ACC NR: AP7002587

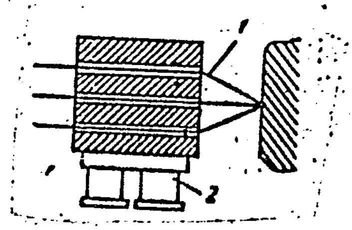

Fig. 1. 1 - measuring thermocouple;
2 - thermoelement

Orig. art. has: 1 diagram.

SUB CODE: 13, 14/ SUBM DATE: 25Jan65

Card 2/2

LEBEDEV, V. V.
Omsk State Veterinary Inst.

LEBEDEV, V. V.- "On the anthelminthic properties of carbocholine, curbit seeds, and akrikhin (atebrin) in cedtodoses of dogs and geese." Omsk State Veterinary Inst. Omsk, 1955.
(Dissertation for the Degree of Candidate in Veterinary Sciences)

SO: Knizhnaya Letopis' No. 20, 1956

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000929030006-2"

USSR/Farm Animals. Small Horned Cattle Q-3

Abs Jour : Ref Zhur - Biol., No 11, 1958, No 50008

Author : Lekomkin A.I., Lebedev V.V.
Inst : Voronezh University, Society for Natural Study
Title : One Method Investigating the Drinking Reactions in Large Horned Cattle.

Orig Pub : Byul. O-va yestestvoi·pyt. pri Voronezhsk. un-te, 1956, 10, 103-105

Abstract : An installation is proposed which utilizes an automatic water dispenser with several modifications. This installation permits to study the drinking reaction in animals, to compute the amounts of water which they consume at various feedings and various keeping conditions. Also, it permits to observe speed and characteristics of the participating drinking reflex.

Card : 1/1

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000929030006-2"

LEBEDEV, V.V.

V

COUNTRY	:	USSR
CATEGORY	:	Pharmacology and Toxicology. Cholinergic Agents
ABS. JOUR.	:	RZhBiol., No.5 1959, No. 23138
AUTHOR	:	Lebedev, V. V.
INST.	:	Omsk Veterinary Institute
TITLE	:	Effect of Arecoline on the Functions of the Thin Portion of the Intestine of Dogs, Free from Invasion and During Invasion
ORIG. PUB.	:	Tr. Omskogo vet. in-ta, 1958, 17, 179-183
ABSTRACT	:	No abstract

Card: 1/1

LEBEDEV, V.V.

Pharmacology of acrichine. Farm. i toks. 21 no.2:71-72 Mr-Ap '58
(MIRA 11:6)

1. Kafedra farmakologii (zav. - prof. N.P. Govorov) Omskogo veterinarnogo instituta.
(QUINACRINE,
pharmacol. (Rus))

L 23173-66 EWT(d)/FSS-2
ACC NR: AP6004350 SOURCE CODE: UR/0108/65/020/010/0036/0037

AUTHOR: Lebedev, V. V. (Active member)

ORG: Scientific and Technical Society of Radio Engineering and Electrocommunication (Nauchno-tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi)

TITLE: Permissible irregularity of the amplitude-frequency characteristic of recirculators

28

SOURCE: Radiotekhnika, v. 20, no. 10, 1965, 36-37

B

TOPIC TAGS: recirculator, spectrum analyzer, frequency characteristic, radio signal, frequency shift

ABSTRACT: The frequency characteristic of a spectrum analyzer having a shifting mixer in the ring is considered. As the signal being recirculated is shifted along the frequency axis, its amplitude varies because of the irregularity of the real frequency characteristic. Simultaneously, the signal summation takes place; by selecting the shape of the frequency characteristic, a summation with a desirable weight function can be achieved. Formulas are derived which describe the connection between the frequency-characteristic shape and variations of signal amplitude with circulations. From these formulas, the effect of the characteristic irregularity upon the maximum permissible number of circulations is deduced. Orig. art. has: 2 figures and 10 formulas.

SUB CODE: 09 / SUBM DATE: 07Dec64 / ORIG REF: 001 / OTH REF: 003

Card 1/1

UDC: 621.317

LEBEDEV, V. V.

Storage and harvesting of root-crops. Moskva, Gos. izd-vo selkhoz i kolkhozno-kooperativnoi lit-ry, 1931. 29 p.

LEBEDEV, V. V., ed.

Manual and reference book on the siloing of the forage. Moskva, Sel'khozgiz, 1933. 154 p.

LEBEDEV, V. V.

24156 LEBEDEV, V. V. Vyrashchivaniye i tipy polezashchitnykh posadok v oroshayemom zemledelii. V sb: Nauch. otchet Bezenchuksk. selekts.-opyt. Stantsii po agrotekhnike oroshayemogo zemledeliya za 1935-1947 GG. (Kuybyshev), 1948, S. 197-206. irrigated land

SO: Letopis, No. 32, 1949.

LEBEDEV, V. V.

Ozelenenie sel'skikh naselennykh punktov [Landscaping of rural settlements]. Kuibyshev, obl. izd., 1952. 72 p.

SO: Monthly List of Russian Accessions, Vol. 6, No. 5, August 1953

LEBEDEV, V. V.

Windbreaks, Shelterbelts, Etc.

Afforestation plan for the Vetlyanka irrigated area. Les i step' 4, No. 2, 1952.

9. Monthly List of Russian Accessions, Library of Congress, June 1952. 1953, Uncl.

LEBEDEV, V.V., kandidat sel'skokhozyaystvennykh nauk; NIKIFOROVA, G.V., nauchnyy sotrudnik; OLESOV, N.K., nauchnyy sotrudnik

Filbert variety testing at the Zakataly branch station. Trudy VKNII no.10:75-83 '54. (MIRA 8:9)

(Filbert)

IGNATENKO, Stepan Vasil'yevich; LEBEDEV, V.V., redaktor; PAVLOVA, M.M., tekhnicheskiy redaktor

[Training and pruning fruit trees in the central part of the U.S.S.R.] Formirovanie i obrezka plodovykh derev'ev v srednei polose SSSR. Moskva, Gos. izd-vo sel'khoz.lit-ry, 1957. 69 p.
(Pruning) (MLRA 10:6)

LEBEDEV, Vladimir Vasil'yevich

[Shelterbelt afforestation in irrigated areas] Zashchitnoe lesorazvedenie na oroshaemykh zemliakh. Moskva, Gos. izd-vo selkhoz. lit-ry, 1957. 102 p. (MIRA 11:4)
(Windbreaks, shelterbelts, etc.)

LEBEDEV, V. V.

SHAMPAN'YA, Pol' [Champagnat, Paul] VORONOVA, M.S.[translator]; LEBEDEV, V.V., kandidat sel'skokhozyaystvennykh nauk, nauchnyy redaktor; IZOTOVA, G.M., redaktor; FEDOROBA, A.F., tekhnicheskiy redaktor

[Pruning of fruit trees. Translated from the English] Obrezka plodovykh derev'ev. Perevod s angliiskogo. Moskva, Gos. izd-vo sel'khoz. lit-ry, 1957. 158 p. (MLRA 10:6)
(Pruning)

LARIONOV, Aleksey Nikolayevich; LEBEDEV, V.V., red.; DEYEVA, V.M., tekhn.red.

[We'll complete the seven-year plan ahead of time] Semiletku vypolnim dosrochno. Moskva, Gos.izd-vo sel'khoz.lit-ry, 1960. 85 p. (MIRA 14:1)

1. Sekretar' Ryazanskogo obkoma Kommunisticheskoy partii Sovetskogo Soyuza (for Larionov).
(Ryazan Province--Agriculture)

LEBEDEV, V.V.

RT-1151 (Ice accretion in Arctic rivers and seas as a function of negative air temperatures) Rost l'da v Arkticheskikh rakakh i moriakh v zavisimosti ot otritsatel'nykh temperatur vozdukha.
PROBLEMY ARKTIKI, (5-6): 9-25, 1938. (Translation does not include illustrations).

LEBEDEV, V. V.

Gidrologicheskiye issledovaniya i raschety pri proyektirovannii mostov i trub. Leningrad, 1949. 301p.

A practical manual for technicians and engineers engaged in hydrological research and calculation necessary for the designing of bridges for railroad and automobile highway bridges; published as a Hydrometerological Edition.

