

AMIRKHANOV, A. Kh.

(3)  
✓ Protein fractionation by successive precipitation. B. N. Amirkhanova and A. Kh. Amirkhanov (Bashky Branch Acad. Sci. U.S.S.R., Ufa). *Biokhimiya* 19, 19-23(1944).— A method is detailed for the successive pptn. of proteins from 0.5% soln. of uranyl nitrate. The protein-pptn. curves are identical with electrophoretic pptn. curves. The distribution of the uranyl nitrate in the pptd. protein fractions is detd. by making use of the radioactive properties of the reagent. It serves as an indicator of the pptn. distribution of the proteins.  $\gamma$ -Globulins appear most reactive with uranyl nitrate. The method serves the same needs as the Tiselius (C.A. 32, 1728'), and has the advantages of low cost, simplicity, rapidity, and nearer complete sepn. of the protein fractions. B. S. Levine

AMIRKHANOV, A.Kh.

Derivation of the equation for the solubility of gases in liquids as a function of the thermal mode of motion, and formulation of some empirical correlations. Uzb. khim. zhur. no.1:39-43 '61.  
(MIRA 14:1)

1. Tashkentskiy gosudarstvennyy universitet imeni V.I. Lenina i Ufinskiy aviatsionnyy institut.  
(Solubility) (Gases)

AMIRKHANOV, A.Kh.

Energy of interaction between particles of a gas obeying  
the law of U.Henry and water molecules. *Uzb.khim.zhur.*  
no.5:37-43 '61. (MIRA 14:9)

1. Tashkentskiy gosuniversitet im. V.I. Lenina i Ufinskiy  
aviatsionnyy institut Gosudarstvennogo vozdushnogo flota.  
(Gases) (Solvents)

AMIRKHANOV, A.Kh.

"Stray" points of the composition on melting diagrams and  
the causes of their appearance. Zhur. neorg. khim. 9 no.8:  
2011-2014 Ag "64.

(MIRA 17:11)

AMIRKHANOV, A. Kh.

Deriving equations for salt crystallization fields in the system  
 $2\text{NaCl} + \text{MgSO}_4 \rightleftharpoons \text{Na}_2\text{SO}_4 + \text{MgCl}_2$  and  $\text{H}_2\text{O}$ . Zhur. neorg. khim. 9  
no.11:2645-2658 N '64 (MIRA 18:1)

33066

S/169/61/000/012/073/089  
D228/D305

3.9110(1121, 11442)

AUTHOR:

Amirkhanov, B. F.

TITLE:

Spine generators and the prospects of their application for measuring the geomagnetic field

PERIODICAL:

Referativnyy zhurnal, Geofizika, no. 12, 1961, 2, abstract 12G9 (Tr. Ural'skogo politekhn. in-ta, 1961, no. III, 108-122)

TEXT: The possibilities of applying spine generators for directly measuring the magnetic field are discussed. The following types of such generators are considered. (1) The Schmelzer generator in which a system of magnetic moments having the natural frequency  $\omega_0 = \gamma H_0$  where  $\gamma$  is the magnetomechanical ratio and  $H_0$  is the intensity of the outer field, is used as an equivalent oscillatory circuit. When appraising the possibility of the practical application of this generator, the author considers

Card 1/3

33066

S/169/61/000/012/073/089  
D228/D305

Spine generators and...

that the best results can be obtained by using in it an electron magnetic resonance in a sodium-ammonia solution. (2) A generator with a flowing pattern in which the precession of the magnetization vector in the field under measurement is sustained by a continuous influx of liquid with an unequiponderant degree of magnetization: The essential defect of this generator is its cumbersome nature connected with the system of tubes, pumps, etc. (3) "Maser"-type generators, i.e., quantum systems which, on the absorption of a definite magnitude of a given frequency, emit great power of the same or lesser frequency: Such generators include the "maser" with a flowing pattern and the "maser" utilizing the inverse effect of Overhauser. A general defect of all the above-mentioned generators is the presence in them of adjusted circuits which under certain conditions may lead to the appearance of the coupling-hysteresis effect and consequently to negligible deviations of the frequency of the generated oscillations from the Larmor frequency. "Masers" based on the principle of optical "pumping" in couples of alkali metals are of considerable interest

+

Card 2/3

**AMIRKHANOV, B.F.**

Spin generators and the prospects of their use in measuring  
the geomagnetic field. Trudy Ural. politekh. inst. no.111:  
108-122 '61. (MIRA 16:6)

(Magnetism, Terrestrial—Measurement)



L 17015-66 EWT(1)/EWT(1R)/FCC/ENP(t) IJP(c) JD/GW  
ACC NR: AT6004292 (N) SOURCE CODE: UR/0175/65/000/026/0020/0025

AUTHOR: Amirkhanov, B. F.; Ryzhkov, V. M.

ORG: none

TITLE: Narrowing the magnetic resonance line in a helium magnetometer 10

SOURCE: USSR. Gosudarstvennyy geologicheskyy komitet. Osnovnoye konstruktorskoye byuro. Geofizicheskaya apparatura, no. 26, 1965, 20-25

TOPIC TAGS: magnetometer, helium magnetometer

ABSTRACT: The width of the resonance line in a helium magnetometer was measured during a pulsed discharge in the absorbing cell. The measurements were conducted by reducing the rf field amplitude to a level at which the width of the observed signal was practically independent of the saturation factor. A further reduction in the line width requires a decreased optical width, which is obtained by lowering the intensity of the light source. However, in this case the signal strength is also affected. It was found that during a pulsed excitation, the width of the magnetic resonance line can be reduced to  $1.2 \times 10^{-5}$  oe, i.e., almost 50 times narrower than the line width obtained with a continuous discharge. With rf broadening taken into account, a line width of the order of  $3 \times 10^{-5}$  oe can be obtained. Thus, the use of a pulsed discharge eliminates the basic deficiency of the helium magnetometer, i.e., the large width of the magnetic resonance line. In comparison with rubidium and cesium magnetom-

Card 1/2

L 11961-66 EWT(m) DIAAF

ACC NR: AP5026601

SOURCE CODE: UR/0056/65/049/004/1097/1102

AUTHORS: <sup>44,55</sup> Amirkhanov, I.; <sup>44,55</sup> Zakhar'yev, B. N.

44  
41  
B

ORG: <sup>44,55</sup> Joint Institute of Nuclear Research (Ob'yedinenny institut yadernykh issledovaniy)

TITLE: Violation of barrier penetration symmetry for composite particles <sup>19 44,55</sup>

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 4, 1965, 1097-1102

TOPIC TAGS: nuclear potential barrier, nuclear particle, elementary particle, *computer calculation*

ABSTRACT: This paper is a continuation of investigations of the specific properties of composite particles moving in an external field (Ann. der Phys. v. 14, 229, 1964 and v. 15, 5, 1965). The correctness of the method employed in the article was also investigated previously (Ann. der Phys. v. 15, 183, 1965). Basic equations are first derived, describing the motion of a composite particle in an external field, and it is shown that the ratio of the coefficients of barrier penetrability in opposite directions must depend on the shape of the barrier. The

Card 1/2

L 11961-66

ACC NR: AP5026601

energy dependence of the effect under discussion at the threshold of excitation of the composite particle is given, after the effect is analyzed for the limiting case of small barrier asymmetry. The results of computer calculations for a specific potential barrier are then presented. It is shown that the penetration coefficients for asymmetric barriers in opposite directions may be very different for composite particles if their energy is sufficient for actual excitation of the higher states of internal motion. This effect should manifest itself in various atomic and nuclear phenomena. Authors thank S. N. Sokolov, discussion with whom stimulated this research. Orig. art. has: 341, 55 figures and 21 formulas.

3

SUB CODE: 20/ SUBM DATE: 30Dec64/ NR REF SOW: 002/ OTH REF: 004

*beh*

Card 2/2

AMIRDZHANOV, K.A., kand. med. nauk

Seasonal nature of epidemic hepatitis. Azerb. med. zhur. 41  
no.9:73-78 S '64. (MIRA 18:11)

1. Iz kafedry detskikh infektsionnykh bolezney Azerbaydzhanskogo  
gosudarstvennogo meditsinskogo instituta imeni Narimanova  
(nauchnyy konsul'tant raboty - prof. B.F. Medshidov), Baku.  
Submitted December 24, 1963.

AMIRDZHANOV, K.A.

C-reactive protein content in the blood of children with  
infectious hepatitis. Azerb. med. zhur. 42 no.8:71-76 Ag '65.  
(MIRA 18:11)

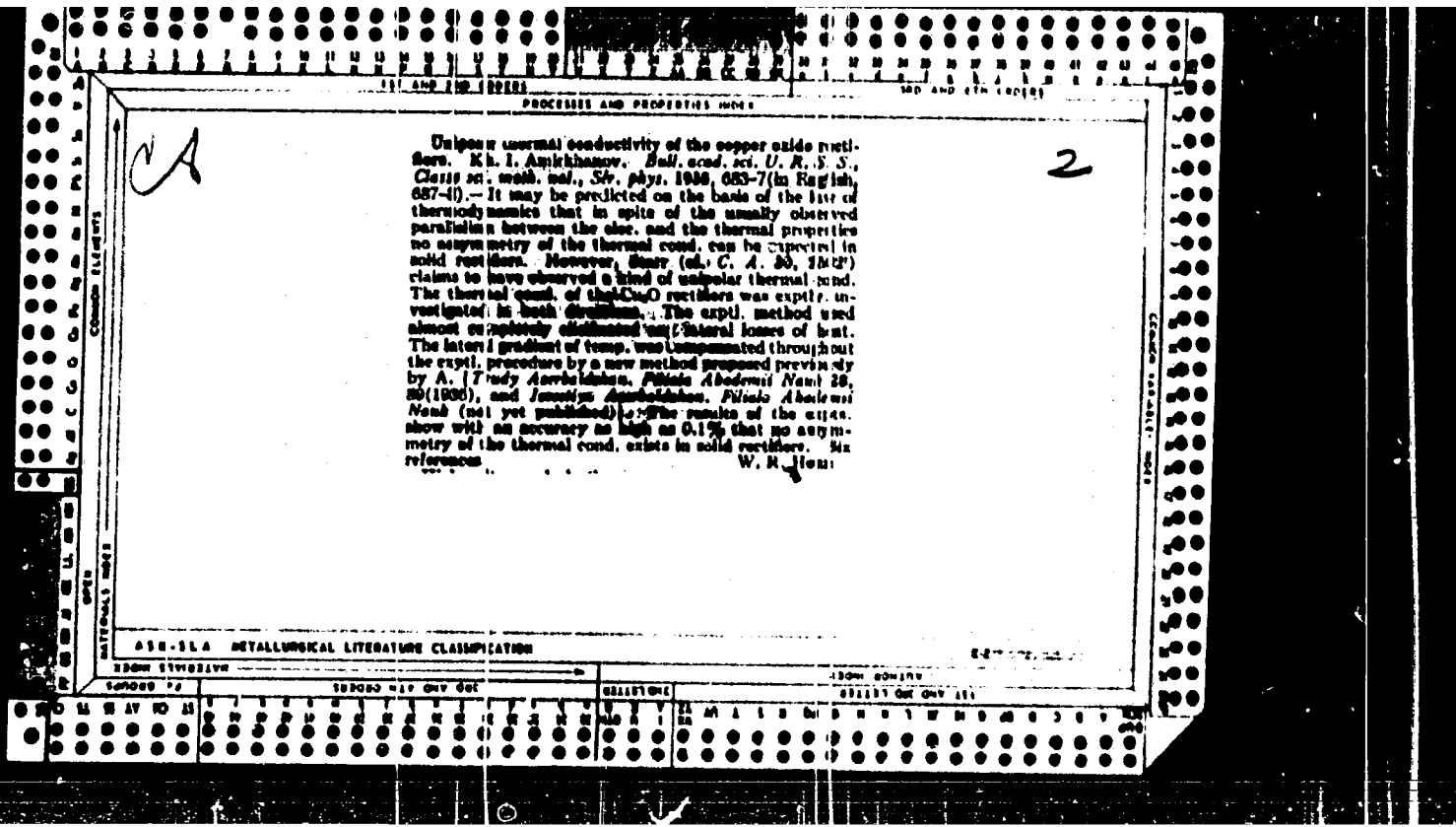
1. Iz kafedry detskikh infektsionnykh bolezney (zav. - dotsent  
M.M. Kulyev) Azerbaydzhanskogo gosudarstvennogo meditsinskogo  
instituta imeni Narimanova (rektor - prof. Mh.A. Gasanov).

