crystal lattice,

Card 1/2

Investigation of the Kinetics of Argon Separation From Microcline-Perthite SOV/7-56-7-1/73

which has been destroyed by the perthite treatment; the latter 2 values correspond to the diffusion from the undisturbed microcline lattice. The share of argon rather ready to be separated amounts to more than 20% (Table); this part is apt to be lost also in nature. This fact makes evident that microcline is not particularly appropriate means for determination of age. There are 3 figures, 1 table, and 12 references, 5 of which are Soviet.

ASSOCIATION: Laboratoriya geologii Kambriya AN SSSR, Leningrad
(Laboratory for the Geology of Pre-Cambrian Times
AS USSR, Leningrad)

SUBMITTED: June 23, 1956

Card 2/2

3(0)

AUTHORS: Gerling, E. K., Polkanov, A. A.

SOV/7-58-8-1/8

TITLE: The Problem of the Absolute Age of the Pre-Cambrian of the Baltic Shield (Problema absolyutnogo vozrasta dokembriya Baltiyskogo shchita)

PERIODICAL: Geokhimiya, 1958, Nr 8, pp 695 - 717 (USSR)

ABSTRACT: More than 240 absolute age determinations on mica were carried out by the K/Ar method, partly also by the Rb/Sr method. The samples came from the Kola peninsula (Kol'skiy poluostrov) (Tables 1 and 3), Kareliya (Tables 1 and 2), Finland (Finlandiya) (Table 4) and **Western White Sea region** (Table 5). The samples from Finland except one were supplied by the Finlyandskiy geologicheskiy institut, Khel'sinki (Finnish Geological Institute, Helsinki). A diagram allows a survey of the results obtained (Fig 1). On the basis of these results a new classification of the pre-Cambrian of the Baltic Shield was established (Table 5, Fig 2). Four large cycles of sedimentation were found for the Eastern part: the Karelian (Karel'skiy) (1900 to 1850.10⁶a), the

Card 1/3

The problem of the Absolute Age of the Pre-Cambrian of the Baltic Shield

White Sea (Belomorskiy) (1850 to 2100.10⁶a), the Svanian (Svanakiy) (2200 to 2400.10⁶a), and the Kitarovian (Kitarovskiyy) (2520 to 3400.10⁶a). Five or six intrusions of acid magma followed the orogenic movements. However, the mentioned data are only provisional and must be confirmed by the lead and Rb, Sr methods. The following results have been determined by all three methods: the age of the Rapakiwi granite and of the Hoglandian epoch (epokha khoglandiya) at 1640.10⁶a and the age of the postkarelian (postkarel'skiy) and postsvionian (postsvionskiy) intrusions of Finland: the postkarelian, postorogenic at 1650 - 1750.10⁶a, synorogenic at 1760 - 1850.10⁶a, the postsvionian, post-orogenic at 1550 - 1660.10⁶a, synorogenic at 1760 - 1860.10⁶a. An age determination by two methods on White Sea granites gave 1950.10⁶a. These data show the contemporary formation of postkarelian and postsvionian intrusions in Finland, Kareliya and the Kola peninsula. There are 2 figures, 6 tables, and 18 references, 10 of which are Soviet.

Card 2/3

- The Problem of the Absolute Age of the Pre-Cambrian of the Baltic Shield SOV/7-56-8-1/8

ASSOCIATION: Laboratoriya geologii dokembriya AN SSSR, Leningrad
(Laboratory for the Geology of the Pre-Cambrian, AS USSR,
Leningrad)

PRESENTED: Komissiya po opredeleniyu absolyutnogo vozrasta geologicheskikh formatsiy (Presented at the 7th Meeting of the Commission for the Determination of the Absolute Age of Geological Formations)

SUBMITTED: July 18, 1958

Card 3/3

GERLING, E.K.: LEVSKIY, L.K.

Origin of rare gases in stone meteorites. Meteoritika no.16:
24-29 '58. (MIRA 11:8)
(meteorites) (Gases, Rare)

GERLING, E. K.

"On the Migration of Isomerism K^{38} in nature "

report presented at the UNESCO Conf. on Utilization of Radioactive Isotopes
in Scientific Research, Paris, 9-20 Sept 1957.
Vestnik AN SSSR, v. 28, No. 1, 1958, p. 71-78.

3(1), 21(8)

AUTHORS:

Gerling, E. K., Levskiy, L. K.