1. Russian--Railroads--Bridges
2. Russia---Roads--Bridges.
3. Russia Tunnels
4. Russia--Road Research
i. Hydrological Research and Calculations on the designing of bridges and tunnels.
ii. Title

LEBEDEV, V. V.

Gidrologiia i gidrometriia v zadachakh [Problems on hydrology and hydrometry]. Posobie diia vysshikh uchebnykh zavedenii. Leningrad, Gidrometeoizdat, 1952. 560 p.

SO: Monthly List of Russian Accessions. Vol. 6 No. 7 October 1953

LEBEDEV, Vladimir Vasil'yevich; kandidat tekhnicheskikh nauk; CHEBOTAREV, A.I., redaktor; SOLOVEYCHIK, A.A., tekhnicheskiy redaktor

[Nomograms for hydraulic calculations; supplement to the book "Hydrology and hydrometry in problems."] Nomogrammy dlia gidrologicheskikh raschetov; prilozhenie k knige "Gidrologiia i gidrometriia v zadachakh." Leningrad, Gidrometeorologicheskoe izd-vo, 1954. 29 p. tables. (MLRA 8:4)

(Hydraulic engineering--Tables, calculations, etc.)

LUCHSHEVA, A.A.; LEBEDEV, V.V., kandidat tekhnicheskikh nauk, redaktor; YASNOGORODSKAYA, M.M., redaktor; SOLOVEYCHIK, A.A., tekhnicheskiy redaktor

[Practical hydrometry; exercises in hydrometric observations] Prakticheskaia gidrometriia. Uprazhneniia po obrabotke gidrometricheskikh nabliudenii. Izd. 2-e. Pod red. V.V.Lebedeva. Leningrad, Gidrometeorologicheskoe izd-vo, 1954. 335 p. (MLRA 7:10)
(Stream measurements)

CHEBOTAREV, V.I., kandidat tekhnicheskikh nauk; SKUYE, A.P., kandidat tekhnicheskikh nauk; LEBEDEV, V.V., redaktor.

[Hydrometrical installations] Gidrometricheskie sooruzheniia. Leningrad, Gidrometeorologicheskoe izd-vo, 1954. 368 p. (MLRA 7:7)
(Flowmeters) (Hydraulic engineering)

LEBEDEV, Vladimir Vasil'yevich; CHEBOTAREV, A.I., redaktor; BRAYNINA, M.I., tekhnicheskiy redaktor.

[Hydrology and hydrometry in problems] Gidrologiia i gidrometriia v zadachakh. Izd. 2-e. Leningrad, Gidrometeorologicheskoe izd-vo, 1955. 550 p. (MLRA 8:9)
(Hydrology)

KARAUSHEV, Anatoliy Vasil'yevich; PANCHURIN, Nikolay Aleksandrovich; MAKKAVEYEV, V.M., doktor tekhnicheskikh nauk, professor, redaktor; [redacted] LEBEDEV, V.V., redaktor; VOLCHOK, K.M., tekhnicheskiy redaktor

[Collection of problems in hydraulics] Sbornik zadach po gidravlike. Pod obshchei red. V.M.Makkaveeva. Leningrad, Izd-vo "Rechnoi transport," Leningr.otd-nie, Pt.2. 1957. 197 p. (MLRA 10:9)
(Hydraulic engineering--Problems, exercises, etc.)

LEBEDEV, Vladimir Vasil'yevich; YASNOGORODSKAYA, M.M., red.; FLAUM, M.Ya., tekhn.red.

[Hydrology and hydraulics in bridge and road construction] Gidrologiia i gidravlika v mostovom i dorozhnom stroitel'stve. Leningrad, Gidrometeor.izd-vo, 1959. 387 p. (MIRA 13:3)
(Hydraulic engineering) (Hydrology)

LEBEDEV, Vladimir Vasil'yevich; DAVYDOV, L.K., doktor geogr. nauk, prof., retsenzent; YASNOGORODSKAYA, M.M., red.; BRAYNINA, M.I., tekhn. red.

[Hydrology and hydrometry in problems] Gidrologiia i gidrometriia v zadachakh. 3. dop. i perer. izd. Leningrad, Gidrometeor.izd-vo, 1961. 699 p. (MIRA 14:12)

1. Zaveduyushchiy kafedroy gidrologii sushi Leningradskogo gosudarstvennogo universiteta (for Davidov).

(Hydrology)

LEBEDEV, Vladimir Vasil'yevich

[Hydrology] Gidrologiia. Leningrad, Izd-vo "Rechnoi transport," 1959. 192 p. (MIRA 15:2)
(Hydrology)

LEBEDEV, Vladimir Vasil'yevich; BELOUSOV, N.F., inzh., nauchn. red.

[Hydrological and water-management calculations for designing water-supply structures] Gidrologicheskie i vodokhoziaistvennye raschety dlia proektirovaniia sooruzhenii vodosnabzheniia. Leningrad, Stroiizdat, 1965. 395 p. (MIRA 18:12)

88380
S/108/61/016/001/007/007
B010/B077

6,9200

AUTHOR: Lebedev, V. V.

TITLE: Discrete Representation of a Time-limited Signal

PERIODICAL: Radiotekhnika, 1961, Vol. 16, No. 1, pp. 75 - 80

TEXT: Referring to studies of V. A. Kotel'nikov and K. Shennon, the representation of a time-limited signal by a finite series is shown which, contrary to the Kotel'nikov series, describes the signal by using discrete values within a time interval O-T. The author discusses topics like estimation of errors, spectroscopic analysis, and references to the Kotel'nikov series. The series in question can be obtained directly from the Fourier series for a function $\Phi(t)$ which is defined for a time interval O-T and vanishes identically outside this integral, if summation is discontinued at a finite value of the summation index. Denoting the frequency connected to this summation index by f_v transforms the Fourier series $\Phi(t) = a_0 + \sum_1^{f_vT} \varphi_n \sin n\omega_1 t + \sum_1^{f_vT} \xi_n \cos n\omega_1 t$ making use of the sums

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$\varphi_n \approx \frac{2}{k} \sum_{0}^{k-1} \Phi(t_k) \sin n \omega_1 t_k$, $\xi_n \approx \frac{2}{k} \sum_{0}^{k-1} \Phi(t_k) \cos n \omega_1 t_k$ which correspond to the integral expressions for φ_n, ξ_n, where $t_k = k\Delta t$ (Δt is a time element of interval 0-T) into a new series

$$\Phi(t) = \sum_{0}^{2f_v T} \Phi(k\Delta t) \frac{\sin \omega_v (t - k\Delta t)}{\omega_v \frac{T}{\pi} \sin \frac{\pi}{T} (t - k\Delta t)} \quad (5)$$ with $\omega_v = 2\pi f_v$, $k = 2f_v T + 1$;

the convergence properties correspond to that of a Fourier series. According to (5) it is possible to describe a function limited to the time interval 0-T by $2f_v T$ discrete function values of the basic time intervals. Fig.1 illustrates the approximation function of (5). A simple calculation is only necessary to show that (5) goes over into a Kotel'nikov series if the interval T approaches infinity keeping ω_v fixed. The error of (5) is estimated by the method of Fourier series; here, the error is connected with the residual energy of the signal above the limit f_v. The author

Discrete Representation of a Time-limited Signal

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concludes his paper by giving the spectroscopic separation of the signal represented by (5); he sets $\Phi(t) = \varphi(t)A(t)$ with $A(t) = 1$ within the interval 0-T and $A(t) = 0$ outside of it; $\varphi(t)$ denotes the periodic function having a period T. The spectrum of $\varphi(t)$ is calculated from

$$\Phi(\omega) = \int_{-\infty}^{\infty} \varphi(\nu)A(\omega-\nu)d\nu \quad (7),$$

where $A(\omega)$ denotes the well-known spectrum of $A(t)$, and $\varphi(\omega)$ the spectrum of $\varphi(t)$ which can be represented by a Fourier series if a Dirac δ-function is used. The following series is obtained from (7) for the spectrum of the signal (5):

$$\Phi(\omega) = \sum_{-f_vT}^{f_vT} \varphi(n) \frac{\sin T(\omega-2\pi n/T)}{T(\omega-2\pi n/T)};$$

$\varphi(n)$ is the coefficient of the Fourier series for $\varphi(\omega)$. There are 2 figures and 13 references: 12 Soviet and 1 British.

