KOZLOV, V., pilot pervogo klassa; PESHKOV, S., pilot pervogo klassa

Landing of a TU-104 plane at a strong cross wind. Grazhd. av. 19 no.7:18-19 Jl '62. (MIRA 15:8)
(Airplanes--Landing)

PESHKOV, S., starshiy inspektor-pilot

Navigational flight in the waiting zone and during the approach for blind landing. Grazhd.av. 12 no.1:15-18 Ja '55. (MIRA 16:3)
(Ground controlled approach)

PESHKOV S.

244/13/3

629.138.5(47)

Flight Operational Characteristics of the Tu 104 (Translation)

Graz. Aviat. (6) 1956 U.S.S.R.

S. Peschkow

A point-by-point account of the handling of this twin-jet aircraft, from starting the engines, through taxiing, climbing, cruising, to landing. Points of difference and similarity with piston-engined aircraft and the control reactions, during critical flight phases are described. Cruising level is about 33,000 ft., at speed of 435 kt. (TIB/OT 2171).

1

PESHKOV, S.

Raise the level of training for pilots. Grazhd. av. no.4:17-18 Ap '57.
(Airplanes--Piloting) (MIRA 10:6)

ORLEBY..., L., PESHKOV, S.

Motion pictures as a part of technical instruction. Grazhd.av. 14 no.7:14 Jl '57. (MLRA ...)
(Motion pictures in aeronautics)

PESHKOV, S.

Method of flight training following approach and landing radio beacons. Grazhd.av. 13 no.8:9-11 Ag '56. (MLRA 9:10)

(Airplanes--Landing) (Aeronautics--Study and teaching)

PESHKOV, S.I., inzhener.

[redacted] The "zero cycle" and development operations in building coal mines. Shakht. stroi. no.7:4-7 Jl '57. (MIRA 10:8)

1. Uralgiproshakht.
(Coal mines and mining) (Mine management)

SMIRNOV, G.A., kand. tekhn. nauk, dotsent; BULANOV, V.B., inzh.; PESHKOV, S.I., inzh.

Calculating bending vibrations of the driving-axle housing of a motor vehicle by means of electric simulation. Izv. vys. ucheb. zav.; mashinostr. no.2:140-147 '65. (MIRA 18:5)

PESHKOV, S. I.

Coal Mines and Mining

Organization of building methods in mine construction. Ugol' no. 2, 1952.

9. Monthly List of Russian Accessions, Library of Congress, May 1952 Unclassified.

P?SHKOV, S. I.

Mining Engineering

Organization of building methods in mine construction., Ugol', no. 2, ?52.

9. Monthly List of Russian Accessions, Library of Congress, May 1952 Unclassified.

PESHEV, TS. Kh.; DINEV, T. S.; ANGELOVA, V. I.

Myomimus personatus Ogn. (Mammalia, Myoxidae), a new rodent in the fauna of Bulgaria. Zool. zhur. 39 no.5:784-785 My '60. (MIRA 13:10)

1. Chair of Vertebrate Zoology, Sofia State University, and Republic Anti-epidemic Station.

(Bulgaria—Dormice)

PESHKOV, P.G., inzh.

Electrochemical stabilization of water-logged soils in earthwork construction. Trudy MIIT no.173:73-83 '63. (MIRA [illegible])

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

M

2

***On the Crystallization of Solutions [Mercury-Zinc Alloys].** V. Peshkov (*Zhur. Fiz. Khim.*, 1948, **20**, (8), 835-851).—[In Russian]. Thermal analyses of the systems benzol-toluol, mercury-zinc, and potassium nitrate-water were carried out with specially constructed apparatus having a temp. regulator by means of which a const. flow of heat could be maintained with an accuracy of 1%. All the systems were studied in the temp. range − 20° to + 160° C. and the positions of the eutectics were determined. The mercury-zinc system was investigated up to 1·040 wt.-% zinc and the eutectic was fixed at − 41·63° ± 0·02° C. and 0·56 ± 0·02 wt.-% zinc. The effect of non-equilibrium conditions and the part played by diffusion in the crystallization of solutions are described, and a method is given for determining solidus curves.

—N. A.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PESHKOV, V.G.

From the experience of the Krasnodar Territory farmers. Zashch. rast. ot vred. i bol. 6 no.4:3-8 Ap '61. (MIRA 15:6)

1. Nachal'nik Krasnodarskoy ekspeditsii.
(Krasnodar Territory--Plants, Protection of)

PAYKIN, D.M.; STAROSTIN, S.G.; MENDE, P.F.; KUZNETSOV, K.P.; POPOVA, M.I.; PESHKOV, V.G.

Mist spraying of chlorophos against the shield bug Eurygaster integriceps. Zashch. rast. ot vred. i bol. 7 no.2:20-21 F '62. (MIRA 15:12)

(Chlorophos) (Eurygasters)
(Spraying and dusting)

PESHKOV, V.G.; TISHCHENKOV, N.K.; TRUNOV, V.G.

We answer with deeds to the appeal of the Ust'-Labinskaya people. Zashch. rast. ot vred. i bol. 8 no.3:3-4 Mr '63. (MIRA 17:1)

1. Nachal'nik Krasnodarskoy stantsii zashchity rasteniy (for Peshkov).

[illegible]

Textile industry and fabrics

Mechanization of straightening ... [illegible]

9. Monthly List of Russian Accessions, Library of Congress, March 1958, Uncl.
2

APPROVED FOR RELEASE: Tuesday, August 01, 2000 CIA-RDP86-00513R0012402

PESHKOV, V.I.; VISHNEVSKIY, B.P.

The BS-80 drilling machine. Biul.tekh.-ekon.inform.Gos.nauch.-issl.inst.nauch.i tekh.inform. 16 no.8:12-14 '63. (MIRA 16:10)

PESHKOV, V.I., gornyy inzh.; AKSANOV, Sh.I., konstruktor

Results of industrial tests of the BS-80 small automatic drilling rig. Gor. zhur. no.9:55-56 S '63. (MIRA 16:10)

1. Institut Sibgiprogormash, Novosibirsk.

GROMOVA, M.I.; ROMANTSEVA, T.I.; PESHKOVA, V.M.

Using the absorption spectra of dichlorooxinates of praseodymium, neodymium, and samarium for the determination of these elements. Vest.Mosk.un.Ser.2:Khim. 19 no.4:57-61 Jl-Ag '64.

(MIRA 18:8)

1. Kafedra analiticheskoy khimii Moskovskogo universiteta.

PESHKOVA, V.M.; SAVOSTINA, V.M.; ASTAKHOVA, Ye.K.; MINAYEVA, N.A.

Extraction concentration of trace quantities of nickel using α-dioximes. Trudy Kom. anal. khim. 15:104-110 '65. (MIRA 18:7)

PESHKOVA, V.M.; MEL'CHAKOVA, N.V.; PEN AN [P'eng Ang]

Study of zirconium and hafnium complex formation with β-diketones by the partition method. Trudy kom.anal.khim. 14:172-182 '63. (MIRA 16:11)

PESHKOVA
f. 2, 3

PHASE I BOOK EXPLOITATION SOV/3850

SOV/9-M-8(11)

Akademiya nauk SSSR. Institut geokhimii i analiticheskoy khimii imeni V. I. Vernadskogo. Komissiya po analiticheskoy khimii

Spektrofotometricheskiye i kolorimetricheskiye metody analiza (Spectrophotometric and Colorimetric Methods of Analysis) Moscow, 1958. 286 p. (Series: Its: Trudy, tom. 8 (11) Errata slip inserted. 3,000 copies printed.

Resp. Ed.: I. P. Alimarin, Corresponding Member, Academy of Sciences USSR; Ed. of Publishing House: V. M. Peshkova; Tech. Ed.: N. I. Moskvicheva.

PURPOSE: The publication is intended for chemists, particularly analytical chemists and geochemists.

COVERAGE: This collection of 29 articles is published as Volume VIII (XI) of the Transactions of the Committee on Analytical Chemistry at the Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy, Academy of

Card 1/6

Sciences USSR. The general subject of the volume is the investigation of spectrophotometric and colorimetric analysis. Individual articles on the following topics may deserve special attention: the present state of light absorption analysis, the sensitivity of the colorimetric methods of inorganic analysis, the basic variations of the kinetic method of analysis, spectrophotometric investigation of heteropolyacids of germanium, a new colorimetric method of determining small quantities of thallium, a fluorimetric method of determining uranium, spectro-photometric investigation of the behavior of oxidation-reduction indicators, a phasometric optical-acoustical method of gas analysis, and a description of an automatic spectrophotometric gas analyser. No personalities are mentioned. References are given at the end of each article.

TABLE OF CONTENTS:

Savost'yanova, M. V. The State of Light Absorption Analysis Today 3

Komar', N. P. Characteristics and Possibilities of Colorimetric and Spectrophotometric Analysis 21

Kuznetsov, V. I. Increasing the Sensitivity of Colorimetric Methods of Inorganic Analysis and Color Reactions 52

Peshkova, V. M. Effect of the Structure of the Molecule of an Organic Reagent on the Absorption Spectra of Metallic Oxime Compounds 75

Yatsimirskiy, K. B. Basic Variations of the Kinetic Method of Analysis 82

Kokorin, A. I. Tri- and Tetraheteropolyacids in Colorimetric Analysis 88

Shakhova, Z. F., and R. K. Motorkina. Spectrophotometric Investigation of Heteropolyacids of Germanium 100

Zhidkova, Z. V. Determining the True Absorption of Adsorbed Substances by the Spectra of the Diffuse Reflection From Adsorbates 110

Tolmachev, V. N., and L. N. Serpukhova. Spectrophotometric Method of Determining Cobalt and Iron With the Aid of Sodium 2, 1, 4 - Nitroso-Naphthol Sulfonate 115

Peshkova, V. M., and V. M. Bochkova. Investigating the Properties of Complex Compounds of Cobalt With Nitro and Isonitroso Compounds 125

Shchemeleva, G. G. A New Colorimetric Method of Determining Small Quantities of Thallium 135

[illegible], V.G., Cand Tech Sci—(diss) "[illegible] study of [illegible] [illegible] spiral conical [illegible]." [illegible], 195[illegible]. 17 [illegible] (Min of Higher Education USSR. [illegible] Peat Inst), [illegible] (KL, [illegible], [illegible])

PESHKOVA, V.M.; GROMOVA, M.I.; ALEKSANDROVA, N.M.