SCV/20-123-3-10/54

TITLE:

The Products of Cosmic Radiation in the Meteorite Sikhote-Alin'
(Produkty kosmicheskoy radiatsii v meteorite Sikhote-Alin')

PERIODICAL:

Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 3, pp 420-423
(USSR)

ABSTRACT:

The present paper deals with the following problems:
1) Investigation of the relative isotope content of light noble gases (He, Ne, A) in individual specimens of meteoritic rain.
2) Investigation of the variation of the content of cosmogenetic products in the interior of a single large specimen.
Investigations were carried out with sample Nr 2093 of the Sikhote-Alin'-meteorite. The carrying out of analyses is described in short; the results obtained by this analysis are shown in a table and in a diagram. According to these results, there is no monotonous change of content in cosmogenetic products in the interior of the sample. There is also no flat maximum, the existence of which is in any case doubtful. The contents of cosmogenetic products of the "richest" and "poorest" samples differ from each other by the 15 to 20-fold. Apparently, the samples with a low content of cosmogenetic products belong

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The Products of Cosmic Radiation in the
Meteorite Sikhote-Alin'

SOV/20-123-3-10/54

to the deep layers of the meteorite. The cosmogenetic argon isotopes are A^{38} and A^{36} . The mean ratio A^{38}/A^{36} is $A^{38}/A^{36} = 1.62$. All three stable neon isotopes are present in equal numbers. The mean ratio A^{38}/Ne^{21} in some samples amounts to 6.8. According to the isotope yield of A and Ne, the primary particle energy amounts to ~ 1000 Mev. This value is somewhat lower than the assumed energy of cosmic particles. Several parts of the sample Nr 2093 have an increased content of cosmogenetic products. These samples correspond to such meteorite parts in which the inclusions of troilite (FeS) and schreibersite (Fe, Ni, Co)₃P are the most developed. For the purpose of determining the connection between the content of light elements and that of cosmogenetic products, several samples were chemically analyzed; results are given in a table. The increase of the neon-isotope content is not unexpected. The cross section of neon production from light nuclei (S, P) is greater than the corresponding cross section of neon production from iron. Explanation of the increased content of

Card 2/3

The Products of Cosmic Radiation in the
Meteorite Sikhote-Alin'

SOV/20-123-3-10/54

cosmogenetic argon isotopes is more complicated. No connection has as yet been found between the content of light nuclei and that of cosmogenetic isotopes, and therefore further investigation of this problem is necessary. There are 1 figure, 2 tables, and 17 references, 5 of which are Soviet.

ASSOCIATION: Laboratoria geologii dokembriya Akademii nauk SSSR (Laboratory for the Geology of the Precambrian of the Academy of Sciences, USSR)

PRESENTED: June 14, 1958, by A. A. Polkanov, Academician

SUBMITTED: June 10, 1958

Card 3/3

GERLING, B.K.; SHUKOLYUKOV, Yu.A.

Isotope composition and xenon content of uranium minerals.
Radiokhimiia 1 no.2:212-222 '59. (MIRA 12:8)
(Uranium ores) (Xenon)

GERLING, E.K.; SHUKOLYUKOV, Yu.A.; MAKAROVICHIN, B.A.

Determination of the half life of the spontaneous decay of U^{238}
from the xenon content of uranium minerals. Radiokhimiya 1
no.2:223-226 '59. (MIRA 12:8)
(Uranium--Decay) (Xenon)

GERLING, E.K.

SOV 7-59-6-14/17

Karamov, V. I., Enorre, K. G.

(S)

AUTHORS:

TITLE:

PERIODICAL:

ABSTRACT:

Determination of the Age of Geocological Formations (at the Oldenburger-geograficheskiy nauchnyy tsentr) [at the Oldenburger-geographical Scientific Center], May 16 - 22, 1959, Moscow

Geokhimiya, 1959, Nr. 6, pp. 569 - 604, (USSR)
The 8th regular session of the International Commission of the Absolute Age of Geocological Formations was held in Moscow from May 16 to 22, 1959 at the Institut geokhimiya (Institute of Geochemistry) building in V. I. Vernadskiy (Institute of Geochemistry and Analytical Chemistry Issel' V. I. Vernadskiy) in the most important parts of the USSR, which are to be presented to the 1st International Geological Congress. The following reports are submitted:
A. V. Polubnyy, **The Problem of the Absolute Age of the Rocks of the Urals and the Baltic Shield.**
A. P. Vinogradov, **The Absolute Age of the Urals.**
P. P. Sushchenko, **V. S. Gerasimov, and M. V. Krasnodar.**
Group of the International Commission of the Absolute Age of the Geocological Formations of the rocks of the Russian Federation.