SUBMITTED: February 1, 1960 (initially), March 4, 1960 (after revision)

Card 3/4

S/106/62/000/006/002/003
A055/A101

6,4400

AUTHOR: Lebedev, V.V.

TITLE: Graphical calculation of automatic gain control filters in receiving systems

PERIODICAL: Elektrosvyaz', 16, no. 6, 1962, 10 - 21

TEXT: Starting from the well-known equation characterizing the frequency properties of the automatic gain control (for small increases of the input signals), the author deduces two formulae giving, respectively, the distortion of the modulus and of the phase of the amplifier output voltage for different modulation frequencies:

$$|\Phi(\Omega)| = \frac{1}{\sqrt{1 + 2R\cos\varphi + R^2}}, \qquad \gamma = \text{arc tg}\left(-\frac{R\sin\varphi}{1 + R\cos\varphi}\right),$$

where $\Phi(\Omega)$ is the amplifier frequency response, Ω is the modulation frequency, γ is the phase shift of the output voltage envelope, φ is the phase shift in the AGC filter and $BW(\Omega) = R(\Omega)e^{i\varphi}$, $W(\Omega)$ being the frequency response

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of the AGC filter and $B = \frac{1}{\Phi(0)} - 1$ being the rigidity of the control. The author plots the graphs of $\Phi(\Omega)$ and γ as functions of R (Ω) for different fixed values of φ (two sets of graphs are reproduced in the article). These sets of graphs permit plotting the frequency response of an amplifier with AGC for the case of any concrete AGC-filter [the R (Ω)-axis being replaced by the Ω-axis]. On the basis of the plotted graphs, the author analyzes the following problems: 1) AGC stability. 2) Operation of the AGC in pulse receivers (the case of simple RC-filters is examined in particular). 3) Transients: the author compares various filter-types in the AGC-circuit, giving the same permissible phase distortions at a determined frequency (Ω_1), from the point of view of the setup time (the compared filter-types are the simple RC-filter, the filter of the second order with phase correction $\alpha = 0.24$ and the double RC-filter $\frac{\tau_1}{\tau_2} = 242$). 4) Demodulating properties of the AGC. In the last part of the article, the author describes a method for calculating the AGC, this calculation being divided into two independent parts: 1)Ensuring the required stability of the output level of the signal. 2) Calculation of the AGC filters that permit obtaining the required phase-frequency characteristic. The author calculates a simple RC-filter and a filter of the second order with phase compensation. Three numerical examples of AGC-filter calculation are reproduced at the end of the article. The Soviet personalities mentioned in the article are: Ya.Z. Tsypkin, G.P. Tartakovskiy, N.I. Chistyakov and A.A. Rizkin. There are 4 figures and 1 table.

SUBMITTED: January 12, 1962

LEBEDEV, V.V.

A nonlinear problem on automatic gain control. Radiotekhnika 17 no.6:38-41 Je '62. (MIRA 15:5)
(Radio)

LEBEDEV, V.V.

Use of a recirculator for the contraction of frequency-modulated signals. Radiotekhnika 18 no.11:62-70 N '63. (MIRA 16:12)

1. Deystvitel'nyy chlen Nauchno-tekhnicheskogo obshchestva radiotekhniki i elektrosvyazi imeni Popova.

KISELEV, B.P.; BALASHOV, V.L.; KOLCHIN, A.A.; LEBEDEV, V.V.

Separation of barium and strontium by the exchange method in the system amalgam - solutions. Radiokhimiia 6 no. 1:114-117 '64. (MIRA 17:6)

L 11386-65

ACCESSION NR: AP4046677 S/0109/64/009/010/1776/1780

AUTHOR: Lebedev, V. V.

(B)

TITLE: Signals summed by a recirculator

SOURCE: Radiotekhnika i elektronika, v. 9, no. 10, 1964, 1776-1780

TOPIC TAGS: recirculator, recirculating storage, signal storage, summability, summable signals

ABSTRACT: A theory is developed to show that a recirculator can be used as a storage device for a broad class of signals. Regarding an arbitrary signal as $S(t) = A(t) \sin \theta(t)$, where $A(t)$ and $\theta(t)$ are its amplitude and phase, respectively, conditions of its "phase summability" are analyzed. The recirculator is able to perform a cophasal summation of all signals whose phase increment over the delay-line time T is a multiple of 2π. Of all possible functions describing the time variation of the signals to be summed, two types — (a) continuously time-

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ACCESSION NR: AP4046677

summable functions and (b) continuously frequency-summable functions — are singled out and analyzed. Sinusoidal signals having frequencies multiple to $2\pi/T$ can be continuously time-summed in a recirculator having a circulating time T. Characteristics of the class of frequency-summable signals are described; the frequency-summation recirculator is held suitable for operation as a spectrum analyzer and as a storage-type filter for isolating a desirable signal from noise. "The author wishes to thank I. S. Gonorovskiy for his attention and help in preparing the article." Orig. art. has: 3 figures and 18 formulas.

ASSOCIATION: none

SUBMITTED: 07Aug63 ATD PRESS: 3114 ENCL: 00

SUB CODE: EC, DP NO REF SOV: 006 OTHER: 001

Card 2/2

RIPS, Ya.A., kand. tekhn. nauk (Moskva); LEBEDEV, V.V., inzh. (Moskva)

Choice of the parameters of the correcting stages of control systems with operative a.c. Elektrichestvo no.8:8-12 Ag '64. (MIRA 17:11)

ACC NR: AP6033396 SOURCE CODE: UR/0293/66/004/005/0731/0739

AUTHOR: Kolchin, A. A.; Lebedev, V. V.; Skrebtsov, G. P.

ORG: none

TITLE: Geometric factor and the directional diagram for single crystalline detectors and for a coaxial telescope

SOURCE: Kosmicheskiye issledovaniya, v. 4, no. 5, 1966, 731-739

TOPIC TAGS: radiation detector, coincidence counting

ABSTRACT: The authors are concerned with the interpretation of the number of nuclear particles recorded by a detector in terms of the intensity of radiation. For an isotropic radiation, the geometric factor Γ is given by

$$N = \Gamma \cdot I. \quad (1)$$

where I is the intensity of particles and N is the number of recorded pulses. For a single infinitely thin detector with an area S and for an isotropic radiation,

$$N = \int_{\varphi=0}^{2\pi} \int_{\theta=0}^{\pi/2} IS \sin\theta \cos\theta \, d\theta \, d\varphi, \quad (2)$$

 UDC: 539.107.45

ACC NR: AP6033396

where θ is the zenith angle, ϕ - azimuth, and $\Gamma = \pi S$. The authors calculate Γ for two cases: cylindrical and square base detectors of finite thickness. Next, they derive Γ for a coaxial telescope (two thin coincidence detectors). Finally, they derive a directional diagram for the case when the radiation is anisotropic. Orig. art. has: 6 figures and 20 equations.

SUB CODE: 03/ SUBM DATE: 24Feb66/ ORIG REF: 002

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L 15206-65 EWG(j)/EWT(m)/EPF(c)/EPF(n)-2/EPR/EWP(j)/T-2/EWP(b) Pc-4/Pr-4/Ps-4/ Pu-4 RAEM(i) JD/WW/JG/MLK/RH

ACCESSION NR: AT4048190 S/0000/64/000/000/0118/0124

AUTHOR: Lebedev, V. V.; Krichko, I. B.

