21 (7)

AUTHORS: Kogan, A. V., Petrov, [illegible], Chudov, L. A., Yampol'skiy, P. K.

SOV/89-7-4-6/28

TITLE: The Tissue Dose of Neutrons

PERIODICAL: Atomnaya energiya, 1959, Vol 7, Nr 4, pp 351-362 (USSR)

ABSTRACT: The present paper deals with the determination of the dosimetric properties of medium-energy neutrons, viz, for thermal neutrons and for neutrons with the energies of 100 ev; 1; 30; 240; 500 kev, and 1 Mev by using the results obtained by means of computers and those of experimental work performed by A. V. Kogan et al (Refs 6, 7). A broad beam of monoenergetic neutrons impinges perpendicularly upon the plane surface of a semi-infinite space, which is filled with a biological tissue. The neutrons impinging upon the tissue surface are partly reflected or scattered, or they are absorbed by the tissue, on which occasion they transfer their energy to the tissue. The main part of the neutrons is absorbed and is scattered within the first 10-15 cm of the tissue. A table shows the chemical composition of the tissue investigated by the authors. The following reactions of neutrons with energies of up to 1 Mev with the tissue elements are possible: (1) Elastic scattering

Card 1/3

on the hydrogen nuclei. (2) Elastic scattering on heavy nuclei (carbon, nitrogen, oxygen). (3) Absorption on hydrogen nuclei with radiation of a γ-quantum having an energy of 2.19 Mev. (4) Absorption on nitrogen nuclei according to the reaction $N^{14}(n,p)C^{14}$ (the energy of the proton here amounts to 0.62 Mev). (5) Radiation capture on nitrogen according to the reaction $N^{14}(n,\gamma)N^{15}$, where, in the case of each capture, an energy of 10.8 Mev is radiated. In the first part of the present paper the energy is calculated which is left over by the neutrons in the tissue in the case of elastic scattering. For this purpose, Boltzmann's kinetic equation was solved by employing numerical methods by means of the electronic computer of the AS USSR. For the determination of the total neutron dose it is necessary, in addition, to take the neutron dose produced in the capture of neutrons into account. Computations are followed step by step. Two tables contain data concerning the flux of the thermal neutrons as well as the distribution of the absorbed energy and the energy albedo. In the tissue neutrons with energies of 1 Mev and less are mainly scattered on hydrogen. The spatial energy distributions of the recoil

The Tissue Dose of Neutrons

SOV/89-7-4-6/28

protons in 1 cm^3 paraffin and in a tissue agree with respect to range units, and the absolute values are proportional to the density of hydrogen nuclei in these substances. In the next two parts the tissue dose due to the recoil protons of the reaction $N^{14}(n,p)$ and the dose due to absorption of γ-radiation are calculated. For the purpose of determining the biological dose the amount of the tissue dose must be multiplied by the coefficient of the relative biological efficiency (according to the nature of the radiation). According to the authors' opinion, 5 is the most suitable value to select for this coefficient. From the maximum values of the biological doses corresponding to the depth of the tissue, the relative values of the biological harmfulness per flux unit of neutrons of various energies were then calculated. There are 10 figures, 4 tables, and 20 references, 5 of which are Soviet.

SUBMITTED: April 2, 1959

Card 3/3

21(8)

AUTHORS: Kogan, A. M., Petrov, G. G., Chudov, L. A., Yampol'skiy, P. A. SOV/89-7-4-17/28

TITLE: The Reflection by Paraffin and Water of Neutrons With Different Energies

PERIODICAL: Atomnaya energiya, 1959, Vol 7, Nr 4, pp 385-386 (USSR)

ABSTRACT: In the course of the solution of the problem of the biological effect of neutrons it is of great importance to know such quantities as characterize the reflection of neutrons of different energies by a tissue. Besides, the dependence of the reflection coefficient on the geometrical conditions of the beam must be known. The authors therefore carried out measurements of the amount and the angular dependence of neutron reflection by a tissue-like substance within a wide energy interval. In these experiments the ratio between the flux of neutrons of all energies coming from the medium and the inciding flux of the neutrons to be investigated was determined. It was thus necessary to find out what portion of the total number of inciding neutrons is absorbed in the substance. The authors employed two methods for measuring reflection: The first method

Card 1/4

is used for neutron sources of small dimensions (nearly punctiform) and is based upon the following: In a large container filled with water, on the center of which the source was located, the radial distribution of the density of the absorption was measured by means of manganese foils. Integration of foil activity over the entire volume of the container then made it possible to determine the strength of the source in relative units, which are connected with the activity of the standard foil. By means of this method the reflection of neutrons of a polonium-beryllium source (mean energy 5 Mev) and of the photoneutrons of a sodium-beryllium source (0.83 Mev), a sodium-deuterium source (0.22 Mev) and of an antimony-beryllium source (25 kev) on paraffin was measured. For measurements carried out on the reactor a second method was employed. For the relative determination of the inciding flux a collimated neutron beam from the reflector of a nuclear reactor was introduced into a device, which, for the neutrons, plays the part of an absolutely black body. This device had the shape of a thin-walled tube ending in a hollow sphere which is surrounded by a thick layer of a weak aqueous solution of manganese chloride. The activity of the solutions was determined from the standard samples of metallic manganese. The results of all measurements are given by the following tables:

Neutron energies	Paraffin reflection coefficient	Neutron energies	Reflection coefficient of water
5 Mev	0.06	2.7 kev	0.47
0.83 Mev	0.12	130 ev	0.56
0.22 Mev	0.19	5 ev	0.71
25 kev	0.38	thermal	0.58

The dependence of the reflection coefficient on the angle of incidence of the neutrons:

Neutron energies	Angle of incidence					
	0°	15°	30°	45°	60°	75°
5 Mev	0.06	0.110	0.21	0.32	0.50	0.74
0.22 Mev	0.19	-	-	0.44	0.61	-
5 ev	0.71	-	0.74	-	0.80	-
thermal	0.58	-	0.63	-	0.76	-

Card 3/4

The Reflection by Paraffin and Water of Neutrons With Different Energies SOV/89-7-1-17/26

The dependence of the albedo on the angle of incidence θ may be described for all energies investigated by the relation $(1 - \alpha)_\theta = (1 - \alpha)_{\theta = 0}^{\cos\theta}$. The authors thank undergraduate degree student of the Leningradskiy politekhnicheskiy institut (Leningrad Polytechnic Institute) G. P. Gordeyev, who took active part in the measurement of the albedo of slow neutrons. There are 2 tables and 2 references.

SUBMITTED: April 2, 1959

Card 4/4

21(6)

SOV/89-7-4-18/29

AUTHORS: Kogan, A. M., Petrov, G. G., Chudov, L. A., Yampol'skiy, P. A.

TITLE: Neutron Absorption Density Distribution in Paraffin

PERIODICAL: Atomnaya energiya, 1959, Vol 7, Nr 4, pp 386-388 (USSR)

ABSTRACT: A tissue dose due to neutrons is determined partly by the energy liberated within the tissue in neutron capture. According to the initial neutron energy, this part of the tissue dose will make a different contribution to the total dose. Thus, for neutrons with an initial energy of some kev, the tissue dose is determined practically entirely by the energy liberated in capture. For the neutrons with an initial energy of 1 Mev the essential part of the dose is determined by that energy which is scattered during the slowing-down process by the neutrons. In order to determine the capture component of the neutron dose, the spatial distribution of neutron absorption in paraffin (which simulates a biological tissue) was investigated. These measurements were carried out during the perpendicular incidence of a broad beam of neutrons upon a plane paraffin surface. The paraffin block had the shape of a rectangular parallelepiped of

Card 1/3

40.40.60 cm. The neutrons impinged upon the surface of 40.40 cm. Neutron density was measured by means of thin manganese foils. In these experiments the depth distribution of the absorption density of the inciding neutrons with the following energies was measured: 1. The thermal neutrons were filtered through cadmium of 1 mm thickness out of a beam emerging from the channel of a nuclear reactor. 2. Neutrons with ~ 5 ev were filtered out of a beam of resonance neutrons at a nuclear reactor by means of a combination of a boron- and a cadmium filter. 3. Photoneutrons of an antimony-beryllium source with an energy of 25 kev. 4. Photoneutrons of a sodium-deuterium source with an energy of 220 kev. 5. Photoneutrons of a sodium-beryllium source with the energy of 0.8' Mev. 6. The neutrons of the reaction $H_1^2(d,n)He_2^3$ with the energy of 2.9 Mev. 7. The neutrons of a polonium-beryllium source with the mean energy of 5 Mev. The maximum statistical error in measuring the activity of the foils was ~ 3%. The results of these measurements are shown by a diagram. The existence of a maximum, which shifts into the interior of the paraffin with increasing energy is characteristic of all curves.