Successive spectrophotometric titration of thorium and of the sum of rare earth elements. Zhur.anal.khim. 17 no.2:218-221 Mr-Ap '62. (MIRA 15:4)

1. Lomonos Moscow State University.
(Thorium--Spectra) (Rare earths--Spectra)

CP

PROCESSES AND PROPERTIES INDEX

2

"Second sound" in He II. V. P. Peshkov. *J. Phys. (U.S.S.R.)* 8, 381; *Compt. rend. acad. sci. U.R.S.S.* 45, 365-6(1944).—A sensitive elec. device was used to observe the "second sound" in He II predicted by Landau (*C.A.* 38, [illegible]). The sound was generated by means of an a.c. flowing through a heater made of thin constantan wire. A phosphor bronze thermometer was used for detecting the waves. If the frequency of the current was the same as the frequency of the thermal vibrations, that is, twice the frequency of the current in the heater, the d.c.

appeared in the circuit. By varying the distance between the thermometer and the heater, periodical variations of the direct current were obtained. Over the λ point this phenomenon was not observed. From the exptl. at frequencies of 100, 400, and 1000 cycles, it could be concluded that the velocity of the waves in He II is 19 ± 1 m./sec. at 1.4°K. This was compared with a value of 20 m./sec. as predicted by Lifshits. R. A. G.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

2

Second sound in He II. V. P. Peshkov. *Doklady Akad. Nauk S.S.S.R.* 45, [illegible](1944).—See *C.A.* 39, [illegible]. J. W. Perry

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

534.22 : 536.48

1255

Two velocities of sound in helium-II. Lifshits, E. M., and Peshkov, V. P. *Vestn. Akad. Nauk* (No. 4) 117 (1945). *Summary in Nature, Lond.*, 157, 200 (Feb. 16, 1946).—The phenomenon predicted by Landau's theory [see Abstr. 2985 (1945)] has been demonstrated as follows: A method of exciting the "abnormal" sound waves by temperature fluctuations was adopted, as analysis showed that the amplitude of pressure oscillation in these waves is low, and all the usual methods of sound excitation only produce the normal sound waves. Stationary waves were set up in a closed tube 25 cm long with a steel piston at one end whose temperature was varied rhythmically by heating with alternating current. For detector, a resistance thermometer of very fine phosphor-bronze wire, which could be moved up and down the tube, was used with a $10^6\times$ amplifier. The velocity of the "abnormal" sound waves was found to be 19·5 m/sec at 1·35°K, rising to 20·4 m/sec at 1·65°K and then rapidly falling to zero at the λ-point (2·19°K). No "dispersion" was found over the frequency range 500-10 000 c/s. The speed of normal sound at these temperatures is 250 m/sec.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

PESHKOV, V. P. and Lifshits, Ye. M.

"Second Sound in Liquid Helium," a report submitted at General Assembly of OFMN in 1944.

IAN-Ser Fiz., Vol 9, No 3, 1945

Determination of the velocity of propagation of the second sound in helium II. V. P. Peshkov. *J. Exptl. Theoret. Phys.* (U.S.S.R.) 16, 1000-10(1946)(in Russian); *J. Phys.* (U.S.S.R.) 10, 389(1946)(in English); cf. *C.A.* 30, 3473[9], 4782[9].—On the basis of the representation of the second sound in superfluid He II as motion of heat quanta, the most favorable method for its production and detection must be thermal in nature; hence, attempts at detection by acoustical procedures having failed, a heating body of 20-μ constantan wire, emitting rapidly alternating heat flow, was used as source and a thin (30 μ) P bronze wire resistance thermometer as detector. The source being heated by a.c. of frequency $\omega/2$ emits heat waves of energy $\frac{1}{2}R_0(1 + \cos\omega t)$, the periodic component of which is rapidly damped in a normal liquid but should propagate freely in He II in the form of a second sound giving rise to temp. oscillations of frequency ω. Detection consists in measuring the current i in the resistance thermometer, the d.c. part of which is $= (\alpha E_0 \cos \varphi)/2R_0$, where α is detd. by the amplitude of the temp. oscillations, E_0 = amplitude of a.c. voltage E of frequency ω applied to the wire, φ = phase angle between temp. and applied voltage. On displacing the thermometer relative to the heater (over a distance of 25 cm.) one detects periodic changes of current (galvanometer deflection) demonstrating the existence of the second sound. Final measurements were made with a more perfected setup in which a column of He II was enclosed between an upper disk carrying the heater and a bottom disk with one of the two resistance thermometers; const. d.c. is sent through the thermometers, the oscillations of the potential drop corresponding to those of resistance are amplified and oscillographed against the a.c. voltage feeding the heater. The column of He II is comparable to the acoustic Quincke air column; displacement of the heating disk results in a resonance peak each time the distance is an integral multiple of half the wave length λ. The amplitude is sharp enough to fall to half its value on a change of distance by 0.3%. Another method of detg. λ consists in displacing the second (mobile) thermometer between the bottom and the heater and locating positions of nodes. From ω and λ the velocity u of the second sound is detd. as a function of temp. from the λ-point at 2.17°K. down to 1.15°K.; at the latter temp. u = 18.7 m./sec., varying only slightly with further rising temp., up to a flat max. 20.4 at 1.63°K. The drop becomes steep near the λ point. At the max., dispersion was looked for but found absent, within 0.1%, between 100 and 10,000 sec.$^{-1}$. In terms of Landau's theory of He II, one can calc. from u, knowing the heat capacity C (Keesom) and entropy S (Kapitza), the ratio of ds. $\rho/\rho_n = 1 + (u^2C^2/S^2T)$ of total and normal He. The curve in terms of temp. coincides perfectly with the data of Andronikashvili (*C.A.* 41, 1515e) from oscillation of disks in He II. Agreement is less satisfactory with the microscopic theory on calcg. the roton and the phonon part of entropy and the effective mass of the roton. In principle, a phenomenon analogous to the second sound is conceivable in superconductors but, owing to friction between normal electrons and the lattice, one can at best expect to observe a diminution of damping of heat waves. Also, a second sound would appear in an ideal perfect crystal if it were realizable.

N. Thon

PESHKOV, V. P.

PA 19/49T101

USSR/Physics
Sound - Attenuation
Sound - Measurements

Oct 48

"Studies on the Properties of Secondary Sound," V. P. Peshkov, Inst of Phys Problems, Acad Sci USSR, 5¼ pp

"Zhur Eksper i Teoret Fiz" Vol XVIII, No 10

Experiments with secondary sound showed its stability is very great. Discovered anomalous relation between amplitude of secondary-sound oscillations and power input during emanation by heat method, and linear relation during

[redacted]

19/49T101

USSR/Physics (Contd)

Oct 48

emanation by filtration method. Measured attenuation of secondary sound in resonators. Submitted 6 Mar 48.

[redacted]

19/49T101

PROCESSES AND PROPERTIES INDEX

The second sound in He II under higher pressures. V. P. Peshkov and K. N. Zinov'eva. *Zhur. Eksptl. Teoret. Fiz.* (*J. Exptl. Theoret. Phys.*) **18**, 438-43(1948); cf. *C.A.* **41**, 3681*i*.—The velocity *u* of the "second sound" was detd., essentially by the same resonance method as described previously, over the whole range of existence of He II, from the pressure of the satd. vapor to the pressure of freezing or transition to He I, and from the λ-line down to about 1.3°K. The results are represented by families of isobars (3.7-27 atm.) and of isotherms (1.43-2.135° K.). The isobars, of a shape similar to the vapor pressure curve, show a max. which shifts to lower temps. as the pressure increases; the line passing through the maxima runs parallel to the λ-line along which *u* = 0. The isotherms fall uniformly with the pressure, down to *u* = 0 at the λ-line. In the temp. range of freezing of He II, *u* decreases with the pressure the slower, the lower the temp., and, at the point of disappearance of the second sound, has a finite value which increases continuously in the direction of lower temps. The uncertainty in *u* is estd., on the av., to 2%. The λ-line and the fusion line, detd. by this method, are in good agreement with Keesom and Keesom (*C.A.* **29**, 7160[9]). N. Thon

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

2

Conditions of the excitation and the propagation of second sound. V. P. Peshkov (Inst. Phys. Problems, Acad. Sci. U.S.S.R., Moscow). *Zhur. Eksptl. Teoret. Fiz.* 18, 857-66 (1948); cf. *C.A.* 41, 2621*i*.—The properties of He II are best described by associating the heat motion with a normal component, of d. ρ_n; the remaining component, of d. ρ_s, represents the superfluid part. The corresponding fractions are, resp., ρ_n/ρ and ρ_s/ρ, where ρ = d. of He II. The magnitude $\rho_n v_n$, where v_n is the velocity of the normal part, represents the momentum of the heat flow. The d. of the kinetic energy in He II can be written $e = {}^1/_2\rho_n v_n^2 + {}^1/_2\rho_s v_s^2$. If the smallness of the coeff. of thermal expansion α of He II (0.01/degree) is taken into account, the velocity of propagation of 2nd sound is found to be $u_2 = (\rho_s S^2 T/\rho_n C)^{1/2}$. It is equally permissible to give up the artificial sepn. of He II into a normal and a superfluid part; in that case, $e = \mu w^2/2$, and $u_2 = (\mu\rho C T)^{-1/2}$, i.e. $\mu = \rho_n/\rho\rho_s S^2 T^2$. The relation between the running wave of 2nd sound u_2 and the oscillations of the heat flow w is $\rho C T' u_2 = w$, where T' is the alternating part of the temp.; this relation covers both the amplitudes and the phases. With T_0' and w_0 denoting the corresponding amplitudes, the time mean energy flux of 2nd sound is $q = T_0' w_0/2T$; this equation is the analog of the Poynting vector. Production of 2nd sound can be achieved by 2 methods. In the thermal method, in which the 2nd sound is emitted by an alternating heat flow from an a.c. heater, the running wave is of the form $w = w_0 e^{i(t - x/u_2)}$, $T' = T_0' e^{i(t - x/u_2)}$. The 2nd method consists in periodic pressing of He II through a filter fine enough to pass only the superfluid part; by this method, 2nd sound and ordinary sound are produced simultaneously, in the intensity ratio $q_2/q_1 = S^2T/Cu_1u_2$. At 2°K., this ratio is 0.1, and at lower temps. it is still lower; consequently, in excitation by the filtration method, the intensity of ordinary sound is much greater than that of the simultaneously emitted 2nd sound. The reverse holds for the ratio of temp. amplitudes $T_2'/T_1' = S/\alpha u_1 u_2$ which, at 2°K., is of the order of 20, and at 1.6°K., about 10. The ratios of the amplitudes of pressure and of d. are, resp., $p_2/p_1 = \alpha u_2 ST/u_1 C$ and $\rho_2/\rho_1 = \alpha u_1 ST/u_2 C$; at 2°K., the 1st ratio is $\sim 3 \times 10^{-4}$, and the 2nd is $\sim 3 \times 10^{-3}$, i.e. the oscillations corresponding to 2nd sound are almost completely masked by ordinary sound. For standing waves in a cylindrical tube of length l, closed at one end by the emitter, and at the other end by a reflector, resonance in thermal excitation occurs at $\omega l/u_2 = n\pi$, where n = 1, 2, 3 . . . ; at the emitting and reflecting surfaces are nodes of the heat flux, and crests of the temp. With the frequency ω slightly out of tune by the factor $\Delta\omega$, so that the amplitude of temp. oscillations is decreased by a factor of $\sqrt{2}$, one has, with γ = damping per unit length of the tube, $\gamma l = \pi\Delta/\omega_r$, which permits detn. of γ for 2nd sound; at resonance $\Delta = 0$, hence $T' = w_0/\rho Cu\Delta$. In the filtration method, resonance of ordinary and of 2nd sound are at different l, and both resonances can be observed. The total energy, spent on the compensation of all losses (vol., surface, and edges) is given by $qQ = w_0^2 Q/2\rho CTu\Delta = \rho CTu\Delta T_0'^2 Q/2T$, where Q = surface area of the emitter. The vol. losses are entirely detd. by the properties of He II and are, as in ordinary sound, proportional to ω^2. The surface losses are composed of thermal and viscosity losses, and can be estd., resp., to $q_T = (T_0'^2/4T)(\lambda\omega C_1/2)^{1/2}$ (where C_1 = heat capacity of the solid, λ = its heat cond.), and $q_\eta = (T_0'^2 C^2 \rho_n^2/4S^2T^2)(\eta\omega\rho_n/2)^{1/2}$. The summary expression for the losses permits their exp. detn. from the width of the resonance curve at different ω and l. N. Thon

