

CZECH/37-58-6-6/30

AUTHOR: Pekárek, Ludík

TITLE: Gradual formation of layers in a Glow Discharge in Hydrogen (Postupný vznik vrstev v doutnavém výboji ve vodíku)

PERIODICAL: Československý časopis Pro Fysiku, 1958, nr 6, pp 661 - 664 + 1/2 plate (Czech)

ABSTRACT: In earlier work (Refs 1,2) the author of this paper investigated the formation of moving layers in a discharge by the method of artificially produced transient processes ~~in inert gases~~ only. The layering wave, which is the fundamental process in the successive formation of layers in such cases, was characterised by the feature that the individual layers moved from the anode to the cathode, whilst the formation of these layers proceeded in the opposite direction. This property of the layering wave in inert gases was taken into consideration when formulating the phenomenological theory (Ref 3). B.N. Klarfeld (Ref 4) observed layers moving in an opposite direction (i.e. from the cathode to the anode) in a hydrogen discharge at a gas pressure of 1 mmHg. The question of how these layers form in the plasma of the positive column has so far not been solved. Solution of

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this problem is of importance not only from the point of view of determining the range of validity of the phenomenological theory of the gradual formation of moving layers but also for determining to what extent the moving layers in discharges in inert gases are the same or different from the moving layers in molecular gases. In this paper, the results are described of experimental investigation of the process of gradual formation of layers moving from the cathode to the anode in a glow discharge in hydrogen, by means of a transient process artificially created in the positive column. In his experiments, the author uses a tube with an internal diameter of 2.2 cm, length of 60 cm, with molybdenum "roller" electrodes. The tube was filled with pure hydrogen by diffusion through a palladium tube. The gas pressure was measured by means of a MacLeod pressure gauge; the mercury vapours were frozen out by liquid nitrogen. The moving layers were observed by means of two photomultipliers and an oscillograph by means of a method described by Donahue and Dieke, Physical Review, 1951, Nr 81, p 248. The surge disturbances intended for bringing about a transient process in the discharge was effected by

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feeding pulses of about 1 μ sec duration to the external electrode which was placed near the cathode, whereby it was possible to vary the voltage and to obtain a low repetition frequency. The same pulses were used for triggering-off the time base of the surge oscillograph (Ref 6). It was possible to detect a relatively wide range without stationary layers at gas pressures of about 3 mmHg and currents from a few mA to several tens of mA. Observation of the positive discharge column in the photo-multiplier proved that moving layers exist in this range of pressures and currents, although in observations by the naked eye, the positive column appeared homogeneous. Figure 2 (plate) shows the oscillogram of the transient process of the change in the illumination intensity in the positive column produced by an external impulse. It can be seen from the diagram, Figure 3, p 662, that the pulse produces in the positive column of the hydrogen discharge a transient process which is fully similar to the layering wave inside inert gases; in the same way as in inert gases, the layering is in the direction from the cathode to the anode. The spatial period λ was determined at 0.62 cm. It follows from the

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results of the work described in this paper that during the formation of moving waves in hydrogen, the layering wave is a fundamental process. This proves that the layering wave is a very generalised phenomenon in discharges not only for layers which move from the anode to the cathode in inert gases but also for layers which move from the cathode to the anode and it is, therefore, obviously a fundamental theoretical problem of the micro processes in the plasma of the positive column. So far, the phenomenological theory of the layering wave published earlier by the author of this paper (Ref 3) is applicable without any changes to the formation of layers in hydrogen. There are 3 figures and 6 references, 1 of which is Soviet, 1 English and 4 Czech.

ASSOCIATION: Fysikální ústav ČSAV, Praha (Physics Institute of the Czech Ac.Sc., Prague)

SUBMITTED: April 14, 1958

Card 4/4

AUTHOR: Pekárek, Luděk

CZECH/37-58-6-7/30

TITLE: Experimental Verification of the Theory of the Gradual Formation of Layers in Glow Discharges (Experimentální ověření teorie postupného vzniku vrstev v doutnavém výboji)

PERIODICAL: Československý časopis Pro Fysiku, 1958, Nr 6, pp 665 - 673 + 1 1/2 plates (Czech)

ABSTRACT: Watanabe and Oleson (Ref 1) and Robertson (Ref 2) have published theoretical work relating to the problem of moving layers inside glow discharges. They interpret the moving waves as sinusoidal waves which propagate with the plasma at a certain phase speed having a wavelength equal to the spatial period of the waves. However, earlier results of the author of this paper (Ref 3) have shown that the fundamental phenomenon in the formation of these waves has a transient process which the author of this paper refers to as "the layering wave". Later on (Ref 4), the author presented a phenomenological theory from which certain quantitative relations could be derived for the parameters of the layering waves as a function of the distance from the point where the wave occurs. Experimental facts known from earlier work on transient

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Experimental Verification of the Theory of the Gradual Formation of Layers in Glow Discharges

processes during the formation of moving waves are in good agreement with the results of this theory but they do not permit determining definitely whether this theory gives quantitatively accurate results for all the properties of the layering wave. This is due to the fact that certain relations derived from the theory have not been determined experimentally at all. Therefore, in the work described in this paper, the author measured the parameters of the layering waves in a glow discharge in neon for the purpose of verifying directly the results of his phenomenological theory. The measured results are described and the results are compared with theoretical results. The measurements were carried out with discharge tubes filled with pure neon. The shapes of these were the same as those described in earlier work (Refs 3-5). An electrode placed at the side of the tube served as a cathode. The tubes were evacuated to a higher vacuum and the gases were removed by heating under vacuum; after filling the tubes with neon, they were sealed. The gas pressure was measured with a MacLeod pressure gauge; the mercury vapours were removed by

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freezing out. Figure 1, p 665, gives a schematic diagram of the apparatus used for exciting and oscillographic observation of the layering waves in the positive column; the apparatus is a modification of that used in earlier work (Ref 3). The discharge current was controlled by a pentode, the grid voltage of which was varied by means of a potentiometer. From a surge generator, voltage surges with amplitudes between 0 and 4 kV of 1 μ sec duration were fed to the external ring electrode. Thereby, the equilibrium conditions in the discharge were disturbed for a short time and this produced a layering wave in the plasma of the positive column. The external electrode could be displaced along the discharge tube. The oscillations of the light intensity caused by the movement of the layers in the positive discharge column were recorded by two photo-multipliers F_1 and F_2 .

The light beam incident on the photo-cathode was limited by 0.5 mm wide slots which were normal to the discharge axis, so that the photo cathode received light emanating from a narrow strip of the positive beam. The voltage produced

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Experimental Verification of the Theory of the Gradual Formation of Layers in Glow Discharges

by the change in the current intensity of the photo-multiplier was fed through a cathode follower (L_1 , L_2) to a wide-band amplifier and the output of the amplifier was fed onto a commutator. From the commutator, signals were received alternately from the two multipliers which were fed into the surge oscillograph. The time base was started by the same surge generator. The time markings enabled accurate measurement of the time intervals on the oscillograph curves. The amplifier, the cathode follower and the load resistances in the anodes of the photo-multipliers were so designed that the investigated transient processes were not distorted. Both photo-multipliers could be slid in the direction of the axis of the discharge tube. Their position was determined on a scale with an accuracy of ± 0.1 mm. One of the photo-multipliers could be slid automatically by means of a motor. The oscillograph of Figure 2 (plate) provides direct experimental proof of the existence of fast and slow layering waves predicted theoretically (Ref 4). The oscillograms of Figure 3 (plate) confirm that the

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parameters of the wave are independent of the amplitude of the external disturbance. It was found that the layering wave is an odd effect. Other features of the theory have also been confirmed. The author summarises his conclusions thus: good agreement of the measured results with the results derived from the phenomenological theory of the gradual formation of the layers justifies the conclusion that this theory describes correctly the properties of the layering wave. This permits systematic study of micro-physical processes which determine the relaxation time and characterise successive formation of the layers. Such measurements can be of importance not only for elucidating the micro-physical nature of the layers in the positive discharge column but also as a method of measuring the speed of certain processes in the plasma, for instance, speed of decay of atoms in metastable states, ion diffusion, etc. For this to be possible, it is necessary first to ascertain in each concrete case what physical process determines the relaxation time of the layering wave. Acknowledgments are made to M. Novák for

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Experimental Verification of the Theory of the Gradual Formation
of Layers in Glow Discharges

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his assistance in measurements and evaluation of the
experimental results and to F. Kroupa and V. Krejčí for
commenting on the manuscript. There are 8 figures,
1 table and 7 references, 2 of which are English and
5 Czech.