B+1

TITLE: Thermodynamics of the reactions of niobium, tantalum and hafnium oxides with carbon and methane

27 27 27 27

SOURCE: AN SSSR. Institut goryuchikh iskopayemy*kh. Gazifikatsiya i piroliz topliv (Gasification and pyrolysis of fuel); sbornik statey. Moscow, Izd-vo Nauka, 1964, 118-124

TOPIC TAGS: niobium oxide, tantalum oxide, hafnium oxide, carbon, methane, metal carbide, free energy

ABSTRACT: The thermodynamics of 18 reactions between the oxides of niobium, tantalum and hafnium and carbon or methane were studied and the variation of the free energy with temperature is plotted for all of them. Because of the absence of thermodynamic functions for carbides, metal oxides and metals at temperatures above 4000K, the free energy is calculated only up to 4000K. The reaction of the formation of metal carbides from Ta_2O_5, Nb_2O_5, HfO_2 and methane proceeds more completely than the reaction of metal oxides with carbon at the same temperature. The logarithmic values of the equilibrium constants of the reactions of Ta_2O_5, HfO_2 and Nb_2O_5 with methane and carbon at 800-4000C are tabulated and plotted. Methane is

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ACCESSION NR: AT4048190

preferable for obtaining metal carbides because the equilibrium constant for the combination of metal oxides with methane is higher by several orders than that for carbon. The equilibrium composition of gases at different reaction temperatures is tabulated. The variation in the degree of conversion of methane at different temperatures during its reaction with Ta_2O_5 and HfO_2 until the formation of tantalum and hafnium or tantalum and hafnium carbides is plotted. For these reactions, it is characteristic that the conversion of metal oxides to carbide proceeds at lower temperatures than their conversion to metals. The complete conversion of Ta_2O_5 to TaC proceeds at 1300K, to metal at 1500K. For hafnium, this temperature difference increases to 550K, the two temperatures being 1450 and 2000K. Orig. art. has: 9 figures, 2 tables, 1 formula and 18 chemical equations.

ASSOCIATION: none

SUBMITTED: 04Apr64 ENCL: 00 SUB CODE: TD, OC, IC

NO REF SOV: 016 OTHER: 003

Card 2/2

SOV/86-58-10-27/40

AUTHOR: Lebedev, V.V., Engr Maj

TITLE: Adjustment of Engines with Turbo Starters (Regulirovka dvigatelya s turbostarterom)

PERIODICAL: Vestnik vozdushnogo flota, 1958, Nr 10, pp 70-73 (USSR)

ABSTRACT: This is a discussion of the adjustments necessary in jet engines, and of pertinent phenomena and difficulties. The superadded fuel fed to the accelerating engine must be strictly controlled; at ground level, the superadditions must not exceed the safe figures which, for early engines, are about 170 to 70 percent above normal. The fuel-air mixture, excessively rich in fuel, leads to faulty engine operation; the engine must then be stopped. At low speeds, the acceleration is controlled by the automatic pickup device (avtomat priyemistosti), and at high speeds by the

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hydraulic decelerator (gidrozamedlitel'). The acceleration of the engine is delayed for a short time while the automatic pickup device is being taken over by the hydraulic decelerator. The engine pickup is adjusted by tuning the automatic pickup device and the hydraulic decelerator. When the adjustment of the automatic pickup device is changed, the acceleration of the engine changes only within the range from low speeds to 3,000 rpms, and when the tuning of the hydraulic decelerator is changed, the acceleration changes at speeds above the cruising value. Within the range from 3,000 rpms to the cruising rpms, the acceleration of the engine develops highest values, and, practically, does not depend on the adjustment of the above devices. A substantial change in the tuning of the automatic pickup device may result either in an excessive supply of the super-added fuel or in an insufficient supply of fuel with ensuing difficulties in both cases. With the automatic pickup device (at up to 3,000 rpms), the

Adjustment of Engines with Turbo Starters SOV/86-58-10-27/40

8-to-10 sec. periods of acceleration are recommended in order to get the most favorable fuel superadditions. Some details on the adjustment and tuning are given. The reliability of the starting of turbojet engines on the ground depends also, to a large degree, on the amounts of the fuel superadditions. Engines with high-power turbo starters start relatively easily, except that some difficulties may occur in the spring or fall, but this can be remedied by taking adequate measures; details are given. The change in the fuel pressure before the fuel nozzles, at about 300 rpms, affects the starting operation very greatly. The change in the adjustment of the automatic pickup device affects the starting, too. If the automatic starter and automatic pickup devices are tuned to excessive or to too small fuel superadditions, unsatisfactory starting may result. Three graphs.

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LEBEDEV, V.V., inzhener-mayor

Take-off boost of the engine. Vest.Vozd.Fl. no.2:71-78 F '61.
(MIRA 14:7)
(Airplanes--Jet propulsion)

PERMYAKOV, V.A., kand.tekhn.nauk; DANILENKOVA, N.I., inzh.; LEBEDEV, V.V., inzh.

Use of models for studying the aerodynamics of the gas channels of TP-90 and TP-100 boilers with T-shaped arrangement of the components. Teploenergetika 8 no.5:45-52 My '61. (MIRA 14:8)

1. TSentral'nyy nauchno-issledovatel'skiy kotloturbinnyy institut imeni I.I.Polzunova i Turbinno-kotel'nyy zavod.
(Boilers)

YELETSKIY, V.S.; LEBEDEV, V.V.

Transistorized doubled-pulse generator. Biul. tekh.-ekon. inform. Gos. nauch.-issl. inst. nauch. i tekh. inform. 17 no.2:43-44 '64. (MIRA 17:6)

AUTHOR: Lebedev, V.V. 32-3-47/52

TITLE: A Device for Investigating Reaction Velocity by the Automatic Recording of Kinetic Curves (Ustanovka dlya izucheniya skorosti reaktsiy s avtomaticheskoy zapis'yu kineticheskikh krivykh)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 3, pp. 372-373 (USSR)

ABSTRACT: A method of investigating redox reactions of metals was worked out. The device necessary for this purpose consists, as may be seen from a schematical drawing, in principle of two systems which can be connected. In the first system there are two three-way faucets by means of which the two systems can be separated and/or connected respectively. One of the parts, among other things, contains a suction pump, the feeding arrangement for hydrogen and nitrogen, connection with the atmosphere, a rheometer, etc., whilst in the second part there is a steam generator, the apparatus establishing contact with the heater and cooler, as well as a system by means of which hydrogen consumption during reduction is recorded. The investigation consists in measuring the consumption of hydrogen (or carbon monoxide) flowing over the heated metal

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oxide which is necessary for reduction. By means of a suitable adjustment of the three-way faucets the reduced metal with steam from the steam generator can again be oxidized so that hydrogen is produced. A curve showing water consumption in the reduction of magnetite at 450° C and a table of the average reduction velocities calculated therefrom is given. There are 2 figures and 1 table.

ASSOCIATION: Institute of Mineral Fuels AS USSR (Institut goryuchikh iskopayemykh Akademii nauk SSSR)

AVAILABLE: Library of Congress

1. Hydrogen consumption-Measurement 2. Steam generators-Application
3. Magnetite-Reduction

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SOV/126-7-6-9/24

AUTHORS: Amonenko, V.M., Vasyutinskiy, B.M., Lebedev, V.V. and Shapoval, B. I.

TITLE: Vacuum Distillation of Metals with Condensation on a Heated Surface

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 7, Nr 6, pp 862-867 (USSR)

ABSTRACT: The properties of heat-resisting alloys are influenced to a considerable extent by the purity of the starting materials. Vacuum distillation is a promising way of purifying such materials. The authors describe their use for purifying iron of the method developed in 1952 at the Fiziko-tekhnicheskiy Institut AN UkrSSR (Physico-technical Institute, Ac.Sc. Ukrainian SSR) for vacuum distillation with condensation of the metal on a surface at a high temperature. The authors consider this more efficient than published methods and they have used it successfully for purifying beryllium (Ref 5). The distillation of the iron was effected in a working vessel (Fig 1) with evacuation by an oil diffusion pump (2500 litres/sec) and a type VN-2 backing pump.

Card 1/4 0.5-3 litre alundum or beryllium-oxide crucibles wound

with molybdenum or tungsten heating coils, contained the metal. The heated column directly over the crucible was generally lined with thin iron sheet, on which condensation occurred. The temperature of the column surface was chosen such that iron condensed while the impurities remained vaporized: the lower part up to 1300°C, the upper to about 1100°C. Assuming as a first approximation that the condensing metal and impurities form an ideal solid solution, the authors apply the Knudsen-Langmuir equation to calculate rates of evaporation. From a crucible at about 1580°C evaporation of metal occurred at 1 g/cm^2 hr., 75-80% of which was recovered at a column temperature of 1250-1300°C. Tables 1-3 show compositions before and after distillation (single and double) of armco, electrolytic (single only) and carbonyl irons, respectively. Purification from Mn, Mg, Cu, S, P, N_2 and O_2 was good and somewhat less so from aluminium. Considerable contamination from evaporation of crucible material was possible, but with double distillation the impurities could be reduced to

0.01%. The resistances of some long-needle single crystals of iron in the condensate were compared at 0°C and at low temperatures in the laboratory of B.G.Lazarev, acting member of the Ac.Sc. UkrSSR: the ratio values agree fairly closely (Table 4) with those of Meysner (Ref 6) for the purest iron and indicate that the needles were 99.996% Fe. The authors have also studied the purification of high-carbon (7% C, 73% Mn) and medium-carbon ferromanganese. The same apparatus was used, evaporation temperatures being 1100-1400°C. Rates of evaporation tended to fall through impoverishment of surface layers with manganese and formation of a graphite layer. Lower iron contents were obtained when baffles (Fig 2) were fitted in the column. On the lower baffles, kept at about 1000°C, almost all iron condensed, the manganese condensing mainly on the middle baffles (750-800°C). Table 6 shows the composition of the condensate from the third and fourth baffles. A carbon content of under 5×10^{-3}% is inferred. The purity of the manganese after a single distillation is over 99.96%.