CA

2

Properties of second sound. V. P. Peshkov (Inst. Phys. Problems, Acad. Sci. U.S.S.R., Moscow). *Zhur. Eksptl. Teoret. Fiz.* 18, 867-72(1948); cf. preceding abstr.—Second sound was produced by the thermal method in a funnel-shaped app. with a heating body (of 20-μ Constantan wire) of 28 sq. cm. area housed at the wide top and a stem of 0.8 sq. cm. cross-section with a 30-μ P bronze thermometer at the bottom as detector. With the heater fed by an a.c. of 100 hertzes, the temp. oscillations T' calcd. by $T' = w/\rho C\omega$ were 20-30% lower than T' calcd. from the half-width $\Delta\omega$ of the resonance curve by $T' = w/\rho C\omega\Delta\omega$. Allowing for the 20% loss due to inertia of the heater, the temp. oscillations at the crests are at $T = 2.03°$K., $T' = 3 \times 10^{-4}$ degrees, and the velocities of propagation, $v_0 = 30$ and $v_s = 50$ cm./sec. The 2nd sound remained stable under these conditions. Consequently, if there is an analog to the crit. velocity (about 20 cm./sec.) observed in the flow of He II through cracks and in the creeping of He II films also in the 2nd sound, then this crit. velocity must either be much greater than the 30 cm./sec. or else damping must gradually increase after the amplitude has reached the crit. value. Detns. of the temp. amplitudes as a function of the energy input, at 1.63°K. and 200 hertzes, showed an initial linear increase, then a level portion, followed by renewed increase extending up to the gas phase. This effect is even more marked under 20 atm., and is found also at other temps. and frequencies. These expts. were repeated with the 2nd sound produced by the filtration method, with a vibrating membrane with a Cu filter replacing the heater. At 1.63°K., the temp. amplitude for the ordinary sound was 1/8 of the amplitude at resonance of the 2nd sound; on that basis, it can be estd. that the damping of the two sounds is of the same order. In this method, the dependence of the temp. amplitude of the 2nd sound on the energy input was linear throughout, without anomalies. With a d.c.-fed heater inserted close to the filter, the amplitude sometimes decreases by 10-15%, at other times only slightly; these irregular effects are attributed to turbulent heat flow, and the fact that this turbulence only lowers the amplitude, but does not disrupt the 2nd sound, is stressed as an indication of its high stability. Detns. of the damping of the 2nd sound were made in standing waves at different lengths of the resonance vol., both by the width of the resonance curve and by the magnitude of the resonance amplitude. At 1.63°K., 400 hertzes, the losses at the edges are equiv. to a tube length of 30 cm., and at the same temp., but 1600 hertzes, to 10 cm. The relative contributions of vol. and surface losses can be estd. from the frequency dependence, vol. losses being proportional to ν^2, and surface losses to $\nu^{1/2}$; exptl. data indicate that thermal losses are predominantly at the surface. Viscous losses are considerably smaller than are thermal losses.

N. Thon

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AS-3

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536.48 : 534.22

2474. **Velocity of second sound from 1·3 to 1·03°K.** PESHKOV, V. P. Letter in *J. Exp. Theor. Phys., USSR*, 18, 950-1 (*Oct.*, 1948) *In Russian*.—The experimental curve shows a minimum at 1·12°K with a subsequent steep rise at further lowering of the temp. This is in complete contradiction to Tisza's, and agreement with Landau's theory. As the main difference between the two authors' theories is to be found in the role ascribed to the phonon part of the thermal excitations, the conclusion to be drawn from the experiments is that the phonons combine with the rotons in producing second sound oscillations, and not with the super-fluidity component, as assumed by Tisza [Abstr. 252 (1948)]. J A.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PESHKOV, V. P.

USSR/Chemistry - Olefins Analysis, Thermal Sep/Oct 49

"Determination of the Purity and Identification of the 1-Alkenes by the Thermic Method," M. D. Tilicheyev, V. P. Peshkov, S. A. Yuganova, 9½ pp

"Zhur Anal Khim" Vol IV, No 5

Determined cryoscopic constants of 1-alkenes with a number of hydrocarbon atoms of 9-13, and established possibility of identifying hydrocarbons on the basis of their initial temperatures of crystallization. This type of analysis, requiring 3.5 ml of 10 ml of the hydrocarbon, is carried out in a sperical or cylindrical Dewar flask, respectively. Submitted 6 Jul 48.

PA 149T26

CA

Dispersion of second sound at low frequencies. V. P. Peshkov (Inst. Phys. Problems, Acad. Sci. U.S.S.R., Moscow). *Zhur. Eksptl. Teoret. Fiz.* 19, 270-1(1949).—Expts. by the resonance method were made in order to decide the question of possible existence of dispersion in 2nd sound, surmised by Band and Meyer (*C.A.* 43, 3653g), and advocated as possible explanation of the contradiction between the expts. of Kapitza (*C.A.* 36, 3097) and the detns. of ρ_n/ρ of Andronikashvili (*C.A.* 41, 1318e); with the value of ρ_n/ρ detd. by the latter, the momentum p calcd. by $p = (\rho_n/\rho)(W/ST)$ (where W = d. of the heat flow, S = entropy) is 3 times as great as that following from the expts. of K. Dispersion was definitely found to be absent at 1.63°K., in the frequency range from 10 to 250 hertzes, and with energy inputs from 0.005 to 0.04 w./sq. cm. Coincidence of the values of ρ_n/ρ from 2nd sound with those of A. indicates absence of dispersion down to $1/n$ hertzes. Consequently, the inconsistency between the expts. of K. and the above formula for p must be due to an error either in the expts. or in the formula. Cf. preceding abstr. N. Thon

Journal of Experimental and Theoretical
Physics, USSR, Vol. 18, No. 5, 1951

Peshkov, V.P. and Zinov'eva, K.N. (Institute of Physical Problems, U.S.S.R. Academy of Sciences). Second sound of helium II at higher pressures, 438-43

"The propagation velocity of second sound has been measured in the whole region of the existence of helium II from 1.3°K to the λ-line. Curves for the transition of helium II to helium I and solid helium have been determined."

Source: [redacted] GTRSPL, Vol. 1, NO. 5

PESHKOV, V. P. 191T20

USSR/Chemistry - Hydrocarbons . Jul 51

"Cryoscopic Constants and Temperatures of Change of State of n-Alkanes C_6-C_{20}," M. D. Tilicheyev, V. P. Peshkov, S. A. Yuganova

"Zhur Obshch Khim" Vol XXI, No 7, pp 1229-1237

By expt found cryoscopic consts (in molar %/deg) for C_6-C_{20} n-alkanes. n-Alkanes with even number of C atoms have consts of higher value, lying on different curve, than those with odd number of C atoms. Only latter undergo change of state in solid phase. Values calcd for their temps of change are slightly higher than best published data, showing greater purity of n-alkanes in this investigation. Calcd heat of the change of state of n-nonane.

191T20

Peshkov, V.P.

USSR.

536.48

6387. Determination of the velocity of the second sound in helium II up to the temperature of 0·85°K. V. P. Peshkov. *Zh. eksper. teor. Fiz.*, 23, No. 6(12) 650-9 (1952) *In Russian.*

A description of an apparatus for obtaining low temperatures by pumping out helium vapour with an oil diffusion pump is given. This apparatus was used to measure the velocity of the second sound up to the temperature of 0·85°K, by the resonance method which was described previously [Abstr. 2174 (1949)]. The velocity increases from a minimum of 18·3 m/sec at 1·12°K to a maximum of 22·5 m/sec at 0·85°K. In the range from 200 to 3000 cycles at 1° and 0·9°K, the velocity of the second sound remains constant. The experiments carried out showed the preference of the resonance method as compared with the pulse method. By this method it was possible to determine the velocity more accurately, and also to establish the absence of dispersion in the region of ultrasonic frequencies.

B. Rabkin

FD-1489

USSR/Physics - Low temperatures

Card 1/1 : Pub. 146-12/20

Author : Peshkov, V. P.

Title : Measurement of the thermomechanical effect in helium II in the vicinity of $1^{\circ}K$

Periodical : Zhur. eksp. i teor. fiz., 27, 351-354, Sep 1954

Abstract : The heat quantity Q absorbed by 1 gram of superfluid He was measured by P. Kapitsa (ibid. 11,581 (1941) from lamda point to $1.33^{\circ}K$. Author determines Q in vicinity of $1^{\circ}K$. Experimental values of the ratio of normal density to ordinary density of He bound by thermal motion determined from velocity of second sound heat capacity and entropy over $0.85^{\circ}K$ agree with theoretical results of L. D. Landau (ibid. 11,592 (1941) within limits of experimental accuracy (10%). Tables and graphs. Six references including 1 foreign.