Neutron Absorption Density Distribution in Paraffin SOV/89-7-4-18/28

In the transition of thermal neutrons to thermal deuterons with an energy of several ev, the maximum shifts abruptly from 3.5 to 2.5 cm. This may be due to the fact that maximum absorption probably takes place in a depth of the order of one transport-length of the range of the inciding neutron. Also the comparatively slow shifting of the maximum into the interior of the paraffin with an energy increase to 5 Mev may be explained by the weak dependence of the scattering cross section in this energy interval. The diagram mentioned indicates a tendency towards increasing on the part of the ratio between absorption in the maximum and absorption on the surface. The velocity of absorption density decrease decreased with an increase of the energy of the inciding neutrons. There are 1 figure and 1 reference.

SUBMITTED: April 2, 1959

Card 3/3

PETROV,G.G., inzhener; YEGOROV,F.I., inzhener

Using cutters with screw thread cutting edges. Der.prom.4 no.5:28 My'55. (MLRA 8:10)

1. Shumerlinskiy mebel'nyy kombinat
(Woodworking machinery)

PETROV, G.G.

PETROV, G.G., NOVIKOV, A.G.; MARKOVICH, M.B., redaktor; MELENT'YEV, A.N. tekhnicheskiy redaktor.

[Construction and repair of bookkeeping (invoice) machines] Konstruktsiia i remont schetno-tekstovoi (fakturnoi) mashiny. 2-e perer. izd. Moskva, Gos. statisticheskoe izd-vo, 1954. 318 p. (Bookkeeping machines) (MLRA 8:8)

EMINOV, Ye.A.; OSHER, R.N.; PATSUKOV, I.P.; CHEKAVTSEV, N.A.; MAZYRIN, I.V.; FUKS, G.I.; VLADZIYEVSKIY, A.P.; PATSUKOV, I.P.; AVDEYEV, A.V.; LOPOYAN, G.S.; PETROV, G.G.; KOZOREZOVA, A.A.; LISITSKIY, K.Z.; YAKOBI, M.A.; BELYANCHIKOV, G.P.; IVANOV, V.S.; VORONOV, N.M.; RUMYANTSEV, V.A.; ZILLER, G.K.; BEREZHNAYA, V.D.; LEVINA, Ye.S., vedushchiy red.; TROFIMOV, A.V., tekhn.red.

[Manual on the uses and consumption standards of lubricants] Spravochnik po primeneniiu i normam raskhoda smazochnykh materialov. Moskva, Gos.nauchno-tekhn.izd-vo neft. i gorno-toplivnoi lit-ry, 1960. 703 p. (MIRA 13:4)

(Lubrication and lubricants)

S/056/60/0[illegible]/[illegible]/[illegible]/[illegible]
B00[illegible]/B0[illegible]

AUTHORS: [illegible], V. I. [illegible], A. [redacted]

TITLE: Observation of the Positronium Reaction in Aqueous Solutions

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, [illegible] Vol. [illegible], No. [illegible], pp. [illegible] - [illegible]

TEXT: The present "Letter to the Editor" brings a [illegible] the properties of the positron annihilation in aqueous solutions and [illegible] [illegible] of the [illegible] tests was [illegible] influence of different additions on these. The purpose of [illegible] different [illegible] results are compiled in a table was to prove that the different [illegible] act mainly kinetically on the positronium annihilation in aqueous [illegible] tions and also to show a comparison of these effects with the oxidation [illegible] reduction characteristics and magnetic characteristics of different [illegible] The authors investigated the rate of 2γ-annihilation of positrons from [illegible] Na^{22} [illegible] solutions. The table shows the [illegible] results of the 2γ-annihilation rate [illegible]

Card 1/4

Observation of the Positronium Reaction in Aqueous Solutions

S/056/62/[illegible]
B102/B[illegible]

influence of different additions is mainly different [illegible] en [illegible] of positronium [illegible] anions. A general tendency [illegible] of the $C_{3\gamma}$ counting rate is found if stronger oxidizers are used. strong deviations can be found [illegible]. The deviations may frequently be caused through a $S \rightarrow S$ conversion at unpaired electrons [illegible] netic ions, but there is no specific connection between the magnetic properties of the ions and the quantity $C_{3\gamma}$. A strong increase [illegible] $C_{3\gamma}$ counting rate was found also by other authors, if NO_3^- ions were added and also that MnO_4^- ions acted stronger yet. The following data [illegible] derive the concentration dependence of $C_{3\gamma}$ for MnO_4^- additions as compared to neutral solutions

Card 2/4

Observation of the Positronium Reaction in Aqueous Solutions

S/056/60/039/[illegible]
B006/B0[illegible]

Concentration MnO_4^- in mole/l	saturated solution	0.1	0.01	0.0[illegible]	[illegible]
$C_{3\gamma}$ min^{-1}	3.6±0.42	5.08±0.45	5.08±0.12	[illegible]	[illegible]

The authors thank Academician A. N. Frumkin for discussions of the results obtained. There are 1 table and 4 non-Soviet references.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute imeni P. N. Lebedev of the Academy of Sciences USSR). Institut khimicheskoy fiziki A[illegible] nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

SUBMITTED: August 2, [illegible]

Card 3/4

S/056/60/039/[illegible]
B006/B077

Вещество 1	Концентрация, моль/л 2	Стандартный окислительно-восстановительный потенциал для указанной в скобках пары окислитель-восстановитель 3	Число неспаренных электронов 4	Разница в $C_{3\gamma}$ (мин$^{-1}$) по отношению к воде 5
KOH	1	+2,92 (K⁺/K)		−0,02±0,31
$BaCl_2$	2	+2,92 (Ba⁺⁺/Ba)		−0,55±0,39
NaCl	2	+2,71 (Na⁺/Na)		+0,07±0,25
$MnCl_2$	2	+1,10 (Mn⁺⁺/Mn)	5	−0,57±0,26
$ZnCl_2$	2	+0,76 (Zn⁺⁺/Zn)		+0,24±0,34
$FeCl_2$	0,1	+0,44 (Fe⁺⁺/Fe)	4	−0,99±0,27
$CrCl_3$	2	+0,41 (Cr⁺⁺⁺/Cr⁺⁺)	3	−1,70±0,28
$TlNO_3$	6 насыщение	+0,34 (Tl⁺/Tl)		−1,24±0,29
$CoCl_2$	2	+0,27 (Co⁺⁺/Co)	3	−1,17±0,40
$NiSO_4$	2	+0,23 (Ni⁺⁺/Ni)	2	−1,03±0,36
$CuCl_2$	2	−0,34 (Cu⁺⁺/Cu)	1	−1,85±0,31
$FeCl_3$	2	−0,77 (Fe⁺⁺⁺/Fe⁺⁺)	5	−2,62±0,33
$FeCl_3$	0,1	−0,77 (Fe⁺⁺⁺/Fe⁺⁺)	5	−1,41±0,28
$KMnO_4$	6 насыщение	−1,63 (MnO_4^-/MnO_2)		−2,44±0,42
H_2O_2	30 вес. % 7	−1,78 (H_2O_2/$2H_2O$)		−1,55±0,28

Table

Legend to the Table:
1) Substance; 2) Concentration in mole/l; 3) Standard redox potential for the oxidizer-reducer pairs given; 4) Number of unpaired electrons; 5) Difference of $C_{3\gamma}$ as compared to water; 6) Saturation; 7) % by weight.