Vacuum Distillation of Metals with Condensation on a Heated Surface SOV/126-7-6-9/24

There are 2 figures, 6 tables and 6 references, 3 of which are Soviet, 1 English and 1 French and 1 German.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UkrSSR (Physico-Technical Institute, Ac.Sc. UkrSSR)

SUBMITTED: July 22, 1957

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AUTHORS: Amonenko, V.M., Shapoval, B.I. and Lebedev, V.V. SOV/126-8-2-14/26

TITLE: Temperature Dependence of Internal Friction and Elastic Constants of Pure Iron

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 8, Nr 2, pp 249 - 254 (USSR)

ABSTRACT: The authors point out that in investigations of the internal friction of iron (Refs 1, 2), the purity of the metal has been insufficient for studying the nature of the internal-friction peaks. For the present investigation the authors used iron vacuum-distilled by the vacuum-distillation method developed at the Fiziko-tekhnicheskiy institut AN UkrSSR (Physico-technical Institute of the Ac.Sc. Ukrainian SSR), in which iron vapour condenses on a surface heated to 1 200 - 1 300 °C and covered with pure-iron foil. Evaporation was effected at 1 600 °C from alundum crucibles. The distilled iron, remelted in a high vacuum, was poured into 5-kg ingots (cast-iron moulds) from which 120 x 15 x 15 mm pieces were cut for shaping into test

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SOV/126-8-2-14/26

Temperature Dependence of Internal Friction and Elastic Constants of Pure Iron

pieces - 10 mm in diameter and 100 mm long. Their 20-mm long working length was turned down to a diameter of 3 mm. Before tests, the specimens were vacuum annealed at 900 °C for two hours and cooled in the furnace. The composition of the metal was: 0.003% each C, O_2; 0.001% each S, P. Al; 0.0001% each N_2, Mg; 0.0007% Mn; 0.008% Ni; 0.0006% Cu. The tests were carried out in vacuum in a resistance furnace (Figure 1); for the measuring circuit the system proposed by Tsobkallo and Chelnokov (Ref 5) was used and test-piece oscillation was produced by a self-oscillating system (V.A. Zhuravlev - Ref 4). The relative deformation on the test-piece surface did not exceed 5×10^{-5}. Figures 2 and 3 show internal friction as functions of temperature. Figure 2 refers to pure iron without (Curve 1) and with (Curve 2) a magnetic field of 100 oE. Curve 1 in Figure 3 refers to armco iron and Curve 2 to vacuum-distilled armco iron. The internal-friction dependence on the temperature was

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Temperature Dependence of Internal Friction and Elastic Constants of Pure Iron

found to be similar for 99.99% iron as for other metals; but the absolute value over the whole temperature range is several times that for armco iron and other metals. The high value for pure iron is due to losses in magneto-mechanical hysteresis arising in periodic deformation in the range of very small strains. The application of a magnetic field reduces the value greatly. The results showed that not all the carbon in the iron is in the form of solid solution. From the internal-friction measuring technique the dependence of the elastic constants on temperature were obtained (Figure 4); for the moduli of normal elasticity and shear the relations are almost linear in character.

There are 4 figures, 1 table and 8 Soviet references.

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Temperature Dependence of Internal Friction and Elastic Constants of Pure Iron SOV/126-8-2-14/26

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UkrSSR (Physico-technical Institute of the Ac.Sc., Ukrainian SSR)

SUBMITTED: June 9, 1958

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67660
SOV/126-8-6-7/24

24.2130

AUTHORS: Gumenyuk, V.S. and Lebedev, V.V.

TITLE: Electrical Conductivity of Iron at High Temperatures 21

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 8, Nr 6, pp 847-850 (USSR)

ABSTRACT: The object of this work was to measure the resistivity of high-purity iron in the range 20 to 1450°C. A compensating method with a PPTV-1 potentiometer and M-21 galvanometer was used, current stabilization being secured at 1A with the aid of a barretter. The test pieces (Fig 1) of the type proposed by Kan and Lazarev (Ref 4) were in the form of 3 to 6 mm diameter and 50 to 100 mm long cylinders with slivers bent back at either end (for voltage tappings). The test-pieces were suspended in the hot zone of a special ceramic-less resistance furnace (Ref 5). This (Fig 2) had a system of horizontal spiral heaters supported by tungsten rods enclosed in a system of molybdenum-sheet cylinders. Its working space was 200 mm high by 35 mm in diameter, giving a temperature up to 2500°C at 6 kW. Temperature was measured with platinum/platinum-rhodium and chromel-alumel thermocouples and a

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Electrical Conductivity of Iron at High Temperatures SOV/126-8-6-7/24

type PP instrument. The furnace with the test piece was placed in a vacuum chamber at 10^{-5} to 10^{-6} mm Hg. The results for distilled iron (Ref 6) are shown in Table 2 and in Fig 3 (curve 5). For comparison Fig 3 also shows the resistivity vs temperature curves for armco iron (curve 2), the corresponding curve (3) obtained by Mokrovskiy and Regel' (Ref 3) and by Sal'dau (Ref 1). In contrast to the results of Mokrovskiy and Regel' the present investigation showed that the resistivity of iron in the delta-range rose with temperature and more rapidly than in the gamma-range. There are 3 figures, 2 tables and 6 references, 5 of which are Soviet and 1 German.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN USSR (Physico-Technical Institute, AS UkrSSR)

SUBMITTED: June 26, 1959

Card 2/2

LEBEDEV, V.V.

24.5200 188100

82632

S/126/60/010/02/002/020
E073/E335

AUTHOR: Lebedev, V.V.

TITLE: Determination of the Coefficients of Heat Conductivity of Metals in the Range of High Temperatures 18

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol. 10, No. 2, pp. 187 - 190

TEXT: A method is proposed of determining the coefficient of heat conductivity of metals and alloys at temperatures above 800-900 °C, which permits taking into consideration relatively simply the thermal losses of the active part of the specimen caused by radiation. An equation is derived for determining the thermal conductivity of a specimen material from the temperature distribution in its centre inside vacuum (Eq. (8), p. 189). By using this method, the coefficient of heat conductivity was measured for a molybdenum rod in the temperature range 900 - 2200 °C. In a plot, p. 189, the results obtained (Curve 2) are compared with those of other authors (Curves 1 and 3 - the latter based on results of Osborn, Ref 2). The author states that the strong dependence of the thermal conductivity of Mo on the temperature obtained by Osborn seems unlikely since

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Determination of the Coefficients of Heat Conductivity of Metals in the Range of High Temperatures

extrapolation of these results to room temperature yields excessive values of the coefficient of thermal conductivity. The measured values of the electric resistance and of the heat conductivity of Mo for various temperatures are given in the table, p. 190, which also contains Wiedmann Franz ratios calculated from these values. In the temperature range under consideration, the obtained values of the ratio $\lambda\rho/T$ are less than the theoretical ones and show little dependence on temperature, with a minimum in the temperature range 1400 to 1600 °C. Acknowledgments are expressed to V.S. Gumenyuk for his assistance in carrying out the here described work.

There are 1 figure, 1 table and 8 references: 2 Soviet and 6 English.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN USSR (Physics-technical Institute of the Ac.Sc. Ukrainian SSR)

SUBMITTED: February, 27, 1960

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LEBEDEV, V.V.

27966
S/185/61/006/004/010/–
D274/D303

18.8100

AUTHOR: Lebedyev, V.V.