Institution : Institute of Physical Problems, Acad Sci USSR

Submitted : January 27, 1954

Peshkov V P

USSR/Atomic and Molecular Physics - Low Temperature Physics, D-5

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 34428

Author: Peshkov, V. P.

Institution: None

Title: Calculation of Parameters of Rectification Column

Original Periodical: Zh. tekhn. fiziki, 1956, 26, No 3, 664-669

Abstract: Theoretical investigation of the operation of a film rectification column (vertical cylindrical tube) with laminar and turbulent vapor motion for all constant values of the separation coefficient. The equations obtained make it possible, under certain simplifying assumptions, to estimate the resistance to mass transfer in the gas and liquid films, the effect of the value of the take-off on the concentration of the product removed, the length of the delay, and the settling time. It is shown that the effectiveness of the column has a minimum in the transition from the laminar to the turbulent state. The results obtained are applied to the case of an actual packed column used to separate the He^3 - He^4 isotopes. The author reports that on the basis of his calculations he was able to select rapidly satisfactory operating conditions for the column, without having to resort to detailed experimental investigations.

1 of 1

PESHKOV, V.P.

D-5

Category : USSR/Atomic and Molecular Physics - Low-Temperature physics

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 887

Author : Peshkov, V.P.
Inst : Inst. of Physical Problems. USSR Acad. of Sciences
Title : The Transformation of the λ-Transition in Helium in the Presence of a Thermal Stream Into a Special Transition of the First Kind.

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 30, No 3, 581-582

Abstract : An investigation was made of the phase transition of He I into He II under conditions of thermal flow across the separation boundary. The instrument used was a cuvette with plane-parallel walls, filled with liquid He under atmospheric pressure. An interference pattern(fringes of equal thickness), which is a function of the distribution of density, was observed. Heat was produced in a heater, and passed through the He in the cuvette and then through a platinum foil into the surrounding helium bath. When enough heat was liberated, a stable visible boundary was produced between He I and He II (photographs are given), indicating a jump in density at the boundary. An investigation of the variation in the interference pattern with variations of the heat flow w led to a determination of the variation of $\Delta\rho$ (w), which turned out to be quadratic. The value of $\Delta\rho$ observed at w = 0.16 watt/cm^2 corresponds

Card : 1/2

PESHKOV, V.P.

CARD 1 / 2

PA - 1317

SUBJECT USSR / PHYSICS
AUTHOR PEŠKOV, V.P.
TITLE Experiments in Connection with the Enrichment of Helium with the Isotope He^3.
PERIODICAL Žurn.eksp.i teor.fis, 30, fasc. 5, 850-854 (1956)
Issued: 8 / 1956 reviewed: 9 / 1956

The aim of this work which was begun in 1949 and was frequently interrupted was the construction of sufficiently productive devices for the purpose of winning the isotope He^3 from a mixture with He^4 and its purification from He^4.
Devices for obtaining He^3: The first device consisted of a DEWAR vessel with liquid helium (2,3°K), from which the He^3 is obtained. It permits enrichment up to 0,2%, i.e. by the 10^5-fold, which is, however, not enough. Besides, the device does not work continuously. With another device which works continuously, the helium is introduced under atmospheric pressure. The He^4 was led off through a filter in form of a superliquid flow for the purpose of enrichtment by thermoosmosis. Besides, the gas enriched by He^3 was led off by means of rectification on the tube. The helium is in an exterior DEWAR vessel under atmospheric pressure and is, according to necessity, replenished from a liquifier. The device is described in detail on the basis of a drawing. In the interior of the DEWAR vessel temperature was kept on a level of from 1,9 - 2° K. The He^3 was completely removed within the limits of error, and the enrichment coefficient may be put at 2.10^4.

PESHKOV, V.P.; KACHINSKIY, V.N.

Measuring the pressure of saturated He^3 --He^4 vapor mixtures with high He^3 concentration. Zhur. eksp. i teor. fiz. 31 no.4:720-721 O '56. (MLRA 9:12)

1. Institut fizicheskikh problem Akademii nauk SSSR.
(Helium--Isotopes) (Low temperature research)

PESHKOV, V.P.

Calculation of fractionating column parameters. V. P. Peshkov. *Soviet Phys. Tech. Phys.* 1, 639-45(1957)(English translation).--See *C.A.* 50, 14275h. H. M. R.

V. P.

120-4-34/35

AUTHORS: Peshkov, V.P. and Kondrat'yev, N.I.

TITLE: A Sylphon McLeod Manometer (Sil'fonnyy manometr Mak-Leoda)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1957, No.4, p. 105 (USSR)

ABSTRACT: The McLeod manometer is the simplest and most convenient absolute manometer. The usual manometer includes a movable reservoir or fore-vacuum. This has the undesirable effect of contaminating the capillaries. The movable reservoir is usually connected in by means of a rubber tube. The action of the mercury on the rubber walls results in the formation of a sulphide film which sticks to glass inside the manometer and causes errors of measurement. Manometers with an additional fore-vacuum are contaminated as a result of constant contact of the mercury with the atmosphere.
A new form of the above manometer is described wherein the movable reservoir is replaced by sylphon bellows. All metal parts which are in contact with the mercury are made of steel. Tests on this instrument have shown it to be satisfactory in practice. The bellows can be mounted either vertically or horizontally. There is 1 figure.

ASSOCIATION: The Vavilov Institute for Physical Problems Ac.Sc.USSR

Card 1/2

PESHKOV, V.P

56-5-50/55

AUTHOR PESHKOV, V.P., ZINOVYEVA, K.N.,

TITLE Visual Observation of the "Stratification" of a He^3-He^4 Solution. (Vizual'noye nablyudeniye rassloyeniya rastvorov He^3-He^4. Russian)

PERIODICAL Zhurnal Eksperim.i Teoret.Fiziki, 1957, Vol 32, Nr 5, pp 1256-1257 (U.S.S.R.)

ABSTRACT In a transparent Dewar vessel of 3 cm^3 capacity pumped of He^3 vapors were caused to condense for the purpose of producting the lowest possible temperatures. A glass ampule with 200 mm^3 capacity (ø = 3,5 mm, height = 20 mm) which was connected with a thin-walled steel capillary (ø = 0,5 mm) was dipped into the Dewar vessel in such a manner that the capillary tube protruded beyond the level of the liquid in the Dewar vessel. A gaseous He^3-He^4 mixture condensed through the capillary tube in the glass ampule in such a manner that a distinct meniscus was formed. At 1,1°K only a homogeneous transparent liquid was visible in the ampule. At a temperature of 0,81±0,01°K (He^3-vapor pressure 3 mm torr) a thin layer with a strictly defined horizontal boundary surface formed in the surface of the liquid. With a further reduction of the temperature to 0,5°K the boundary surface was conserved and could not even be influenced by shaking the ampule. With an increase of temperature this boundary surface disappeared again completely at more than 0,81°K.

Card 1/2

Peshkov, V.P.

56-4-1/54

AUTHOR: Peshkov, V.P.

TITLE: Determination of the Density of He^3 by the Optical Method (Opredeleniye plotnosti He^3 opticheskim metodom)

PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol. 33, Nr 4, pp. 833 - 838 (USSR)

ABSTRACT: For the density determination of He^3 in the liquid as well as in the gaseous phase the formula of the molar polarization is used:

$$A = \frac{3}{4\pi} \cdot \frac{n^2 - 1}{n^2 + 2} \cdot \frac{M}{\varrho} = \text{const.}$$

It was found that the molar polarization for He^3 amounts to $A = 0{,}123\ cm^3/Mol$. It was further shown that at temperatures and pressures which are lower than the corresponding critical values the equation of state of the gaseous He^3 can be represented by the expression

$$p/\varrho = 27{,}35\ T - 2{,}3 \cdot 10^3 \varrho + 1{,}8 \cdot 10^4 \varrho^2$$

p/ϱ is expressed in at. cm^3/g. For the compressibility of li-

Card 1/2

PESHKOV, V.P.

PHASE I BOOK EXPLOITATION SOV/1297

Vsesoyuznaya nauchno-tekhnicheskaya konferentsiya po primeneniyu radioaktivnykh i stabil'nykh izotopov i izlucheniy v narodnom khozyaystve i nauke, Moscow, 1957

Polucheniye izotopov. Moshchnyye gamma-ustanovki. Radiometriya i dosimetriya; trudy konferentsii... (Isotope Production. High-energy Gamma-Radiation Facilities. Radiometry and Dosimetry; Transactions of the All-Union Conference on the Use of Radioactive and Stable Isotopes and Radiation in the National Economy and Science) Moscow, Izd-vo AN SSSR, 1958. 293 p. 5,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR; Glavnoye upravleniye po ispol'zovaniyu atomnoy energii SSSR.

Editorial Board: Frolov, Yu.S. (Resp. Ed.), Zhavoronkov, N.M. (Deputy Resp. Ed.), Aglintsev, K.K., Alekseyev, B.A., Bochkarev, V.V., Leshchinskiy, N.I., Malkov, T.P., Sinitsyn, V.I., and Popova, O.L. (Secretary); Tech. Ed.: Novichkov, N.D.

PURPOSE: This collection is published for scientists, technologists, persons engaged in medicine or medical research, and others concerned with the production and/or use of radioactive and stable isotopes and radiation.

COVERAGE: Thirty-eight reports are included in this collection under three main subject divisions: 1) production of isotopes 2) high-energy gamma-radiation facilities, and 3) radiometry and dosimetry.

TABLE OF CONTENTS:

PART I. PRODUCTION OF ISOTOPES

Frolov, Yu.S., V.V. Bochkarev, and Ye.Ye. Kulish. Development of Isotope Production in the Soviet Union 5
This report is a general survey of production methods, apparatus, raw materials, applications, investigations and future prospects for radio isotopes in the Soviet Union.

Card 2/12

Isotope Production (Cont.)