A. AMIRKHANOV, Ph. I.

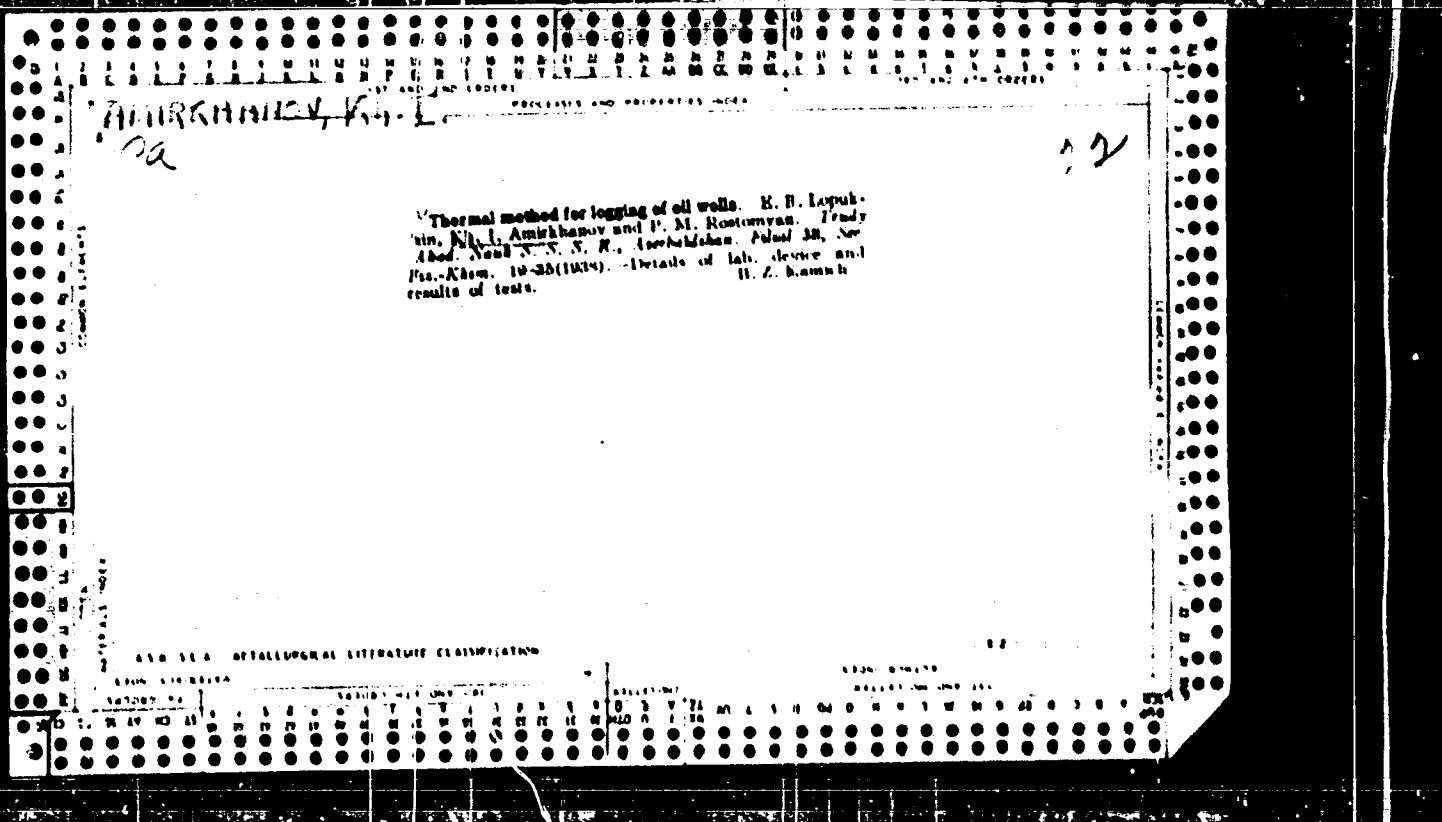
Amirkhanov, Ph. I. "Contribution to the Method of Determining the Coefficient of the Heat Conductivity of Rocks." *Trudy Azerbaidzhanского Filiala Akad. Nauk U.S.S.R., Fiz.-Khim. Seriya, Baku, vol. 26, 1936, pp. 81-98.*

AMIRKHANOV, Kh. I.

Amirkhanov, Kh. I. "An Investigation of the Electrical Conductivity of Rocks." Trudy Azerbaidzhanskogo Filiala Akad. Nauk S.S.S.R., Fiziko-Khimicheskaya Seriya, 1936, vol. 28, pp. 99-116.







113  
M. A. ...  
2148  
**The Thermal Energy of Rectification.** H. I. Anshin. *Dokl. Akad. Nauk SSSR*, 1957, Vol. 127, No. 5, pp. 447-450. In Russian with English summary. A semiconductor placed between two electrodes becomes a rectifier if the electrodes are kept at different temperatures. Experiments with Cu<sub>2</sub>O and PbS are described and the results tabulated and curves plotted. The direction of rectification depends on whether the conductivity of the sample is of the electron or hole type. The distribution of resistivity in the barrier layer was also investigated. A theoretical interpretation of the results is given.

621 414 (1) 1944 (1) 11

**The Asymmetry of Conductivity in Diatomic Semiconductors.** *Nb. Amsharov.* *Zh. fiz. i khim. 1944.* Vol. 18, No. 9, pp. 109-102. The experimental data are summarized with which the dependence of the asymmetry is associated. It is shown that the asymmetry is associated with the difference in the shape of the two conductive bands of the two electrodes. (b) Temperature dependence. Experimental data, supplemented by the author's own experiments, are surveyed, and the theoretical implications of each of the above factors discussed. The effects of combining several of these factors are then considered under the following headings: (a) Contact between a metallic needle and a crystal. Heat is generated at the point of the contact, and thus both factors 1 and 3 are effective in this case. The two effects are cumulative in appearance, but other effects are cumulative in appearance, but other effects according to the type of conductivity of plate rectifiers. No definite indication is available as to whether factors 1 and 3 are essential in this case with factor 2. (b) Thermal rectification in this is effective simultaneously with factors 1 and 3. It is pointed out that in the case of copper oxide thermal rectification can only take place if there is a high resistance layer on the electrode. This is proved by a number of experiments in which copper-oxide plates were etched by nitric acid. The results of these experiments given in series 2 show that thermal rectification has a negligible influence on plates with polished surface.

*Handwritten notes:*

11/11/44

11/11/44

*Handwritten mark:*

2

110

2342

021 114 03 1 022 318 34

An Anomalous Phenomenon in Thermal Rectification in Lead Sulphide (Preliminary Communication). Kh. Amirkhanov. *Izv. Akad. Nauk SSSR*, 1944, Vol. 14, No. 6, pp. 103-104. Experiments were conducted with lead sulphide obtained chemically in the form of a black powder. Samples at room temperature and a pressure of 1000 kg/cm<sup>2</sup> possessed a hole-type conductivity, and a resistivity of  $4 \times 10^8 \Omega \cdot \text{cm}$ . After heat treatment at 200°C, depending on the duration of the treatment, the resistivity decreased, and the hole-type conductivity was replaced by that of the electron type. In one sample, however, conductivity of the electron type changed again to the hole type after a current had passed for 30-60 sec. The phenomenon also occurred when the direction of the temperature gradient was changed. No residual polarization or other effects were observed. A table of the experimental data is given.

25

*Handwritten notes:*  
*10/10/42*      *Sh. Sh.*

1942  
**The Effect of Temperature Gradient on the Rectifying Action of Copper Oxide Rectifiers.**  
 Kh. Amirkhanov. (Zh. tekhn. fiz., 1942, Vol. 14, No. 7, pp. 104-107.) Experiments were conducted with plates of various types with facilities for varying the temperature at both sides of the plate within a range of 15 to 150°C. The apparatus used is described, and the results obtained are shown in three tables. The main conclusion reached is that heating the upper electrode (cathode) and cooling the lower (anode) considerably improves the rectifying action. At the same time the sensitivity of the plate is also raised. It appears that under these conditions the thermal rectification is superimposed on the normal rectifying process. It is suggested that in practice provision could be made for cooling only the copper surface at the rectifier elements. This would not only decrease the forward resistance, but also raise the permissible current density, as shown by Sharavski (ibid. p. 1078).

Some of the results obtained in these experiments are also discussed from the point of view of an investigation of the barrier layer in copper oxide rectifiers by means of a thermal probe, reported by the author elsewhere.

AMIRKHANOV, Kh. I.

Amirkhanov, Kh. I. - "An investigation of the thermal and electrical properties of electronic semiconductors", Izvestiya Akad. nauk Azerbaydzh. SSR, 1949, No. 4, p. 39-50, (Resume in Azerbaijani), - bibliog: 13 items.

SO: U-4630, 16 Sept. 53, (Letopis 'Zhurnal 'nykh Statey, No. 23, 1949).

AMIRKHANOV, Kh. I.

USSR/Physics - Semiconductors, Thermal Rectification Mar/Apr 52

"Thermal Rectification," M.U. Gashim-Zade, Inst of Phys and Math, Acad Sci Azerbaydzhan SSR

"Iz Ak Nauk, Ser Fiz" Vol XVI, No 2, pp 218-224

Thermal rectification or asym elec cond was first detected by Kh. I. Amir-khanov ("Zhur Eksp'er 1 Teoret. Vol 5, No 4, 5, 1941; "Iz Ak Nauk, Ser Fiz" No 1940). Exptl research by author proved that

220796

Thermal rectification is found in all semiconductors with either electron or hole cond; that the coeff of thermal cond is a function of temp gradient and depends on potential; rectification coeff could be improved by creation of thermal field.

220796

USSR/Physics - Semiconductors

1 Jul 53

"Rectification by Semiconductors Located in a Thermal Field," I. M. Tsidilkovskiy, Dagestan Affiliate, Acad Sci USSR

DAN SSSR, Vol 91, No 1, pp 63-66

Investigated thermal rectification, first studied by Kh. I. Amirkhanov (Iz Ak Nauk, Ser Fiz 4 (1941); Zhur Eksp i Teoret Fiziki, 14, 187 and 195 (1944)). Computed rectification coeff agreed with exptl ones. The rectification coeff rises with the difference between electrode temps. Presented by Acad A. F. Ioffe, 22 Apr 53.

266T98



AMIRKHANOV, KH. I.

USSR/Physics - Heat Capacity

11 Jul 53

"Heat Capacity of the System Water-Phenol in the Critical Range," Kh. I. Amirkhanov, Active Member, Acad Sci Azerbaydzhan SSR, and I. G. Gurvich, Dagestan Affiliate, Acad Sci USSR

DAN SSSR, Vol 91, No 2, pp 221-223

Tests showed that K. G. Khomayakov et al (Zhur Fiz Khimii 25 (1951)) erroneously interpreted the slowing of cooling near the critical range as a jump of heat capacity. As demonstrated by V. K. Semenchenko (ibid 73 (1950)) the viscosity of the soln rises sharply near the critical point. Received 8 May 53.