TITLE: Determining thermal conductivity of metals at high temperatures

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 6, no. 4, 1961, 522-524

TEXT: A method is proposed for determining the thermal conductivity of metals up to melting point. This is important, as the experimental study of thermal conductivity at high temperatures is beset by many difficulties. If a metal rod is heated by a current in a vacuum, no heat is lost by convection. The process is described by

$$\lambda S \frac{d^2T}{dx^2} - c\varepsilon\sigma (T^4 - T_o^4) + \frac{I^2\rho}{S} = 0, \quad (1)$$

where σ is the Boltzmann constant, ε - a radiation constant, λ - the coefficient of thermal conductivity and c is the perimeter

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of the rod. In general, Eq. (1) cannot be solved analytically. The method for determining λ is as follows. If two short rods are heated by an electrical current to the same temperature (the rods being of the same material and having nearly the same diameter), then a region exists in the interior of the specimens where the temperature gradient (along the specimens) is practically the same and follows a parabolic law. Thereupon, the differential equations

$$\lambda S_1 \frac{d^2T}{dx^2} - c_1 \varepsilon\sigma (T^4 - T_o^4) + \frac{I_1^2 \rho}{S_1} = 0, \quad (2)$$

$$\lambda S_2 \frac{d^2T}{dx^2} - c_2 \varepsilon\sigma (T^4 - T_o^4) + \frac{I_2^2 \rho}{S_2} = 0, \quad (3)$$

hold (The subscripts 1,2 denote the respective rods). Solving this system of equation, and using the expressions $\varepsilon\sigma (T^4 - T_o^4)$ for equality of temperatures at the center of the specimens ($x = 0$), one obtains

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$$\lambda\left(\frac{S_1}{c_1} - \frac{S_2}{c_2}\right)\frac{d^2T}{dx^2} + \rho\left(\frac{I_1^2}{S_1c_1} - \frac{I_2^2}{S_2c_2}\right) = 0, \quad (4)$$

or

$$\frac{d^2T}{dx^2} + f(\lambda) = 0, \quad (5)$$

where

$$f(\lambda) = \frac{\rho}{\lambda}\cdot\frac{\frac{I_1^2}{S_1c_1} - \frac{I_2^2}{S_2c_2}}{\frac{S_1}{c_1} - \frac{S_2}{c_2}}. \quad (6)$$

Using the boundary conditions for $x = 0$ ($T = T_m$ and $dT/dx = 0$), one obtains from Eq. (5):

$$\Delta T = T_m - T = \frac{1}{2}f(\lambda)x^2. \quad (7)$$

Thus, by knowing the temperature distribution near the center of

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the specimens, one can find $f(\lambda)$ from Eq. (7), and then find λ. The above method was used (as an application) for determining the thermal conductivity of a molybdenum rod at temperatures of 1000-1400°C. The measured values are given in a table, together with the values obtained by Osborn by means of Worting's graphic method. There is good agreement between both results. There is 1 table and 8 references: 2 Soviet-bloc and 6 non-Soviet-bloc. The 4 most recent references to English-language publications read as follows: A.G. Worting, D. Halliday, Heat, 1948; S.C. Jain, K.S. Krishnan, Proc. Roy. Soc., A 222, N 1149, 167, 1954; S.C. Jain, K.S. Krishnan, Proc. Roy. Soc., A 225, N 1160, 1, 1954; K.S. Krishnan, S.C. Jain, Brit. J. Appl. Phys., 5, N 12, 426, 1954.

ASSOCIATION: Fizyko-tekhnichnyy instytut AN USSR, Kharkiv (Physicotechnical Institute AS UkrSSR, Khar'kov)

SUBMITTED: September 19, 1960

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89939

18.8100 1045, 1418, 1138 S/126/61/011/001/002/019
24.7600 1043, 1160, 1158 E032/E314

AUTHORS: Gumenyuk, V.S. and Lebedev, V.V.

TITLE: Study of the Thermal and Electrical Conductivity of Tungsten and Graphite at High Temperatures

PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol. 11, No. 1, pp. 29 - 33

TEXT: A description is given of an apparatus for the determination of the thermal and electrical conductivity and their ratio for metals and alloys in the temperature region 900-2 200 °C. Data on the temperature dependence of the thermal and electrical conductivity of tungsten and graphite are reported as well as the values of the Wiedemann-Franz ratio in a wide temperature interval. Empirical formulae are put forward to represent the thermal conductivity of tungsten and graphite as a function of temperature. The thermal conductivity was determined by the method described in a previous paper (Ref. 5) and is based on the following considerations. If a short and a long rod of the same diameter and chemical composition

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Study of the Thermal and Electrical Conductivity of Tungsten and Graphite at High Temperatures

are heated in a vacuum by an electric current to the same temperature, then the shorter rod will require a higher current owing to additional heat losses at the ends. The thermal conductivity of the material can then be calculated from the formula

$$\lambda = \frac{\rho x^2 (I^2 - I_1^2)}{2S^2 \Delta T}$$

where λ is the thermal conductivity,
ρ is the resistivity,
S is the cross-sectional area of the specimen,
ΔT is the temperature drop over a length x,
I is the current necessary to heat the short specimen,
I_1 is the current necessary to heat the long specimen.

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Thus, in order to determine λ it is necessary to measure ρ and I_1 on the long specimen and I and ΔT on the short specimen. These quantities were measured with the aid of a special device. The specimens were placed in water-cooled holders, one of which was free to move when the specimen expanded so that no stresses were applied to the specimen. The distance between the holders could be varied between 0 and 150 mm and the potential difference across defined sections of the specimen were measured by means of molybdenum or tungsten contacts. The whole system was placed in the vacuum chamber in a vertical position, the vacuum being of the order of 10^{-5} mm Hg. The potential differences were measured with the AC potentiometer Р-56 (R-56), while the temperature was measured by the optical pyrometer ОППИР-09 (OPPIR-09) which was attached to the telescope of the cathetometer KM-6. In this way, the temperature and the

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distance were measured at the same time. In order to increase the accuracy of temperature measurement, the pyrometer was designed so that the potential difference across the pyrometer lamp was measured by a potentiometer. Careful calibration was also carried out against a platinum-platinum rhodium thermocouple (up to 1 500 °C) and by a ЦНИИЧМ-1 (TsNIIChM-1) thermocouple. In the case of the short specimen, the temperature distribution near its centre is given by

$$\Delta T = \frac{1}{2} f(\lambda) x^2 .$$

Hence, in order to determine the thermal conductivity it is sufficient to plot ΔT vs x^2 and hence determine $f(\lambda)$ from the slope of the straight line. Fig. 2 shows such plots at 1 600 °C (Curve 1), 1 400 °C (Curve 2) and 1 600 °C (Curve 3)

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for a tungsten specimen. The experiments were carried out on spectrally pure graphite and tungsten specimens which were heated to 1.700 °C for one hour before the measurements. Fig. 3 shows the thermal conductivity (Curve 1) (cal/cm deg sec) and the resistivity (Curve 2) (Ω cmx10^6) as functions of the temperature (°C) for tungsten. A similar plot for graphite is shown in Fig. 4. The thermal conductivity of tungsten is in approximate agreement with the data reported by Osborn (Ref. 2). The results are not in agreement with those reported by Filyand and Semenova in Ref. 4, which are said to be incorrect. The Wiedemann-Franz ratio was calculated from these data. It was found that the Lorentz number obtained exceeds the theoretical value and is not very dependent on the temperature. In the case of graphite, the results obtained are in good agreement with published data. The temperature dependence of λ for tungsten was found to be

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$$\lambda = 0.361 - 1.17 \cdot 10^{-4} T + 2.32 \cdot 10^{-8} T^2$$

and for graphite

$$\lambda = 0.12 - 0.547 \cdot 10^{-4} T + 1.42 \cdot 10^{-8} T^2 ,$$

where the temperature interval is 900 - 2 200 °C.
There are 4 figures, 3 tables and 6 references: 3 Soviet and 3 non-Soviet.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UkrSSR (Physicotechnical Institute of the AS Ukrainian SSR)

SUBMITTED: July 22, 1960

10.3500 25928 S/126/61/012/001/020/020
26.5100 E073/E535

AUTHOR: Lebedev, V.V.