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A. P. Vinogradov, **The Absolute Age of the Precambrian Rocks of the Urals and the Baltic Shield.**
L. Ya. Ennore, **The Absolute Age of the Eastern Part of the Antarctic Continent.**
A. Ya. Erlyozh, **The Absolute Age of the Rocks of the Tectonic Zone of the Tianshan Mountains.**
S. D. Ivanovskiy, **Results of the Geochronological Studies of the Rocks of the Tianshan Mountains.**
L. P. Ovechinnikov and M. A. Zakharenko, **The Absolute Age of the Tianshan Mountains.**
E. I. Poleva and G. A. Samoylov, **Absolute Age Determination of the Tianshan Mountains.**
L. F. Granyuz, **The Absolute Age of the Tianshan Mountains.**
Rocks of the absolute age of the granite intrusions of the Tianshan Mountains.

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The research work of a number of laboratories, IAN, GKOBI, LAGBI, MIREL, etc., etc., is mentioned. It is noted that a report of E. K. Gerling on isotope work in uranium minerals as well as on the results of research work carried out by the Laboratory of the Academy of Sciences of the USSR, the Laboratory of the USSR Academy of Sciences, and the Laboratory of Age Determination of the Academy of Sciences of the USSR under the supervision of the Institute of Atomic Energy and Flame Chemistry. The determination of the age of sedimentary rocks was discussed. It is noted that the age of sedimentary rocks well represented as boulders, sands, sandstones, clays, etc., in the report by E. K. Gerling and V. I. Ennore were the first to attempt to determine the absolute age of sedimentary rocks according to isotopic composition.

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POLKANOV, A.A.; GERLING, E.K.

Using the K-ar and Rb-Sr methods for the determination of the age
of Pre-Cambrian sediments in the Baltic Shield. Trudy Lib.geol.
dokem. no.9:7-41 '59. (MIRA 13:11)
(Baltic Shield--Geological time)

5(2), 5(4)
AUTHORS:

Gerling, E. K., Shukolyukov, Yu. A. SOV/75-14-1-21/32

TITLE:

Determination of Micro-Quantities of Xenon by Means of a Mass Spectrometer (Opredeleniye mikrokolichestv ksenona pri pomoshchi mass-spektrometra)

PERIODICAL:

Zhurnal analiticheskoy khimii, 1959, Vol 14, Nr 1, pp 104-107 (USSR)

ABSTRACT:

In the practical application of the xenon-method of determining the absolute age of minerals (Ref 1) the main problem to be solved is the ~~separation~~ and measurement of micro-quantities of xenon. In this connection the possibility of using the mass spectrometer MS-2M for the determination of small quantities of xenon ($10^{-6} - 10^{-5} \text{ cm}^3$) was investigated. For the purpose of gauging the mass spectrometer standard mixtures of argon and xenon were produced. Production of these mixtures was carried out in a high vacuum apparatus which is illustrated and described in this paper. By means of the mass spectrometer the xenon content was determined in artificial mixtures of varying composition. These mixtures were produced in the same apparatus that was used for gauged mix-

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Determination of Micro-Quantities of Xenon by
Means of a Mass Spectrometer

SOV/75-14-1-21/32

tures. The mixtures were also adsorbed on active carbon at -183° and were measured after desorption on the mass spectrometer. It was found that in the desorption of active coal a partial separation of argon and xenon occurs because xenon is more firmly bound. Part of the xenon remains adsorbed even at temperatures of 320° . Complete desorption of the xenon could be attained only by a reduction of the quantity of active coal to 0.04 g. Besides, partial adsorption of xenon occurs in the "cooling traps" cooled with liquid air. As this effect may be very great, a "cooling trap" with alcohol and dry ice (-78.5°) must be used for freezing out vapors. Two methods were employed for spectrometric measurement: The pressure method and the method of relative sensitivity. Both methods are explained in this paper. Accuracy is approximately the same in both. In the mass spectrometer pressure amounted to $1 \cdot 10^{-7}$ - $2 \cdot 10^{-7}$ torr. Use of the mass spectrometer MS-2M made it possible to determine $1 \cdot 10^{-6}$ - $5 \cdot 10^{-5}$ cm³ xenon with an average accuracy of $\pm 8\%$. For the final checking of the reliability of the results obtained the xenon content in the

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Determination of Micro-Quantities of Xenon by
Means of a Mass Spectrometer

SOV/75-14-1-21/32

uraninite Chernaya Salma was determined. The results obtained were compared with those of previously carried out xenon-determinations by the volumetric method (Ref 1), and results were found to agree well with one another. There are 3 figures, 2 tables, and 1 Soviet reference.