276T24

AMIRKHANOV, R. M.

4E2D  
Spectral-luminescent analysis of Daghestan crude oil  
K. I. Amirkhanyan, I. L. Sklyannik and R. I. Bashirayev  
Doklady Akad. Nauk SSSR 1975, 236, 191-193  
(1954). Luminescence analysis of the crude oil was  
carried out on samples of Daghestan crude oil. Typical  
luminescence spectrum curves are given. It is noted that  
the shape of the curves is the result of the presence of  
deposits of the same origin. The method of analysis  
The app is suitable for oil tests.

4E2D  
11/26

AMIRKHANOV, KH. I.

USSR/Physics - Conductivity

Card 1/1 : Pub. 22 - 12/49

Authors : Amirkhanov, Kh. I., Active member of the Acad. of Scs. of the AzSSR;  
Daibov, A. Z.; and Zhuze, V. F.

Title : Regarding the question about the change of heat conductivity of  
semi-conductors in a magnetic field

Periodical : Dok. AN SSSR 98/4, 557-560, Oct. 1, 1954

Abstract : Experimental studies of changes in heat conductivity of semi-conductors  
in magnetic fields are described. The purpose of these studies was  
to determine the causes of the observed deviations (from the theory)  
in the heat conductivity of some semi-conductors (such as Te, MoS<sub>2</sub>,  
etc.) in magnetic fields. Twenty references (1901-1952). Table;  
graph.

Institution : Physical Laboratory of the Dagestan branch of the Acad. of Scs. of  
the USSR

Submitted : ...

AMIRKHANOV, Kh. I.

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

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 36317

Author: Amirkhanov, Kh. I., Gurvich, I. G., Sardarov, S. S.

Institution: None

Title: Mass-Spectrometric Accelerated Method of Determining the Absolute Age of Geological Formations Using the Radioactive Decay of  $K^{40}$  in  $Ar^{40}$

Original Periodical: Izv. AN SSSR, ser. geol., 1955, No 4, 80-87

Abstract: A method was developed for accelerated determination of the absolute age of rocks by argon-potassium methods. The total time of one determination of the amount of the radiogenic argon is 1-2 hours. The data obtained are in good agreement with the data measured by other methods. The values of the decay constants of potassium were taken from the data by E. K. Gerling. Measurements were made on the age of rocks and minerals in the northern Caucasus. The results of these measurements make it possible to

Card 1/2

AMIRKHAPOV, N. T.

Mass spectrometric method for measuring the quantity of  
 radionuclides in geological formation samples for a deter-  
 mination of their absolute age. Kh. I. Amirkhanyan, I. G.  
 Gurvich, L. S. Slusky, and S. S. Zolotarev. *Geochem. Int.*  
 25, 28-40 (1988). Argon can be expelled from minerals by  
 high-frequency heating to 1800°. After sepn. of Ar from  
 H<sub>2</sub>O, CO<sub>2</sub>, Ca, Na, CO, Fe, etc. the Ar<sup>39</sup>:Ar<sup>40</sup> ratio was detd.  
 by the isotopic method. With an Archeozoic micro-  
 site sample the radioacti- A content was 0.86 ± 0.0  
 a mol. 1/g. for a 10 contain of 0.0051 g./g. sample. This  
 gives for the abs. age of the sample 1.6 × 10<sup>9</sup> yrs.  
 Franz H. Rathmann

Fig.

AMIRKHANOV, Kh. I.

USSR/ Chemistry - Physical chemistry

Card 1/1

Pub. 22 - 33/60

Authors

Amirkhanov, Kh. I., Act. Memb. of Azerb. Acad. of So.; Gurvich, I. G.;  
and Matizen, E. M.

Title

Specific heat of a phenol-water system in the critical zone

Periodical

Dok. AN SSSR 100/4, 735-736, Feb 1, 1955

Abstract

The specific heat of the phenol-water system was measured in the critical zone for the purpose of determining the magnitude of the specific heat jump with a greater accuracy than before and to compare the measured value with that obtained by another researcher. An increase in measurement accuracy was attained by continuous control of the temperature difference of the thermostat fluid and the investigated solution which reduced the uncontrollable heat losses. The measurements proved that the specific heat jump in the critical point had a small finite value for the phenol-water system. Two USSR references (1953 and 1954). Graph; drawing.

Institution

Academy of Sciences USSR, The Dagestan Branch

Submitted

July 30, 1954

AMIRKHANOV, Kh.I.; BRANDT, S.B., red.; SHCHERBAKOV, D.I., akad.; KLEYZMER,  
I.A., tekhn. red.

[Determination of the absolute age of rocks on the basis of  
radioactive transformation of potassium 40 into argon 40.] Opređenje  
absolütного vozrasta gorných porod po radioaktivnomu prevrshcheniu  
kaliia 40 v argon 40. Makhachkala, Akad. nauk SSSR, Dagestanskii  
filial, 1956. 149 p. (MIRA 11:11)

(Radiocarbon dating)

AMIRKHANOV, Kh. I.; BASHIROV, R. I.; DAIBOV, A. Z.; TSIDIL'KOVSEIY, I. M.

Thermomagnetic phenomena in semiconductors. Izv. AN SSSR, Ser. fiz. 20  
no. 12:1519-1520 D 1956. (MLRA 10:3)  
(Semiconductors) (Thermomagnetism)



AMIRKHANOV, Kh. I.

USSR/ Physical Chemistry - Thermodynamics. Thermochemistry. Equilibrium.  
Physicochemical analysis. Phase transitions

B-8

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 11168

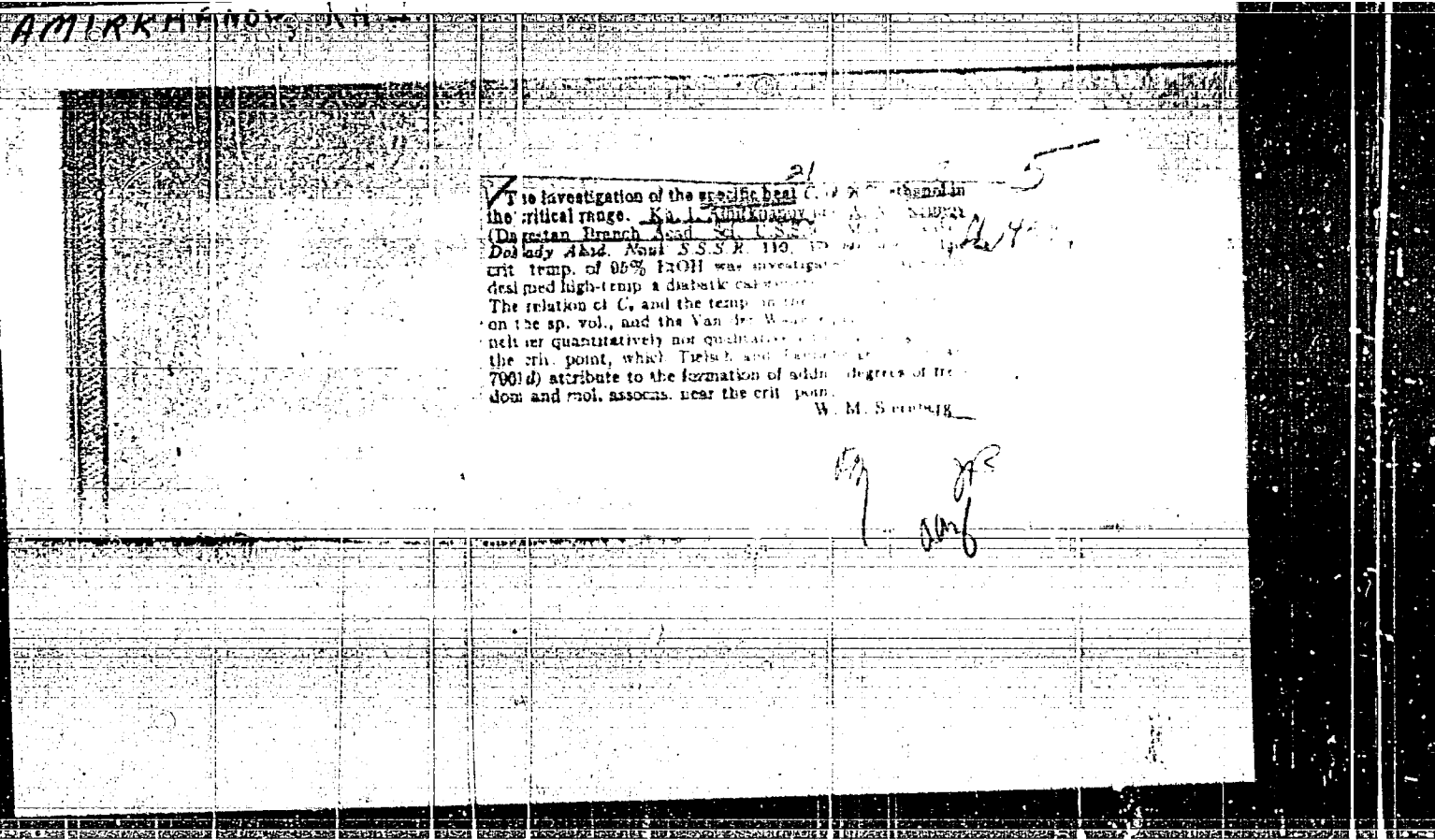
Author : Amirkhanov Kh. I., Gurvich I.G., Matixen E.V.

Title : Concerning the Article by V.P. Skripov and V.K. Semchenko  
"Phase Transitions of Second Kind and Critical Phenomena. V. On Heat  
Capacity Maximum in Critical Region of Stratification of Binary  
Liquid Systems".

Orig Pub : Zh. fiz. khimii, 1956, 30, No 5, 1158-1161

Abstract : Discussion article. See RZhKhim, 1956, 18737

Card 1/1



L 38:06-65 ENT(1)/EPA(s)-2/EWI(m)/EPF(n)-2/ENG(v)/EPR/EWP(t)/EWP(b)/EKA(1) Pe-5/  
S/0181/65/007/002/0637/0640

ACCESSION NR: AP5005314

Ps-4/Pt-10/Pu-1

IJP(c) JD/WI/JG

AUTHORS: Amirkhanov, Kh. I. Magomedov, Ya. B.

TITLE: Thermal conductivity of indium antimonide in the solid and liquid states

SOURCE: Fizika tverdogo tela, v. 7, no. 2, 1965, 637-640

TOPIC TAGS: indium antimonide, thermal conductivity, electric conductivity, phonon scattering, melting point

ABSTRACT: Results are reported of the measurements of the thermal conductivity of InSb in the solid and liquid states from 76 to 910K. This is the first investigation of the thermal conductivity of InSb in the liquid state. Four samples cut from two polycrystalline ingots, with carrier density  $7 \times 10^{17}$  and  $9 \times 10^{17} \text{ cm}^{-3}$ , were used for the measurements. The measurements were made with accuracy 1.5% by an absolute method under stationary thermal conditions, in an atmosphere of argon, as described elsewhere (Izv. AN AzSSR, no. 4, 3, 1946). The results show that the thermal conductivity of InSb in the solid state decreases in the entire investigated temperature interval, displaying no anomalous increase at high temperatures. The measured electric conductivity agreed with the results of others. The results indicate that at 770K the thermal conductivity due to pairs is only 14% of the total electronic conductivity and 20% of

Card 1/2

L 38606-65  
ACCESSION NR: AP50053i4

the conductivity due to the carrier diffusion. This is due to the large ratio (88--90) of the electron and hole mobilities. The electronic component of the thermal conductivity is calculated from the results. The phonon conductivity is also calculated, and the results show that the thermal resistivity of InSb from 125 to 240K is due to pure three-phonon scattering processes and that a strong four-phonon influence appears above 240C. It is concluded from the analysis of the results that the temperature variation of the electric conductivity and thermal conductivity in the solid and liquid phases can be broken up into two stages, one connected with the melting and the other with further heating of the melt and ultimate transition to the metallic state. Orig. art. has: 1 figure.