TITLE: On measuring the heat conductivity of metals at elevated temperatures

PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol.12, No.1, pp.157-158

TEXT: In earlier work of the author (Ref.1: FMM, 1960, 10, No.2, 187) and of V. S. Gumenyuk and the author (Ref.2: FMM, 1961, 11, 29) a method and experimental equipment for determining the coefficient of heat conductivity of metals at high temperatures were described. For carrying out the measurements it is necessary to use an "infinitely long" specimen, i.e. one with a length 40 to 50 times the diameter. However, due to brittleness or a complex technology, it may be difficult to manufacture such specimens in the case of various high melting point metals. In this communication a method is described which enables using shorter specimens with length to diameter ratios of 10:20. Assume that two specimens of the same diameter and chemical composition are available which differ in length and these are heated in

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vacuum by the electric currents I_1 and I_2, respectively, so that the temperature in the centre of the specimens $T_m (x = 0)$ is equal for both. In this case the following differential equations can be written for the thermal balance (Ref.1: FMM, 1960, 10, No.2, 187):

$$\frac{d^2T_1(x)}{dx^2} - \frac{c\varepsilon\sigma}{\lambda S}\left[T_1^4(x) - T_o^4\right] + \frac{I_1^2\rho}{\lambda S^2} = 0,$$

$$\frac{d^2T_2(x)}{dx^2} - \frac{c\varepsilon\sigma}{\lambda S}\left[T_2^4(x) - T_o^4\right] + \frac{I_2^2\rho}{\lambda S^2} = 0,$$

where $T_1(x)$ and $T_2(x)$ - temperature distributions in the first and the second specimens respectively, λ - heat transfer coefficient, c - perimeter, S - cross-section of the specimens, ε - total radiation capacity, ρ - specific electric resistance, T_o - ambient temperature, σ - Stefan-Boltzman constant.

By simultaneous solution of this system of equations we obtain:

$$\left[\frac{d^2T_1(x)}{dx^2}\right]_{x_1} - \left[\frac{d^2T_2(x)}{dx^2}\right]_{x_2} + \frac{\rho}{\lambda S^2}(I_1^2 - I_2^2) = 0,$$

where the points x_1 and x_2 are so chosen that $T_1(x_1) = T_2(x_2)$. Near the centre the temperature distribution along short rods obeys the parabolic law (Ref 2: Gumenyuk, V.S. and Lebedev, V.V., FMM, 1961, 11, 29 and Ref.3: Krishnan, K.S., Jain, S.C., Brit. J. Appl.Phys., 1954, 5,12,426). Therefore, the functions $T_1(x)$ and $T_2(x)$ can be written as follows:

$$T_1(x) = T_m + a_1x^2; \quad T_2(x) = T_m + a_2x^2.$$

Consequently

$$\frac{d^2T_1(x)}{dx^2} = 2a_1; \quad \frac{d^2T_2(x)}{dx^2} = 2a_2.$$

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The magnitude of the coefficients a_1 and a_2 are determined from the inclination angle of the straight lines

$$\Delta T = T_m - T(x) = -ax^2.$$

Thus, knowing the temperature distribution near the centre of the investigated specimens the heat transfer coefficient can be determined from the following relation

$$\lambda = \frac{\rho\left(I_1^2 - I_2^2\right)}{2S^2(a_1 - a_2)}$$

If one of the specimens (for instance the second) is taken as being "infinitely long", then for this specimen $\Delta T = 0$, i.e. $a_2 = 0$ and the expression is transformed into the equation obtained earlier (Ref.1):

$$\lambda = \frac{\rho\left(I_1^2 - I_2^2\right)}{2S^2 a} = \frac{\rho x^2\left(I_1^2 - I_2^2\right)}{2S^2 \Delta T}$$

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Thus, the earlier described method is more generally applicable than was previously assumed and permits measuring the heat transfer coefficient of metals and alloys within a wide temperature range on specimens of a simple geometrical shape. Acknowledgments are expressed to V. S. Gumenyuk and V. G. Bar'yakhtar for their assistance and criticism. There are 3 references: 2 Soviet and 1 non-Soviet.

[Abstractor's Note: Complete translation.]

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UkrSSR
(Physico-Technical Institute AS UkrSSR)

SUBMITTED: February 20, 1961

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S/862/62/C01/000/005/012
E202/E492

AUTHORS: Gumenyuk, V.S., Ivanov, V.Ye., Lebedev, V.V.

TITLE: Determination of the thermal conductivity of metals at temperatures in excess of 1000°C

SOURCE: Teplo- i massoperenos. t.1: Teplofizicheskiye kharakteristiki materialov i metody ikh opredeleniya. Ed. by A.V.Lykov and B.M.Smol'skiy. Minsk, Izd-vo AN BSSR, 1962, 94-101

TEXT: A method and apparatus developed in the Fiziko-tekhnicheskiy institut AS USSR (Physico-Technical Institute AS UkrSSR) for measurement of the thermal conductivity of metals and alloys up to their melting point are described. Calculation of the thermal conductivity requires determination of the specific electrical resistance, the amount of current and the distribution of temperature along the samples, which are in the form of right circular cylinders (e.g. wires). The apparatus comprises a vacuum chamber with the sample placed between two water-cooled clamps and connected to the electrical supply. Surface temperature measurements are carried out by means of a micro-
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pyrometer of the disappearing filament type, mounted on a cathetometer so that the measurements may be taken along the whole length of the sample. The samples used were within 0.5 to 5 mm in diameter and the distance between the clamps could be varied up to 250 mm. As an example, the authors carried out measurement of electrical resistivity and conductivity of Mo, Ta and W wires and developed from first principles the heat balance equations, considering the loss due to radiation and conductivity only. The method is recommended on account of the relatively simple apparatus and relatively high accuracy, and was tried within the range from 0 to 1200°C. It was found that within the above range the thermal conductivities of all the metals studied decrease with temperature. There are 7 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UkrSSR
(Physico-Technical Institute AS UkrSSR)

S/120/62/000/001/048/061
E039/E485

18.8100

AUTHORS: Gumenyuk, V.S., Ivanov, V.Ye., Lebedev, V.V.

TITLE: The determination of the thermal and electrical conductivity of metals at temperatures higher than 1000°C

PERIODICAL: Pribory i tekhnika eksperimenta, no.1, 1962, 185-189

TEXT: The investigation of the thermal properties of metals and alloys at high temperatures is of considerable interest in the theory of metals and for practical applications. There is no published data in the Soviet literature on the thermal conductivity of refractory materials and only a limited number of non-Soviet papers. In the method described the sample in rod form is heated by an electric current in a vacuum. Differential equations are set up, taking into account the Stefan-Boltzman radiation law, and formulae are derived for determining the coefficient of thermal conductivity and electrical conductivity of the sample material. In order to obtain the required data it is necessary to measure the potential difference on the working length of the sample and also the temperature distribution over the

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The determination of the thermal ... S/120/62/000/001/048/061
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same length. This must be done for two samples differing either in length or diameter. The samples are held in water cooled clamps in the vacuum chamber and the potential difference along them is measured by means of two tungsten or molybdenum probes and a potentiometer. The temperature is measured by means of a micro-optical pyrometer ОМП-019 (OMP-019), fastened to the moving carriage of a cathetometer, which enables an accurate temperature distribution to be obtained. The thermal conductivity λ and specific resistance ρ for tantalum is shown to vary from λ = 0.1129 cal/cm sec °C and ρ = 50.50 micro ohms cm at 900°C to λ = 0.0904 cal/cm sec °C and ρ = 108.42 micro ohms cm at 2500°C. There are 4 figures and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UkrSSR (Physicotechnical Institute AS USSR)

SUBMITTED: May 11, 1961

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S/126/62/013/004/021/022
E039/E435

18.8100

AUTHORS: Ivanov, V.Ye., Lebedev, V.V.