Peshkov, V.P., and V.M. Kuznetsov. Low Temperature Methods of Separating Helium Isotopes (He^3 - He^4) 149

PART II. HIGH-ENERGY GAMMA FACILITIES

Sinitsyn, V.I. Problems and Trends in Creating High-energy Gamma Facilities 160

Sibergal', A.V., U.Ya. Margulis, and V.G. Khrushchev. Principles and Techniques of Using Radioactive Isotopes as High-energy Sources in Radiobiology and Medicine 175
Basic problems concomitant to planning and constructing radiation facilities are systematized according to the purpose of the facility. Descriptions and schematic drawings are given for some facilities classified as to purpose: a) experimental radiobiology, intended for low radiation of relatively small objects (animals, plants) b) experimental installations intended for radiation of various biological preparations of small size but requiring high dosage (microorganisms, biological substrates) c) industrial radiation of biological products requiring sterilization, preservation, disinfection, etc. d) medical and therapeutical purposes

Card 7/12

24(8) SOV/30-58-12-20/46

AUTHOR: Peshkov, V. P., Professor

TITLE: Brief Communications (Kratkiye soobshcheniya) Conferences on Low Temperatures (Konferentsii po nizkim temperaturam)

PERIODICAL: Vestnik Akademii nauk SSSR, 1958, Nr 12, pp 77 - 78 (USSR)

ABSTRACT: The conferences were both held in the Netherlands. The first one was convened in Delft from June 17 to 21, 1958. It was organized as an extended session of the First Commission of the International Institute for the Investigation of Low Temperatures and was attended by delegates from more than 20 countries, including the USSR (E. L. Andronikashvili, M. P. Malkov, and V. P. Peshkov). Reports were heard on cryogenic equipment, thermometry, crystal lattice destructions at low temperatures and transfer phenomena. From among the Soviet delegates M. P. Malkov reported on some problems of liquefaction and storing of hydrogen and helium. V. P. Peshkov reported on mass transfer in the separation of helium isotopes. The second conference was convened in Leyden from June 23 to 28, 1958, by the Commission for Low Temperatures of the International Association of Theoretical and Applied Physics. In this conference, V. I. Yepifanov

Card 1/2

5(4) SOV/56-35-6-4/44

AUTHOR: Peshkov, V. P.

TITLE: Observation of a λ-Transition in Helium for a Heat Flow Through a Phase Boundary (Nablyudeniye λ-perekhoda v gelii pri teplovom potoke cherez granitsu faz)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 6, pp 1350-1354 (USSR)

ABSTRACT: In continuation of a preliminary investigation carried out by the author (Ref 1) of the same problem, the present paper describes experiments carried out for the purpose of investigating the density- and temperature continuity on the boundary between superfluid and nonsuperfluid helium in the presence of a heat flow. The device, which permitted optical investigation of the phase boundary is represented by figure 1 and is described in detail in the introduction. Figure 2 shows a total of 16 photographs of strips of equal optical thickness such as were observed in the course of experiments. The first four were taken with the camera inclined at 7^o towards one side, and the further 4 photographs were taken with the camera inclined at an angle of 7^o towards the other side. The last series shows these strips for an inclination of 4.5^o.

Card 1/2

SOV/56-35-6-4/44

Observation of a λ-Transition in Helium for a Heat Flow Through a Phase Boundary

The horizontal rows of the photographs correspond to heat flows of 0, 0.06, 0.11, and 0.19 W/cm^2. The results obtained by measuring density- and temperature continuities are shown by figure 3 in form of a diagram. Density jumps are proportional to the square of heat flow density and at 0.16 W/cm^2, for instance, the density of nonsuperfluid helium on the boundary is less by $1.3 \cdot 10^{-3}$ g/cm^3 than that of superfluid helium, i.e. by about 1 %. In superfluid helium a temperature gradient of $dT/dx = 1.5 \cdot 10^{-3}$ degrees/cm was observed at $W = 0.06$ W/cm^2. In nonsuperfluid helium (with W being equal) a temperature gradient of 10 degrees/cm was found. In conclusion, the author explains boundary stability and gives several examples of a disturbance of this stability, which may occur in the case of high thermal flow densities. The author finally thanks P.L. Kapitsa, Academician, for the interest he displayed, and he expresses his gratidtude to A.I. Filimonov and I.A. Uryutov for helping to carry out the experiments.-There are 5 figures and 3 Soviet references.

Card 2/3

Inst. Physical Problems AS USSR

SOV/53-67-4-7/7

24(0)

AUTHOR: Chentsov, R.

TITLE: The Fifth All-Union Conference on the Physics of Low Temperatures (5-ye Vsesoyuznoye soveshchaniye po fizike nizkikh temperatur)

PERIODICAL: Uspekhi 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-matemati-
cheskikh 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 uni-
versitet im. Stalina (Tbilisi State University imeni Stalin).
The Conference was attended by about 500 specialists from
Tbilisi, Moscow, Khar'kov, Kiyev, Leningrad, Sverdlovsk, and
other cities as well as by a number of young Chinese scientists
at present working in the USSR. About 50 lectures were deliver-
ed which were divided according to research fields. - I. Liquid
Helium. Reports were delivered by the researchers of the
Laboratoriya nizkikh temperatur TGU (Laboratory for Low Tem-

Card 1/11

peratures of Tbilisi State University) under the supervision
of E. L. Andronikashvili: D. S. Tsakadze, Yu. G. Mamaladze
and S. G. Matinyan spoke about the investigation of the damp-
ing of rotational oscillations of a single disk in He II in
dependence on the rotation rate. G. A. Gamtsemlidze spoke
about the influence exercised by the state of the disk sur-
face on critical rate and on the damping of its oscillations
in the transcritical range. V. P. Peshkov (IFP AN SSSR -
Institute for Physical Problems AS USSR) spoke about further
investigations of the boundary between superfluid and non-
superfluid helium (discovered by himself) in a heat flow.
This boundary characterizes the density- and temperature jump.
Kuang, Wei-yen, V. N. Zinov'yeva and V. P. Peshkov spoke about
investigations at extremely low temperatures (down to 0.5°K)
which were attained by the method of the evacuation of
He^3-vapors. Kuang, Wei-yen investigated in the interval
0.57 - 2.07°K the phenomenon of the temperature jump (dis-
covered by P. L. Kapitsa in 1941) on the boundary of a solid
(in this case Cu) by means of He II; for the thermal resistance
not the T^3-law but a T^n-law holds, [illegible]. Zinov'yeva and
Peshkov investigated, among other things, also the phase

Card 2/11

diagram of He^3 dissolved in He^4 (20 - 83%). V. L. Ginzburg
(FIAN) gave a report on the phenomenological theory of He II
in the region of the λ-point in consideration of quantum
effects (the theory was developed by himself and by L. P.
Pitayevskiy). B. T. Geylikman (IAE AN SSSR - Institute for
Atomic Energy, AS USSR) delivered a short report on the
theory of phase transition in liquid He^4. I. M. Lifshits
and D. G. Sanikidze (KhFTI AN USSR - Khar'kov Physico-techni-
cal Institute AS UkrSSR) investigated the melting of solid
He^3 on the basis of Landau's theory of the Fermi-fluid and
found that melting pressure as a function of temperature has
a minimum at 0.5°K (Pomeranchuk-effect). The comprehensive
discussion was held under the supervision of P. L. Kapitsa.-

V. P. Peshkov and M. P. Malkov gave information con-
cerning scientific work of Soviet scientists in foreign coun-
tries (zagranichnaya nauchnaya komandirovka), and E. V.
Shpol'skiy spoke about the abstracting journal "Fizika".

Card 10/11

V.P Peshkov

SOV/56-36-4-/70

24(8)

AUTHORS: Peshkov, V. P., Zinov'yeva, K. N., Filimonov, A. I.

TITLE: He^3 Cryostats (Kriostaty s He^3)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 4, pp 1034-1037 (USSR)

ABSTRACT: For investigations at low temperatures (1 - 4.2°K) cryostats with He^4 are generally used. However, as the latter becomes superfluid already at 2.18°K, it is difficult, by means of such devices, to get near to absolute zero. A record achievement was attained by means of such a He^4-cryostat by Keesom (Leiden, 1932, Ref 1) with 0.71°K with the aid of a strong pump (pumping capacity 675 l/sec); Lazarev and Yesel'son (Ref 2) were able to attain the same value by means of a much weaker pump (15 l/sec). In the present paper the authors describe work carried out with cryostat devices operating with He^4 and He^3, which are able to attain and to maintain temperatures of up to 0.3°K. These devices are at the Institut fizicheskikh problem (Institute for Physical Problems). Use of the

Card 1/3

SOV/56-36-4-11/70

He^3 Cryostats

very rare isotope He^3 was found to be necessary, because at such low temperatures He^3 is not yet superfluid and therefore pumping out helium vapors presents no difficulties. Figure 1 is a schematical representation of the first device. In principle, the cooling vessel consists of a double Dewar vessel containing He^4; in its interior there is a second Dewar vessel which contains 3 cm^3 of liquid He^3. Sucking off of the gas is carried out by means of a thin-walled steel tube which is connected by means of a copper connecting piece with the Dewar vessel, by means of a mercury diffusion pump DRN-10 (30 l/sec) operating with a counterpressure of 20 - 30 torr. Owing to the low temperature of the He^4 surrounding ... pump is able to operate without a pre-vacuum. The ... temperature attainable by means of this device is about 0.3°K (p = 0.002 torr). Temperature measurement is carried ... means of a resistance thermometer (30μ phosphor bronze wire) which had been previously gauged at He^3 vapor pressure (Pressure measurement by means of a MacLeod manometer). If ... regular supply of liquid He^3 is maintained, the device may be kept in operation for 8 - 10 hours with one and the same ...

Card 2/3

SOV/56-36-4-...

He³ Cryostats

ling of gaseous He^3 (about 5 l). If the pumps are ... the He^3 liquid increases within 3 hours from 0.. to ..°K. The second model is, in principle, similar to the first (Fig 1), the different construction of the cooling vessel is shown by figure 2. The mechanical Tepler-pump (mercury operating as a pre-vacuum pump was replaced in device 2 by an oil pump of the type NVG-2 developed at the NIVI. The He^3-vapors were also sucked off by means of a mercury diffusion pump which, in this case, however, worked with the pre-vacuum pump NVG-2. By means of this device it is possible to attain up to 0.35°K, by continuous operation 0.5°K. Temperature measurement was carried out as in the case of device 1. The two devices are described with all details by the present paper. There are 2 figures and 6 references, 3 of which are Soviet.

ASSOCIATION: Institut fizicheskikh problem Akademii nauk SSSR (Institute for Physical Problems of the Academy of Sciences, USSR)

Card 3/3

5(4).