ASSOCIATION: Dagestanskiy filial AN SSSR, Makhachkala (Dagestan Branch AN SSSR)

SUBMITTED: 20 May 64

ENCL: 00

SUB CODE: SS

NR REF SOV: 014

OTHER: 008

Card

2/2 *llc*

AMIRKHANOV, KH.I.

VOL. # 9. PP. 68-72

2

55. INVESTIGATION OF THE SPECIFIC HEAT OF WATER AND STEAM NEAR THE  
 BOUNDARY CURVE INCLUDING THE CRITICAL POINT. Amirhanov, Kh.I., Korinov,  
 A.D. (Teplotnizetika [Heat for Engng. Moscow], Sept. 1957, 68-72).  
 Experiments were made in a spherical calorimeter with a thin inner shell  
 supported by a dense layer of cuprous oxide inside a second metal shell. There  
 were electric heating coils inside the inner shell and outside the outer shell,  
 and the two shells with the cuprous oxide between them were used as a thermo-  
 electric detector of any temperature difference between the two shells. The  
 difference was automatically corrected, so that conditions inside the inner  
 shell were adiabatic. Specific heats obtained are tabulated. A critical  
 zone was discovered within which the specific heat at the transition from the  
 two-phase to the single single-phase varies continuously. (U).

*Dagestanskij filial Akademii nauk  
 SSSR.*

AMIRKHANOV; Kh.I.; BRANDT, S.B.; HARTNITSKIY, Ye.N.

Some problems relative to the theory of the argon method of the  
determination of the absolute age of rocks. Trudy Geol.inst.-  
Dag.fil. AN SSSR 1:175-187 '57. (MIRA 14:9)  
(Geological time) (Argon)

← AMIRKHANOV, Kh.I.; BRANDT, S.B.; BARTNITSKIY, Ye.N.; ANOKHINA, L.K.;  
IVANOV, V.S.

Diffusion of the radiogenic argon in micas. Trudy Geol.inst.  
Dag.fil. AN SSSR 1:188-193 '57. (MIRA 14:9)  
(Diffusion) (Argon) (Mica)

AMIRKHANOV, Kh.I.; BRANDT, S.B.; BARTNITSKIY, Ye.N.; GURVICH, V.S.;;  
GASANOV, S.A.; IVANOV, V.S.

Thermal stability of radiogenic argon in the dispersion micas.  
Trudy Geol.inst.Dag.fil. AN SSSR 1:194-199 '57. (MIRA 14:9)  
(Argon) (Mica)



AUTHOR  
TITLE

~~XXXXXXXXXX~~  
AMIRKHANOV KH., KERIMOV A.M.

An investigation of the specific heat of water <sup>20-2-36/67</sup>  
in the critical region. (Issledovaniye teploynkosti c<sub>v</sub>  
vody i vodyanogo para v kriticheskoy oblasti.-  
Russian)

PERIODICAL

Doklady Akademii Nauk SSSR 1957, Vol 113, Nr 2, pp 368-371  
(U.S.S.R.)

ABSTRACT

Publications lack particulars on the specific heat c<sub>v</sub> of  
water and water-vapour dependent on their temperature and  
pressure. For the determination of these values the authors  
used an adiabatic calorimeter with thermoelectric control,  
as described in a former paper. It is known that for the  
investigation of the behavior of specific heat an equilibri-  
um of the temperature field is required in addition to  
obtaining adiabatic conditions in the calorimetric system.  
Here this field is more easily attainable as Grassho's  
number in the critic region, where the coefficient of the  
thermal dilatation

$$\alpha = \frac{1}{v} \left( \frac{dv}{dT} \right) p$$

is very high, also rises to very high values. In order to  
obtain a turbulent motion of the liquid the condition  
Gr - 5.10<sup>-4</sup> must be satisfied. Gr here reached 10<sup>7</sup> in the

CARD 1,6

An Investigation of the specific heat of water in the critical region.

~~SECRET~~  
20-2-36/67

experiment with one single substance and at a difference of temperature of 0.01°. Thus the natural development of the turbulent motion in the critical region promotes the earlier obtaining of a temperature equilibrium. It can be maintained that a complete thermo-dynamic equilibrium was obtained, that is

$$\varphi_1 (p,T) = \varphi_2 (p,T)$$

so that the experiment may be carried out without any mixture. Illustration 1 shows the transformation of the specific heat of water when it passes from a 2-phase into a 1-phase condition. Removed from the critical point,  $c_v$  when intersecting the boundary curve suffers an abrupt flexion. The abrupt  $c_v$ -modification, however, is deranged by approximation towards the critical point (that is with increasing specific volumes), although the absolute value of these flexions continues increasing in the heterogeneous domain. Transition is extended over a considerable temperature section (up to 4.5° in the case of water). It was found that the critical region for water with regard to volume is limited by an interval of  $v = 2.5 \text{ cm}^3/\text{g}$  to  $v = 4.15 \text{ cm}^3/\text{g}$  and with regard to temperature by an inter-

CARD 2/6

20-2-36/67

An Investigation of the specific heat of water in the critical region.

~~SECRET~~

VTI (Vsesoyuznyy tekhnicheskii institut \* Allunion Technical Institute), from the values of Yukolovich, furthermore from the values of Krillin and Zubarev. From the classical point of view the increase of the  $c_v$  of water in the 2-phase condition at transition into the 1-phase condition can be explained by the fact that an added quantity of heat is not only consumed for the temperature increase of single phases but also for the separation of molecular bonds of a compound of many molecules. Vaporization heat cannot have an essential influence on the transformation of the  $c_v$  as with its approximation towards the critical point its value tends towards zero. In the meantime the extent of the Gr-flexion increases. At the point of transition into the 1-phase condition dissociation process and vaporization suddenly cease. This causes a jerky decrease of  $c_v$ . At the critical point the number of separated molecular bonds reaches its maximum, which causes a maximum increase of the  $c_v$ -value. By means of the equation of Van-der-Waals the above described behavior of the substance at other than critical temperatures cannot be explained either qualitatively or quantitatively. In fact, if this equation is rearranged in the

CARD 4/6

20-2-36/67

An Investigation of the specific heat of water in the  
critical region.

~~XXXXXXXXXX~~

following way:

$$p = \frac{RT}{v-b} - \frac{a}{v^2}, \text{ it is found that } \left( \frac{\partial^2 p}{\partial T^2} \right)_v = 0.$$

Therefore  $\left( \frac{\partial c_v}{\partial v} \right)_T = T \left( \frac{\partial^2 p}{\partial T^2} \right)_v = 0$ , i.e. say the

specific heat  $c_v$  must not depend on the volume and can form a function of only the temperature. According to the experiment this condition is satisfied only for the maxima for the critical and supercritical isothermes. In the case of every other specific volume the condition

$\left( \frac{\partial c_v}{\partial v} \right)_T = 0$  is not satisfied, which means that the equation of Van-der-Waals is not applicable for the critical and supercritical region. (4 Illustr., 14 citations from publications)

CARD 5/6

AMIRKHANDOV, KH. I.

20-6-8/47

AUTHORS: Amirkhanov, Kh. I., Member of the AN Azerbaidzhan SSR  
Bagduyev, G. B., Kazhlayev, M. A.

TITLE: The Thermal Conductivity of Tellurium (Teploprovodnost' tellura).

PERIODICAL: Doklady AN SSSR, 1957, Vol. 117, Nr 6, pp. 953 - 955 (USSR)

ABSTRACT: The present paper gives the results of investigations of the temperature dependence of the thermal conductivity  $\lambda$  of pure tellurium in the interval of from 10 to 500°C. Object of the investigations were finely crystalline samples produced in the form of tablets by cold pressing under a pressure of 4000 kg/cm<sup>2</sup> and by 6 hours hot pressing at a temperature of 400°C under a pressure of 360 kg/cm<sup>2</sup>. The thermal conductivity was measured by the compensation method with the use of a vacuum for avoiding the oxidation of the sample. Special investigations of the course of temperature of the heat capacity were additionally made by an adiabatic microcalorimeter. The existence of charge carriers of two signs in tellurium further complicates the already complicated total image of thermal conductivity, which is also indicated by the experimental data found here. The curves given here illustrate the course of temperature of the different components of the thermal conductivity of tellurium. One of these curves illustrates the temperature dependence of the phononic part of thermal con-

Card 1/2

The Thermal Conductivity of Tellurium.

20-6-8/47

ductivity calculated according to Eucken (Eyken)'s law. Then an expression for the electron-hole-thermal conductivity is written down. The results of these tests indicate the following: The thermal conductivity in tellurium is in the entire domain of the thermal conductivity proper (beside the quasielastic vibrations of the lattice and by the thermal diffusion of the charge carriers) also guaranteed by the thermal conductivity due to diffusion and recombination of the electron-hole pairs. On passage through the melting temperature a dissociation of an immense amount of atoms takes place in tellurium, whereby the amount of free charge carriers is highly increased. The here-described tests with a temperature-melt comprise a small interval (460-490°C) between the two extreme states (passing continuously one into the other) of the tellurium melt, namely between the semiconductor-state immediately after melting (4520) and the metallic state (5500). The tests discussed here are continued in another temperature interval. There are 2 figures, and 9 references, 6 of which are Slavic,

SUBMITTED: July 16, 1957

AVAILABLE: Library of Congress

Card 2/2

*AMIRKHANOV, KH. I.*

**AUTHORS:** Amirkhanov, Kh. I., Member of AN Azerb. SSR, Magatayev, K. S., and Brandt, S. B.

20-4-37/52

**TITLE:** Determination of the Absolute Age of Sedimentary Minerals by Radioactive Methods (Opredeleniye absolyutnogo vozrasta osadochnykh mineralov radioaktivnymi metodami).

**PERIODICAL:** Doklady AN SSSR, 1957, Vol. 117, Nr 4, pp. 675-677 (USSR)

**ABSTRACT:** Though most of the works deal with the determination of the age of eruptive rocks and minerals, the primary conditions of radioactive geochronometry can also be applied with depositions. That requires that a precipitating mineral contains a radioactive mother-rock, and further that the developing daughter-rock remains well conserved in the mineral and that it is not contained in the mineral in the moment of precipitation. Finally it is required that the moment of formation of the respective mineral agrees with the moment of precipitation of all other sediments of the respective horizon containing it. Since the absolute age of the sylvinite could be determined (reference 1), this problem was attacked with respect to an authigenic mineral - glauconite (reference 2). The age of 45 samples, altogether, was determined. 26 measurements agree quite precisely with the

Card 1/3

Determination of the Absolute Age of Sedimentary  
Minerals by Radioactive Methods

20-4-37/52

ASSOCIATION: Dagestan Branch AN USSR (Dagestanskiy filial Akademii nauk  
SSSR)

SUBMITTED: July 2, 1957

AVAILABLE: Library of Congress

Card 3/3



20-117-5-14/54

AUTHORS: Amirkhanov, Kh.I., Member of the Academy of Sciences  
of the Azerbaijan SSR, Bashirov, R.I., Daibov,  
A. Z., Tsidil'kovskiy, I. M.

TITLE: The Influence of the Phonon Drag Effect on Thermomagnetic Phenomena in Bismuth Selenide (O vliyanií effekta "uvlecheniya" na termomagnitnyye yavleniya v selenide vismúta).