TITLE: On the relation between the lattice and electron components of thermal conductivity in metals

PERIODICAL: Fizika metallov i metallovedeniye, v.13, no.4, 1962, 632-635

TEXT: Assuming that the experimental values of thermal conductivity are equal to the sum of one component due to the motion of electrons and another due to the vibration of the lattice the following expression is obtained from the Wiedemann-Franz relation

$$\frac{\lambda_{obs}}{\sigma T} = \frac{\lambda_e}{\sigma T} + \frac{\lambda_\Phi}{\sigma T} = L_o + \frac{\lambda_\Phi}{\sigma T} \quad (3)$$

where λ_{obs} is the experimental value of thermal conductivity; λ_e the component due to electrons; λ_Φ that due to the lattice; σ the electrical conductivity; T the absolute temperature and L_o the Lorentz number. In this work is considered the

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possibility of making a more rigid division of the experimental values of thermal conductivity into the electron and lattice components at high temperatures. The electron component is independent of temperature while the lattice component decreases with increasing temperature. The thermal conductivity of Mo and W is measured at temperatures up to about 2200°C and shown to approach a constant value asymptotically. This value must equal λ_e. Values of λ_{Φ} are given for Pt, Pb and Cd for temperatures up to 500, 282 and 252°C respectively. Values of λ_e and λ_{Φ} are given for Cu, Au, Ag and Al up to 700°C. In the case of W, λ_e is equal to 0.204 cal/cm.°C.sec while λ_{Φ} varies from 0.071 at 900°C to 0.012 cal/cm.°C.sec at 2200°C. The dependence of the Lorentz number on temperature is also obtained. In the case of Cu it varies from $\sim 2.3 \times 10^{-8}$ at 100°C to $\sim 2.46 \times 10^{-8}$ at 500°C. It is concluded that: 1) The division of the coefficient of thermal conductivity of metals into electron and lattice components with the aid of Eq.(3) appears to be incorrect. 2) At temperatures near to the Debye temperature it is impossible to neglect the lattice component of the thermal

On the relation between ...

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E039/E435

conductivity, even for good thermal conductors. 3) The Wiedemann-Franz law is not fulfilled near the characteristic temperature for metals. It is suggested that a more rigorous experimental investigation is required for a wider range of materials. There are 2 figures and 3 tables.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UkrSSR (Physicotechnical Institute AS UkrSSR)

SUBMITTED: May 22, 1961

Card 3/3

LEBEDEV, V.V.

Multiple-position automatic cold-header. Kuz.-shtam. proizv. 5 no.10:24-28 O '63. (MIRA 16:11)

LEBEDEV, V.V

PROCESSES AND PROPERTIES INDEX

Testing a two-stage pump for ammonium nitrate. G. V. Kruglov and V. V. Lebedev. *Khim. Mashinostroenie* 8, No. 3, 18-19(1939). A two-stage pump designed to handle NH_4NO_3 at a rate of 6 cu. m./hr. and at a pressure of 8 atm. was tested with an 80-83% NH_4NO_3 soln. at a temp. of 110-20°. During the pumping process the stuffing boxes exploded. Owing to the frictional heat generated by the stuffing box the oil with which the asbestos stuffing was impregnated ignited, the NH_4NO_3 decompd., and as a result the explosion followed. It is suggested that pumps without stuffing boxes should be used for handling NH_4NO_3.

B. Z. Kamich

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

LEBEDEV, V.V.

CA

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Utilization of heat from condensation of water vapor in carbon dioxide generating process. V. V. Lebedev. *Prom. Energetika* 3, No. 10, 8-9(1946).—A redesigned flow sheet is presented where the heat from the condensed H_2O vapor is used for preheating the absorption soln. M. Hoseh

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

LEBEDEV, V. V.

"Synthesis of Methane From the Components of Generator Gases." Thesis for degree of Cand. Technical Science Sub. 28 Nov. 49, Inst. of Mineral Fuels, Acad.Science USSR

SUMMARY 82, 18 Dec. 52, Dissertations Presented for Degrees in Science and Engineering in Moscow in 1949. From Vechernyaya MOSKVA Jan - Dec. 1949.

LEBEDEV, V. V.

3

USSR.

1440. MECHANISM OF SYNTHESIS OF METHANE FROM CARBON MONOXIDE AND HYDROGEN ON A NICKEL CATALYST. Lebedev, V.V. (Trud. Inst. gor. Iskop. (Trans. Inst. Combust. Min., Acad. Sci. U.S.S.R.), 1950, vol. 2, 138-145; abstr. in Chem. Abstr., 1955, vol. 49, 4260). An analysis of data in literature on the synthesis of methane shows that many authors fail to take into consideration the physical factors of transfer to the reacting substances to the catalyst surfaces. It was proved experimentally that the methane synthesis upon a nickel catalyst within the temperature interval 267-408° is described by the equations: $CO + 3H_2 \rightleftharpoons CH_4 + H_2O$ and $CO + H_2O \rightleftharpoons CO_2 + H_2$.

Lebedev, V.V.

A method for the production of city gas by the methanation of water gas. V. S. Al'tshuler and V. V. Lebedev. *Gasovaya Prom.* 1956, No. 11, 17-21.—Schematic drawings illustrate the lab. app. for methanating water gas according to the reaction equations: $CO + 3H_2 \rightarrow CH_4 + H_2O$, $CO + H_2O \rightarrow CO + H_2$. Exptl. results show that with the CO/H_2 ratio of 1.0–1.5, for different catalysts the following conditions are optimum: 10% Ni-silica gel, temp. 300–60°, vol. velocity 1000 gas to 1 of catalyst/hr.; 10% Ni-refractory clay, temp. 350°, velocity 600–800:1; Ni-10% Al_2O_3, temp. 280–350°, velocity 6000–15,000:1. A typical gas methanated at 280° at a velocity of 6000:1 with the aid of a Ni-Al_2O_3 catalyst was composed of CO_2 35.5, O 0.2, CO 6.6 H 14.6, CH_4 86.0, N 6.0 vol. %; thermal value 4060 kcal./cu.m. (455 B.t.u./cu. ft.). Conversion efficiencies are uniformly about 85%. The process is recommended for small cities lacking a natural-gas supply. H. L. Olin

OSTROUKHOV, M.Ya., kandidat tekhnicheskikh nauk; KHODAK, L.Z.; LEBEDEV, V.V.

Cinematographic study of the process of coke burning. Priroda 45 no.7: 78-81 Jl '56. (MLRA 9:9)

1. Institut metallurgii imeni A.A.Baykova Akademii nauk SSSR, Moskva (for Khodak). 2. Laboratoriya nauchno-prikladnoy fotografii kinematografii Akademii nauk SSSR, Moskva (for Lebedev).
(Coke) (Combustion) (Cinematography--Scientific applications)

LEBEDEV, V.V.

AL'TSHULER, V.S.; LEBEDEV, V.V.

Manufacture of utility gas. Biul. tekh.-ekon. inform. no.1:10-11 '57. (MIRA 11:4)

(Gas manufacture and works)

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PHASE I BOOK EXPLOITATION 1102

Lebedev, Vladimir Vasil'yevich

Vodorod, yego polucheniye i ispol'zovaniye (Hydrogen, Its Manufacture and Uses) Moscow, Izd-vo AN SSSR, 1958. 68 p. (Series: Akademiya nauk SSSR. Nauchno-populyarnaya seriya) 10,000 copies printed.

Resp. Ed.: Gamburg, D.Yu.; Ed. of Publishing House: Levi, T.G.; Tech. Ed.: Markovich, S.G.

PURPOSE: The booklet is intended for the general reader.

COVERAGE: This booklet describes in popular form the physical and chemical properties of hydrogen, its preparation and uses. Isotopes of hydrogen and thermonuclear reactions (as energy sources) are also discussed. No personalities are given. There are no references.

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LEBEDEV, V.V.; KUSAKOV, M.M.

Capillary hysteresis following the rise of a viscous liquid in ascending conical capillaries. Izv. vys. ucheb.zav.; fiz. no.1: 15-28 '58. (MIRA 11:6)

1.Moskovskiy neftyanoy institut imeni akad. I.M. Gubkina.
(Capillarity)

BELOV, I.G.; LEBEDEV, V.V.

Causes of petroleum losses when switching wells from flow production to pumping method. Trudy VNII no.17:142-147 '58. (MIRA 12:1)

(Krasnodar Territory---Petroleum engineering)

LEBEDEV V.V.

НОВЫЕ МЕТОДЫ ПРОИЗВОДСТВА ВОДОРОДА
НА ОСНОВЕ ТВЕРДЫХ ТОПЛИВ

В. В. Лебедев

VIII Mendeleyev Congress for General and Applied Chemistry in
Section of Chemistry and Chemical Technology of Fuels,
publ. by Acad. Sci. USSR, Moscow 1959

abstracts of reports scheduled to be presented at above mentioned congress,
Moscow, 15 March 1959.