ASSOCIATION: Laboratoriya geologii dokembriya AN SSSR, Leningrad
(Laboratory for the Geology of the Precambrium of the AS USSR,
Leningrad)

SUBMITTED: November 25, 1957

Card 3/3

STARIK, I.Ye., otv.red.; SHCHERBAKOV, D.I., akademik, zamestitel' otv.red.;
BARANOV, V.I., prof., zamestitel' otv.red.; SHATSEIY, N.S., aka-
demik, red.; POLKANOV, A.A., akademik, red.; VINOGRADOV, A.P.,
akademik, red.; AFANAS'YEV, S.D., red.; GERLING, E.K., prof., red.;
PEKARSKAYA, T.B., kand.geologo-mineral.nauk, red.; IVANOV, B.V.,
red.izd-va [deceased]; GUSEVA, A.P., tekhn.red.

[Transactions of the sixth session of the Committee on the Deter-
mination of the Absolute Chronology of Geological Formations,
May 22-27, 1957] Trudy shestoi sessii komissii po opredeleniiu
absoliutnogo vozrasta geologicheskikh formatsii; 22-27 maia 1957 g.
Moskva, 1960. 306 p. (MIRA 13:7)

1. Akademiya nauk SSSR. Komissiya po opredeleniyu absolyutnogo
vozrasta geologicheskikh formatsiy.
(Geological time)

STARIK, I.Ye., otv.red.; SHCHERBAKOV, D.I., akademik, zamestitel' otv.
red.; BARANOV, V.I., prof., zamestitel' otv.red.; VINOGRADOV, A.P.,
akademik, red.; POLKANOV, A.A., akademik, red.; SHATSKIY, N.S.,
akademik, red.; AFANAS'YEV, G.D.; GERLING, E.K., prof., red.;
PEKARSKAYA, T.B., kand.geol.-miner.nauk, red.; SIMKIN, S.M., red.
izd-va; KUNI, Ye.V., tekhn.red.

[Transactions of the Seventh Commission on the Determination of
the Absolute Chronology of Geological Formations] Trudy Sed'moi
sessii Komissii po opredeleniiu absolutnogo vozrasta geologicheskikh
formatsii, 8-12 maia 1958 g. Moskva, 1960. 432 p. (MIRA 13:6)

1. Akademiya nauk SSSR. Komissiya po opredeleniyu absolutnogo voz-
rasta geologicheskikh formatsiy. 2. Chleny-korrespondenty AN SSSR
(for Starik, Afanas'yev).

(Geology, Stratigraphic)

ABSTRACT:

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TITLE:

...

PERIODICAL:

...

ABSTRACT:

...

$$\Delta_{n+1} = (1 + \frac{1}{n}) \Delta_n$$

$$\Delta_{n+1} = \Delta_n + \frac{\Delta_n}{n}$$

...

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Average Number of Neutrons Produced by Spontaneous Fission of ^{235}Pu Reported to the Editor

1957

of ^{235}Pu and ^{239}Pu are $\lambda_{sp} = 0.00017 \pm 0.00001 \text{ sec}^{-1}$ and $\lambda_{sp} = 0.00017 \pm 0.00001 \text{ sec}^{-1}$ respectively. The mean value of λ_{sp} is $(0.0 \pm 0.5) \cdot 10^{-4} \text{ year}^{-1}$. The value of ΔH_{sp} is $0.01 \text{ cal/cm}^2/\text{hr}$ and $\bar{D}_{sp} = 1.1$. This is in excellent agreement with the calculations of Kuz'minov and Salrenkin (Journal of experimental and theoretical physics, 37, No 2(e), Nov. (1967)) who calculated \bar{D}_{sp} as 1.0 from the exact values of nuclear fission reactions. These calculations agree with experimental data for Pu^{230} , Pu^{232} , Pu^{234} , Pu^{236} , Pu^{238} , Pu^{240} , Pu^{242} , Pu^{244} , Pu^{246} , and Pu^{248} . The only disagreement is with the experimental value for Pu^{235} , calculated by E. Soper, which is lower than the value calculated by Soper, 4 Soviet, International, 1961, U.S.S.R. The most recent U.S. value for λ_{sp} of ^{235}Pu is: $\lambda_{sp} = 0.00017 \text{ sec}^{-1}$, P. T. P. International, 1961, New York,