Card 4/4

GOL'DANSKIY, V.I.; KARPUKHIN, O.A.; PETROV, G.G.

Observing the reactions of positronium in water solutions. Zhur. eksp.i teor.fiz. 39 no.5:1477-1478 N '60. (MIRA 14:4)

1. Fizicheskiy institut imeni P.N.Lebedeva AN SSSR i Institut khimicheskoy fiziki AN SSSR.
(Positronium)

PETROV, G.I.

Sowing winter barley in packed soil. Zemledelie 4 no.7:63-66 Jl '56.
(Budennovsk District--Barley) (MLRA 9:9)

[illegible]

: Used [illegible]

: [illegible] ty. The gr[illegible] [illegible] of resi[illegible] [illegible] hardiest [illegible] to the [illegible] [illegible] millet, [illegible] [illegible] y at all. [illegible] corn. [illegible] hay). [illegible] inter wheat [illegible] than [illegible] high [illegible]

COUNTRY : [illegible] M

CATEGORY : Cultivated [illegible]. General Problems.

ABS. JOUR. : [illegible], 1958

AUTHOR : [illegible]
INST. : [illegible]
TITLE : [illegible] Perennial Grasses in the Arid [illegible] of [illegible]

ORIG. PUB. : [illegible] Stavro[illegible] [illegible]-ta

ABSTRACT : [illegible] at the [illegible] of the Institute [illegible] grasses in the [illegible] it is most expedient to [illegible] the layer is plowed [illegible] For this purpose, the layer is plowed [illegible] first [illegible] the preceding [illegible] of the [illegible] the layer of the [illegible] is [illegible] lay- [illegible] drying of the [illegible] of the sowings with grasses. The [illegible] on the increase in the yield including the after-effect on the second crop comprised [illegible]-3 centners/ha after the early [illegible] N. [illegible]rov

[illegible] 1/1

PETROV, G.I., kand.sel'skokhozyaystvennykh nauk

For increased production of winter grain. Zemedelie 24 no.6: 70-75 Je '62. (MIRA 15:1.1)

1. Stavropol'skaya vostochnaya sel'skokhozyaystvennaya opytnaya stantsiya.

(Grain)

KOTOVOY, S.F.; PETROV, G.I.; TIKHONOVA, G.P., red.; ZHUKOVA, Ye.G., tekhn. red.

[Agricultural collective and state farm administrations] Proizvodstvennye kolkhozno-sovkhoznye upravleniia. Leningrad, Izd-vo Leningr. univ., 1963. 43 p. (MIRA 16:10)

(Agricultural administration)

PETROV, G.I., kand. sel'skokhoz. nauk

Sowing winter barley on stubble in Stavropol Territory.
Zemledelie 25 no.6:37-45 Je '63. (MIRA 16:7)

1. Stavropol'skaya vostochnaya sel'skokhozoaostvennaya opytnaya stantsiya.
(Stavropol Territory—Barley)

LEVIN, B.I.; ROZENBERG, V.M.; YAKOVLEV, P.A.; KORF, Z.G.; KULYGIN, B.A.; PETROV, G.I.

Unification of structures of sea and river mooring installations. Transp. stroi. 15 no.9:39-42 S '65. (MIRA 18:11)

1. Gosudarstvennyy proizvodstvennyy komitet po transportnomu stroitel'stvu SSSR (for Levin). 2. Gosudarstvennyy institut proyektirovaniya i izyskaniya na rechnom transporte (for Yakovlev, Korf). 3. Gosudarstvennyy proyektno-konstruktorskiy i nauchno-issledovatel'skiy institut morskogo transporta (for Kulygin, Petrov).

PETROV, G.I.

Brigade has mastered the technology of constructing bored piles. Transp. stroi. 15 no.6:31-32 Je '[illegible].

[illegible]

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001240420015-2"

PETROV, G.I. (Moskva, Zh-68, Novo-Ostapovskaya ul., ...)

Influencing metabolism as a factor in the in... organism in antineoplastic therapy; two cases of ... large doses of aurantin. Vop. onk. 9 no.10:88-9...

MIRA ...

1. Iz gigiyenicheskogo otdela (zav. - deystvitel'nyy ... AMN SSSR prof. L.K.Khotsyanov) Instituta gigiyeny truda i professional'nykh zabolevaniy AMN SSSR (direktor - deystvitel'nyy ... AMN SSSR prof. A.A.Letavet).

L 10717-65 EWT(m)/EWP(b) IJP(c) JD

ACCESSION NR: AP4045410 S/0136/64/000/009/0074/0076

AUTHOR: Petrov, G. I., Andreyev, V. M., Andreyeva, L. I.

TITLE: Effect of the physical properties of germanium dioxide on its reduction

SOURCE: Tsvetny*ye metally*, no. 9, 1964, 74-76

TOPIC TAGS: germanium dioxide, germanium dioxide physical property, germanium dioxide reduction, germanium tetrachloride hydrolysis, calcination

ABSTRACT: The paper considers some of the physical properties of GeO_2 prepared by hydrolysis of germanium tetrachloride in deionized water, and their effect on the reduction rate with hydrogen. The physical structure of the dioxide was found to be affected by the method of hydrolysis. Simultaneous loading of the tetrachloride and water results in a fine structure with a highly developed surface, while continuous loading of both leads to coarse, dense dioxide grains. The reduction rate was determined from the pressure drop in the system due to freezing out of water vapor produced by the chemical reaction. The reduction rate was found to increase sharply with decreasing specific gravity of the sample. After filtration under similar conditions, the light-weight germanium dioxide contained 25-30%

Card 1/2

L 10717-65

ACCESSION NR: AP4045410

moisture, while the "heavy" dioxide contained only 6-10%. This also affects the reduction. The usual calcination of germanium dioxide in air may also change its physical properties. Thus, an increase in the calcination temperature leads to an increase in hygroscopicity up to 400-500C, the quantity of hygroscopic moisture removed from light-weight GeO_2 being 3.6 times as high as from "heavy" germanium dioxide. The amount of water of crystallization removed is exactly the same for both light and heavy germanium dioxide. At higher temperatures, the hygroscopicity decreases, probably due to decreased porosity. Many publications (I. A. Sokolov, T. L. Joseph and others) have noted the relationship between the reduction rate of oxides and their porosity, meaning the porosity after preliminary calcination. The article concludes that the decrease in rate of reduction of GeO_2 after calcination at high temperatures is caused not only by the decrease in porosity, but also by the formation of a new β-GeO_2 modification which is reduced with difficulty. In tests at high temperatures, the partially reduced germanium powder always contains β-GeO_2. Orig. art. has: 5 figures.

ASSOCIATION: None

SUBMITTED: 00 ENCL: 00 SUB CODE: MM

NO REF SOV: 002 OTHER: 002

Card 2/2

PETROV, G. I.

"On the Diffusion of Waves in a Viscous Fluid and the Origin of Turbulence," Moscow, 1938

PETROV, G. I.

"Application of Galerkin's Method to the Problem of the Stability of Current in Viscous Fluid," Prik. mat. i mekh., novaya seriya, 4, No.3, 1940

AUTHOR: Petrov, G.I. (Moscow)

TITLE: The Estimation of the Exactness of an Approximate Calculation of the Eigenvalue According to the Galerkin's Method (Otsenka tochnosti priblizhennogo vychisleniya sobstvennogo znacheniya metodom Galerkina)

PERIODICAL: Prikladnaya Matematika i Mekhanika, 19[illegible], Vol [illegible], Nr [illegible] pp [illegible] (USSR)

ABSTRACT: Given the linear functional equation

(1) $L(\lambda, U) = l(U) - l_\lambda(\lambda, U) = 0$

in which $l(U)$ is a linear operator with the derivatives of higher order and $l_\lambda(\lambda, U)$ is an operator the coefficients of which depend on λ. The author seeks values λ_k such that the functions $U_k(\lambda_k, x)$ satisfying the equation (1) on the interval (a,b) and the corresponding boundary conditions, are not vanishing everywhere on (a,b). In an earlier paper [Ref 1] the author has shown that if the eigenfunctions are represented in the form

$$u^n = \sum_{i=1}^{n} a_i^n \psi_i ,$$

Card 1/2

The Estimation of the Exactness of an Approximate Calculation of the Eigenvalue According to the Galerkin's Method

where ψ_i is a complete system of functions satisfying the boundary conditions of the given problem, and if the a_i^n are determined from a certain linear homogeneous system of equations, then the $U^{(n)}$ and the corresponding $\lambda^{(n)}$ approximate the exact eigenfunctions and eigenvalues:

$$U_1^{(n)} \to U_1 , \qquad \lambda_1^{(n)} \to \lambda_1 \qquad \text{as} \quad n \to \infty .$$

By a decomposition with respect to the elements of the first row of the determinant of the mentioned linear system of equations the author obtains the difference between the rigorous and the approximate solution: $|\lambda_1 - \lambda_1^{(n)}|$. After numerous transformations then an evidently very rough estimation of this difference is obtained. There are [illegible] references, [illegible] of which are Soviet, and [illegible] Hungarian.