AUTHORS: Zinov'yeva, K. N., Peshkov, V. P. SOV/56-37-1-5/64

TITLE: Phase Diagram of Liquid He^3-He^4 Solutions (Fazovaya diagramma zhidkikh rastvorov He^3-He^4)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 1, pp 33-37 (USSR)

ABSTRACT: Following an earlier paper (Ref 1), the authors report further investigations of the phase diagrams of He^3-He^4-mixtures, of the temperature course of the curve of λ-transitions in such mixtures, and of the phase separation curve for solutions with high He^3-concentration. All measurements were carried out by means of visual observation. The device with which the authors operated is described in detail; its inner part, which consists essentially of a double-walled Dewar vessel, is shown by figure 1. A Dewar vessel with liquid He^4 contains a transparent Dewar vessel with liquid He^3; the latter contains a glass ampoule, into which a condensed He^3-He^4 mixture is introduced from above through a long steel capillary tube. The temperature of the mixture in the glass

Card 1/3

ampoule is measured by means of a resistance thermometer and vapor pressure by means of a MacLeod manometer. Figure 2 shows the results obtained by measuring the λ-curve and the phase separation curve of the mixture. The data obtained by the authors, those obtained by Yesel'son, Bereznyak, Kaganov (Ref 4), as well as those obtained from reference 7, are located on continuous curves; the curve of reference 3 partly shows a certain deviation. The critical point for phase separation in this mixture became $T^{crit}_{max} = (0.88 \pm 0.01)^{\circ}$ K at a molar He^3-concentration $x = (64 \pm 1)$ % ($x = He^3/(He^3 + He^4)$[%]). The point of intersection between the λ-curve and the phase separation curve has the coordinates $T^{crit}_{\lambda} = (0.67 \pm 0.02)^{\circ}$ K and $x = (81 \pm 1)$ %. Above this point both phases are superfluid, and below it the He^3-rich phase is not superfluid. The measuring data obtained are given in a table for a multiple of x-values. Finally, the authors thank P. L. Kapitsa for his interest in this investigation, and N. I. Yakovleva for assisting in the measurements. There are 2 figures, 1 table, and 8 references, 3 of which are Soviet.

24(8),21(5),5(4) SOV/53-67-2-1/7

AUTHORS: Peshkov, V. P., Zinov'yeva, K. N.

TITLE: Experimental Work With He^3 (Eksperimental'nyye raboty s He^3)

PERIODICAL: Uspekhi fizicheskikh nauk, 1959, Vol 67, Nr 2, pp 193-242 (USSR)

ABSTRACT: In the present paper the authors give a very detailed survey, which was compiled from more than 100 Soviet and Western publications, on the production and investigation of He^3 and on its properties. This survey is of particular value because of the numerous and most recent data it contains, which are clearly shown by several tables. The following problems are dealt with individually: The methods of separating He^3 (three tables, some of which extend over several pages, contain data concerning the dependence of vapor pressure on the temperature for various compositions of the liquid phase, the dependence of output condensation pressure on the temperature for mixtures with different He^3-content, the He^3-distribution between vapor and liquid for different compositions of the liquid phase and various temperatures); the pressure of saturated vapor and the determination of the critical point (a table gives He^3 vapor pressure for low temperatures ~0.30°K to 3.30°K in steps of

Card 1/3

Experimental Work With He^3 SOV/53-67-2-1/7

0.01°K); the thermonuclear pressure differences in He^3 (Table 6); the melting-point curve and the phase transitions of solid He^3 (Figs 8-11, Tables 7, 8); the density of liquid, vaporous, and solid He^3 (Tables 9, 10); evaporation heat (Fig 14 and Table 11); specific heat (figure 15 shows temperature dependence up to 2.0°K of the specific heat of liquid He^3 under saturated steam; experimental and theoretical curves are compared; figure 16 shows the molar heat capacity of liquid He^3 between 0.10 and 0.75°K at a pressure of 120-150 torr); the entropy (Figs 17, 18, 19); the magnetic properties of He^3 (contrary to He^4, the He^3 atom has a magnetic moment that is different from zero, $1.07 \cdot 10^{-23}$ CGS units, and a spin 1/2, and therefore it is characterized by a number of special interesting features which are discussed); the absence of superfluidity; viscosity (figures 24 and 25 show viscosimeters, table 13 contains data on the temperature range of between 0.35 and 3.2°K in different intervals, figure 26 shows the corresponding diagram, figure 27 the dependence of the η-value for gaseous He^3 and He^4 on temperature). Further chapters deal with thermal conductivity, the temperature jumps of He^3 on its boundary with a solid, surface tension (diagram in Figure 31, range 0.25 - 3°K),

Card 2/3

the measurement of the velocity of sound (figure 32 shows a measuring apparatus according to reference 101, figure 33 the temperature diagram in liquid He^3, table 14 contains data for u(T), the compressibility of He^3 (figure 34 - isothermal compressibility of liquid He^3, figure 35 - adiabatic compressibility, the adsorption of He^3 on active carbon). The following chapter discusses several types of kyrostats and the last chapter discusses the possibility of attaining deep crystallization temperatures for He^3 (Pomeranchuk, Ref 46). The following Soviet scientists are mentioned: B. N. Yesel'son, B. G. Lazarev, N. G. Bereznyak, M. I. Kaganov, T. P. Ptukha, V. M. Kuznetsov, N. Ye. Alekseyevskiy, V. N. Kachinskiy, L. D. Landau, I. M. Khalatnikov, A. A. Abrikosov, K. N. Zinov'yeva, A. I. Filimonov and I. B. Danilov. There are 40 figures, 15 tables, and 110 references, 27 of which are Soviet.

PESHKOV, V. P.

"Critical Velocities in Superfluid Helium."

report presented at the Intl Conference on Low Temperature Physics, IUPAP, Toronto, 29 Aug - 3 Sep 60.

Inst. of Physical Problems, Acad. Sci. USSR

S/030/60/000/011/014/026
B021/B056

AUTHOR: Peshkov, V. P., Doctor of Physical and Mathematical Sciences

TITLE: The VII International Conference on the Physics of Low Temperatures

PERIODICAL: Vestnik Akademii nauk SSSR, 1960, No. 11, pp. 108-109

TEXT: The 7th International Conference on the Physics of Low Temperatures took place from August 29 to September 3, 1960 at Toronto (Canada). Such conferences are regularly convened by the commission for low temperatures of the International Society for Pure and Applied Physics, of which the USSR is a member. About 400 research scientists, mainly from the USA, Canada, England and Holland took part in this work. The Soviet delegation consisted, apart from the author of B. I. Berkin and B. N. Samoylov. About 200 reports on various problems of the physics of low temperatures were submitted to the conference. During the conference, it was announced that Academician L. D. Landau was awarded the F. London Prize for work in the field of low temperatures. A large part of the reports at the conference dealt with the investigation of the properties of liquid and solid

Card 1/2

The VII International Conference on the Physics of Low Temperatures

S/030/60/000/011/014/026
B021/B056

helium. A large part of the work concerned problems connected with the investigation of the magnetic properties of substances. The next conference on low temperatures is intended to be convened in 1962

Card 2/2

PESHKOV, V.P.

Second sound in helium II. Zhur.eksp.i teor.fiz. 38 no.3: 799-805 Mr '60.
(MIRA 13:7)

1. Institut fizicheskikh problem Akademii nauk SSSR.
(Helium)

24.5600

89230
S/056/61/040/001/036/037
B102/B212

AUTHOR: Peshkov, V. P.

TITLE: Critical velocities in superfluid helium

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 1, 1961, 379-381

TEXT: The flow-velocity independence of He II of the pressure drop has been known for a long time; P. L. Kapitsa has investigated the critical velocity as a function of pressure very accurately when studying the thermomechanical effect, and has stated the conditions for superfluidity. It can be inferred therefrom that the flow velocity has to be larger than the sound velocity in order to obtain phonons, and to produce rotons a velocity higher than 70 m/sec is required. Different formulas are given by different authors for the critical velocity; e.g., $v_s = \hbar/md$, $v_s = \hbar/m\sqrt{ad}$, $v_s = (\hbar/md)\ln(d/a)$, where m denotes the mass of the He-atom, d the diameter of the capillary tube or the gap, a the magnitude of the interatomic distances. Even the latter formula (Feynman)

Card 1/4
3

89230

Critical velocities in superfluid... S/056/61/040/001/036/037
B102/B212

does not hold for $d < 10^{-3}$ cm. In the present "Letter to the editor" an attempt is made to find the reason of the divergence; for this purpose the effect of the vorticity (which is assumed to be the cause of disturbance in superfluidity) is examined more closely. The energy of a vorticity with a radius R is given by $\varepsilon \approx (\varrho_s R h^2/2m^2)\ln(R/a)$, its momentum $p \approx \varrho_s \pi R^2 h/m$, where ϱ_s denotes the density of the superfluid part in question, $h = 2\pi\hbar$; thus, besides phonons and rotons there is another form of excitation: vortex rings. Such a vortex ring with a minimum radius is a roton having energy $\Delta = k \cdot 9.8^\circ = 1.23 \cdot 10^{-15}$ erg and a momentum of $p_0 = 2.1 \cdot 10^{-19}$ g·cm/sec. Thus, $a \approx 10^{-8}$ cm and $R = 2.6 \cdot 10^{-8}$ cm, and the spectrum of vortex rings is given by: $\varepsilon = \Delta\sqrt{(p/p_0)}(1 + \frac{1}{2}\ln\frac{p}{p_0})$. In order to obtain excitations, $v_s > \varepsilon/p$ must hold; the shape of the spectrum shows that vortices are most likely to be formed with such a p. It can be concluded from the analogy between the formation of turbulence in a normal fluid and vortex formation in superfluid helium that the latter occurs

Card 2/4 3

Critical velocities in superfluid... S/056/61/040/001/036/037
B102/B212

with a relaxation time τ. If superfluidity is disturbed by vortices with a maximum radius R and an energy ε then relation

$$\alpha \frac{\varrho_s v_s^2}{2} \pi R^2 (R+v_s\tau) = \varrho_s \frac{Rh^2}{2m^2} \ln\frac{R}{a};\ v_s^2 R(R+v_s\tau) = \frac{h^2}{\alpha\pi m^2} \ln\frac{R}{a}$$

holds, α denoting the part of kinetic energy necessary for vortex formation. v_s as a function of R has been calculated with different parameters. The figure shows test results, $v_s(R)$ calculated for $a = 10^{-8}$cm, $\tau = 4\cdot10^{-4}$sec, and $\alpha = 0.122$ (solid curve) and for $a = 3\cdot10^{-7}$cm, $\tau = 2\cdot10^{-4}$sec, and $\alpha = 0.116$ (dashed curve). Also the occurrence of a transcritical region is explained here. There are 1 figure and 9 references: 2 Soviet-bloc and 7 non-Soviet-bloc.