ASSOCIATION: Fyzikální ústav ČSAV, Praha (Physics Institute of
the Czech Ac.Sc., Prague)

SUBMITTED: May 19, 1958

Card 6/6

AUTHOR: Pekárek, Luděk

CZECH/37-58-6-18/30

TITLE: Influence of External Illumination on Moving Layers in Discharges Inside Neon (Vliv vnějšího osvětlení na pohybující se vrstvy ve výboji neonu)

PERIODICAL: Československý Časopis Pro Fysiku, 1958, Nr 6, pp 735 - 736 + 1 plate (Czech)

ABSTRACT: The author investigated experimentally the changes of the parameters of slow and of fast layering waves in the neon discharge caused by illumination with a light of the same spectral composition. The arrangement for illuminating the discharge was similar to that used by Meissner and Miller (Ref 1) for determining the changes of the electrical gradient after illumination. As a source of intensive light, a discharge tube with a heated cathode was used (1 cm dia., filled with neon of a pressure of 23 mmHg). The current of the illuminating discharge tube was 0.8 - 1 A. In Figure 1 (plate) oscillograms are reproduced of slow layering waves obtained simultaneously from two photo-multipliers; oscillograms are reproduced which were obtained in the absence of external illumination and for the case of simultaneous illumination by means of an external source. A drop in the oscillation

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CZECHOSLOVAKIA/Electronics - Electrical Discharges in Gases and H-7
Gas Discharge Apparatus.

Abs Jour : Ref Zhur - Fizika, No 12, 1958, No 28026

Author : ~~Pekarek Ludok~~

Inst : Physics Institute, Czechoslovak Academy of Sciences,
Prague, Czechoslovakia

Title : Factors Affecting the Self-Excitation of Low Frequency
Oscillations in an Electric Discharge

Orig Pub : Coskosl. casop. fys., 1958, 8, No 1, 35-45

Abstract : Using as an example the glow discharge in neon, an experimental investigation has been made of the factors that influence the self-excitation of low frequency oscillations, connected with the appearance of moving striations in a gas-discharge plasma (see Referat Zhur Fizika, 1956, No 6, 17264 and 1957, No 4, 9804). Such factors are the following: the tendency of the plasma to striation, the length of the discharge gap, the processes at the electrodes, and the parameters of the external electric circuits. The most

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CZECHOSLOVAKIA/Electronics - Electrical Discharge in Gases and H.
Gas Discharge Apparatus.

Abs Jour : Ref Zhur - Fizika, No 7, 1959, 15930

Author : Pekarek, Ludek

Inst : -

Title : Local Excitations of the Wave of Stratification in the
Positive Column of an Electric Discharge.

Orig Pub : Chekhosl. fiz. zh., 1958, 8, No 4, 498-499

Abstract : See Ref Zhur Fizika, 1959, No 5, 11109.

Card 1/1

PEKAREK, L.

SCIENCE

Periodicals: CESKOSLOVENSKY CASOPIS PRO FYSIKU. Vol. 8, no. 5, 1958

PEKAREK, L. Experimental test of the theory of successive production of striations in a glow discharge. p. 665.

Monthly List of East European Accessions (EEAI) LC, Vol. 8, No. 5,
May 1959, Unclass.

PEKAREK, L.

SCIENCE

Periodicals: CESKOSLOVENSKY CASOPIS PRO FYSIKU. Vol. 8, no. 6, 1958

PEKAREK, L. Successive production of striations in a glow discharge in hydrogen. p. 661.

Monthly List of East European Accessions (EEAI) LC, Vol. 8, No. 5,
May 1959, Unclass.

PEKAREK, L.

CZECHOSLOVAKIA/Electronics - Electrical Discharges in Gases and Gas Discharge Apparatus. H

Resour : Ref Zbur Fizika, No 1, 1960, 1533
Author : Pekarek, Ludek
Inst : -
Title : The Successive Production of Striation in a G.W. Discharge in Hydrogen
Orig : Czechosl. fiz. zh., 1958, 8, N. 6, 699-704
Abstract : See Abstract 1531.

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CZECHOSLOVAKIA/Electronics - Electrical Discharges in Gases and H
Gas Discharge Apparatus

Abs Jour : Ref Zhur Fizika, No 12, 1959, 27886
Author : Pekarek, Ludek
Inst :
Title : The Influence of External Illumination on Moving
Striations in a Discharge in Neon
Orig Pub : Chekosl. fiz. zh. 1958, 8, No 6, 742-744
Abstract : See Abstract 2783).

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PHASE I BOOK EXPLOITATION

CZECH/5663

Pekárek, Luděk

Termonukleární energie (Thermonuclear Energy) Prague, Orbis, 1959.
194 p. (Series: Malá moderní encyklopedie, sv. 13) 17,000
copies printed.

Sponsoring Agency: Československá společnost pro šíření politických
a vědeckých znalostí.

Ed.: Vladimír Špinka, Engineer; Resp. Ed.: Ema Bílková.

PURPOSE: This book is intended for the general reader interested
in the field of controlled thermonuclear reactions and prospects
for its continued development.

COVERAGE: The author presents in simple terms the nuclear theory
at the base of the development of the atom and the hydrogen bombs,
and discusses the theoretical and experimental work being done
on controlled thermonuclear reactions with a view to acquiring a

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Thermonuclear Energy

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new and inexhaustible source of energy. The text is illustrated with 31 diagrams and graphs and 8 photos. No personalities are mentioned. There are 12 references: 3 Soviet, 3 English, 1 French, and 5 Czech.

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1. Do We Require New Sources of Energy?	
Man and energy	9
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CZECH/37-59-3-23/29

AUTHORS: Pekárek, Luděk and Novák, Miloš

TITLE: A New Type of Moving Striations in Neon (Letter to Editor)

PERIODICAL: Československý časopis pro fysiku. 1959, Nr 3, pp 327-328

ABSTRACT: Evidence for a third type of moving striation in neon is shown in Figure 1(p 338a). The slow wave is marked p , the previously described (Ref 1) fast one r and the new fast wave is s . The anode current was 3.6 mA, the discharge tube 300 mm long, 11 mm diameter, neon pressure 2.0 mm Hg (see also the work of L. Pekárek - Refs 2,3). With increasing current (between 2.1 and 3.2 mA) the velocity of the striations decreases. The striations s are probably related to molecular ions (M.A. Biondi and L.M. Chanin - Ref 4). There are 1 figure, 1 table and 4 references, of which 3 are Czech and 1 English.

ASSOCIATION: Fyzikální ústav ČSAV, Praha (Physics Institute of the Czechoslovak Ac.Sc., Prague)

SUBMITTED: December 17, 1958 ✓

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CZECHOSLOVAKIA/Radio Physics - Application of Radiophysical Methods. I

Abs Jour : Ref Zhur Fizika, No 12, 1959, 28213
Author : Pekarek, Ludek
Inst :
Title : Radio Spectroscopy -- New Field of Modern Physics
Orig Pub : Pokroky mat., fys. a astro., 1959, 4, No 2, 162-179
Abstract : Survey article.

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Experimental verification of the theory of successive
production of striations in a glow discharge. ²⁻⁴⁶³⁰ ⁴⁶³⁰
Laděk Pehárek
(Czechoslov. Acad. Sci., Prague). *Czechoslov. J. Phys.*
67-77(1959)(in English); cf. preceding abstr.—The proper-
ties of the wave of stratification in the plasma of the pos-
column in a glow discharge in Ne are measured (*ibid.* 6,
488(1958)). The measurements are compared with the
results of the theory of the successive production of stria-
tions and good agreement is found. A. Krembáček

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PEKAREK, L

A new type of moving striations in neon. ³ Ludek Pekárek
 and Milos Novak (Czech. Acad. Sci., Prague). *Czechoslov.
 J. Phys.* 9, 401-2(1959)(in German).—Three types of
 striation waves (stratification) are observed. They are
 designated *s, r, p*. It appears likely that the newly dis-
 covered, fast-moving *s* striation waves are related to the
 presence of mol. ions. The app. is described in *ibid.* 4, 211
 (1954) and *C.A.* 53, 15776g. A. Kremheller—

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PEKÁREK, L.

✓ Microphysical phenomena causing the creation of fast stratification waves in a neon glow discharge? Luděk Pekárek and Miloš Novák (Czechoslov. Acad. Sci., Prague). *Czechoslov. J. Phys.* 9, 641-51(1959)(in German).—The authors investigate exptl. and theoretically the effect of space charge and ion diffusion. The relaxation times of the fast waves are dependent on the diffusion lifetime of at. and mol. ions. A. Kremheller.

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FEKAREK, L

CZECHOSLOVAKIA/Electronics - Electrical Discharges in Gases and
Gas Discharges Apparatus.

Abs Jour : Ref Zhur Fizika, No 1, 1960, 1534
Author : Fekarek, Ludek
Inst :
Title : Experimental Verification of the Theory of the
Successive Production of Striations in a Glow
Discharge
Cri. Pub : Czechosl. fiz. zh., 1959, 9, No 1,
Abstract : See Abstract 1532.