SUBMITTED: July 20, 1956

AVAILABLE: Library of Congress

1. Analytic functions 2. Transformations 3. Topology

Card 2/2

ACCESSION NR: AP4041396

S/0020/64/156/006/1316/1319

AUTHOR: Anfimov, N. A. Petrov, G. I.

TITLE: Diffusion separation of a gas mixture in the presence of dissociation

SOURCE: AN SSSR. Doklady*, v. 156, no. 6, 1964, 1316-1319

TOPIC TAGS: diffusion gas separation, gas dissociation, gas boundary layer, diffusion coefficient, gas temperature gradient, hydromechanics

ABSTRACT: The gas composition in the mixture of dissociating gases differs in the boundary layer from that in the outer flux, if there is a temperature gradient at the surface. The separation is caused by differences in the diffusion coefficients of different components. This phenomenon was discussed in an earlier paper (Izv. AN SSSR, Mekh i mashinostr. #5, 117 (1963)). The present work deals with the effect of various factors, such as the degree of dissociation of the gas in the outer flux

$$\alpha = \left(\frac{c_A}{c_A + c_{A_2}} \right)$$

Card 1/2

ACCESSION NR: AP4041396

concentration of the other (inert) gas, and the ratio of diffusion coefficients of atoms and molecules of the dissociating gas. The assumptions are made in computations, that the rate of the chemical reaction $A_2 \rightleftharpoons 2A$ is zero in the boundary layer, and is infinitely high at the body surface, and that thermal diffusion inside the boundary layer is absent. The following cases are considered: $O-O_2-N_2$; $O-O_2-He$; $O-O_2-Kr$; $H-H_2-He$; $H-H_2-N_2$; $J-J_2-Kr$. Orig. art. has: 2 figures and 5 equations.

ASSOCIATION: None

SUBMITTED: 15Jan64 DATE ACQ: 00 ENCL: 00

SUB CODE: ME NO REF SOV: 002 OTHER: 000

Card 2/2

PHASE I BOOK EXPLOITATION SOV/6201

Vsesoyuznyy s"yezd po teoreticheskoy i prikladnoy mekhanike. 1st, Moscow, 1960.

Trudy Vsesoyuznogo s"yezda po teoreticheskoy i prikladnoy mekhanike, 27 yanvarya -- 3 fevralya 1960 g. Obzornyye doklady (Transactions of the All-Union Congress on Theoretical and Applied Mechanics, 27 January to 3 February 1960. Summary Reports). Moscow, Izd-vo AN SSSR, 1962. 467 p. 3000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Natsional'nyy komitet SSSR po teoreticheskoy i prikladnoy mekhanike.

Editorial Board: L. I. Sedov, Chairman, V. V. Sokolovskiy, Deputy Chairman; G. S. Shapiro, Scientific Secretary, G. Yu. Dzhanelidze, S. V. Kalinin, L. G. Loytsyanskiy, A. I. Lur'ye, G. K. Mikhaylov, G. I. Petrov, and V. V. Rumyantsev, Resp. Ed. L. I. Sedov, Ed. of Publishing House: A. G. Chakhirev, Tech. Ed. R. A Zamarayeva.

Card 1/6

(25)

PURPOSE. This book is intended for scientific and engineering personnel who are interested in recent work in theoretical and applied mechanics.

COVERAGE: The articles included in these transactions are arranged by general subject matter under the following heads general and applied mechanics (5 papers), fluid mechanics (10 papers), and the mechanics of rigid bodies (8 papers). Besides the organizational personnel of the congress, no personalities are mentioned. Six of the papers in the present collection have no references, the remaining 17 contain approximately 1400 references in Russian, Ukrainian, English, German, Czechoslovak, Rumanian, French, Italian, and Dutch.

TABLE OF CONTENTS:

SECTION I. GENERAL AND APPLIED MECHANICS

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001240420015-2"

PETROV, G. I., BONDAREV, E. N. (Moscow)

"Experimental Results Concerning the Interaction of a Shock Wave with Turbulent Boundary Layer."

report presented at the First All-Union Congress on Theoretical and Applied Mechanics, Moscow, 27 Jan - [illegible] Feb [illegible].

SEDOV, L.I., otv. red.; SOKOLOVSKIY, V.V., red.; DZHANELIDZE, G.Yu., red.; KALININ, S.V., red.; LOYTSYANSKIY, L.G., red.; LUR'YE, A.I., red.; MIKHAYLOV, V.V., red.; PETROV, G.I., red.; RUMYANTSEV, V,V., red.; SHAPIRO, G.S., red.; CHAKHIREV, A.A., red. izd-va; ZAMARAYEVA, R.A., tekhn. red.

[Proceedingsof the All-Union Congress on theoretical and Applied Mechanics, January 27- February 3, 1960] Trudy Vsesoyuznogo s"ezda po teoreticheskoi i prikladnoi mekhanike. 1st, Moscow, 1960; obzornye doklady. Moskva, Izd-vo Akad. nauk SSSR, 1962. 467 p. (MIRA 15:9)

1. Vsesoyuznyy s"ezd po teoreticheskoy i prikladnoy mekhanike. 1st, Moscow 1960.

(Mechanics- Congresses)

PETROV, G.I.; ANDREYEV, V.M.; ANDREYEVA, L.I.

Effect of the physical properties of germanium dioxide on its reduction. TSvet. met. 37 no.9:74-76 S '64. (MIRA 18:7)

PETROV, G.I.

Building bridge supports on bored pilings. Osn., fund. i mekh. grun. 5 no.4:10-13 '63. MIRA 1[illegible]:11

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001240420015-2"

LUKOV, B.N., prof. (Kuybyshev); PETROV, V.I., dotsent (Moskva); PAVLENKO, T.M., aspirant (Moskva); YERMOLAYEV, V.G., prof. (Leningrad); ADO, A.D., prof.; VOVSI, M.S., prof.; YERMOLAYEV, V.G., prof. (Leningrad); KUPRIYANOVA, N.A. (Kazan'); PETROV, G.I. (Moskva); DOLGOPOLOVA, A.V. (Moskva); SAKHAROV, P.P., prof.; BYKHOVSKIY, Z.Ye., prof.; MIN'KOVSKIY, prof. (Chelyabinsk); KHMEL'CHONOK, I.P. (Irkutsk); TEMKIN, Ya.S., prof. (Moskva); MIN'KOVSKIY, A.Kh., prof. (Chelyabinsk); MIL'SHTEYN, T.M., doktor med.nauk (Leningrad); TRUTNEV, V.K., zasluzhennyy deyatel' nauki, prof.; TSYRESHKIN, B.D., kand.med.nauk (Moskva); SOBOL', I.M., prof. (Stavropol'); TURIK, G.M. (Moskva); FRENKEL', M.M. (Moskva); MAZO, I.L.; POKRYVALOVA, K.P.; PROSKURYAKOV, S.A., prof.; ATKARSKAYA, A.A., prof.; GOL'DFARB, I.V., prof. (Izhevsk); PORUBINOVSKAYA, N.M. (Moskva); RUDNEV, G.P., prof.; VOL'FSON, I.Z., prof. (Stalingrad); DOROSHENKO, I.T., prof. (Kalinin); ROZENFEL'D, M.O., prof. (Leningrad); SHUL'GA, A.O., prof. (Orenburg); MIKHLIN, Ye.G., prof.; TRET'YAKOVA, Z.V. (Moskva); MANUYLOV, Ye.N., prof. (Moskva); DOROSHENKO, I.T., prof. (Kalinin); YERMOLAYEVA, V.G., prof.