PERIODICAL: Doklady AN SSSR, 1957, Vol. 117, Nr 5, pp. 781 - 784 (USSR)

ABSTRACT: The authors here investigate the electric conductivity, the Hall-effect, the thermoelectromotoric force and the transversal and longitudinal Nernst-Ettinghausen-(Ettingsgauzen)- effect of ten polycrystalline samples of bismuth-selenide. These samples were produced by a compression at high temperature or by a slow cooling of the smelting. The methods of measurements were already described in two previous papers by the author (reference 3,4). The measurements described here were conducted in the temperature interval from 120 - 700°K. Here the results of the examination of six samples are given. The properties of the different samples are shortly enumerated. In the case of crystals with a predominantly homoeopolar bonding (comprising bismuth-selenide) the Nernst-Ettinghausen (Ettingsgauzen) effect must be positive. The Nernst-Ettinghausen effect is caused in one of the samples of Bi<sub>2</sub>Se<sub>3</sub> in the range of low temperatures investigated here mainly by the

Card 1/2

AMIRKIANOV, M. I., akademik; BAGDUYEV, G. B.; KAZHLAYEV, M. A.

Thermal conductivity of tellurium. Dokl. AN SSSR, 117 no. 6: 953-955  
D '57. (MIRA 11:3)

1. Akademiya nauk Azerbaydzhanskoy SSR (for Amirkhanov).  
(Tellurium) (Heat--Conduction)

AMIRKHANOV, Kh. I., KERIMOV, A. I. and ALIBEKOV, A. I.

"Investigation of Phenomena Accompanying the Propagation of Ultrasound and Methods to be used in Work in this Field" Correlation of Acoustic Measurements of Heat Capacity with Direct Measurements."

report presented at the 5th Sci. Conference on the Application of Ultrasound in the investigation of Matter, 3-7 Feb 1958, organized by Min. of Education RSFSR and Moscow Obshch Pedagogic Inst. im N. K. Krupskaya.

AMIRKHANOV, KH. I.

Amirkhanov, Kh. I., K. S. Magatayev - Determination of Age of Sediments  
in the Oil-Producing Provinces of the Dagestan ASSR.

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

SOV/11-58-11-9/14

AUTHORS: Amirkhanov, Kh.I., Brandt, S.B., Bartnitskiy, Ye.N.

TITLE: The Determination of the Absolute Age of Potash Feldspars by the Argon Method (K opredeleniyu absolutnogo vozrasta kaliyevykh polevykh shpatov argonovym metodom)

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya geologicheskaya, 1958, Nr 11, pp 110 - 112 (USSR)

ABSTRACT: The authors propose a method to determine the absolute age of potash feldspars by the ratio of  $A^{40}$  and  $K^{40}$  in the permanent zone of a given sample. There is 1 graph, 1 table, 4 references, 1 of which is Soviet, 1 German and 2 American.

ASSOCIATION: Dagestanskiy filial AN SSSR, Makhachkala (The Dagestan Branch of the AS USSR, Makhachkala)

SUBMITTED: June 5, 1958

1. Geology 2. Potassium carbonates 3. Age--Determination  
4. Radioisotopes--Applications

Card 1/1

SOV/76 32-8-1/37

AUTHORS: Amirkhanov, Kh. I., Kerimov, A. M.

TITLE: Investigating the Specific Heat  $C_v$  of 96% Ethyl Alcohol within the Critical Range (Issledovaniye teployemkosti  $C_v$  96% nogo etilovogo spirita v kriticheskoy oblasti)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol. 32, Nr 8, pp. 1697-1702 (USSR)

ABSTRACT: This paper deals with direct determinations of  $C_v$  of liquids within a wide temperature and pressure interval carried out according to a new and specialized experimental technique. An adiabatic spherical calorimeter was used and the measurements carried out in the case of mixing as well as without it showed that no influence on the results caused by mixing may be observed, whereas the measuring period was considerably cut. From the investigations of 96% ethanol may be found that beyond the critical range of  $C_v$  an exact limit curve in the coordinates  $T - v$  may be plotted, as on the region of the transition from the biphasic to the monophasic range a loop of

Page 1,2

*Amir Khanov, Kh. I.*

## AUTHORS:

Amirkhanov, Kh. I., Member of the AN Azerbaydzhan SSR, 20-2-33/60  
Brandt, S. B., Bartnitskiy, Ye. N., Gurvich, V. S., Gasanov, S. A.

## TITLE:

Problem of the Preservation of Radiogenic Argon in Glauconites (K vo-  
prosu o sokhrannosti radiogenogo argona v glaukonitakh).

## PERIODICAL:

Doklady AN SSSR, 1958, Vol. 118, Nr 2, pp. 328-330 (USSR).

## ABSTRACT:

Glauconite was chosen for the determination of the absolute age of sedimentary rocks due to its great structural similarity with mica, especially with biotite. The first samples showed good results, as far as the agreement of the absolute age with the assumed geological age is concerned. Beside data on a good stability of the glauconite structure a weak potassium-linkage to the lattice (reference 4) is indicated. The preservation of potassium and thus also of radiogenic argon apparently depends on the state of dispersion of the micas. In glauconites from Dagestan sometimes very small contents to complete absence of radiogenic argon were determined. The method was described in earlier papers (references 7-9). In order to determine the problem mentioned in the title, the dependence of the separated radiogenic argon on the temperature of heating was investigated. Simultaneously samples for an X-ray structural analysis were produced. The remaining content of argon after 8 and 10 hours of heating at 100-1150°C is gi-

Card 1/3

Concerning the  
Problem of

"APPROVED FOR RELEASE: 03/20/2001

20-2-35/60

CIA-RDP86-00513R00010123000

ven in table and figure 1. About 20% of radiogenic argon is lost from glauconite at 100°C. At 500°C argon is entirely separated. Argon is, for instance, much more solidly bound to muscovite and mica. Its linkage to the crystal lattice of glauconite, however, is very weak. As separation of argon already takes place before the destruction of the glauconite lattice, as the X-ray structural analysis (table 2) proves. When comparing the curves of the separation of radiogenic argon with those of the thermal analysis (reference 12,13) it will be seen that the 2 endothermic effects (between 100 and 200°C, and between 500 and 600°C, respectively) of the latter (separation of the adsorbed water and loss of the water of constitution) are in agreement with the peaks of the curve of the separation of argon. The loss of the adsorbed water apparently entails the loss of 20% argon, whereas that of the water of constitution causes the separation of the argon residue. This also indicates a weak argon- and possibly also a weak potassium-linkage to the glauconite-lattice. Further investigations are necessary. For determining the absolute age of the sediments according to glauconites a sufficient knowledge of the geological history of every individual sample is necessary. Glauconite may possibly be used as material for paleo-thermometric investigations.

Card 2/3

Concerning the Problem of the Preservation of Radiogenic Argon in Glauconites. 20-2-35/60

There are 2 figures, 2 tables, and 13 references, 11 of which are Slavic.

ASSOCIATION: Dagestan Branch of the AS USSR (Dagestanskiy filial Akademii nauk SSSR).

SUBMITTED: June 22, 1956.

AVAILABLE: Library of Congress.

Card 3/3



AMIRKHANOV, Kh. I.

PHASE I BOOK EXPLOITATION

80V/4342

Vserossiyskaya konferentsiya professorov i prepodavateley pedagogicheskikh institutov.

Primeneniye ul'traakustiki k issledovaniyu veshchestva; trudy konferentsiy, vyp. 9 (Application of Ultrasonics in the Study of Substances, No. 9) Moscow, Izd. MOPI, 1959. 245 p. Errata slip inserted. 1,000 copies printed.

Eds.: V. F. Nozdrev, Professor, and B. B. Kudryavtsev, Professor.

PURPOSE: This collection of articles is intended for scientists specializing in ultrasonics, and for those interested in the application of ultrasonics to the study of the properties of materials, and to the quality control of machined parts and structural elements.

COVERAGE: The collection constitutes the transactions of the All-Russian Conference of Professors and Teachers of Pedagogical Institutes. The articles report on recent theoretical and experimental investigations in the field of ultrasonics and discuss the application of ultrasonics to the study of

~~Card 1/7~~

3(8)

SOV/11-59-3-8/17

AUTHORS: ~~Amirkhanov, Kh.I., Brandt, S.B., Bartnitskiy, Ye.N., Gasanov, S.A., and Gurvich, V.S.~~

TITLE: The Mechanism of Radiogenic Argon Losses in Mica  
(O mekhanizme poter' radiogenogo argona v slyudakh)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geologicheskaya, 1959, Nr 3, pp 104-107 (USSR)

ABSTRACT: The thermic stability of radiogenic (r/g) argon was tested by the above-mentioned authors in dispersed mica. It showed that low-temperature losses (150 - 600 C) of r/g argon were incurred, beginning with grains of the 50-100 micron order. Graphical representations and equations were developed by having used as basis the Langmuir order:

Card 1/ 4

$$\frac{v}{v_M} = \frac{bp}{1 + bp} \quad (1)$$

SOV/11-59-3-8/17

The Mechanism of Radiogenic Argon Losses in Mica

The coefficient b is subjected to the following temperature dependence:

$$b = \alpha \frac{e^{q/RT}}{T^{1/2}} \quad (2)$$

Here  $\frac{v}{v_M}$  = the relative quantity of the absorbed

gas; p = pressure;  $\alpha$  = numerical coefficient dependent upon the properties of the sorbent and of the gas to be absorbed; q = temperature of sorption. The

Card 2/4

SOV/11-59-3-8/17

## The Mechanism of Radiogenic Argon Losses in Mica

value  $q/R$  has usually the order  $10^3 \left( \frac{10^{11}}{8,32 \cdot 10^7} \right)$ .

For the initial analysis it is possible to use  $\alpha_p = 30$ . By using these tolerances, the authors transform (1) and (2), as above, applicably to this case:

$$\frac{A^{40}}{A_M^{40}} = \frac{30e^{1000/T}}{T^{1/2} \left( 1 + \frac{30e^{1000/T}}{T^{1/2}} \right)}$$

The authors arrived at the following conclusions:  
 1) Losses of radiogenic argon from mica up to a temperature of 600 C are incurred as a result of the desorption processes and are well described by the

Card 3/4

SOV/11-59-3-8/17

The Mechanism of Radiogenic Argon Losses in Mica

isotherms of Langmuir; 2) losses of argon in mica resulting from a diffusion become perceptible only after a temperature of 600 C; 3) at normal temperatures, the diffusion coefficient in mica is not to exceed  $10^{-31}$  cm<sup>2</sup>/sec. There are 4 graphs and 6 Soviet references.

ASSOCIATION: Dagestanskiy filial AN SSSR, g. Makhachkala (The Dagestan Branch AS USSR, Makhachkala)

SUBMITTED: June 5, 1958.

Card 4/4

SOV/7-59-6-8/17

3(5)

AUTHORS:

Amirkhanov, Kh. I., Brandt, S. B., Bartnitskiy, Ye. N.,  
Voronovskiy, S. N.

TITLE:

On the Diffusion of Radiogenic Argon in Sylvites

PERIODICAL:

Geokhimiya, 1959, Nr 6, pp 538 - 545 (USSR)

ABSTRACT:

The diffusion constants of radiogenic argon, the activation energy of diffusion, the electrical conductivity of frequencies of 0 - 20 megacycles and their activation energy were measured on two different types of sylvite - red and pink - of the Solikamsk deposit in the temperature range of from 20 to 700°C. The diffusion mechanism of radiogenic argon was found to differ from the conductivity mechanism and the eigendiffusion of K<sup>+</sup>. The activation energy of diffusion is at equal temperature higher than the activation energy of conductivity. Activation energy is not likely to decrease at low temperature (under 200°C). It is not possible to make spatial diffusion responsible for argon losses occurring in the course of geological evolution. The diffusion constant amounts to 10<sup>-30</sup> cm<sup>2</sup>/sec extrapolated to a temperature of 300°K. Diffusion according to pair vacancies and Schottky-defects is assumed to be the most probable diffusion mechanism. Argon losses by desorption at low temperature on one

Card 1/2

On the Diffusion of Radiogenic Argon in Sylvites SOV/7-59-6-8/17

of the two sylvites may be explained by mosaic-structure.  
There are 5 figures and 11 references, 5 of which are Soviet.