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Low-frequency Wavelike Phenomena in the Plasma of Glow Discharge

SOV/48-23-8-24/25

seen from oscillograms, perturbation expands throughout the discharge tube in the form of momentary variation of the luminous power. Velocity is 1,400 m/sec, and relaxation time amounts to 5 μ sec. There are 3 figures and 3 Soviet references.

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Z/037/60/000/005/001/056

B192/E382

AUTHOR: Pekárek, L.

TITLE: Ionization Phenomena in Gases

PERIODICAL: Československý časopis pro fyziku, 1960,
No. 5, p. 379

TEXT: During the last few years the ionization phenomena in gases have been studied very extensively. This is due to the fact that various attempts have been made to realize controlled thermonuclear reactions. In Czechoslovakia the following problems have been studied:

- 1) the fundamental processes in electrical discharges;
- 2) very high temperature plasmas which could be produced and maintained in a confined space (practical attempts to obtain thermonuclear reactions);
- 3) the problems of plasma stability and oscillations and waves in plasmas;
- 4) interaction between an electrical discharge and the surfaces of certain substances;
- 5) some theoretical problems and
- 6) applications.

ASSOCIATION: Fyzikální ústav ČSAV, Praha (Physics Institute
of the ČSAV, Prague)

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40355
S/194/62/000/06/184/232
D201/D308

94.2120

AUTHORS: Pekárek, L., and Krpata, V.

TITLE: Time dependent changes in the velocity and length of striations in a hydrogen discharge stratification wave

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 6, 1962, 56-57, abstract 6Zh368, (Chekhosl. fiz. zh., 1961, B. 11, no. 1, 849-851)

TEXT: Using a photomultiplier and an oscilloscope, the changes of the radiation intensity from the positive column of a discharge in H_2 at different distances from the cathode were recorded. The discharge current was 1.8 mA, the hydrogen pressure 2.2 mm Hg, the diameter of the discharge tube 20 mm and its length 300 mm. A short aperiodic pulse was produced at the cathode end of the discharge column. Measurements have shown that the direction of propagation of the resulting striations coincides with the direction of their propagation during the discharge in inert gases. The velocity of propagation of individual striations decreases with time. Thus, for
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24.6714

38191
S/058/62/000/004/145/160
A061/A101

AUTHORS: Pekárek, L., Krejčí, V.

TITLE: The physical nature of the production of moving striations in a d-c discharge plasma

PERIODICAL: Referativnyy zhurnal, Fizika, no. 4, 1962, 59 - 60, abstract 42h406 ("Chekhosl. fiz. zh.", 1961, v. B11, no. 10, 729 - 742, English)

TEXT: A mechanism of the lamination of a positive d-c column is suggested and physically interpreted on the basis of a greatly simplified system of equations, whose solution describes the production of a periodic structure of the plasma of a positive column after an aperiodic disturbance. Only three principal physical phenomena, taking place in the plasma of any d-c discharge, were considered: 1) dependence of ionization on the electron temperature, and, consequently, on the electric field; 2) formation of space charges as the result of different ion and electron diffusion rates; 3) production of additional electric fields due to the appearance of space charges. The foregoing processes as a whole give rise to a characteristic circuit, developing in time and space, and,

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PEKAREK, L.; KREJCI, V.; STIRAND, O.

Direction of motion of striations in an inert gas-hydrogen mixture. Chekosl fiz zhurnal 13 no.4:243-245 '63.

1. Fyzikalni ustav, Ceskoslovenska akademie ved, Praha.

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ACC NR. AP6000657

SOURCE CODE: CZ/0055/65/015/009/0644/0661

AUTHOR: Pekarek, L.; Masek, K.

ORG: Institute of Physics, Czechoslovak Academy of Sciences, Prague

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B

TITLE: Macroscopic space charge field in distributed quasineutral plasma

SOURCE: Chekhoslovatskiy fizicheskiy zhurnal, v. 15, no. 9, 1965, 644-661

TOPIC TAGS: electron plasma, plasma magnetic field, homogeneous magnetic field, magnetic field intensity, ion density, perturbation, Gaussian distribution

ABSTRACT: A method of calculating the electric field intensity in a quasi-neutral plasma homogeneity is found for the case when the problem can have a one-dimensional formulation. The general formula

$$E = E_0 - 4\pi q_0 \sum_{j=1}^J C_{j+1} H_0^{(j)} \frac{\partial^{j-1} n_+}{\partial z^{j-1}} - Q,$$

where

$$C_{j+1} = \frac{c_2^{j+1} - (-1)^{j+1} c_1^{j+1}}{c_2 + c_1}.$$

including Ohm's law, ambipolar approximation, and higher approximations of the space-charge electric field intensity expressed in terms of deviation n_+ in ion

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Card 2/2 *dda*

ACCESSION NR: AP4033425

Z/0055/64/014/004/0247/0255

AUTHOR: Sicha, M.; Vesely, V.; Novak, J.; Pekarek, L.

TITLE: Determination of the relaxation time of the electron temperature in the positive column of the electric discharge

SOURCE: Chekhoslovatskiy fizicheskiy zhurnal, v. 14, no. 4, 1964, 247-255

TOPIC TAGS: relaxation time, electron temperature, electric discharge, electron density, positive column

ABSTRACT: A method of measuring the relaxation time of the temperature of electrons in the positive column of an electric discharge is described. The method uses measurements of the phase shift between the course of the electron temperature and that of the concentration of electrons in artificially excited moving striations of small amplitude. These data and the values measured for the electric field and temperature of the electrons in a homogeneous column are used to calculate the relaxation time of the electron temperature on the assumption that the diffusion of the electron temperature has no substantial influence on the time. The authors conclude that their results indicate that theoretical

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ACCESSION NR: AP4033425

mastery of the layer phenomena in the positive column plasma has already opened new possibilities in plasma diagnostics. Orig. art. has: 10 formulas and 3 tables.

ASSOCIATION: Lehrstuhl für Elektronik und Vakuumphysik der Karlsuniversitaet, Prag (Chair of Electronics and Vacuum Physics, Charles University); Physikalisches Institut der Tschechosl. A. d. W., Prag (Physics Institute, Czech. Academy of Sciences)

SUBMITTED: 06Nov63

DATE ACQ: 01May64

ENCL: 00

SUB CODE: GP

NO REF SCV: 002

OTHER: 011

Card 2/2

SECHA, M.; VESELY, V.; NOVAK, J.; PEKAREK, L.

Determination of the relaxation time of electron temperature in the positive column of an electric discharge.
Cheskosl fiz zhurnal 14 no.4:247-255 '64.

1. Chair of Electronics and Vacuum Physics, Charles University, Prague 2, Ke Karlovu 5 (for all except Pekarek).
2. Institute of Physics, Czechoslovak Academy of Sciences, Prague 8, Lumumbova 1 (for Pekarek).

PEKAREK, L.; KREJCI, V.

The theory of moving striations in a D-C discharge plasma,
Pt.2. Chekhosl fiz zhurnal 13 no.12:881-894 '63.

1. Fyzikalni ustav, Ceskoslovenska akademie ved, Praha.

PEKAREK, L.; KREJCI, V.

Analogy between the stratification wave in plasma and waves on water. Cs cas fys 12 no.5/6:546-552 '62.

1. Fysikalni ustav, Ceskoslovenska akademie ved, Praha.

45267

Z/057/62/000/005-6/017/049
E192/E382

26.2311

AUTHORS: Pekárek, L. and Krejčí, V.

TITLE: Analogy between a stratified plasma wave and the waves on the surface of water

PERIODICAL: Československy časopis pro fyziku, no. 5-6, 1962,
546 - 552

TEXT: The process of wave-formation on a smooth water surface is well known, whereas a similar process of the appearance of mobile layers, known as "stratification waves", in a gas discharge is a comparatively unknown phenomenon. Such waves in gas discharges can be produced, for instance, by applying an aperiodic voltage pulse to an electrode situated in the discharge tube. This results in the formation of a similar stratum which rapidly disappears but in the direction of the anode. In turn, after a delay, another stratum is produced and so on; a set of strata which moves towards the anode is observed only after several ms, whereas the individual strata move in the opposite direction. The theory of gravitation waves on the surface of water can be approximately described by the
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Analogy between