Speeches in the discussion. Trudy gos. nauch.-issl. inst. ukha, gorla i nosa no.11:79-87,129-146,179-186,233-248,311-333 '59. (MIRA 15:6)

1. Chlen-korrespondent AMN SSSR (for Ado). 2. Direktor Moskovskogo gosudarstvennogo instituta ukha, gorla i nosa (for Trutnev). (OTORHINOLARYNGOLOGY—CONGRESSES)

PETROV, G.I. (Novosibirsk)

Apparatus for hydraulic testing of central heating equipment. Vod.i san.tekh. no.5:36-37 My '6[illegible]. ([illegible])
(Radiators--Testing)

PETROV, G.I., inzh.

Jet pump for conveying cement. Transp. stroi. 13 no.5:70 My '63. (MIRA 16:?)

(Pumping machinery)
(Cement—Transportation)

PETROV, G.I., inz.

Switchless a[illegible] ... Trans. stroi. [illegible]
Ag [illegible]3. (MIRA [illegible])

[illegible], [illegible].I., inzh.

Using the SMG-1 pistols for installing sanitary engineering equipment. Mont. i spet. rab. v stroi. 24 no.1:26-27 Ja '6[illegible]. ([illegible])
(Building--Tools and implements)

PETROV, G.I.; KUTENKOV, M.V.; TENENBAUM, I.M.; YEVSEYEVA, L.S.; KONSTANTINOV, M.M., nauchnyy red. [deceased]; SHASHKIN, V.L., nauchnyy red.; SURAZHSKIY, D.Ya., nauchnyy red.; ZAVODCHIKOVA, A.I., red.; MAZEL', Ye.I., tekhn.red.

[Methods of geological and geophysical exploration and control in uranium mines] Metody geologo-geofizicheskogo obsluzhivaniia uranovykh rudnikov. Moskva, Izd-vo Gos.kom-ta Soveta Ministrov SSSR po ispol'zovaniiu atomnoi energii, 1960. 217 p. (MIRA 13:10)

(Mining geology) (Uranium ores)

PETROV, G.I., inzh.

All-purpose compressionless sprayer. Transp.stroi. 9 no.12:59 D '59. (MIRA 13:5)
(Plastering--Equipment and supplies)

1. B[illegible], A. A.; PETR[illegible], [illegible]. I.

2. USSR ([illegible])

4. Geology and Geography

7. Theoretical Principles of the Science [illegible] Deposits. By I. I. T[illegible]. (K[illegible], Ukraine State Technical Press, [illegible]). Reviewed by A. A. Be[illegible] and [illegible]. I. Petr[illegible]v, Sov. Kniga, No. 6, 1[illegible].

9. [redacted] Report U-3[illegible]2, 1[illegible] Jan. 195[illegible]. [illegible]

PETROV, G.I., inzh.

Work of mixed brigades. Transp.stroi. 9 no.5:13-14
My '59. (MIRA 12:12)
(Krasnoyarsk Territory--Electric railroads)
(Electric lines--Poles)

PETROV, G.I., inzh.

Switch for mortar pumps. Transp.stroi. 9 no.10:59 0 '59.
(MIRA 13:2)
(Motar--Transportation)

PETROV, G.K.

Automatic water depth indicator service (radio gauge). Rech. transp. 18 no.5:49-50 My '59. (MIRA 12:9)
(Hydrography--Equipment and supplies)
(Gauges)

PETR.., G. I.

USSR/Petroleum Industry
Acetylene

May 48

"Study of an Electropyrolyser and an Electropyrolyser Gas," G. L. Petrov, Cand Tech Sci, Leningrad Polytech Inst, 4 pp

"Avtogen Delo" No 5 - p. 9-12

Methods to produce acetylene containing gas from petroleum derivatives, studies of operation of Electropyrolyser Works imeni Mart, and studies conducted on pyrolyser gas.

2/40T96

[redacted]

5

B

Material and Heat Balance During Oxy-Acetylene Cutting of Low-Carbon Steel. (In Russian.) [illegible] Welding, Dec. [illegible]

Presents results of extensive experimental investigation [illegible] ... [illegible] ... tested and calculated [illegible] ... [illegible] ... heat [illegible]

METALLURGICAL LITERATURE CLASSIFICATION

PETROV, G. L., Doc Tech Sci -- (diss) "Chemical non-uniformity in welded assemblies." Leningrad, 1960. 26 pp; (Ministry of Higher and Secondary Specialist Education RSFSR, Leningrad Polytechnic Inst im M. I. Kalinin); 150 copies; price not given; list of author's works on pp 25-26 (12 entries ; (KL, 17-60, 150)

USSR/Metals - Flame Cutting Jun 50

"Deformation of Plates in Oxyacetylene Cutting,"
G. L. Petrov, Cand Tech Sci, Leningrad Polytech
Inst imeni M. I. Kalinin, 6 pp

"Avtogen Delo" No 6

Describes experiments for studying deformations in process of oxygen cutting, and develops graphoanalytic method for determining such deformations. Suggests some measures for preventing deformations, such as electromagnetic tables for fixing plate position, and formers with reverse bend for compensating deformation.

161T95

[redacted]

ACCESSION NR: AT4038448 S/2563/63/000/229/0065/0072

AUTHOR: Petrov, G. L.; Shchipkov, M. D.

TITLE: Sources of gases in titanium alloy welds

SOURCE: Leningrad. Politekhnicheskiy institut. Trudy*, no. 229, 1963. Svarochnoye proizvodstvo (Welding production), 65-72

TOPIC TAGS: titanium alloy, titanium alloy weld, alloy weld, TIG weld, MIG weld, submerged arc weld, AN TZ flux, weld gas content, gas source, weld oxygen content, weld hydrogen content, weld nitrogen content, gas content

ABSTRACT: In the TIG, MIG, and submerged arc welding of titanium alloys, gases may come into the weld metal from the base metal, the electrode or filler wire, shielding gases, or from the flux. The nitrogen content in the weld metal usually does not exceed 0.04—0.05%, depending on the nitrogen content in the electrode, filler wire, or base metal. The main source of hydrogen and oxygen in shielding gases is water. At hydrogen contents in the base metal up to 0.001%, the use of commercial-grade argon (dew point, -40C) may increase the hydrogen content in the weld metal to 0.002—0.003%; high-purity argon with a

Card 1/3

ACCESSION NR: AT4038448

dew point of -70C causes little or no increase in hydrogen content. The hydrogen and oxygen contents of weld metals deposited in different shielding media with an electrode wire containing 0.001—0.004% hydrogen and 0.14% oxygen are shown in Table 1 of the Enclosure. The AN-TZ flux requires degassing prior to application. Orig. art. has: 4 figures and 4 tables.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 12Jun64 ENCL: 01

SUB CODE: MM NO REF SOV: 008 OTHER: 002

ATD PRESS: 3041

Card 2/3

ACCESSION NR: AT4038448

ENCLOSURE: 01

Table. 1. Hydrogen and oxygen contents of weld metals

Shielding medium	Oxygen %	Hydrogen %	Electrode wire
High-purity argon	0.15	0.0032	
80% helium 20% argon	0.14	0.0021	with 0.004% hydrogen
AN-TZ flux	0.44	0.0010	
AN-TZ flux with expelled air	0.20	0.00070	with 0.001% hydrogen

Card 3/3

PETROV, G.L.; MILLION, A.

Contributions to the study of hydrogen diffusion influence on fissure formation in welded joints. Studii cerc metalurgie 9 no.2:253-274 '64.

PETROV, G. L.