Card 2/3

average number of great-grandchildren
Spontaneous Mutation of HBB. Letter
to the Editor

1959
3979-3980

1958; P. Kuroda, R. Edwards, J. L. G., and Paul.
Chem., 5, 586 (1957); J. Finsen, Proc. of the Symposium
on the Ego. of Plasma, York River, Ontario, 1956,
p 238; P. Kuroda, R. Edwards, J. Chem. Phys., 23, No
11, 1940 (1957); E. Searle, Phys. Rev., 60, 21 (1955).

SUBMITTED: April 12, 1959

Card 3/3

GERLING, N.K.; LEVSKIY, L.K.

Products of cosmic radiation in the Sikhote-Alin meteorite.
Meteoritika no.18:100-105 '60. (MIRA 13:5)
(Sikhote-Alin Range--Meteorites)

GERLING, Erik Karlovich. Prinimali uchastiye: YASHCHENKO, M.L., starshiy nauchnyy sotrudnik; YERMOLIN, G.M., starshiy nauchnyy sotrudnik; TITOV, N.Ye., mladshiy nauchnyy sotrudnik; AFANAS'YEVA, L.I., mladshiy nauchnyy sotrudnik; KOL'TSOVA, T.V., mladshiy nauchnyy sotrudnik; OVCHINNIKOVA, G.V., mladshiy nauchnyy sotrudnik; SHUKOLYUKOV, Yu.A., mladshiy nauchnyy sotrudnik; LEVSKIY, L.K., mladshiy nauchnyy sotrudnik; MOROZOVA, K.M., mladshiy nauchnyy sotrudnik; MATVEYEVA, I.I., mladshiy nauchnyy sotrudnik; BARKAN, V.G., mladshiy nauchnyy sotrudnik; BARANOVSKAYA, N.V., mladshiy nauchnyy sotrudnik; VARSHAVSKAYA, E.S., mladshiy nauchnyy sotrudnik; SERGEYEV, A.N., starshiy laborant; KURBATOV, V.V., starshiy nauchnyy sotrudnik; KRAT'S, K.O., kand.geol.-mineral.nauk, otv.red.; ARON, G.M., red.izd-va; BOGHEVER, V.T., tekhn.red.

[Present status of the argon method for age determination and its use in geology] Sovremennoe sostoianie argonovogo metoda opredeleniia vozrasta i ego primenenie v geologii. Moskva, Izd-vo Akad.nauk SSSR, 1961. 130 p. (MIRA 14:12)

1. Radiyevyy institut im. V.G.Khlopina (for Kurbatov).
(Geological time) (Radioargon dating)

1 (2) 2.1550

AUTHORS: Gerling, E. E., Lyskiy, L. K.

SSR/86-130: 11/69

TITLE: The Cosmic Age of the Meteorite of Sph. to All.

PERIODICAL: Doklady Akademii Nauk SSSR, 1969, Vol. 110, No. 1, pp. 45 - 46 (USSR)

ABSTRACT: In the present paper the content of the radioactive isotopes H^3 and A^{10} in the meteorite of Sph. to All. is determined. A counter with relatively low background was constructed for measuring the low activities to be expected. An accurate description of this device and the experimental technique will be given in a separate paper. The results of measurements are summarized in table 1. The data obtained from irradiation with iron targets with 3.10^3 Mev protons yielded $He^3/H^3 = 2.4$ for the ratio of the He^3 and H^3 nuclei. Thus, the value $1.3 \cdot 10^{13}$ at/g is obtained for the amount of H^3 formed by tritium decay. By means of this quantity and the rate of tritium decay (i.e., the rate of production after equilibrium has occurred) the duration of irradiation or the cosmic age of the meteorite was found to

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The Cosmic Age of the Meteorite of Sikhotealin