ASSOCIATION: Institut fizicheskikh problem Akademii nauk SSSR (Institute of Physical Problems, Academy of Sciences USSR)

SUBMITTED: November 24, 1960

Card 3/4
3

89230

26697
S/056/61/041/005/012/038
B109/B102

24.5600

AUTHORS: Peshkov, V. P., Tkachenko, V. K.

TITLE: Kinetics of the destruction of superfluidity in helium

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 5(11), 1961, 1427 - 1432

TEXT: In continuation of studies carried out by P. L. Kapitsa (ZhETF, 11, 581, 1941), L. D. Landau (ZhETF, 11, 591, 1941) and at the Institut fizicheskikh problem (Institute of Physical Problems) by V. Markov and Tkachenko, the authors investigated the heat transfer along a capillary tube. The measuring arrangement in essential consisted of a spiral capillary tube of 1.4 mm diameter and 8 m length, placed in a vacuum container of 70 mm diameter and 170 mm length. The upper end of the capillary tube was connected to a helium vessel, the lower was surrounded by a heater coil. 12 phosphor-bronze thermometers (R_1) with a measuring current of 0.2 ma are mounted on the capillary tube. For T = 1.34°K and a heat flux of $W = 4.4 \cdot 10^{-2}$ w/cm^2 = 1.19 W_{crit}, Fig. 3 renders the time

Card 1/4

dependence of the thermometer temperature. Between 1.3 - 1.4°K the thermometer resistance was ~15 - 20 ohms. It was found that a turbulence front moves with constant velocity $v_T = 2.2 \pm 0.1$ mm/sec from the heated end to the cold end of the tube. This front increases the thermal resistance of the helium. On the other hand, a front with the constant velocity $v_x = 1 \pm 0.03$ mm/sec propagates from the cold end of the tube. Fig. 4 shows the velocity of the fronts as functions of the heat flux densities at T = 1.34°K. For $W_{crit} = 3.7 \cdot 10^{-2} \pm 0.1 \cdot 10^{-2}$ w/cm^2 which the authors estimate to occur at $v_n = 1.85$ cm/sec and $v_s = 0.114$ cm/sec, v_T and v_x practically turn zero. Pretreatment of the helium has a considerable effect upon the turbulence. Turbulence occurs at the ends of the capillary tube but may arise also inside the tube at a subcritical heat flux if the settling time of the helium before the application of the heat flux was too short. A. N. Vetchinkin (PTE, 1, 192, 1961) is mentioned. There are 8 figures and 10 references: 4 Soviet and 6 non-Soviet. The four most recent references to English-language publications read as

26697

Kinetics of the destruction... S/056/61/041/005/C12/038
B109/B102

follows: L. Onsager. Nuovo Cim., 6, Suppl., 2, 249, 1949; W. F. Vinen. Proc. Roy. Soc., A240, 114, 128, 1957; R. P. Feynman. Progr. in low temp. phys., 1, Amsterdam, 1955; K. R. Atkins. Liquid helium, Cambridge, 1959.

ASSOCIATION: Institut fizicheskikh problem Akademii nauk SSSR (Institute for Physical Problems of the Academy of Sciences USSR)

SUBMITTED: June 7, 1961

Card 3/4

26699
S/056/61/041/005/014/038
B108/B102

24.5600

AUTHORS: Peshkov, V. P., Stryukov, V. B.

TITLE: The reason for the loss of the superfluid properties

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 5(11), 1961, 1443-1448

TEXT: In order to investigate as to what is the reason why helium II loses its superfluid properties, the authors measured the critical velocities for the superfluid part and for the oppositely moving superfluid and normal parts with the apparatus shown in Fig. 1. The authors had adopted W. F. Vinen's method of second-sound attenuation (Proc. Roy. Soc., A240, 128, 1957). The capillary tube in which the flow was measured had a diameter of 0.385 ± 0.005 cm and was 10 cm long. The counter-flow was established by a heater. The single superfluid flow was raised by the thermodynamic effect through the Fe_2O_3 crocus by another heater. The capillary tube and its lower lid together formed the second-sound resonator with a Q of about 140.

Card 1/

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The reason for the loss of the...

The second-sound measuring device was essentially the same as that described in a paper by V. P. Peshkov (ZhETF, 38, 799, 1960). The critical velocities of a single superfluid flow, caused by the heater 4, and of the counterflow, caused by heater 2 were determined from the attenuation of second sound in the turbulent flow. The measurements definitely showed that the velocity relatively to the walls must be considered the critical velocity. A value of about 0.03 cm/sec was found for the latter. The loss of the superfluid properties is due to vortex rings arising at the walls of the capillary tube. P. L. Kapitsa is thanked for his interest. Mention is made of V. P. Peshkov and V. K. Tkachenko (ZhETF, v. 41, no. 5(11), 1961, p. 1427). There are 4 figures and 12 references: 4 Soviet and 6 non-Soviet. The three most recent references to English-language publications read as follows: H. C. Kramers, Proc. VII-th Intern. conf. on low temp. phys. 1960, str. 94; K. R. Atkins, Liquid Helium, Cambridge, 1959; J. N. Kidder, W. M. Fairbank, Proc. VII-th Intern. conf. on low temp. phys., 1960, p. 91.

ASSOCIATION: Institut fizicheskikh problem Akademii nauk SSSR (Institute of Physical Problems of the Academy of Sciences USSR)

Card 2/3

L 39449-65 EWT(l)/EWT(k)/EWA(c)/EWT(l)/EWT(m)/T/EWP(b)/EWA(d)/EWP(t) Pf-4/Pr-4
IJP(c) GG/JD/HW

ACCESSION NR: AP5006485 S/0056/65/048/002/0393/0403

AUTHORS: Peshkov, V. P.; Parshin, A. Ya.

TITLE: Concerning superconducting thermal switches

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 2, 1965, 393-403

TOPIC TAGS: superconductivity, thermal switch, critical temperature, critical field, thermal conductivity

ABSTRACT: In view of the impossibility of reaching definite conclusions concerning the advantages of any particular material for use in superconducting thermal switches, the authors measured the thermal conductivity of superconductors under conditions similar to those under which thermal switches operate. A metal cryostat containing He^3, described earlier (ZhETF, v. 36, 1034, 1959) was used to obtain and to maintain low temperatures. Two variants of the instrument used to measure the thermal conductivity are illustrated in Fig. 1 of the Enclosure. Lead, tin, and aluminum of 99.99% purity were initially chosen as the object of the investigations. The samples were of 0.05 mm foil, obtained by rolling single crystals, rolled up into rods 100 mm long and of diameter close to 1.5 mm. Samples made of pure tin of foil cleansed in acid, and of single-crystal tin were also tested. The temperature was measured with carbon resistance thermometers specially prepared to decrease the heat capacity and to increase the

Card 1/3

L 39449-65

ACCESSION NR: AP5006485

thermal contact. The operating efficiency of superconducting thermal switches and of the influence of the sample purity and dimensions on the thermal conductivity were estimated theoretically. The characteristics of 15 superconductors are tabulated, but the tabular data cannot be compared with experiment, since there are no direct measurements of thermal conductivities at temperatures below which the electron contribution to the thermal conductivity of the superconductor can be neglected. However, reasons are given for believing that the values presented in the table are of the correct order of magnitude. Orig. art. has: 4 figures, 6 formulas, and 1 table.

ASSOCIATION: Institut fizicheskikh problem Akademii nauk SSSR (Institute of Physics Problems, Academy of Sciences SSSR)

SUBMITTED: 18Jul64 ENCL: 01 SUB CODE: SS, EM

NR REF SOV: 013 OTHER: 028

Card 2/3

ACC NR: AP7003221 SOURCE CODE: UR/0056/66/051/006/1821/1828

AUTHOR: Peshkov, V. P.

ORG: Institute of Physics Problems, Academy of Sciences, SSSR (Institut fizicheskikh problem Akademii nauk SSSR)

TITLE: A cryostat operating on the heat of transition of He^3 from a solution rich in He^3 to a solution rich in He^4

SOURCE: Zh eksper i teor fiz, v. 51, no. 6, 1966, 1821-1828

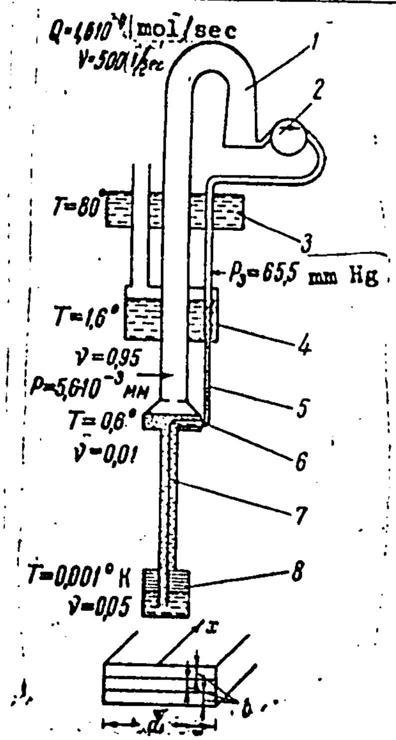
TOPIC TAGS: liquid helium, cryogenic liquid cooling, cryostat, ~~phase transition~~ HEAT OF TRANSITION

ABSTRACT: The author presents calculations for an apparatus operating on the heat of transition of He^3 from one liquid phase of helium to another. The apparatus is similar to that described by B. Neganov et al. (ZhETF v. 50, 1445, 1966) (Fig. 1). The operating principle of the apparatus is described. It is shown that at temperatures on the order of several millidegrees the cooling effect is proportional to the heat of transition $q = 100\ T^2$ [J/mole]. The apparatus will produce a temperature of 0.001K and a heat absorption of 5 erg/min at this temperature, at a He^3 circulation rate equal to 1.6×10^{-4} mole/sec. It is concluded that operation of this apparatus is feasible not only in the variant described in the article, but also with other parameters under different conditions. Orig. art. has: 2 figures, 10 formulas, and 1 table.

ACC NR: AP7003221

Fig. 1. Liquid helium cryostat. 1 - Diffusion pump, 2 - rotary pump, 3,4 - reservoir, 5 - capillary, 6 - evaporation reservoir, 7 - heat exchanger, 8 - dissolution reservoir.