USSR/Engineering - Welding

Card 1/1 Pub. 128 - 23/34

Authors : Petrov, G. L., and Kyrchenov, V. V.

Title : Investigating the welding of the turbine-rotor type air blower

Periodical : Vest. mash. 12, 73-76, Dec 1954

Abstract : The condition of weld seams and welded components of the turbine-rotor type air blower was investigated by the I. I. Polzunov Central Scientific Research Institute for Boilers and Turbines. Technical data specifying the types of steel, temperatures and welding procedures employed during the above mentioned experiments are presented. Drawing; tables; illustrations; graphs.

Institution : ......

Submitted : ......

PETROV, G. L.

USSR/Engineering - Welding

Card : 1/1

Authors : Kondrat'ev, V. M., Engineer; Petrov, G. L., Cand. Tech. Sc., Docent

Title : Causes of flaws in welded seams of small-diameter pipes

Periodical : Vest. Mash., 34, Ed. 6, 78 - 83, June 1954

Abstract : The development of flaws in high-pressure water heaters was traced to defective welding. A description is given of experiments conducted in the gas-welding of pipes of the dimensions 25 x 3 and 38 x 4.5 mm. An analysis is made of the results of such experiments to determine the nature and origin of welding defects and ways are indicated for avoiding them. Illustrations; drawings; graph; tables.

Institution : ...

Submitted : ...

Evaluation B-83422

PETROV, G.L., dotsent; KYRCHENOV, V.V., inzhener

Electrodes for welding austenitic steel intended for protracted workings at high temperature. Svar.proizv. no.8:9-13 Ag '55.
(Steel--Welding) (Electrodes) (MLRA 8:11)

PETROV, G.L.

USSR/ Engineering - Oxygen cutting

Card 1/1 Pub. 11 - 7/8

Authors : Petrov, G. L.

Title : Concerning the nature of chemical heterogeneity of metal in the vicinity of the cut, during an oxygen cutting

Periodical : Avtom. svar. 8/1, 60-74, Jan-Feb 1955

Abstract : The effect of oxygen cutting of steel and metal on their chemical heterogeneity and affinity in the vicinity of the cut, was analyzed on the basis of experimental materials and calculus. Technical data are given on carburization and decarburization processes, diffusion coefficients, temperature coefficients, rate of cutting and the concentration of carbon in metals. Fourteen references: 12 USSR and 2 USA (1929-1954). Tables; graphs; drawing.

Institution : Leningrad M. I. Kalinin Polytechnical Institute

Submitted : July 25, 1954

PETROV G L

USSR/Engineering - Metallography FD-3026

Card 1/1 Pub. 41 - 10/15

Author : Petrov, G. L., Leningrad

Title : On the macro-heterogeneity of the chemical composition of the metal in weld seams.

Periodical : Izv. AN SSSR, Otd. Tekh. Nauk 9, 13?-154, Sep ??

Abstract : Studies the macro-heterogeneity of the chemical composition of the metal in weld seams resulting from the very welding process itself, i.e., fusion of the base and weld metals and subsequent crystallization, variation of base and weld metal content in the seam, possibility of altering composition of the non-fused metal by thermal action during welding, etc. Presents thorough analysis of tests conducted to determine the effect of welding process on the macro-heterogeneity of the chemical composition of the weld seam. Microphotographs, tables, formulae, diagrams. Seven references, all USSR.

Institution:

Submitted : May 12, 195?

RUSSO, Vladimir Leonidovich; PETROV, G.L., otvetstvennyy redaktor; OSVENSKAYA, A.A., redaktor; FRUMKIN, P.S., tekhnicheskiy redaktor

[The welding of aluminum and its alloys] Svarka aliuminiia i ego splavov. Leningrad, Gos. soiuznoe izd-vo sudostroit. promyshl., 1956. 136 p. (MLRA 9:9)
(Aluminum--Welding)

PETROV, G.L.

Diffusion of elements during cutting and welding and causes for the heterogenous chemical composition of weld macrostructures. Avtom. svar. 9 no.6:77-82 N-D '56. (MLRA 10:3)

1. Leningradskiy politekhnicheskiy institut im. M.I. Kalinina. (Welding) (Diffusion)

USSR

Translation from: Referativnyy Zhurnal Metallurgiya

AUTHOR Petrov, G. L.

TITLE Composition of Weld Metal in the Vicinity of the Zone of Fusion (O sostave metalla shva v neposredstvennoy blizosti zony splavleniya)

PERIODICAL Tr. Leningr. politekhn. in-ta, 1956, Nr 183, pp 2... 4...

ABSTRACT Calculated and experimental data on the dimensions of the zone of fusion, the diffusion of certain elements from the weld into the parent metal, and the effect of the fused parent metal on the composition of the weld metal near the zone of fusion in arc welding are presented. The magnitude of the zone of fusion depends upon the liquidus-solidus temperature difference and the temperature gradient near the boundary of the welding bath. Excess alloying elements are diffused from the welding bath into the parent metal. The depth of their penetration is (in mm) as follows: C ... Cr 0.01 - 0.03, Mn and Mo 0.001 - 0.007, Ni 0.001 ... Higher rates of crystallization at the boundary of fusion and the absence for that reason of intensive intermixture of the fused metal in this region gives rise to chemical inhomogeneity ... The weld metal at the fusion boundary is ... by the excess

Card 1/2

137-58-2-3646

Composition of Weld Metal in the Vicinity of the Zone of Fusion

elements of the parent metal are depleted in terms of elements of the weld metal. The size of this zone of transition in composition is 0.4 - 0.5 mm. in single pass welding of austenitic steels

I. S.

1. Welds--Metallurgical analysis

Card 2/2

137-58-5-9681

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 5, p ..., (USSR)

AUTHORS Zenzin, V ., Petrov, G.L., Bruk, B. I.

TITLE The Latest Achievements of the Scientific Research Organizations of Leningrad in the Welding of Alloy Steels (Noveyshiye dostizheniya nauchno-issledovatel'skikh organizatsiy Leningrada v oblasti svarki legirovannykh staley)

PERIODICAL V sb.: S... ...hnove proiz-vo. Leningrad, Lenizdat, 1957, pp 38-55

ABSTRACT The results of investigations in the field of the welding of alloy steels related to problems of the chemical inhomogeneity of welded joints, determination of a rational composition of austenitic heat-resistant facing metal, and study of the zone of fusion of welds of different steels are presented. Radioactive isotope and metallographic methods of analysis were employed in the investigations.

B. V.

Card 1/1

PETROV, G.L.

Processes of stabilization of the chemical composition of weld metal bounding on the fusion zone. Avtom. svar. 10 no.5:19-37 S-O '57.
(MIRA 10:12)

1. Leningradskiy politekhnicheskiy institut im. M.I. Kalinina.
(Electric welding) (Diffusion)

Translation from: Re[illegible] Met[illegible] 1958

AUTHORS Petrov, G. L. [illegible]

TITLE A Novel Tec[illegible] for the Evaluation of the Effects of We[illegible] Materials and Certain Basic Parameters of Welding [illegible] of Weld [illegible] to Hot Cracking (Novaya metodika [illegible] materialov [illegible] tekhnologi[illegible] metalla svarnykh [illegible] goryach[illegible])

PERIODICAL Tr. Leningr. [illegible] 1957, Nr 189 [illegible]

ABSTRACT The method de[illegible] makes it possible to establish [illegible] between such factors as the employment of various welding materials, the size of the root opening, the included groove angle, the welding current, and other technological parameters and the tendency of welds toward hot cracking (HC). In order to determine [illegible] temperature corresponding to permissible deformation [illegible] metal, preliminary investigations were carried out on [illegible] which had been welded with a Kh20N10G6 welding wire [illegible] with an alkaline flux. The properties of the weld metal were [illegible]

Card 1/3

at elevated temperatures maintained in an oven. The heating of specimens was conducted in a stepwise fashion, the exposure to the testing temperature ... ing 10-15 minutes. The rate of deformation of the specimens amounted to ... mm. Regions of brittle failure of metal were observed at temperatures ... 1500°C. The following procedure was employed to evaluate the HC ... welds. Two halves of a specimen ... 25x15 mm in cross section ... rigid frame with an initial ... gap a between them. ... distance Δa by means of heating of the sections ... the two sections of the specimen ... of filler metal being rigidly controlled. The heated portion of the ... cooled in water, thereby ... tensile deformation of the specimen ... absolute magnitude of the maximum deformation possible in a weld ... of hot cracks in the latter was taken as the criterion ... It was established that the HC tendencies of the weld metal become ... as the root opening gap a is increased and the ... groove angle ... Compared with TsT-7 electrodes, which produce welds of a composition ... to that of Kh20N10G6 steel, KT-... electrodes exhibit the least tendency to ... HC. Even more susceptible to HC than TsT-7 electrodes are electrodes of the E... type. In the case of automatic welding, maximum stability is found ...