Z/037/62/000/005-6/017/049
E192/E382

following basic equations:

$$\frac{\partial^2 \varphi}{\partial x^2} + \frac{\partial^2 \varphi}{\partial y^2} + \frac{\partial^2 \varphi}{\partial z^2} = 0 \quad (1)$$

$$\frac{\partial^2 \varphi}{\partial t^2} + g \frac{\partial \varphi}{\partial z} = 0 \quad (2)$$

where φ is the velocity potential, x and y are horizontal coordinates, z is the vertical coordinate, t is time and g is the gravity. The stratification waves in inert gases can similarly be described by a system of partial differential equations

$$\partial e / \partial x = 4 \pi q_0 n_+ \quad (5)$$

$$\partial n_+ / \partial t = z' N_0 e \quad (6)$$

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E192/E382

Analogy between

where e is the local deviation of the electric field from its equilibrium value, n_+ is the deviation of the ion concentration from the equilibrium value N_0 , q_0 is an elementary charge, z' is a constant relating the ionization intensity to the electric-field strength e and x is the distance from the position of the initial perturbation of the equilibrium state. Eqs. (5) and (6) are valid for deviations and take into account the three basic processes in plasma: 1) dependence of the ionization rate on the electron temperature, the temperature being directly proportional to the field; 2) production of space charges by differing electron and ion diffusion rates and 3) appearance of an additional electric field due to the space charge. The solution of Eqs. (5) and (6) is approximately given by:

$$n_+(x < 0, t) = -J_0 [2a\sqrt{(-xt)}] \approx$$

$$\approx -\sqrt{\frac{2}{\pi a}} \cdot \frac{1}{\sqrt[4]{(-xt)}} \cos [a\sqrt{(-xt)} - \pi/4]$$

Card 3/4

Analogy between

Z/037/62/000/005-6/017/049
E192/E382

where $a = \sqrt{(4\pi q_0 \mu N_0)}$. Comparison of the theory of stratification waves in inert gases with the theory of the gravitation waves on water shows that although the two effects are very similar, the differences between them are primarily due to the different modes of propagation of the perturbations (from the equilibrium state); whereas in waves on water the contact forces are the most important, the electrical phenomena in plasma are such as to act either directly or remotely. In this respect, the moving strata differ from the waves on water and have no direct analogy in mechanical systems. There are 3 figures.

ASSOCIATION:

Fysikalni ustav CSAV, Praha
(Physics Institute, CSAV, Prague)

Card 4/4

NEMECEK, Jiri; PEKAREK, Petr

Contribution to the kinetics and mechanism of thermal decomposition
of iron sulphates. Chem prum 15 no.3:132-137 Mr 1965.

1. Research Institute of Inorganic Chemistry, Usti nad Labem.

PEKAREK, Robert, inz.

Use of slurries in fertilizer plants. Vodni hosp 14 no.4:
153-156 '64.

1. Ministry of Agriculture, Forestry and Water Resources
Management.

FEKAREK, Robert

Prefabricated biological filters. Vodni hosp 13 no.2:53-55
'63.

1. Ministerstvo zemedelstvi, lesniho a vodniho hospodarstvi.

PEKAREK, V.

"Transuranium elements" by A.K. Lawruchina [Lavrukina, A.K.],
J.A. Solotov [Zolotov, Yu.A.]. Reviewed by V. Pekarek. Jaderna
energie 9 no.3:108 Mr '63.

PEKAREK, V.

Air pollution in Most-Usti soft coal district. Pracovni lek. 4 no.5:
339-345 Oct 1952. (CIML 23:4)

1. Of the Institute of Industrial Medicine (Head--V. Pekarek, M.D.),
Usti/Labe.

PEKÁREK, V.

"Mining Ores of Nonferrous Metals." ^{Rudy} p. 25, Vol. 2, no. 2, Feb. 1954, Praha.

SO: East European Accessions List, Vol. 3, No. 9, September 1954, Lib. of Congress

EXCERPTA MEDICA Sec. 17 Vol. 3/6 Public Health June 57

1918. PEKÁREK V. *Risiko silikosisy při dřevění skla tryskáním písku. Hazard
of silicosis during sandblasting of holes in glass PRACOV-
NÍ LÉKARSTVI (Praha) 1956, 8:4 (294-296) Illus. 1

The working process and apparatus for cutting holes into glass by blasting of dry
quartz dust of fine granulation is described. During the preparation of the sand
and during blasting, high values of silica in the atmosphere of the workshop were
measured; the workers were thereby seriously exposed to the hazard of silicosis.
(XVII, 15)

PEKAREK, VLAD MIRE

CZECHOSLOVAKIA/Chemical Technology - Chemical Products and
Their Application. Safety Engineering. Sanitary
Engineering.

H-6

Abs Jour : Ref Zhur - Khiniya, No 3, 1958, 8517

Author : Pekarek Vladimír, Ponca Euzen, Iizera Zdenek

Inst : -

Title : Workshop Atmosphere and Health of Workers in the Production of Permanganate.

Orig Pub : Pracovni lekar., 1957, 9, No 2, 104-111

Abstract : At a permanganate manufacturing plant the highest concentration of Mn, in the atmosphere, was found in the department where the finished product is packaged (17.84 μ /liter, 95% of particles less than 1 μ). A maximum permissible concentration of Mn has not been set by Czechoslovak standards. 54 plant workers, employed for periods from 5 months to 35 years, were examined. Pneumonia recorded in 11.1% of cases, bronchitis in 16.6%, 9.6% of cases

Card 1/2

FEKAREK, V.

COUNTRY : Czechoslovakia H-7
CATEGORY : Chemical Technology. Chemical Products and Their Applications--Chemical and technological aspects*
ABB. JOUR. : J. IN., 1975, 1037, 57545

AUTHOR : Koval, M. and Lekarsk, J.
ISSI. : Not given
TITLE : The Extraction of Uranium from Mixed Nitric Acid-hydrochloric Acid Solutions

ORIG. PUB. : Jadrana Energet, 4, No 9, 250-260 (1975)

ABSTRACT : Uranium ores containing CaCO₃ are treated with an excess of a mixture of HCl and HNO₃. The U is extracted from the solution obtained by the use of strongly basic anion-exchange resins. The U is eluted from the resins with a solution of HNO₃ and separated from the elements of the first and second groups of the periodic table as well as from Al, Fe, Pb, Zn, and the rare earths. A flow sheet for a pilot plant installation is given. The bibliography lists seven titles.

I. Yelinez

ORIG: 1/1 * of the nuclear industry.

PEKAREK, Vladimir; STASTNY, Vaclav; BUDLOVSKY, Josef

Use of organic phosphates in agriculture in the former Usti region during the period of 1958-1960. Prac. lek. 14 no.6:289-291 Ag '62.

1. Oddeleni hygieny prace KHES KUNZ v Usti nad Labem, prednosta MUDr. V. Pekarek, Ordinariat nemoci z povolani KUNZ v Usti nad Labem, ordinar MUDr. J. Budlovsky.

(PHOSPHORUS POISONS ORGANIC)

MARAN, Bohuslav, akademik, laureat statni ceny; KAUT, Vl., inz.;
SVORCOVA, S., MUDr.; TUSL, M., MUDr., C.Sc.; RABA, Jan.;
MATERNA, Jan, inz.; KLIMECEK, Rostislav; BETTELHEIM, Jan, inz.;
HALA, Eduard, doc., inz., dr.; UHER, L., inz.; KORDIK, E.;
ERDOS, Emerich, doc., inz., dr.; VOSOLSOBE, Jan, doc., inz., dr.;
NADENIK, O., inz.; HRUDKA, J.; HOSTALEK, Zdenek, inz., dr.;
RADL, K., inz.; PEKAREK, Vl., MUDr.; BLISTAN, J., inz.; STORCH, O.
inz.

A national conference on protection against chemical fumes
from electric heat plants; a summary of reports. Energetika Cz
11 no.2:109-111 F '61.

PEKAREK, Vladimir; SLECHTA, Theodor; JIZERA, Zdenek

On the problem of air pollution by tars during electrolytic production of aluminum, Pracovní. lek. 11 no.7:367-368 S '59.

1. Oddelení hygieny práce KHS, Usti n. L.
(AIR POLLUTION)
(TARS)
(ALUMINUM)

DIAMANT, J.; DUPEK, J.; HOSKOVEC, J.; KRISTOF, M.; PEKAREK, V.; ROTH, B.;
VELEK, M.; Technicka spoluprace: Kubickova, d.s. M.

Electroencephalographic study of hypnosis. Cesk. psychiat. 55
no.5:285-295 0 '59.

1. Psychiatricka klinika a neurologicka klinika KU v Praze,
Ustredni zdravotni ustav MV; psychiatricka lecebna v Praze 5.
(ELECTROENCEPHALOGRAPHY)
(HYPNOSIS physiol.)

BARDODEJ, Z.; PEKAREK, V.

Styrenes. Prac. Lek. 15 no.8:suppl:19-20 0 '63.

X

S/081/62/000/012/034/063
B166/B101

AUTHORS: Budlovský, J., Pekárek, V.