ASSOCIATION: Dagestanskiy filial Akademii nauk SSSR, Makhachkala  
(Dagestan Branch of the Academy of Sciences USSR, Makhachkala)

SUBMITTED: April 18, 1959

Card 2/2

KA 1. *Plenik*

31(0)  
 DIVISION: Chester, E.  
 307/53-67-4-7/1  
 TITLE: The Fifth All-Union Conference on the Physics of Low Temperatures (5-ye Vsesoyuznyye soboraniye po fizike nizkikh temperatur)

PERIODICAL: Uspehi fizicheskikh nauk, 1959, Vol. 67, Nr. 4, pp 743-750 (USSR)  
 ABSTRACT: This Conference took place from October 27 to November 1 at Tbilisi; it was organized by the Otdeleniye fiziko-matematicheskikh nauk Akademii nauk SSSR (Department of Physico-mathematical Sciences of the Academy of Sciences, USSR), the Akademiya nauk Gruzinskoy SSR (Academy of Sciences, Gruzinskaya SSR), and the Tbilisskiy gosudarstvennyy universitet im. Shalvaya (Tbilisi State University imeni Shalva). The conference was attended by about 100 specialists from 11 countries: USSR, Poland, Czechoslovakia, Hungary, and other states as well as by a number of young Chinese scientists who are present working in the USSR. About 50 lectures were delivered which were divided according to research fields.

3. Various Questions.  
 One of the most interesting lectures delivered at this Conference was that by I. A. Gindin, S. G. Lazarev, Ya. D. Shkardobov and V. I. Molodtsov (LPTI) on the polymorphism of metals at low temperatures; P. L. Kapitza commented on this topic during the discussion. S. P. Bulatova, V. S. Korzun and S. G. Lazarev (LPTI) investigated the  $\gamma$ -rays hydrogen-deuterium by the methods of low-temperature-radiography, thermal analysis, and the visual observation of crystallization. E. I. Anisimov, Sh. Kh. Akhmedova and E. I. Shalimov investigated the structure and the properties of compounds of the type

$A^{119}B$  and  $A^{119}C$ , and dealt with the phenomenon of the "photo wind" predicted by Curvitchi; the investigation was carried out at the Dagestanskii filial AN SSSR (Dagestan Branch, AN USSR). E. M. Reynov and A. P. Shilov (LPTI - Zeningrad Physico-technical Institute) gave a report on the measurement of the electricity limit of tin- and indium polycrystals at very low temperatures (1 K), and V. M. Reynov and E. I. Krivko (LPTI) spoke about attempts made to find the expected diamagnetic resonance on polarons in cuprous oxide. G. V. Kuzhichvili (Ivrukh Institute of Chemistry, USSR) reported on the results of a theoretical investigation of the Grotthuss effect in non-aqueous solutions. V. P. Feokhlov investigated the electron- and nuclear (proton) resonances in diphenylpicryl hydrazyl at helium temperature. B. E. Samojlov spoke about experiments he carried out concerning the orientation of Cobalt- and Au-70-nuclei (in iron) at extremely low temperatures. E. P. Zakharchenya and Ya. P. Gross (LPTI) investigated the absorption spectrum of a cuprous oxide crystal in the magnetic field at helium temperature and observed the effect of magneto-optical oscillations. V. P. Feokhlov and E. P. Balgov gave information concerning the work of Soviet scientists in foreign countries (Australia, West Germany, etc.).

Shpol'skiy spoke about the abstracting journal "Zhurnal Fizicheskoy Khimii". The head of the department for problems of the physics of low temperatures, Academician P. L. Kapitza and the President of the Academy of Sciences Gruzinskaya SSR, Academician N. I. Muskhelishvili closed the Conference. The 6. All-Union Conference on the Physics of Low Temperatures will be held in June and July 1959 in the city of Sverdlovsk.

Card 9/11

Card 10/11



24(2),24(B)  
AUTHORS:

~~Amirkhanov, Kh. I., Academician, AS~~ SOV/20-124-3-16/67  
Azerbaydzhanskaya SSR, Bagduyev, G. B., Kazhlayev, M. A.

TITLE:

The Anisotropy of Thermal Conductivity in a Single Crystal of Tellurium (Anizotropiya teploprovodnosti v monokristalle tellura)

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 3, pp 554-556 (USSR)

ABSTRACT:

The present paper gives the results obtained by measurements of the thermal conductivity on a tellurium single crystal bred in a furnace by slow cooling from 750° K to room temperature. The tellurium casting thus produced (length 6 cm, diameter 2 cm) was a massive single crystal without any fine-crystalline inclusions. The single crystal was split along its parallel surfaces and formed reflecting faces at the points of fracture. From this single crystal samples were cut out parallel and vertical to the cleavage face for the purpose of measuring thermal conductivity. Also electric conductivity and the Hall effect were measured. The method of measuring thermal conductivity has already been described in one of the authors' previous papers (Ref 1). A diagram shows the temperature dependence of thermal conductivity and a second diagram shows the

Card 1/3

The Anisotropy of Thermal Conductivity in a Single  
Crystal of Tellurium

SOV/20-124-3-16/67

dependence of the electric conductivity of the samples within the temperature interval of from 100 to 640° K. The curves of the first diagram show marked anisotropy of thermal conductivity in the direction of the crystallographic axes of the single crystal, which becomes weaker with increasing temperature. Numerical data concerning this anisotropy are given. The anisotropy of thermal conductivity in a tellurium single crystal is probably connected with the fact that in a heat flow along the cleft, thermal resistance is essentially due to phonon-phonon scattering. However, in the case of a heat flow that is vertical to the cleavage plane, there is, besides phonon-phonon scattering, also a considerable amount of scattering of phonons on the crystal layers, which act as additional scattering centers. At low temperatures of about up to room temperature, that part of thermal conductivity which is due to electrons may be neglected as being infinitely small, and the total thermal conductivity in this temperature interval may essentially be ascribed to the thermal diffusion of phonons. Next, expressions are given (separately for low and high temperatures) for the dependence of the thermal

Card 2/3

The Anisotropy of Thermal Conductivity in a Single  
Crystal of Tellurium

SOV/20-124-3-16/67

conductivity coefficient of a tellurium single crystal parallel and vertical to the crystallographic axes. The lesser degree of decrease of thermal conductivity in a tellurium single crystal at high temperatures can, as in the case of polycrystalline samples, be ascribed to the participation of current carriers in the transfer of thermal energy. Various indications tend to show a diffusion and recombination of electron-hole pairs. There are 3 figures and 3 Soviet references.

ASSOCIATION: Dagestanskij filial Akademii nauk SSSR (Dagestan Branch of the Academy of Sciences, USSR)

SUBMITTED: August 28, 1958

Card 3/3

5(0)

## AUTHORS:

Amirkhanov, Kh. I., Academician, SOV/20-125-6-48/61  
AzerbSSR, Brandt, S. D., Bartnitakay, Ye. N.

## TITLE:

The Diffusion of Radiogenic Argon in Feldspars (Diffuziya radiogennogo argona v polevykh shpatakh)

## PERIODICAL:

Doklady Akademi nauk SSSR, 1959, Vol 125, Nr 6, pp 1345-1347  
(USSR)

## ABSTRACT:

It is known that considerable losses of radiogenic argon  $A^{40}$  formed in feldspars by the radioactive transformation of  $K^{40}$  occur in the last mentioned mineral. The linear approximations in the references 1,2 distort the separation mechanism of  $A^{40}$ . The authors give in this paper investigation results of the separation kinetics of  $A^{40}$  in two Precambrian feldspar samples (Ref 3). The figures 1 and 2 give the results. The diffusion equation for a spherical case (1) as well as the known dependence of the steady diffusion on the temperature (2) are used for the interpretation of the obtained curves. Figure 1 (sample Nr 1) shows that the heating curves have at 800 and 1100 horizontal sections of considerable length contrary to the dependence (1). The slope of the curve increases against

Card 1/4

## The Diffusion of Radiogenic Argon in Feldspars

SOV/20.125-6-48/61

the dependence 2 periodically, in intervals which are separated from one another by curves with a horizontal section, not gradually with the temperature. A part of the sample Nr 1 was pulverized in an agate mortar in order to clarify the nature of these horizontal sections. Portions of 1.5 g each were subjected to differently long heating. The determination results of the  $A^{40}$  which remained in these portions are indicated in figure 1 by crosses. The horizontal section is not shifted on the vertical line, but only prolonged in the direction of the ordinate axis. Thus its existence is caused by the structural peculiarities, not by the grain size. The beginning of the section is determined by the quantity  $D_t/x_0^2$  in line with the equation (1). The process occurring at 800 and 1100° can be interpreted as rapidly dying down diffusion which exhausts the  $A^{40}$ -content in a certain stage. This stage is characterized by values of E and  $D_0$  typical of it. Therefore the curves have to be interpreted according to  $A^{40}$  which belongs to each single phase. Thus the sample Nr 1 has three phases (Fig 3: I and II - the numbers of the phases). Figure 4 shows an analogous sub-

Card 2/4

## The Diffusion of Radiogenic Argon in Feldspars

SOV/20-125-6-48/61

division of the sample Nr 2. The slope of the curves in the figures 3 and 4 increases gradually for each phase with the increase of  $t$ . This makes their analysis in the terms of the equations (1) and (2) possible which confirms the rightness of the authors' interpretation. A raster was constructed from the equation (1) for different  $D$ -values in order to determine the value of  $D_t$ . The  $D_t$ -values were detected by applying this raster to the curves of the figures 3 and 4. 2 adjacent  $D_t$ -values from the equation (2) were determined. The obtained  $D_t$ - and  $E$ -values as well as the  $D_{273}$ -values, extrapolated according to the equation (2), were compiled in the table 1. This shows that each single phase is characterized only by the  $E$ -value typical of it. The separation of  $A^{40}$  is carried out at the mentioned temperatures by diffusion. The diffusion can, however practically not influence the maintenance of  $A^{40}$  as it is shown by the  $D_{273}$ -values for each phase. All losses of  $A^{40}$  in the course of the geological time are due to the separation from the "zero"-phase only. The variety of the feldspars is not exhausted by the two samples, though the figure and the

Card 3/4

The Diffusion of Radiogenic Argon in Feldspars

SOV/20-125-6-48/61

configurations of the phases differ in the two samples. There are 4 figures, 1 table, and 3 references, 1 of which is Soviet.

ASSOCIATION: Dagestanskiy filial Akademii nauk SSSR (Dagestan Branch of the Academy of Sciences USSR)

SUBMITTED: December 29, 1958

Card 4/4

3 (8)

## AUTHORS:

Amirkhanov, Kh. I., Academician of the SOV/20-126-1-44/62  
AS AZERSSR, Bartnitskiy, Ye. N., Brandt, S. B., Voytkevich,  
G. V.