Card 2/3

SO[illegible]

A Novel Technique for the E[illegible] [illegible] Eff[illegible] [illegible] Ma[illegible]

performed with welding wire of the El[illegible] grade in conjunction with AN[illegible] Less stable are welds performed with the same grade of weld[illegible] flux of the [illegible] type. Welding wire of the Sv-K[illegible]N[illegible] Gr[illegible] when used with either flux. Bibliographies and references.

Card 3/3

SOV 137-58-7-15003

Translation from Referativnyy Zhurnal, Metallurgiya, 1958, Nr 7, ... (USSR)

AUTHORS Petrov, G.L., Korr... V.I.

TITLE Welding of Nickel and Monel Metal (Svarka nikelya i monel-metalla)

PERIODICAL Tr. Leningr. politekhn. in-ta, 1957, Nr 187, pp ...

ABSTRACT The possibility of obtaining high-quality arc-welded joints between Ni and Monel metal was investigated, together with the possibility of welding of Ni to austenite steel 1Kh18N9T. Welding electrodes made of Ni nickel and NMts 2.5 Ni-Mn alloy were employed in welding of both Ni and Monel metal. The electrodes were covered with a UONII 13/45 coating and a 44-44-2 coating manufactured by Krupp. Welding of Ni to 1Kh18N9T steel was accomplished with the aid of electrodes which produced welded joints composed of metal of any of the following types: Kh30, Kh22N15, Kh20N10G6, Kh20N12G7M2F, and Ni. Ni-Mn welding rods submerged in fluxes AN-20 and BKF-1 were employed in the investigation of the process of automatic welding of Ni. Current, welding rate, the method of advancing the arc, and the temperature of preliminary heating - all these

Card 1/2

SOV 137-58-7-...

Welding of Nickel and Monel Metal

factors were varied in the course of the investigation. The materials in vestigation. The materials investigated were 4-5 mm thick. It was established that satisfactory joints may be obtained with rolled Ni stock of medium thickness if UONII-13/45 electrodes with NMts-2.5 cores are employed (σ_b =42-49 kg/mm^2, Φ = 160-180^{o}C). The porosity of welded Ni joints constitutes their major drawback. This condition may be remedied by employing moderate currents and rates of welding as well as procedures which tend to reduce the rate of cooling in the welding pool (longitudinal vibrations of the electrode etc.). Welded joints with mechanical properties identical to those produced by manual welding can be attained by automatic welding methods. Welding of Ni to steel 1Kh18N9T is readily accomplished by means of electrodes that produce welded joints composed of Cr-Ni austenitic steel (electrodes KTI-5, type of metal in the weld Kh25N12...M2F σ_b= 46-48 kg/mm^2, rupture occurs in the vicinity of the weld). Monel sheet metal lends itself readily [illegible]

[illegible]

Φ = 160-180°

Card 2/2 [illegible]

PETROV, G. L. (Cand. Tech. Sci.)

"Chemical Nonhomogeneity of Welded Connections," p. 102
in book Reports of the Interuniversity Conference on Welding, 1956.
Moscow, Mashgiz, 1958, 266pp.

66505

18.7200

66505

SOV/[illegible]

[illegible] the base metal [illegible] metal [illegible] "chains" entail [illegible] [illegible] the metal [illegible] The seam metal was alloyed with [illegible] Mn, Mo and V through the covering [illegible] amount was controlled by varying [illegible] content [illegible] the chemical composition of [illegible] [illegible] $\leq$ [illegible] P $\leq$ [illegible] Cr respectively [illegible] steel. Mechanical properties [illegible] ageing for [illegible] electrodes for welding-[illegible] [illegible] 12 tons for "[illegible]

V.P.

AUTHOR: Gulyayev, B.B. SOV/24-58-[illegible]

TITLE: Conference on Crystallisation of Metals (Soveshchaniye po kristallizatsii metallov)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr [illegible], pp 153 - 155 (USSR)

ABSTRACT: This conference was held at the Institut mashinovedeniya AN SSSR (Institute of Mechanical Engineering of the Ac.Sc. USSR) on June 28-31, 1958. About 400 people participated and the participants included specialists in the fields of foundry, metallurgy, crystallography, physics, welding, heat, physical chemistry, mathematics, physics and other related subjects. In addition to Soviet participants foreign visitors included Professor D. [illegible] (East Germany) and N.I. Chvorinov (Czechoslovakia). This conference on crystallisation of metals was the fourth conference relating to the general problems of the theory of foundry processes.

Crystallisation of Non-ferrous Metals. [illegible] and A.A. Dodonov - in their paper "Investigation of the Crystallisation and [illegible] of Non-ferrous Metals Under Conditions of Applying Pressure", presented results of experiments on producing castings which crystallise under pressure from all sides and piston pressure within a wide range of specific loads. The results of the investigation provide material for improving existing methods of applying pressure to influence the crystallisation of alloys. The influence of the conditions of crystallisation on the casting and mechanical properties of aluminium alloys, at normal and at elevated temperatures, were discussed in the papers of I.F. [illegible] and A.Ye. Semenov. The results of investigations of the conditions of crystallisation of aluminium alloys during continuous casting were presented in the paper of Ye.D. Zakharov. N.L. Pokrovskiy and D.Ye. [illegible] dealt with the features of crystallisation of various

Card8/10

non-ferrous alloys and the physico-chemical phenomena accompanying this process.

Crystallisation of Metals in the Welding Bath. The following papers were read: B.A. [illegible] - "[illegible] of the Features of the Microscopic Chemical Non-uniformity in Alloys"; G.L. Petrov - "Crystallisation and Chemical Non-uniformity in Weld Joints"; M.Kh. Shorshorov and V.S. Sedykh - "Influence of Non-uniformities of Crystallisation in the Weld Bath on the Formation of Hot Cracks".

Crystallisation of Metals in an Ultrasonic Field. The following papers were read: [illegible] Member of the Ac.Sc. Belorussian SSR N.N. Sirota, Ye.I. [illegible] and B.E. Smolyarenko - "Crystallisation of Metals and Alloys in an Ultrasonic Field"; [illegible] - "Influence of Elastic Oscillations on the Processes of Crystallisation and the technological properties of Alloys"; [illegible] and A.A. Yerokhin - "Effect of Ultrasonics on Crystallising Metal in the Weld Bath"

Card9/10

PETROV, G.L., kand.tekhn.nauk, dots.; YEFIMOV, L.A., inzh.

Selection of electrodes for welding thin elements of EI417(Kh23N18) steel. Energomashinostroenie 4 no. 6:25-27 Je '58 (MIRA 11:8)

(Electrodes)

(Steel--Welding)

SOV-135-58-10-16/19

AUTHORS: Akerblom, K.A., Doctor of Technical Sciences, Professor, Demyantsevich, V.P., and Petrov, G.L., Candidates of Technical Sciences

TITLE: Problems of Electrode Standardization in Arc Welding (K voprosu o standartizatsii elektrodov dlya dugovoy svarki)

PERIODICAL: Svarochnoye proizvodstvo, 1958, Nr 10, pp 40 - 42 (USSR)

ABSTRACT: With reference to an article published by A.A. Yerokhin in a previous copy of this periodical, entitled "Principal Problems of Standardization For Arc-Welding Electrodes", the authors present some principal and practical observations dealing with the classification and requirements of different electrode types. As an example, 4 tables containing approximate requirements of electrodes for welding different steel grades, are included. There are 4 tables.