TITLE: State of health of workers engaged in the production of
glass-reinforced laminated plasticsPERIODICAL: Referativnyy zhurnal, Khimiya, no. 12, 1962, 369, abstract
12I413 (Pracovní lékař., v. 13, nos. 8-9, 1961, 481-483)

TEXT: During a sanitary and hygiene study of two organizations producing glass-reinforced laminated plastics styrene vapors in an average concentration of 188 and 587 γ/l were detected in the air of working positions which are not used every day and not for a whole shift. The maximum permissible concentration according to American standards is 420 γ/l . During a medical check-up of 34 workers at both organizations (engaged on this work from 2 weeks to 2 years, and aged between 16 and 51) complaints of coughs, irritation of the eyes, increased irritability, fatigue, neurovegetative upsets and head aches were noted. A tendency to hypotonia was noted. The blood count was unchanged. 380-886 mg/l

Card 1/2

KIAS, Ladislav, inz. (Kladno); PEKAREK, Viktor, inz. (Kladno)

Precise electric control of limit tension of tension pulley
cables, used in hole boring. Elektrotechnik 17 no.1:11-12
Ja '62.

L 38702-66 EWP(1) LJP(c) BB/GG/GD

ACC NR: AT6017138

SOURCE CODE: UR/0000/65/000/000/0195/0196

AUTHOR: Pekarek, Ya.

ORG: Aritma National Enterprise, Prague, ChSSR (Natsional'noye predpriyatiye Aritma)

TITLE: Universal transistorized MEDA 40 TA analog computer

SOURCE: Sovet ekonomicheskoy vzaimopomoschni. Postoyannaya komissiya po koordinatsii nauchnykh i tekhnicheskikh issledovaniy. Sredstva i metody mekhanizatsii podgotovki i poiska nauchno-tekhnicheskoy informatsii, inzhenernogo i upravlencheskogo truda (Means and methods for mechanizing the preparation and research of scientific and technical information and of engineering and control work); lektsii, pročitannyye na vystavke "Inforga-65" v mave-iyune 1965 g. Moscow, 1965, 195-196

TOPIC TAGS: analog computer, computer memory / MEDA T analog computer, MEDA 20T analog computer, MEDA 40 TA analog computer, MEDA 80T analog computer

ABSTRACT: The Czechoslovakian MEDA T family of computers is discussed. The MEDA 40 TA is a compact universal nonlinear differential analyzer which solves nonlinear differential equations up to the 12th order. The other systems are conventional analog computers. The MEDA T computer is built on the basis of small plug-in units. The following units are used in the MEDA T family: 1. TZP-1: 2 operational amplifiers + 1 mechanical modulator; 2. TDQ-1: 2 diode, parabolic type squarers; 3. TDG-1: one diode

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ACC NR: AT6017138

function generator with 19 linear intervals with fixed breaking points; and 4. TZK-1: 2 comparator amplifiers. Other features of the MEDA T are: repetitious operation with 50 solutions per sec, automatic hold in case of programmer or machine error (with indication of the defective unit), 10 five-turn spiral precise ARIPOT potentiometers and memory circuits. The MEDA T family includes the MEDA 20T, MEDA 40 TA and the MEDA 80T.

[14]

SUB CODE: 09/ SUBM DATE: none

Card 2/25M

PEKARSKY, Z.

New method of staining of vaginal smears. Cesk. gyn. 16 no.7:329-333
1951. (CJML 21:5)

1. Of the Institute of Mother and Child in Prague-Podole (Director-
-Prof. J. Trapl, M.D.).

BYKADOROV, V.S., red. toma; PEKAFETS, P.A., red. toma; RADCHENKO,
G.P., red. toma; RYABOVICH, N.P., red. toma; TYALICH,
S.M., red. toma; IZRAILEVA, G.A., vod. red.

[Geology of coal and oil shale deposits in the U.S.S.R.]
Geologiya mestorozhdenii uglia i goriuchikh slantsev SSSR.
Vol.8. 1964. 790 p. (MIRA 17:12)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy geologicheskii
komitet.

S/169/63/000/002/061/127
D263/D307

AUTHOR: Pekarets, P. A.

TITLE: Geological and structural characteristics and the available minerals of the southern part of Tunguskiy basin

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 2, 1963, 3-4, abstract 2D19 (In collection: Materialy po geol. i po- lezn. iskopayemym Irkutskoy obl., no. 1 (28), Irkutsk, 1961, 62-81)

TEXT: The southern part of the Tunguskiy basin may be resolved into three local structures which differ sharply in their conditions of formation. (1) The hollow between the zone of Angarsk folding and the Chadobetskoye depression, filled by the deposits of Lower, Middle and Upper Carboniferous, Lower Permian, and Lower Triassic. (2) The Nutskiy hollow, in which conditions of coal deposition were analogous to those in the SE part of the Tunguskaya syncline. The coal seams are thin and are found in the central

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Geological and structural ...

S/169/63/000/002/061/127
D263/D307

part of the depression; a thick layer of Middle and Upper Paleozoic rocks is also present, containing conglomerates of 'exotic' composition. (3) The Kokuyskiy hollow, which underwent uplift during the Lower Carboniferous, as a result of which Lower and Middle Paleozoic strata were eroded back to the Upper Cambrian. The hollow began to form in Middle Carboniferous. The SE margin of the Tunguskaya syncline and the Murskiy hollow were thus formed earlier than the Kokuyskiy hollow, and differ therefore by a fuller complex of Middle and Upper Paleozoic strata. Useful mineral deposits are situated chiefly in regions where terrace-forming secondary structures have been developed (Chadobetskoye, Angaro-Katangskoye, Kovinskoye, etc.). Diamonds, coal, iron and other useful minerals should be mentioned. Diamonds occur most frequently in anticlinal regions and in areas adjoining hollows and synclines, in the alluvia of which diamonds may be discovered, generally cut through the base of Upper Paleozoic strata, and are represented by 'exotic' conglomerates. The latter act apparently as secondary collectors of locally occurring diamonds. A wide distribution of ferruginous sandstones and hydrothermal magnetite formations was established

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Geological and structural ...

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D263/D307

in this region. Areas were marked out which are promising for the prospecting for iron ores of sedimentary origin: the upper and middle courses of the Polivo river, the region of the Kovrizhka river, and the Ilimo-Katskoye inter-river zone. Concentrations of rare and dispersed elements in the coals of the SE part of the Tunguskiy basin, and in the carbonate rocks of the Kovrizhka and other regions, are of considerable interest. The main wealth of the described territory are coals, whose reserves are enormous, and which may be partially worked out in open pits. [Abstracter's note: Complete translation.]

Card. 3/3

5(2)

SOV/78-4-1c-23/4c

AUTHORS: Tylkina, M. A., Pekarev, A. I., Savitskiy, Ye. V.

TITLE: Phase Diagram of the System Titanium - Hafnium

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol. 4, No. 10,
pp 2320 - 2322 (USSR)

ABSTRACT: According to data obtained by means of different methods the phase diagram Ti - Hf was constructed (Fig 1a). As it was to be expected according to the analogous structure of the electron shell of these elements, they form a continuous series of solid α - and β -solutions which are separated by a diphas $\alpha+\beta$ -region. The curves of the changes of physical properties of the melts with variable composition (Fig 1b) confirm this phase diagram. Figure 2 shows the microstructure of titanium - hafnium alloys treated in a different way. There are 2 figures and 6 references, 3 of which are Soviet.

ASSOCIATION: Institut metallurgii im. A. A. Baykova Akademii nauk SSSR (Institute of Metallurgy imeni A. A. Baykov of the Academy of Sciences, USSR)

SUBMITTED: May 4, 1959
Card 1/1

33177

S/180/61/000/006/007/020
E193/E383

18.950D 1521 1530 1418 1454

AUTHORS: Savitskiy, Ye.M., Kopetskiy, Ch.V., Pekarev, A.I.
and Novosadov, M.I. (Moscow)

TITLE: Properties of single crystals prepared by electron-
beam zone melting

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye
tekhnicheskikh nauk. Metallurgiya i toplivo,
no. 6, 1961, 74 - 78

TEXT: The properties of high-purity W, Re, Ta, Mo, Nb and V
were studied on single-crystal specimens prepared by electron-
beam zone melting (5 - 8 passes at 8 - 10 cm/h) from sintered-
powder compacts (2 - 5 mm in diameter) preliminarily degassed by
vacuum treatment at 1 800 - 2 500 °C. It was confirmed by X-ray
diffraction study that single crystals were, in fact, obtained
by this method. No preferred crystal-growth orientation was
observed and, in some cases, there was evidence of a slight
($< 0.5^\circ$) block misalignment. The existence of sub-boundaries
was revealed by metallographic examination. The results of
hardness measurements are reproduced in Table 1, where columns
Card 1/3

x

0177

Properties of single crystals

S/180/61/000/006/007/020
E193/E383

There are 2 tables, 5 figures and 6 references: 2 Soviet-bloc and 4 non-Soviet-bloc. The four English-language references mentioned are: Ref. 3: A. Calverley, M. Davis, R.F. Lever - J. Scient. Instrum., 1957, v.34, no. 4; Ref. 4: H.R. Smith - J. Metals, 1959, v. 2, no. 2; Ref. 5: H.W. Schadler - Trans. Metallurg. Soc. AIME, 1960, 218, 4, 649.