SUB CODE: 20/ SUBM DATE: 06Jun66/ ORIG REF: 005/ OTH REF: 005



Card 2/2

L 26761-66 EWT(d)/EWT(l)/EWT(m)/EPF(n)-2 IJP(c) JD/WW

ACC NR: AP6014021 SOURCE CODE: UR/0056/66/050/004/0844/0852

AUTHOR: Peshkov, V. P.; Borovikov, A. P.

ORG: Institute of Physical Problems, AN SSSR (Institut fizicheskikh problem AN SSSR)

TITLE: Measuring the Lambda transition temperature and the maximum density of liquid He^4

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 50, no. 4, 1966, 844-852

TOPIC TAGS: vapor pressure, temperature measurement, heat transfer, helium, liquid helium

ABSTRACT: The vapor pressure of He^4 at the λ point and the temperature difference between the λ point (T_λ) and the temperature of the maximum density of liquid helium ($T_{max\ \rho}$) were measured with high accuracy. The position of the λ point was determined on the basis of the specific heat curve and the sharp change in heat transfer. The position of the maximum density was determined on the basis of the change of the nature of convection. The vapor pressure at the λ point was found to be $P_\lambda = 37.80 \pm 0.03$ mm Hg (0C, G = 980.665 cm/sec^2),

Cord 1/2

L 26761-66

ACC NR: AP6014021

$T_{\lambda}^{(58)} = 2.172_0 + 0.0003K$. The temperature difference is $T_{max\ \rho} - T_{\lambda} = 0.0065 \pm 0.0005^{\circ}$. Orig. art. has: 7 figures and 2 formulas. [Based on author's abstract] [NT]

SUB CODE: 20/ SUBM DATE: 06Jul65/ ORIG REF: 002/ OTH REF: 009

Card 2/2

L 52246-65 EPF(c)/EWT(1)/EWT(m)/EWP(b)/EWP(t) Pr-4 IJP(c) JD

ACCESSION NR: AP5010492 UR/0056/65/048/004/0997/1012

25 27 B

AUTHOR: Peshkov, V. P.

TITLE: Experimental detection of the transition of He^3 to the superfluid phase

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 4, 1965, 997-1012

TOPIC TAGS: superfluidity, helium 3, liquid helium, adiabatic demagnetization

ABSTRACT: An instrument with three-stage demagnetization of paramagnetic salts, using superconducting thermal switches, is described. This instrument was used to determine the dependence of the specific heat of liquid He^3 on the temperature in the range 0.0035—0.015K. The purpose of the experiment was to observe the transition of He^3 to the superfluid state not by determining the anomaly in the heat transfer, which could not be expected to be large, but by seeking for an anomaly in the temperature dependence of the specific heat of He^3. The cooling agent and thermometer comprised a sphere of slightly compressed powder of cerium magnesium nitrate, in the pores of which was located the liquid He^3. The sphere

Card 1/2

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ACCESSION NR: AP5010492

4

was the third stage of adiabatic demagnetization and served as a calorimeter. The apparatus and various experiments are described in detail. An appreciable increase in the specific heat of He^3, compared with the expected value for a linear temperature dependence, was observed at 0.005—0.006°, and it is concluded that He^3 becomes superfluid at 0.0055°. This agrees with some results by others. "I thank P. L. Kapitsa for the opportunity to carry out the experiments, the theoretical group of the Institute, with whom the properties of He^3 were discussed many times, A. I. Filimonov and A. M. Terekhov for help with the experiments, and the members of the mechanical and radio shops for preparing the apparatus." Orig. art. has: 6 figures and 5 formulas. [02]

ASSOCIATION: Institut fizicheskikh problem Akademii nauk SSSR (Institute of Physical Problems, Academy of Sciences SSSR)

SUBMITTED: 22Oct64 ENCL: 00 SUB CODE: GP, TD

NO REF SOV: 011 OTHER: 013 ATD PRESS: 4008

Card 2/2

YAKIMENKO, Nikolay Stepanovich; PESHKOV, V.P., red.

[Methods of increasing the sugar content of beets and the yield of sugar per hectare] Puti povysheniia sakharistosti svekly i uvelicheniia sbora sakhara s gektara. Tambov, Tambovskoe knizhnoe izd-vo, 1963. 71 p. (MIRA 17:9)

ALEK... ROV, G.M.; ZAYMIDOROGA, O.A.; KULYUKIN, M.M.; PESHKOV, V.P., SULY...EV, R.M.; FILIPPOV, A.I.; TSUPKO-SITNIKOV, V.M.; SHCHERBAKOV, Yu.A.

Use of helium-3 for filling a high-pressure diffusion chamber. Prib. i tekh. eksp. 9 no.1:69-75 Ja-F '64. (MIRA 17:4)

1. Ob"yedinennyy institut yadernykh issledovaniy.

PESHKOV, V.P.

PESHKOV, V.P.

Optical determination of the density of He^3. Zhur. eksp. i teor. fiz. 33 no.4:833-838 O '57. (MIRA 11:1)

1. Institut fizicheskikh problem Akademii nauk SSSR.
(Helium--Isotopes)

PESHKOV, V. P.; PARSHIN, A.

"The efficiency of semiconducting thermo switches."

report submitted for 9th Intl Conf on Low Temperature Physics, Columbus, Ohio, 31 Aug-4 Sep 64.

Inst Physical Problems, AS USSR, Moscow.

ACCESSION NR: AP4018367 S/0120/64/000/001/0069/0075

AUTHOR: Aleksandrov, G. M.; Zaymidoroga, O. A.; Kulyukin, M. M.; Peshkov, V. P.; Sulyayev, R. M.; Filippov, A. I.; Tsupko-Sitnikov, V. M.; Shcherbakov, Yu. A.

TITLE: Use of helium-3 for filling a high-pressure diffusion chamber

SOURCE: Pribory* i tekhnika eksperimenta, no. 1, 1964, 69-75

TOPIC TAGS: diffusion chamber, helium-3 tritium separation, high pressure diffusion chamber, synchrocyclotron, OIYaI synchrocyclotron, high purity helium-3

ABSTRACT: A method of highly purifying helium-3 from tritium ($H^3/He^3 < 10^{-11}$) is described. Helium-3 condensation with subsequent evaporation at 1.2 K was used. The cycle was repeated 4 times; a small amount of H_2 (about 0.005%) was added prior to every liquefaction. The source gas contained 0.1% of H^3 and 0.5-1% of H_2, D, N, O, and A. The final elimination of H_2 was attained by burning it with copper oxide heated to 500C. The internal parts of the DK-2 standard diffusion chamber (see M. S. Kozodayev, et al., PTE, 1958, no. 6, p. 47) were remodeled; its volume, about 11 lit., was filled with helium-3 up to 20 atm; equipment and

ACCESSION NR: AP4018367

filling details are given. The chamber was in continuous (500 hrs) operation with the OIYaI synchrocyclotron. It can be filled within 5 hrs. Gas loss at each exposure has been 0.1% or less. "The authors are deeply grateful to P. L. Kapitsa for his permission to separate He^3 from T in IFP AN SSSR, and to V. M. Kuznetsov and A. I. Filimonov for lending the equipment and their help in determining T concentrations. We are also thankful to V. P. Dzhelepov and L. I. Lapidus for their interest in the project, and to K. A. Baycher and S. F. Maly*sheva for their help in building the outfit. Mounting was performed by A. G. Zhukov, P. Ye. Laykov, N. V. Lebedev, V. I. Orekhov, V. F. Poyenko, A. G. Potekhin, and A. I. Chernetskiy, for which we thank them. We would particularly like to acknowledge the discussions as well as the active help of B. Pontecorvo throughout the project stages." Orig. art. has: 4 figures.

ASSOCIATION: Ob"yedinenny*y institut yaderny*kh issledovaniy (Joint Institute of Nuclear Studies)

SUBMITTED: 23Feb63 DATE ACQ: 18Mar64 ENCL: 00

SUB CODE: NS NO REF SOV: 006 OTHER: 005

Card 2/2

ACCESSION NR: AP4031194 S/0056/64/046/004/1510/1513

AUTHOR: Peshkov, V. P.

TITLE: On the superfluidity of He^3

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 4, 1964, 1510-1513

TOPIC TAGS: helium, liquid helium, superfluidity, He^3, helium specific heat, superfluid transition temperature, adiabatic demagnetization cooling

ABSTRACT: Adiabatic-demagnetization equipment for cooling liquid He^3 to temperatures at which superfluidity might be observed is briefly described. A total of 1.12 cm^3 of liquid He^3 was reduced to a magnetic temperature 0.0033°. The character of the specific-heat curves obtained with the aid of the apparatus and the abrupt increase in the heat transfer from the He^3 at temperatures below 0.0055° offer strong evidence that He^3 goes into the superfluid state near

Card 1/2

ACCESSION NR: AP4031194

this temperature. The experimental results agree with published theoretical estimates of the transition temperature. A more detailed description of the experiments will be published later. "I take the opportunity to thank P. L. Kapitsa for valuable advice, the group of theoreticians of the Institute with whom the properties of He^3 were discussed many times, and A. I. Filimonov for help with all the main experiments." Orig. art. has: 2 figures.

ASSOCIATION: Institut fizicheskikh problem AN SSSR (Institute of Physics Problems, AN SSSR)

SUBMITTED: 21Feb64 DATE ACQ: 07May64 ENCL: 02

SUB CODE: PH NO REF SOV: 006 OTHER: 006

Card 2/2

ARTEMOVA, Lidiya Yegorovna, svinarka; PESHKOV, V.P., red.; POPOV, V.N., tekhn. red.

[Practices in fattening swine] Opyt otkorma svinei. Tambov, Tambovskoe knizhnoe izd-vo, 1961. 9 p. (MIRA 16:6)

1. Sovkhoz "Kozlovskiy", Pervomayskiy rayon (for Artemova). (Swine--Feeding and feeds)

FEDOROV, Vladimir Aleksandrovich; KAREV, Vitaliy Mikhaylovich; PESHKOV, V.P., red.; POPOV, V.N., tekhn. red.

[Green fallow] Zaniatyi par. Tambov, Tambovskoe knizhnoe izd-vo, 1961. 62 p. (MIRA 16:6)

(Tambov Province--Tillage)

POPOV, Anatoliy Vasil'yevich; PESHKOV, V.P., red.; POPOV, V.N., tekhn. red.

[School of advanced practices] Shkola peredovogo opyta. Tambov, Tambovskoe knizhnoe izd-vo, 1963. 26 p.

(Tambov Province—Swine) (MIRA 16:4)

VIDENIN, Kirill Fedorovich, kand. sel'khoz. nauk; PESHKOV, V.P., red.; POPOV, V.N., tekhn. red.

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