ASSOCIATION: Leningradskiy politekhnicheskiy institut (Leningrad Polytechnical Institute)

1. Arc welding--Electrodes 2. Electrodes--Standardization

Card 1/1

PETROV, G.L.

Characteristics of metal solidification in fusion welding. Trudy LPI no.199:123-135 '58. (MIRA 12:9)
(Welding research) (Solidification)

PETROV, G.L.

Carbon and sulfur migration in the zone of the fusion weld boundary. Trudy LPI no.199:143-156 '58. (MIRA 12:9)
(Welding--Testing) (Diffusion) (Metallography)

-3(1) 13(5) PHASE I BOOK EXPLOITATION SOV 2099

Akademiya nauk SSSR. Institut metallurgii

Goryachiye treshchiny v svarnykh soyedineniyakh slitkakh i otlivkakh (Hot Cracks in Welds, Ingots, and Castings) Moscow, Izd-vo AN SSSR, 1959. 163 p. 2,700 copies printed.

Ed.: N. N. Rykalin, Corresponding Member, USSR Academy of Sciences; Ed. of Publishing House: V. S. Rzheznikov; Tech. Ed.: Yu. V. Rylina.

PURPOSE: This book is intended for metallurgists and welding engineers.

COVERAGE: This is a collection of scientific papers dealing with the formation of hot cracks in ingots, castings, and welded products. Some papers are concerned mainly with the nature or mechanism of the phenomenon; others examine the effect of factors such as steelmaking procedure. Sufficient evidence is presented to identify some of the causes of hot cracks. Various means of investigating and preventing the phenomenon are described. A number of references, both Soviet and non-Soviet, accompany the papers. For further coverage see the Table of Contents.

Card 1/3

TABLE OF CONTENTS:

The author makes the following recommendations: At the end of the run the basicity of the slag, i.e., the ratio of CaO to SiO_2, should be within the limits of 2.5 and 3.0, and the fluidity of the slag, as tested by viscosimeter, should amount to some 30-60 mm. Preliminary deoxidation of the steel in the furnace by means of blast-furnace ferrosilicon should not be carried out. If ferrochrome and ferromanganese have been added, the time for holding the heat should be determined by the formula $z = \frac{1.5q}{P}$, min., where q = the weight of ferroalloys added (in kg), and P = the output of the furnace (t/24 hr). In the production of carbon and low-alloy steel, alloying and deoxidation should be carried out in the teeming ladle. Government standards (GOST 380-50 and 5521-50) for rimmed steel should be revised so as to specify a manganese content of 0.30-0.50 percent instead of the present 0.35-0.60 percent.

Yefimov, V. A. Causes of Cracks in Steel Ingots and Means of Preventing Them 10

The following causes of ingot cracks are discussed: shrinkage and plasticity of steel at high temperatures, crystallization conditions in the ingot mold, ingot-mold design and teeming conditions, hydrodynamics of ingot-mold filling, and sticking of the ingot to the mold and other factors associated with top pouring.

Pronov, A. P. Mechanism of Hot-crack Formation on Steel Ingot Surfaces 30

Bidulya, P. N., V. G. Gruzin, and V. N. Saveyko. Formation and Prevention of Hot Cracks in Steel Castings 39

As a criterion for the quantitative determination of the resistance of steel to the formation of exterior hot cracks, the author finds it convenient to employ the concept of "crack resistance", or the force required to form a crack during the shrinkage of a standard cast specimen with rigidly fastened ends. For mild carbon steel and low-alloy (Cr, Mo, V) structural steel, pouring temperature is one of the most important factors in crack development. Filling the molds with steel at the temperature of the liquidus or below should be avoided. A direct relationship between crack resistance and linear shrinkage, fluidity, and gas liberation was established. Increasing the fluidity of the mushy stage by changing the composition or the conditions helps to increase the crack resistance. Sulfur, hydrogen, and methane decrease the crack resistance of steel. Additions of manganese, molybdenum, and vanadium to carbon steel or low alloy steel increase the crack resistance. The manganese content should be held at a maximum so as to assure a ratio of Mn/S $\leq$ 13.

Gulyayev, B. B., I. I. Lupyrev, and L. M. Postnov. Formation of Hot Cracks in Steel Castings 51

The author recommends the following measures for controlling hot cracks in steel castings: 1) decreasing the size of the casting and eliminating projections by casting in several pieces with subsequent welding of the components; 2) Equalization of the cooling rates of various parts of the casting and elimination of conjugate parts through a rational determination of the thickness of their elements; 3) increasing fillet radii; 4) rejection of X-shaped designs and conjugate walls at angles of less than 90°; 5) increasing the pliancy of molds through the use of more pliable molding media and by

SOV [illegible]

pitting the molds; 6) strengthening weak spots through the use of chills and ribbing; 7) regulating the metal composition, insofar as possible, and the pouring conditions so as to reduce the probability of crack development. Consistent application of these measures, the author states, will effectively prevent hot cracks from development. Consistent application of these measures, the author states, will effectively prevent hot cracks from developing.

Pokhodnya, I. K. Hot (Crystallization) Cracks in the Hard Facing of High-Carbon Low-Chrome Steels 68

The author discusses the nature and mechanism of hot-crack formation and examines various factors contributing to it (chemical composition of added metal, cooling rate, etc.).

Medovar, B. I. Hot Cracks in the Welding of Chrome-Nickel Austenitic Steels 92

Prokhorov, N. N. Intergranular Strength of Metals 108

The author points out that hot cracks are one of the main causes of rejection of welded and cast products. To solve the problem he suggests intensive study of the hot strength of metals, using several different approaches: 1) investigation of deformations caused by welding and casting processes, accompanied by development of computational methods of determining deformations and their concentration at high temperatures; 2) study of the mechanical properties of metals during crystallization and cooling; 3) development of a single working hypothesis of intergranular strength of metals which would guide investigators and manufacturers in solving theoretical and practical problems connected with hot-crack formation (in this connection the author suggests the utility of his own hypothesis, based on a comparison of the numerical values of the deformation and plasticity of metals within a definite temperature range of brittleness); development of unified methods of testing metals for susceptibility to hot-crack formation in welding and casting; 5) development of quantitative methods of determining the effect of the shape of the product, as required by manufacturing and constructional considerations, on intergranular strength of welded and cast products; 6) systematic adoption of new scientific methods by manufacturers.

Lashko-Avakyan, S. V., and N. F. Lashko. Intergranular Crystallization Cracks in the Casting and Welding of Aluminum Alloys 131
According to the author, certain alloys ordinarily subject to the formation of cystallization cracks after welding can be

rendered resistant to such cracks by the use of an added metal (alloy) which satisfies the following conditions: (a) the weld metal must not be subject to crack formation after welding; (b) the liquidus temperature of the weld metal must not be higher than that of the parent metal; (c) the weld metal must not contain components that in penetrating the base metal along the boundaries of fused grains in the heat-affected zone would form alloys with significantly lower eutectic temperatures than that of the base metal.

Petrov, G. L. New Methods of Determining the Susceptibility of Weld Metal to Hot-Crack Formation 147

The article describes new methods developed by N. O. Okerblom and associates, Welding Department, Leningrad Polytechnic Institute. The methods make it possible to determine the effect of various welding materials and basic welding parameters on the development of hot cracks in weld metal.

BRUK, Boris Il'ich; PETROV, G.L., dotsent, retsenzent; ZHUKOV, O.N., nauchnyy red.; NIKITINA, R.D., red.; SHISHKOVA, L.M., tekhn.red.

[Use of radioactive isotopes in welding metallurgy and metallography] Radioaktivnye izotopy v metallurgii i metallovedenii svarki. Leningrad, Gos.soiuznoe izd-vo sudostroit.promyshl., 1959. 231 p. (MIRA 12:6)

(Radioisotopes--Industrial applications)
(Electric welding) (Metallography)

APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R001240420015-2"