SUBMITTED: April 1, 1961

Table 1:

Металл Metal	H _v , кг/мм ² kg/mm ²		Металл Metal	H _v , кг/мм ² kg/mm ²	
	I	II		I	II
W	345	345-355	Mo	177	175-185
Re	112	220-250	Nb	79	130-140
Ta	76	150-170	V	91	170-190

Card 3/3

18 9500

1043 1160

26392

S/032/61/027/008/011/020

B124/B215

AUTHORS: Savitskiy, Ye. M., Kopetskiy, Ch. V., Pekarev, A. I. and Novosadov, M. I.

TITLE: Device for zone melting of high-melting metals and alloys by electron bombardment

PERIODICAL: Zavodskaya laboratoriya, v. 27, no. 8, 1961, 1041 - 1042

TEXT: A device for zone melting (Fig. 1) was designed in the laboratoriya redkikh metallov i splavov Instituta metallurgii AN SSSR (Laboratory of Rare Metals and Alloys of the Institute of Metallurgy, AS USSR) on the basis of western papers (A. Calverley, M. Davis, R. F. Lever, J. Sci. Inst., 34, 4, (1957); H. R. Smith, J. of Metals, 11, 2 (1959)). This device may be used to obtain single-crystal rods 150 - 200 mm long and 3 - 5 mm in diameter for use in radioelectronics, in the manufacture of precision instruments, and for research purposes. In electron bombardment, a zone is melted with a width approximately equal to the diameter of the specimen serving as anode. The liquid metal is kept in the melted zone by means of surface tension. The above method permits
Card 1/5

X

Device for...

2639?
S/032/61/022/008/017/020
B*24/B2*5

the purification of rods 12 - 14 mm in diameter. The support 2 for fixing the specimen 3 is placed on the water-cooled plate 1. Tantalum springs which permit free expansion of the specimen during heating, are used for fixing the specimen in perpendicular position between the molybdenum clamps 4. The support with the fixed specimens is insulated from the plate and serves as an anode. The cathode is a loop of tungsten filament 0.6 - 0.7 mm in diameter, or is made of tantalum foil. It is fixed in position by the holders 5 made of steel. The cathode is heated by a charged copper wire connected to the holders. The support with the cathode holders is adjusted by a guide nut which is driven out of the working chamber by a conical, vacuum-tight, mobile device. One cathode holder and the plate are earthed. The electrons emitted from the cathode are focused by means of two parallel molybdenum plates placed at a distance of 4 - 5 mm from each other. The plates have 5 - 7 mm openings. The whole working chamber is enclosed by a water-cooled steel or glass envelope 7. The guide nut is rotated by a d-c electric motor 8 over a belt drive and worm reduction gear 9 at a total transmission ratio of 1:100. The electric motor is turned off by the limit switches 10 at a distance of 1 - 1.5 cm between focusing plates and specimen holders. The vacuum
Card 2/5

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S/032/61/027/008/017/020
B124/B215

Device for...

system consists of a BH-2(VN-2) forepump and a BA-05-1 (VA-05-1) standard unit. The latter consists of an oil vapor diffusion pump of type H5 (N5), a slider, and a chamber with ionization and thermocouple manometers. A vacuum of $1 \cdot 10^{-5}$ mm Hg at an evacuation rate of 3000 l/min may be attained in the system. A rectifier consisting of a step-up transformer and four KP-110 (KR-110) kenotrons connected in parallel, was used for feeding the anode grid. The rectifier guarantees semiperiod rectification with a voltage of 3.6 kv and a maximum current of approximately 350 ma. The above feeding system permits a continuous regulation of the metal temperature and the elimination of unexpected overcharges. For visual checking of the melting process, a lens was inserted into the glass envelope through which enlarged images of the cathode heated to 2000 - 2500°C, of the focusing screens, and the zone of the melted metal can be projected onto a screen. For the purpose of degassing the specimen before zone melting, the specimen is annealed in vacuo by means of an electron beam, 100 - 300°C below the melting point of the material. The melting conditions for some high-melting metals are given in a table. The new device was used for preparing

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26392
 S/032/61/027/008/017/020
 B124/B215

Device for...

Nb, Mo, Ta, Re, and W single crystals whose properties demonstrate the great value of zone melting by electron bombardment in a high vacuum. There are 2 figures, 1 table, and 1 non-Soviet-bloc reference.

ASSOCIATION: Institut metallurgii Akademii nauk SSSR im. A. A. Baykova
 (Institute of Metallurgy of the Academy of Sciences imeni A. A. Baykov)

Table: Melting conditions for high-melting metals. Legend:
 (A) Metal; (B) diameter of rod, mm; (C) voltage, v; (D) current, ma; (E) niobium; (F) molybdenum; (G) tantalum; (H) rhenium; (I) tungsten.

A) Металл	B) Диаметр прутка мм	C) Напряжение в	D) Ток ма
E) Ниобий	4	1200	110
F) Молибден	2	1500	130
G) Тантал	2	1800	150
H) Рений	2,5	2000	160
I) Вольфрам	2	3000	180

7Ав.

Card 4/5

18.7500

29817
S/O20/61/140/006/014/030
B'04/B102

AUTHORS: Savitskiy, Ye. M., Tylkina, M. A., Pekarev, A. I., Gavriilyuk, M. I., and Zabavnova, A. P.

TITLE: Recrystallization diagram of cast tungsten

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 6, 1961, 1301 - 1303

TEXT: By x-ray diffraction studies, microscopic examinations, and hardness measurements (Vickers hardness, 10 kg load) the authors constructed a complete recrystallization diagram of cast tungsten (99.6 %). After casting the specimens were compressed (70 %) and annealed (1600°C). The material had a grain size of 40 - 50 μ . The specimens were compressed from 6 to 90 % with a hammer in a hydrogen atmosphere at 700 - 1100°C. These temperatures are just below the recrystallization temperature of tungsten. After this treatment specimens of each deformation degree were annealed in the range from 1000 to 2500°C at every 100°C for one hour (between 1400 and 1600°C at every 50°C). The specimens were electrolytically polished (10 % NaOH in water, 1.7 a/cm²). The recrystallization Card 1/4 3

1
X

Recrystallization diagram of cast ...

29817
S/020/61/140/006/014/030
B104/B102

diagram of deformed tungsten is shown in Fig. 1. At deformations between 30 and 90 %, recrystallization sets in at 1450°C. The recrystallization takes place between 1450 and 1600°C. At a temperature of 1700°C, the grains start growing. At 9 % deformation, recrystallization sets in at 1600°C. The critical degree of deformation shifts from 12 % deformation at an annealing temperature of 1600°C to 6 % deformation at an annealing temperature of 2100°C. The coarsest grains were obtained by annealing at 2500°C. With an increase of the degree of deformation from 30 to 90 % hardness increased from 380 kg/mm² to 440 kg/mm². When recrystallized grains appear, hardness drops to 360 kg/mm². The optimum annealing temperature of tungsten deformed by 50 - 90% was assumed to be between 1500 and 1600°C. A comparison with data on high-purity single crystals showed the strong influence of impurities on the recrystallization temperature. There are 1 figure and 4 references: 2 Soviet and 2 non-Soviet. The 2 references to English-language publications read as follows: E. L. Hamon, J. Metals, 12, no. 9 (1960); S. J. Noesen, I. R. Hughes, Trans. Met. Soc., AIME, 218 (1960).

ASSOCIATION: Institut metallurgii im. A. A. Baykova Akademii nauk SSSR
(Institute of Metallurgy imeni A. A. Baykov of the Academy
of Sciences USSR)

Card 2/4 3

Recrystallization diagram of cast ...

29817
S/020/61/140/006/C14/030
B104/B102

PRESENTED: June 2, 1961, by I. V. Tananayev, Academician

SUBMITTED: May 31, 1961

Fig. 1. Recrystallization diagram of commercial cast tungsten. Legend:
(1) degree of deformation; (2) annealing temperature; (3) mean diameter
of grains.

Card 3/A 3

X

SAVITSKIY, Ye.M.; KOPETSKIY, Ch.V.; PEKAREV, A.I.; NOVOSADOV, M.I.

Obtaining, and the properties of, single crystals of high-~~melting~~^{melting} tungsten, rhenium, tantalum, molybdenum, and niobium metals. Issl. po zharopr. splav. 9:192-194 '62. (MIRA 16:6)
(Metal crystals) (Zone melting)

PEKAREV, A.I.

Method of representation of a diagram "composition - property"
for ternary systems. Zhur.neorg.khim. 7 no.6:1481-1483 Je
'62. (MIRA 15:6)

(Systems (Chemistry))

S/109/62/007/009/009/018
D409/D301

AUTHORS: Dyubua, B.Ch., Pekarev, A.I., Popov, B.N., and
Tylkina, M.A.