SOV/72-70-1-1/69

$(200 \pm 200) \cdot 10^6$ years. The computation of the total amount of decayed A^{39} nuclei is very complicated. A^{39} decays into K^{39} , and the latter is added to the potassium contained in the meteorite. This potassium admixture cannot be reliably determined by experiments. The amount of decayed A^{39} nuclei, however, can be estimated proceeding from the content of A^{39} ($\approx 1.1 \cdot 10^{-7}$ cm³/g). By taking into account several corrections A^{39}/A^{38} is found to be 0.5. After introduction of these corrections the amount of the K^{39} atoms formed by the decay of A^{39} is $1.7 \cdot 10^{12}$ at/g. Herefrom it follows that the duration of irradiation $T = (430 \pm 50) \cdot 10^6$ years. This value is close to that obtained by E. L. Fireman (Ref 1), and is obviously the most reliable one. The duration of irradiation obtained here allows to estimate the number N of cosmic particles per 1 cm² and 1 sec from the amount of A^{39} . $N = 2n / \sigma_A n_0 T$, where n denotes the number of the A^{39} atoms in 1 g, n_0 - the number of iron atoms in 1 g, σ_A the near production cross section of

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The Cosmic Age of the Meteorite of Sikhote-Alin

SOV/20-30-11/69

A^{16} . Therefrom it results that $N = 2.3$ particles/cm².sec. This value is in satisfactory agreement with the experimental data for the intensity of cosmic radiation in the polar regions of the Earth (2 particles/cm².sec). There are 1 table and 4 references.

ASSOCIATION. Laboratoriya geologii dokambriya Akademii nauk SSSR (Laboratory for the Geology of the Pre Cambrian of the Academy of Sciences of the USSR)

PRESENTED. March 11, 1959, by L. A. Polkanov, Academician

SUBMITTED. March 11, 1959

Card 3/3

STARIK, I.Ye., otv. red.; SHCHERBAKOV, D.I., akademik, zam. otv. red.;
BARANOV, V.I., prof., zam. otv. red.; VINOGRADOV, A.P., aka-
demik, red.; SHATSKIY, N.S., akademik, red. [deceased]; POL-
KANOV, A.A., akademik, red.; AFANAS'YEV, G.D., red.; GERLING,
E.K., prof., red.; PEKARSKAYA, T.B., kand. geol.-miner. nauk,
red.; ARON, G.M., red. izd-va; ZAMARAYEVA, R.A., tekhn.
red.

[Transactions of the ninth session of the Commission for the
Determination of the Absolute Age of Geologic Formations,
June 14-18, 1960] Trudy devyatoi sessii Komissii po oprede-
leniiu absoliutnogo vozrasta geologicheskikh formatsii, 14-
18 iyunia 1960 g. Moskva, 1961. 331 p. (MIRA 14:8)

1. Akademiya nauk SSSR. Komissiya po opredeleniyu absolyutnogo
vozrasta geologicheskikh formatsiy. 2. Chlen-korrespondent AN
SSSR (for Starik, Afanas'yev)
(Geological time)

GERLING, E.K.; MORZOVA, I.M.; KURBATOV, V.V.

Retention of radiogenic argon in powdered potassium minerals.
Geokhimiia no.1:39-48 '61. (MIRA 14:3)

1. Laboratoriya geologii dokembriya i Radiyevyy institut im.
V. G. Khlopa AN SSSR, Leningrad.
(Argon)
(Microcline)
(Mica)

POLKANOV, A.A.; GERLING, I.I.

Geochronology and geologic evolution of the Baltic Shield and
its folded margin. Trudy Lab.geol.dokem. no.12:7-102 '61. (MIRA 14:11)
(Baltic shield--Geological time)

POLKANOV, A.A.; GERLING, E.K.

Pre-Cambrian geochronology of the Baltic Shield. Trudy Len. ob-va
est. 72 no.1:63-66 '61. (MIRA 15:3)
(Baltic Sea region--Geology, Stratigraphic)

23891

1966/03/001/017/020
A05/A:29

3,1900 (1057,1062)

AUTHORS: Verling, H. H. L. & L. A. L.

TITLE: The effect of iron isotopes upon identifying targets with
F¹⁹C and Fe⁵⁷ isotopes

PERIODICAL: Radiochimica Acta, v. 3, p. 1-10, 1961, 27-100

TEXT: The authors discuss the target of neutron activation analysis in a
neutrony. It is shown that certain isotopes, according to
Ref. 1, it was previously established that certain isotopes of iron, enriched
enriched with Fe⁵⁷ and Fe⁵⁴ isotopes (Fe⁵⁷ and Fe⁵⁴) yield a rela-
tively higher amount of ⁵⁹Fe than the natural iron. The
assumption that the isotopes of iron, enriched with the nuclei of
average weight Fe⁵⁷ and Fe⁵⁴ in the target, causes an in-
crease in nuclear reaction cross-sections, according to theories and experi-
mental data is highly unlikely. In conclusion the authors establish

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