## TITLE:

On the Migration of Argon and Helium in Certain Rocks and  
Minerals (O migratsii argona i geliya v nekotorykh porodakh  
i mineralakh)

## PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 1,  
pp 160-162 (USSR)

## ABSTRACT:

The A- and He-separation from one and the same sample was investigated in order to define precisely the loss mechanism of the two radiogenic gases mentioned in the title. The authors used for this purpose carbonaceous schist, hornblende, and Precambrian pyroxene. They used the mass-spectroscopic method of isotopic dilution (Ref 1) which was somewhat modified for this purpose. The measuring results are given in figures 1-3. The diffusion coefficients D and in several cases the activation energy E can be determined from these curves. The formula of the spherical diffusion (2) was used for the calculation of D. The quantity of the radiogenic A<sup>40</sup> was measured by the usual

Card 1/3



On the Migration of Argon and Helium in Certain  
Rocks and Minerals

SOV/20-126-1-44/62

method; the  $\text{He}^4$ -quantity according to the formula (1).  
Figure 1 shows curves for the carbonaceous schist, figure 2  
for hornblende from granite-pegmatite, figure 3 for pyroxene.  
Equal D-values of argon and helium for hornblende and  
pyroxene prove that the migration of the radiogenic gases is  
caused by other reasons, not by the nature of the atoms  
 $\text{A}^{40}$  and  $\text{He}^4$ . It is possible that the nodal vacancies (holes)  
shift in the crystalline lattice of the mineral. Their  
quantity increases with the temperature rise. They seize and  
"transport" the atoms of radiogenic gases. A certain  
difference of the D-value for A and He in the carbonaceous  
schists is apparently due to the occurrence of several phases  
in these rocks in which the gases may be differently  
distributed. The boundary layers between the individual phases  
are apt to cause considerable losses in  $\text{A}^{40}$  and  $\text{He}^4$  as well  
in the case of low temperatures. The E- and D-values for  
pyroxene prove that the radiogenic gases are fully preserved  
in this rock. The authors draw from the aforesaid facts the conclusion that  
the absolute age is to be determined by the argon- and helium

Card 2/3

On the Migration of Argon and Helium in Certain  
Rocks and Minerals

SOV/20-126-1-44/62

method only in the case of samples which were first  
investigated for the preservation of the radiogenic gases.  
There are 3 figures and 1 Soviet reference.

ASSOCIATION:

Dagestanskiy filial Akademii nauk SSSR (Dagestan Branch of  
the Academy of Sciences, USSR)

SUBMITTED:

December 29, 1958

Card 3/3

AMIRKHANOV, Khabibula Ibragimovich; BRANDT, Sergey Borisovich;  
BARTNITSKIY, Yevgeniy Nikolayevich; KLEYZMER, I.A., tekhn.red.

[Radiogenic argon in minerals and rocks] Radiogennyi argon v  
mineralakh i gornyykh porodakh. Predisl.D.I.Shcherbakova.  
Makhachkala, Akad.nauk SSSR, Dagestanskiy filial, 1960. 200 p.  
(MIRA 14:4)

(Argon)

(Radioargon dating)

54806

29035

S/081/61/000/018/006/027  
B104/B101

54120

AUTHORS: Amirkhanov, Kh. I., Kerimov, A. M., Alibekov, B. G.

TITLE: Thermo-physical properties of a substance at critical temperature. Heat capacity  $C_v$  in the critical range

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 18, 1961, 43, abstract 18B297 (Sb. "Kritich. yavleniya i flyuktuatsii v rastvorakh". M., AN SSSR, 1960, 5-13)

TEXT: The heat capacity  $C_v$  of carbonic acid and n-heptane was investigated as a function of temperature and volume in the critical range. In contrast to the sudden jumps of  $\sim C_v$  during crossing the boundary curve far from the critical point, the jump of  $C_v$  near the critical point has a certain temperature interval which reaches its maximum value at the critical isochore. At the temperature of transition of the system from a two-phase into a single-phase region, boundary curves of different isochores in T-V coordinates are plotted. (outside the critical range these curves

Card 1/2

S/169/61/000/008/003/053  
A006/A101

**AUTHORS:** Amirkhanov, Kh. I., Brandt, S. B., Bartnitskiy, Ye. N., Gurvich, V. S., Gasanov, S. A.

**TITLE:** On the problem of preservation of radiogenic argon in glauconites

**PERIODICAL:** Referativnyy zhurnal, Geofizika, no. 8, 1961, 4-5, abstract 8A37 ("Tr. 6-y sessii Komis. po opredeleniyu absolyutn. vozrasta geol. formatsiy", 1957, Moscow, AN SSSR, 1960, 202-207)

**TEXT:** The basic premise of using glauconites to determine the absolute age by the K-argon method, is the similarity of its structure with the mica structure. The authors studied the dependence between the quantity of radiogenic argon liberated from glauconite and the heating temperature within a range of 100 - 1,500°C. Argon was determined by the method of isotopic dilution. The data obtained are compared with the known E. K. Gerling curves showing argon liberation from mica and microclines. At 100°C the glauconite loses about 20% argon, whereas argon liberation from microcline and muscovite begins at 400 and 600°C respectively. At 500°C, 100% argon are liberated from glauconite, whereas 8 hour heating of microcline at 1,200°C entails only 76% argon loss. ✓

Card 1/2

AMIEKHANOV, Kh.I.; BRANDT, S.B.; BARTNITSKIY, Ye.F.

E.K. Gerling's method of determining the activation energy of  
radiogenic gases in minerals. *Geokhimiya* no.7:646-649. '60.  
(MIRA 13:11)

(Argon)

(Helium)

(Diffusion)

S/O20/60/132/04/16/064  
3014/8007

AUTHORS: Amirkhanov, Kh. I., Academician of the AS Azerbaydzhanskaya  
SSR, Bashirov, R. I., Zakiyev, Yu. E.

TITLE: Galvanometric Effects in n-InSb in Magnetic Pulsed Fields

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 4, pp. 793-796

TEXT: In the introduction, some investigations carried out with germanium are mentioned, among them those by I. G. Fakidov and E. A. Zavadskiy (Ref. 6). The present paper contains experimentally determined data of investigations of the Hall effect carried out on five n-type indium-antimonide samples in magnetic pulsed fields with field strengths of up to 900 kilogauss. The dependence of the effects on the field strength and temperature were investigated. The dimensions of the samples are given, and the measurement of the longitudinal magnetic resistance and the transverse resistance are discussed. Fig. 1 shows the dependence of the longitudinal and the transverse magnetic resistance on the magnetic field strength for n- and p-type samples. Fig. 2 graphically represents the dependence of the Hall constant of a sample on the magnetic field

VC

Card 1/2

Galvanometric Effects in n-InSb in Magnetic Pulsed Fields

S/O20/60/132/04/16/064  
B014/B007

strength, and Fig. 3 is a graphical representation of the dependences of the longitudinal and the transverse magnetic resistance for two samples. The results are inexplicable from the classical standpoint of galvanometric effects. The curves given in Figs. 1 and 2 are explained by the quantum character of the motion of electrons in the magnetic field. The author discusses this standpoint in detail and gives several formulas. The dependence of the longitudinal and the transverse magnetic resistance on temperature is brought into connection with the two scattering mechanisms acting within the temperature range of from 77°K to 200°K. The dependences of the galvanometric effects on the magnetic field described here were observed also in n-type samples of HgTe and InAs. The authors thank N. B. Brandt for taking part in the discussion of the results. There are 3 figures and 14 references, 3 of which are Soviet. ✓

ASSOCIATION: Dagestanskiy filial Akademii nauk SSSR (Dagestan Branch of the Academy of Sciences, USSR)

SUBMITTED: March 4, 1960

Card 2/2



AMIRKHANOV, K.M.I.

Report presented at the Conference on Heat and Transfer.  
Minsk, USSR, 9-10 June 61.

RM-2832  
27

- 306. P. T. Serdyukov, External Heat and Mass Transfer at Drying of Food Grains by Pests. Trudy.
- 307. G. S. Kozlovskii, Heat and Mass Transfer at Freezing of Fish.
- 308. V. V. Korotkiy, Investigation of Thermal Conductivity Properties of Carbonaceous Materials in the Process of Graphitization.
- 309. K. S. Stepanov, Determination of Temperature on the Inner Surface of Refractory Structures by Calculation Methods.
- 310. G. L. Pyzd, Heat Transfer Problems at Large Vessel Engineering Structures Design.
- 311. M. Ya. Polyan, On Application of the Transient Heat Transfer Theory for Design of Refractories of Construction.
- 312. Yu. P. Baryk, Investigation of Thermal Parameters of the Process of Organic Matter for Determination of the Optimum Heating Curve.
- 313. N. Sh. Yaglam, Determination Methods of Thermal Values on the Basis of Quasi-Stationary Heating Periods.
- 314. A. B. Verbitskiy, The Method of Constant Power Source.
- 315. P. G. Alekseyev, Complex Determination of Thermal Properties of Polymers and Investigation of Their Dependence on Temperature and Pressure.
- 316. B. P. Pashulya, Change of Thermal Conductivity of Some Metals and Alloys at Heating.
- 317. Dr. I. Ayrhanov, A. P. Masov, L. H. Lertin, Thermal Conductivity of Carbon Blocks Along the Boundary Curve Indicial for an Optimal Method.
- 318. D. S. Kabanov, Investigation of Heat Transfer and Thermal Properties of Carbon Blocks in the Critical Region of Thermodynamic State.
- 319. V. I. Pecherinskiy, L. S. Kobzarev, New Transient Method of Heat Transfer Coefficient Measurement.
- 320. V. B. Lomon, Experimental Investigation of Heat Transfer under the Free Heating of Thin Conductors.

S/169/52/000/010/018/071  
D228/D307

AUTHORS: Amirkhanov, Kh.I., Dzhamalov, S.A., Magatayev, K.S.,  
Musayev, S.Ye. and Bydtayev, A.B.

TITLE: Geothermal investigations in Dagestan

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 10, 1962, 17-18,  
abstract 10A111 (In collection: Probl. geotermii i  
prakt. ispol'zovaniya tepla Zemli, v. 2. M., AN SSSR,  
1961, 167-170)

TEXT: A description is given of the results of work by the  
Dagestanskiy filial AN SSSR (Dagestan Branch, AS USSR) on the study  
of geothermal phenomena in the region of Dagestan's Tertiary depos-  
its. Upper Cretaceous and Tertiary deposits in the plains part of  
the territory are the most perspective for hot water. The following  
tentative conclusions were drawn on the basis of this research.  
1. The temperature growth magnitude decreases with depth. 2. Deep  
temperature changes depend on the underground water movement. The  
heat conductivity of wet rocks is very much higher, so that the

Card 1/2

AMIRKHANOV, Kh.I.; KERIMOV, A.M.; ALIBEKOV, B.G.

Direct measurements of the heat capacity of n-heptane and  
carbon dioxide. Prikl. ul'traakust. k issl. veshch. no.13:  
89-99 '61. (MIRA 16:6)

(Heptane--Thermal properties)  
(Carbon dioxide--Thermal properties)

24, 7600 (1035, 1137, 1043)

32091  
S/161/61/003/012/026/028  
B125/P100

AUTHORS: Amirkhanov, Kh. I., Rashirov, R. I., and Gadzhaliyev, M. M.

TITLE: Quantum thermomagnetic Nernst-Ettingshausen effects in n-type InSb and n-type InAs

PERIODICAL: Fizika tverdogo tela, v. 3, no. 12, 1961, 3743 - 3745

TEXT: Longitudinal and transverse Nernst-Ettingshausen effects in three non-degenerate specimens of n-type InSb:

- (1) InSb specimen I-II-1,  $n = 6.8 \cdot 10^{13} \text{ cm}^{-3}$ ,  $R\sigma = 310,000 \text{ cm}^2/\text{v}\cdot\text{sec.}$ ;
  - (2) InSb specimen I-II-2,  $n = 8.8 \cdot 10^{13} \text{ cm}^{-3}$ ,  $R\sigma = 161,000 \text{ cm}^2/\text{v}\cdot\text{sec.}$ ;
  - (3) InSb specimen IV-38n,  $n = 1.15 \cdot 10^{15} \text{ cm}^{-3}$ ,  $R\sigma = 84,200 \text{ cm}^2/\text{v}\cdot\text{sec.}$ ;
- and in one degenerate specimen of n-type InAs ( $n = 1.6 \cdot 10^{16} \text{ cm}^{-3}$ ).