TITLE: Thermionic emission of tungsten-titanium and tungsten-
hafnium alloys and its dependence on oxygen pressure

PERIODICAL: Radiotekhnika i elektronika, v. 7, no. 9, 1962,
1566 - 1573

TEXT: The dependence of the work function of W-Ti and W-Hf alloys on their composition was investigated. It was found that the work function of solid solutions is lower than that of pure metals. Solid solutions and chemical compounds should be considered as new emitters whose properties differ from the properties of pure metals. As the original materials, tungsten powder of grade B4 (VCh) (highly pure) was used, titanium of grade ИМТ-1А (IMP-1A), and chemically-pure hafnium. The composition of the alloys was determined by chemical analysis. The alloys underwent X-ray structural and metallographic analysis. The lattice parameters of the solution of hafnium in tungsten were calculated; it was found that the value of
Card 1/3

S/109/62/007/009/009/018
D409/D301

Thermionic emission of ...

the lattice parameter increases from 3.160 to 3.185 KX. The thermionic emission of the alloys was measured by means of an experimental lamp. For the W-Ti alloys, three values of the work function were obtained, in addition to the work functions of the pure metals. These values are roughly similar (3.6 - 3.75 ev). The dependence of the thermionic emission on the oxygen pressure, was investigated for both alloys without Ba-coating and with Ba-coating. In the first case, the behavior of the alloys is as follows: 1) If the oxygen pressure is increased, the thermionic emission changes in the same way as that of the low melting-point component; 2) the critical oxygen pressure is higher for the alloys (at equal temperatures), than for pure tungsten, but lower than that of the component metals. In the case of Ba-coated alloys, the following qualitative results were obtained from the experiments: 1) Under the action of the oxygen, the emission of the alloys initially increases, and then decreases (similar to the emission of tungsten); but the increase in emission is several hundredfold less than that of tungsten. 2) In the case of the alloys, the drop in emission starts at higher oxygen pressures than for pure tungsten, but at lower pressures than for pure titanium and hafnium. The authors also calculated

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E/0149/63/000/006/0111/0113

ACCESSION NO: AP4009844

AUTHOR: Pekarov, A. I.

TITLE: Determining surface tension of tungsten, molybdenum, and rhenium

SOURCE: IVUZ. Tsvetnaya metallurgiya, no. 6, 1963, 111-113

TOPIC TAGS: surface tension, metal surface tension, W, Mo, Re, drop test

ABSTRACT: Surface tension of W, Mo, and Re was studied by the drop method. The procedure involved a polished metal anode fixed vertically, and a tungsten wire with a system of molybdenum focusing plates placed under the anode. The lower free end of the anode was subjected to electron bombardment in vacuum $(6-8) \times 10^{-5}$ mm Hg. During the upward movement of the cathode (with the velocity 1 mm/min) the anode was melting, and the drop forming at its free end grew longer and eventually separated. Before the separation, the weight of molten metal was balanced by the surface tension

$$mg = 2\pi r\sigma, \quad (1)$$

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ACCESSION NO: AP4009844

whence

$$\sigma = \frac{mg}{2\pi r} \quad (2)$$

where m is mass of molten metal and r is radius of the rod. Since the separated metal represents only part of the whole metal drop formed at the end of the rod, an additional function

$$F = \gamma \left(\frac{v}{r^2} \right) \quad (3)$$

was introduced into the equation to account for the separated volume depending on the radius of the rod. This volume was calculated from the weight of the solidified drop and from the specific weight of the drop at melting temperature. Assuming that the volume variation during metal melting depended on the type of the metal lattice, it was accepted that Mo and W volume increased 2.5% and Re volume by 4.7%. After the correction F was introduced, the final formula for the calculation of surface tension was

$$\sigma = \frac{Wg}{F} \quad (4)$$

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The calculations showed that surface tensions of W, Mo, and Re were equal to 2220, 1915, and 2610 dynes/cm respectively. Orig. art. has: 4 formulas and 1 figure.

ASSOCIATION: Moskovskiy institut stali i splavov, Kafedra chistykh metallov i poluprovodnikovykh materialov (Moscow Institute of Steel and Alloys, Department of Pure Metals and Semiconductor Materials)

SUBMITTED: 27May63

DATE ACQ: 07Feb64

ENCL: 00

SUB CODE: ML

NO REF SOV: 005

OTHER: 001

Card 1 3/3

PEKAREV, A.I.; SAVITSKIY, Ye.M.; TYLKINA, M.A.

Interaction of lithium with titanium at high temperatures.
Trudy Inst. met. no.12:189-192 '63. (MIRA 16:6)

(Diffusion coatings)
(Titanium--Metallography)
(Lithium--Thermal properties)

FEKAREV, A.I.

Determining the orientation of tungsten crystals by etch figures.
Izv. vys. ucheb. zav.; tsvet. met. 6 no.4:123-126 '63.
(MIRA 16:8)

1. Institut metallurgii AN SSSR.
(Tungsten--Metallography)

L 23529-66

ACC NR: AP6008069

EWP(k)/EWT(d)/EWT(m)/EWP(h)/T/EWA(d)/EWP(l)/EWP(v)/EWP(t) IJP(c) JU/30

SOURCE CODE: UR/0032/55/032/002/0228/0231

AUTHOR: Pekarev, A. I.; Gartsan, M. V.; Chistyakov, Yu. D.

ORG: Moscow Institute of Steel and Alloys (Moskovskiy institut stali i splavov)

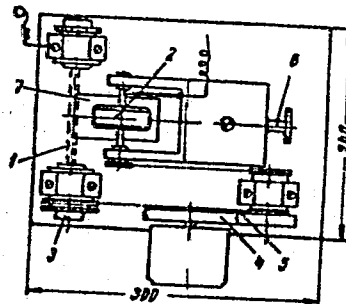
61
B

TITLE: A method for tensile testing of tungsten and molybdenum single crystals

SOURCE: Zavodskaya laboratoriya, v. 32, no. 2, 1968, 228-231
27 453, 27 44.7 16

TOPIC TAGS: tungsten, molybdenum, single crystal, tensile test, finishing machine, metal polishing

ABSTRACT: The authors describe a special machine designed for preparing single crystal specimens to be used in tensile tests (see figure). The process reduces to electrolytic polishing of the rotating single crystal 1 by shaper cathode 2 in the form of a specially shaped polished disc. The cylindrical single crystal is held by two collets 3 and turned at a rate of 20 rpm by an SD-2 motor through a gear box 4 and belt drive 5. Stainless steel disc 2, which rotates at a speed of 15 rpm, is fed 1.0-0.2 mm toward the surface of the single crystal by lead screw 6 in such a way that the electrolyte from container 7 located beneath the disc wets the surface of the single crystal for normal electrolytic polishing.



Card 1/2

UDC: 620.172

Card 2/2 -30

PEKAREV, A.I.; CHISTYAKOV, Yu.D.

Attachment to a metallomicroscope for the direct observation
of the electrolytic polishing and etching of sections. Izv.
vys. ucheb. zav.; tsvet. met. 7 no. 4:147-149 '64
(MIRA 10:1)

1. Moskovskiy institut stali i splyavov, kafedra proizvodstva
chistykh metallov i poluprovodnikovyykh materialov.

PEKAREV, A.I.; CHISTYAKOV, Yu.D.

Attachment to microscopes for the observation of electropolishing
and etching processes. Zav.lab. 31 no.10:1272 '65.

(MIRA 19:1)

1. Moskovskiy institut stali i splavov.

CHISTYANOV, Yu.D.; PERKIN, A.I.

Methods of metallographic study of cast and deformed tungsten;
review. Zav. lab. 31 no. 12:1467-1473 '65 (MIRA 19:1)

L 00090-66 EWT(m)/T/EWP(t)/EWP(b)/EWA(c) JD

ACCESSION NR: AP5022338

UR/0149/85/000/003/0065/0072

669.28

AUTHOR: Pekarev, A. I.; Chistyakov, Yu. D.; Shchirenko, G. N.

63
60
B

TITLE: Statistical analysis of the direction of preferential growth of single crystals of molybdenum obtained by electron bombardment zone recrystallization without a crucible

SOURCE: IVUZ, Tsvetnaya metallurgiya no. 3, 1985, 65-72

TOPIC TAGS: single crystal growth, molybdenum, metal zone refining, electron beam melting

ABSTRACT: The starting material was 99.8% pure molybdenum in the form of a forged and polished rod 5 mm in diameter with an overall length of 200 mm. By four passes through the zone, a monocrystal 130 mm long was obtained. The vacuum during zone melting was better than $4 \cdot 10^{-4}$ mm Hg. Final purity of the molybdenum reached 99.98%. The orientation of the single crystals obtained was determined by an X-ray method with an accuracy of $\pm 1^\circ$. The most objective criterion of the preferential direction of growth of the single crystals is the direction or region with a maximum density of orientations. This direction has the

Card 1/2

L 13742-65 EWT(m)/EPF(n)-2/EWP(t)/EWP(b) Pu-1 JD/JG
ACCESSION NR: AP4047496 S/0149/64/000/004/0147/0149

AUTHOR: Pekarev, A. I. ; Chistyakov, Yu. D.