Card 1/4

32091  
S/161/61/003/012/026/028  
B125/B:08

Quantum thermomagnetic ...

$R_0 = 35,800 \text{ cm}^2/\text{v}\cdot\text{sec}$ ) as functions of the magnetic field strength were investigated at hydrogen temperatures with a low-resistance potentiometer and a sensitive galvanometer. The field dependence of the longitudinal and transverse Nernst-Ettingshausen effects are shown in Figs. 1 and 2, respectively. The dimensionless field of the Nernst-Ettingshausen effect satisfies  $E_x = (|\alpha_H| - |\alpha_0|)/(k/e)$ , where  $\alpha_H$  and  $\alpha_0$  are the differential thermo-emf with and without a magnetic field, respectively. The effective electron mass in InSb is assumed to be  $m^* = 0.012 m_0$ . Measurements at above 0 koe were made in the interval 22 - 33°K which lies around the quantum limit  $\hbar\omega_0 \gg kT$ , where  $\omega_0 = eH/m^*c$  is the cyclotron frequency. According to A. I. Ansel'm and B. M. Askerov (FTT, 2, 3672, 1961), the field strength of the transverse effect in classical statistics amounts to  $E_y \sim H$  for carrier scattering from acoustic vibrations, and to  $E_y \sim H^2$

Card 2/4

32091

S/181/61/003/012/026/028  
B125/B108

Quantum thermomagnetic ...

for scattering from the short-range potential. The longitudinal Nernst-Ettingshausen effect is positive ( $E_x > 0$ ), and its absolute value increases with the magnetic field within the quantum region, especially around 25 koe. The sign of  $E_x$  changes between 10 - 20 koe, where the carriers are scattered mainly from ions. The sign is negative in the region  $kT < \hbar\omega_0$ . The transverse Nernst-Ettingshausen effect is negative and described by  $E_y = \frac{1-r}{2} a_r' \left(\frac{uH}{v}\right)^{-1}$  for  $\omega_0\tau \gg 1$  ( $\tau$  = carrier relaxation time) and  $\hbar\omega_0 \ll kT$ .  $r$  is the power in  $1-v^2$ ,  $l$  the mean free path,  $v$  the carrier velocity,  $u$  their mobility, and  $a_r'$  a coefficient depending on  $r$ . In the specimen investigated, carrier scattering from impurity ions is predominant near 20°K. The condition of the quantum limit is not satisfied for the degenerate InAs sample at 39°K. Quantization affects the Nernst-Ettingshausen effect at  $H \geq 10^4$  oe. There are two figures and 4

4

Card 3/5 4

32091

S/181/61/003/012/026/028  
B125/B108

Quantum thermomagnetic ...

references: 3 Soviet and 1 non-Soviet. The reference to the English-language publication reads as follows: H. F. R. Frederikse a. W. R. Hosler. Phys. Rev., 108, 1136, 1960.

ASSOCIATION: Dagestanskiy filial AN SSSR Makhachkala (Dagestan Branch of the AS USSR, Makhachkala)

SUBMITTED: June 12, 1961 (initially) and August 23 (after revision)

Fig. 1. Longitudinal Nernst-Ettingshausen effect  $E_x$  as a function of magnetic field strength in InSb and InAs.

Fig. 2. Transverse. Nernst-Ettingshausen effect  $E_y$  as a function of magnetic field strength for InSb and InAs. 1 - InSb<sup>PII-1</sup>, 22°K. The other denotations are the same as in Fig. 1.

Card 4/8 4

31765

S/056/61/041/006/GJ1/054

B108/B138

24,2200 (1160, 1144, 1147)

AUTHORS: Amirkhanov, Kh. I., Bashirov, R. I., Zakiyev, Yu. E.

TITLE: Quantum galvanomagnetic effects in n-type InAs

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41,  
no. 6(12), 1961, 1699-1703

TEXT: Hall effect and resistivity were studied in a n-type InAs strong pulsed magnetic field at temperatures from 20 to 360°K. A magnetic field of up to 450,000 gauss was achieved by discharging a 1200- $\mu$ F capacitor block through a beryllium bronze coil. The relative change in resistivity in a pulsed magnetic field does not depend on the length-to-width ratio of the specimens where this is greater than 10. The specimens studied had impurity concentrations of about  $3 \cdot 10^{16} \text{ cm}^{-3}$  and  $2 \cdot 10^{18} \text{ cm}^{-3}$ . Figs. 3 and 4 show the results of measurements of Hall constant R and resistivity in a transverse magnetic field for two kinds of samples:  $\Gamma_1$  (G1)-type InAs with a conductivity of  $175 \text{ ohm}^{-1} \text{ cm}^{-1}$  and  $R = 200 \text{ cm}^3 \text{ C}^{-1}$  at 77°K, and

Card 1/4



Quantum galvanomagnetic effects in...

31765

S/O56/61/021/006/001/054  
B108/B138

M-13 (M-13)-type InAs with  $\sigma = 2870 \text{ ohm}^{-1} \text{ cm}^{-1}$  and  $R = 3 \text{ cm}^3 \text{ C}^{-1}$  at  $77^\circ \text{K}$ . In G1-type specimens at 300 and at  $77^\circ \text{K}$  Hall constant was independent of the magnetic field strength up to 400,000 gauss. At  $20^\circ \text{K}$  it was constant in fields of up to 160,000 gauss and then rose slightly, due to the fact that at  $H > 160,000$  gauss the activation energy of the impurities is greater than the mean energy of the free electrons. Therefore, the carrier equilibrium concentration decreases. In the strongly degenerate M-13-type specimens at  $20^\circ \text{K}$  Hall constant did not change in a magnetic field, owing to overlapping of the conduction band and of impurity levels. It is pointed out that InAs could be used as a pickup in magnetic-field strength measurements. Scattering of carriers in G1-type InAs has a mixed phonon-ion character. In the range  $20\text{-}77^\circ \text{K}$  a strong magnetic field reduces the degeneracy which is marked by only a slight dependence of  $\Delta Q/Q_0$  on  $H$ . This becomes stronger if the concentration of the equilibrium carriers decreases (M. I. Klinger, P. I. Voronyuk, ZhETF, 33, 77, 1957). There are 4 figures and 13 references: 5 Soviet and 8 non-Soviet. The three most recent references to English-language publications read as follows: P. N. Argyres, J. Phys. Chem. Solids, 8, 124, 1959; E. N. Adams,

Card 2/4

31765  
S/056/61/041/006/001/054  
B108/B138

Quantum galvanomagnetic effects in...

T. D. Holstein. J. Phys. Chem. Solids, 10, 254, 1959; J. R. Dixon,  
D. P. Eright. J. Appl. Phys., 30, 733, 1959.

ASSOCIATION: Dagestanskiy filial Akademii nauk SSSR (Dagestan Branch of  
the Academy of Sciences USSR)

SUBMITTED: February 5, 1961 (initially)  
July 25, 1961 (after revision)

Fig. 3. Resistance versus magnetic field strength.

Legend: (a), (b), (b') for G1-type InAs, (c) for M-13-type InAs.  
Abscissa -  $H \cdot 10^3$  gauss.

Fig. 4. G1-type InAs.

Legend: (a) resistance versus temperature ( $H = 252,000$  gauss), (b) Hall  
constant versus magnetic field strength ( $T = 200K$ ), (c) resistance versus  
magnetic field strength ( $T = 200K$ ). Abscissa -  $h \cdot 10^3$  gauss; T, degree K.

Card 3/4

AMIRKHANOV, Kh.I., akademik; KERIMOV, A.M.

Heat capacity  $c_v$  of water and water vapor at high temperatures and under high pressures. Dokl. AN SSSR 139.no.2:398-401 JI '61. (MIRA 14:7)

1. Dagestanskiy filial AN SSSR. 2. AN AzerbSSR (for Amirkhanov).  
(Water vapor) (Heat capacity)

AMIRKHANOV, Kh. I.; ADAMOV, A. P.; LEVINA, L. N.

Thermal conductivity of carbon dioxide along the boundary  
curve including the critical region. Teplo- i massoper. 1:  
105-108 '62. (MIRA 26:1)

1. Dagestanskiy filial AN SSSR, g. Makhachkala.

(Carbon dioxide—Thermal properties)

AMIRKHANOV, Kh.I.; BRANDT, S.B.; BARTNITSKIY, Ye.N.; VORONOVSKIY, S.N.;  
ZAR'YANOV, V.I.

Sound foundation for geochronometry. *Biul.Kom.po opr.abs.vozr.geol.*  
form. no.5:53-59 '62. (MIRA 15:11)  
(Geological time)

AMIRKHANOV, Kh.I., akademik; KERIMOV, A.M.

Specific heat ( $c_p$ ) of water and water vapor in phase transitions and supercritical parameters. Dokl. AN SSSR 142 no.5:1101-1104 F '62. (MIRA 15:2)

1. Dagestanskiy filial AN SSSR. 2. AN Azerbaydzhanskoy SSR (for Amirkhanov).

(Water)  
(Heat capacity)  
(Phase rule and equilibrium)

AMIRKHANOV, Kh.I.; BASHIROV, R.I.; ZAKIYEV, Yu.E.

Variation of resistance in high magnetic fields in n-type  
indium arsenide. Fiz. tver. tela 5 no.2:469-474 F '63.  
(MIRA 16:5)

1. Institut fiziki Dagestanskogo filiala AN SSSR, Makhachkala.  
(Indium arsenide--Electric properties) (Magnetic fields)

AMIRKHANOV, Kh.I.; BASHIROV, R.I.; ISMAILOV, Z.A.

Hall effect in indium antimonide in high pulsed magnetic fields.  
Fiz. tver. tela 5 no.10:2832-2834 0 '63. (MIRA 16:11)

1. Institut fiziki Dagestanskogo filiala AN SSSR, Makhachkala.



AMIRKHANOV, Kh.I., akademik; ADAMOV, A.P., inzh.

Thermal conductivity of carbon dioxide along a boundary curve  
and in the region of the critical state. Teploenergetika 10  
no.7:77-82 J1 '63. (MIRA 16:7)

1. Dagestanskiy filial AN SSSR. 2. AN AzerSSR (for Amir'khanov).  
(Carbon dioxide--Thermal properties)

AMIRKHANOV, Kh.I., doktor fiz.-matem. nauk; KERIMOV, A.M., kand. fiz.-  
matem. nauk

Study of thermal capacity of water and steam with a constant  
volume using a direct method along the line of saturation  
including the critical point. Teploenergetika 10 no.8:64-  
69 Ag '63. (MIRA 16:8)

1. Dagestanskiy filial AN SSSR.  
(Steam) (Heat—Transmission)

AMIRKHANOV, Kh. I., doktor fiziko-matematicheskikh nauk; KERIMOV, A.M.,  
kand. fiziko-matemat. nauk

Experimental study of the heat capacity  $c_v$  of water and water  
vapor at supercritical parameters of state. Teploenergetika  
10 no.9:61-66 S '63. (MIRA 16:10)

1. Dagestanskiy filial AN SSSR.  
(Water—Thermal properties)

AMIRKHANOV, Kh.I., doktor fiz.-matem.nauk, prof.: ADAMOV, A.P., inzh.

Heat transmission of steam in near-critical and supercritical  
states. Teploenergetika 10 no.10:69-72 0\*63 (MIRA 17:7)

1. Dagestanskiy filial AN SSSR.