TITLE: Attachment to a metal microscope for direct observation of the process of electrical polishing and etching of microsections / 6

SOURCE: VUZ. Tsvetnaya metallurgiya, no. 4, 1964, 147-149

TOPIC TAGS: metal microscope, electrical polishing, electrical etching, alloy microstructure

ABSTRACT: Several devices and installations exist for electrical polishing and etching of microsections, which help to check and control the amperage, voltage, electrolyte temperature, electrolyte flow rate and other features. The "Elipowist" installation made in East Germany performs electrical polishing and etching of 6 mm diameter microsections under a special metal microscope. The installation facilitates the selection of electrical polishing rates and the exposure of microstructural elements such as the grain boundary, spots, etching, etc. However, this installation is not always available and may be replaced by a standard metal microscope with an attachment designed in the

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L 13742-65

ACCESSION NR: AP4047496

authors' laboratory (Fig. 1 of the Enclosure). The metal is observed through a plane-parallel glass plate. The attachment is placed on the specimen table instead of the replaceable metal washer. The MIM-7 and MIM-8 microscopes with OE-23 and OE-14 objectives have magnifications from 70 to 270, with the possibility of taking photographs with a magnification of 300. Polarized light may be used for observations. Even greater magnification is possible with the MVT microscope. The attachment was used to examine the microstructure of mono- and polycrystalline tungsten. The electrolyte was a 10% aqueous solution of sodium hydroxide. The attachment may be used for preparing micro-sections and observing the structure of tungsten and molybdenum, and other electrolytes may be used for other metals. Orig. art. has: 3 figures. 27

ASSOCIATION: Kafedra proizvodstva chistykh metallov i poluprovodnikovykh materialov, Moskovskiy institut stali i splavov (Department for the Production of Pure Metals and Semiconductor Materials, Moscow Institute of Steel and Alloys)

Card 2/4

L 13742-65

ACCESSION NR: AP4047498

SUBMITTED: 10Oct63

NO REF SCV: 002

ENCL: 01

SUB CODE: MM

OTHER: 001

Card 3/4

L 13742-65
ACCESSION NR: AP4047496

ENCLOSURE: 01

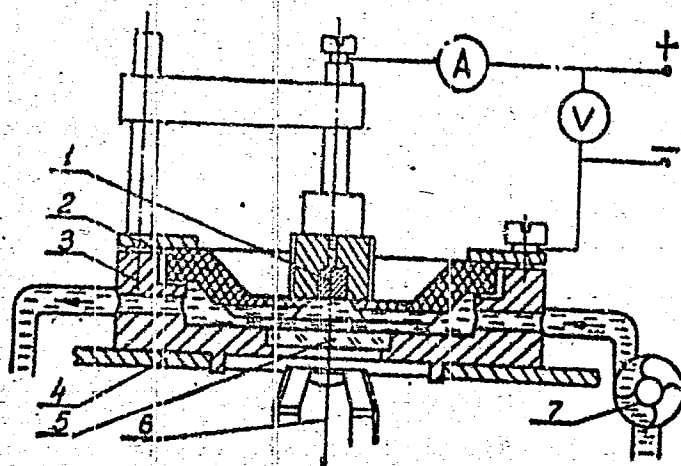


Fig. 1. Attachment to a microscope for electrical polishing and etching of metal microsections (cross section): 1 -- sample; 2 -- teflon cover; 3 -- chamber; 4 -- specimen table; 5 -- glass plate; 6 -- objective; 7 -- pump

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ACCESSION NR: AP4034047

S/0126/64/017/004/0500/0504

AUTHORS: Curov, K. P.; Pekarev, A. I.

TITLE: The influence of impurities on the thermionic emission of tungsten

SOURCE: Fizika metallov i metallovedeniye, v. 17, no. 4, 1964, 500-504

TOPIC TAGS: tungsten, thermionic emission, work function, conduction band, hafnium, tantalum

ABSTRACT: An equation is derived describing the effect of impurities on the work function of tungsten. The change in the work function is given by $\Delta\varphi = \Delta E_0 - \Delta E_F$.

The change in E_0 , the energy of the bottom of the conduction band in the absolute energy scale, is due to the additional potential energy of the impurity ions. This is caused by the excess charge Z (either positive or negative) of the impurity ion compared to that of the tungsten ion and is a short range effect because of screening by the conduction electrons. The change in E_F , the energy of the Fermi level measured from the bottom of the conduction band, is due to the change in the number of electrons in the system. The relative atomic concentration c of the impurity is assumed small enough so that there is essentially no interaction

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ACCESSION NR: AP4034047

between impurity ions. In the approximation of nearly free electrons, the distribution of electrons is assumed uniform. Then $\Delta E_0 = -\frac{Zc}{n_A(E_F)}$, where $n_A(E_F)$ is the density of states per atom per ev in the conduction band about the Fermi level.

Also $\Delta E_F = \frac{Zc}{n_{AF}(E_F)}$, where $n_{AF}(E_F)$ is the total density of levels at the Fermi level.

For tungsten $n_{AF}(E_F)$ is about three times as large as $n_A(E_F) = 0.27$ states/ev.

With one atomic % of Hf in W ($c=0.01$, $Z=2$) ($\Delta\phi \approx -0.07$) ev. According to experimental data the work function is decreased by 0.1 ev, as it is for Ta in W $\Delta\phi \approx -0.04$ ev. Orig. art. has: 16 equations and 2 diagrams.

ASSOCIATION: Institut metallurgii im. A. A. Baykova AN SSSR (Institute of Metallurgy AN SSSR)

SUBMITTED: 19Apr63

DATE ACQ: 20May64

ENCL: 00

SUB CODE: SS

NO REF SOV: 003

OTHER: 005

Card 2/2

N. PEKAREVA

N. PEKAREVA

I. A. FCMIN (BY) M. MINKUS I N. PEKAREVA POD. RED. YU. SAVITSKOGO MOSKVA, GOS.
IZD-VO LIT. PC STROITELSTVU I ARKHITECTURE, 1953. 309 P. ILLUS., PLATES. BIBLIOGRAPHY:
P. 279-(305) ON SPINE: MASTERA SOVETSKOY ARKHITECTURY.

N/5
884
.F6M6

PEKAREVA, Niss Aleksandrovna; VOLODIN, P.A., red.; VINOGRAD, V.A., red.

[Housing area of the Zaporzh'ye Transformer Factory] Zhiloi raion
Zaporozhskogo transformatornogo zavoda. Pod red. P.A. Volodina.
Moskva, Gos. izd-vo lit-ry po stroit., arkhitekt. i stroit. materialam
1958. 57 p. (MIRA 11:9)
(Zaporozh'ye--Housing)

MALAKHOV, YAKOV ISAYEVICH

"Elektrostal" by Ya.I. Malakhov and Pekareva, N.A.

Moscow, GOSSTROYIZDAT, 1962

126 p., illus., diagr., maps, tables.

At head of title: Academy of Construction and Architecture SSR
Institute of Theory and History of Architecture and Construction Techniques.

VOLODIN, P.A.; ZHURAVLEV, A.M.; IOFAN, B.M.; KADINA, I.G.; PEKAREVA,
N.A.; STRIGALEV, A.A.; MINERVIN, G.B., red.; OSELEDETS, Z.M.,
red.; PAVLENKO, M.V.; BHUSINA, A.N., tekhn.red.

[New districts of Moscow] Novye raiony Moskvy. Moskva, Gos.
izd-vo lit-ry po stroit., arkhitekt. i stroit.materialam, 1960.
284 p. (MIRA 13:7)

(Moscow---City planning)

IVANOV, K.A., kand. arkhitektury; VOLODIN, P.A., kand. arkhitektury;
PEKAREVA, N.A., kand. arkhitektury

Architecture is in the process of reorganizing. Izv. ASiA no.2:
25-33 '61. (MIRA 15:1)

(Architecture)

PEKAREVA, N.A., kand.arkhitektury; SHEVELEV, A.P., arkhitektor

Creative path of Pavel Vasil'evich Abrosimovich. Izv.
ASIA no.2:134-136 '61. (MIRA 15:1)
(Abrosimovich, Pavel Vasil'evich, 1900-)

CHERTKOV, B.A.; PEKAREVA, T.I.

Density and viscosity of aqueous solutions of $(NH_4)_2SO_3$, NH_4HSO_3 ,
and $(NH_4)_2SO_4$. Zhur. prikl. khim. 34 no.1:143-150 2Ja³61.4 3'
(Ammonium sulfite) (MIRA 14:1)