24-4-5/34

AUTHOR: Pavlov, V.P. (Moscow).

TITLE: On the mechanism of formation of spheroidal graphite in magnesium inoculated cast iron. (O mekhanizme obrazovaniya sharovidnogo grafita v magniyevom chugune).

PERIODICAL: "Izv. Ak. Nauk, Otd. Tekh. Nauk" (Bulletin of the Ac. Sc., Technical Sciences Section), 1957, No.4, pp.33-39(USSR).

ABSTRACT: According to Gorshkov, A.A. (Liteynoye Proizvodstvo, 1955, No.3) addition of pure magnesium or of magnesium alloys brings about a rapid evaporation of magnesium which is accompanied by the formation of a very large number of bubbles which rise upwards gradually decreasing in dimensions due to the consumption of magnesium vapours on the reactions expressed by eqs. (1) and (2), p.34; a complete elimination of these bubbles cannot take place due to the fact that they form spaces where the partial pressures of other gases approach zero and to which hydrogen will diffuse which is neutral relative to the magnesium at the liquid iron temperatures. These almost immobile bubbles in the still liquid iron will contain carbon, formed as a result of the reactions, in the form of graphite crystallisation nuclei. Since oxided irons yield more CO and CO_2, Gorshkov concludes that such irons should be used for obtaining magnesium inoculated cast iron. To verify the theory of Gorshkov the author of this paper investigated the treatment with magnesium of iron which was prelimin-

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On the mechanism of formation of spheroidal graphite in magnesium inoculated cast iron (Cont.) 24-4-5/34

arily degassed. In a 70 kg ladle 350 g (0.5%) soda was placed first and, after filling the ladle with iron, treatment was effected with 1.5 kg of an alloy containing 7.92% magnesium, the rest consisting of 75% ferrosilicon. A specimen of standard dimensions (30 mm dia) withstood a bending stress of 125 kg/mm^2 with a sag amounting to 14 mm; the micro-structure was that of a typical magnesium iron, Fig.1, p.35. A second ladle of equal capacity was preliminarily treated with air-dried timber; after treatment with an alloy of the same composition as in the previous case, the obtained iron had a bending strength of 113.2 kg/mm^2 with a deflection of 14 mm. Irons treated with the same alloy but without preliminary degassing had a lower mechanical strength, namely, a 111 kg/mm^2 bending strength with a deflection of 6 mm. The results do not confirm the views of Gorshkov. It appears that the magnesium refines the iron without actually reacting with the iron or getting dissolved in it but forming carbides. Soot particles which form in the iron as a result of the reactions caused by the magnesium are the fundamental nuclei for graphite crystallisation which determine its shaping; the soot particles become rolled in the moving liquid and assume spherical shape. The dimension of the

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On the mechanism of formation of spheroidal graphite in magnesium inoculated cast iron (Cont.) 24-4-5/34

soot particles of various types varies between 16 and 400 mμ.

Card 3/3 There are 6 figures including micro-photographs. There are 11 references, all Russian.

SUBMITTED: September 11, 1956.

AVAILABLE:

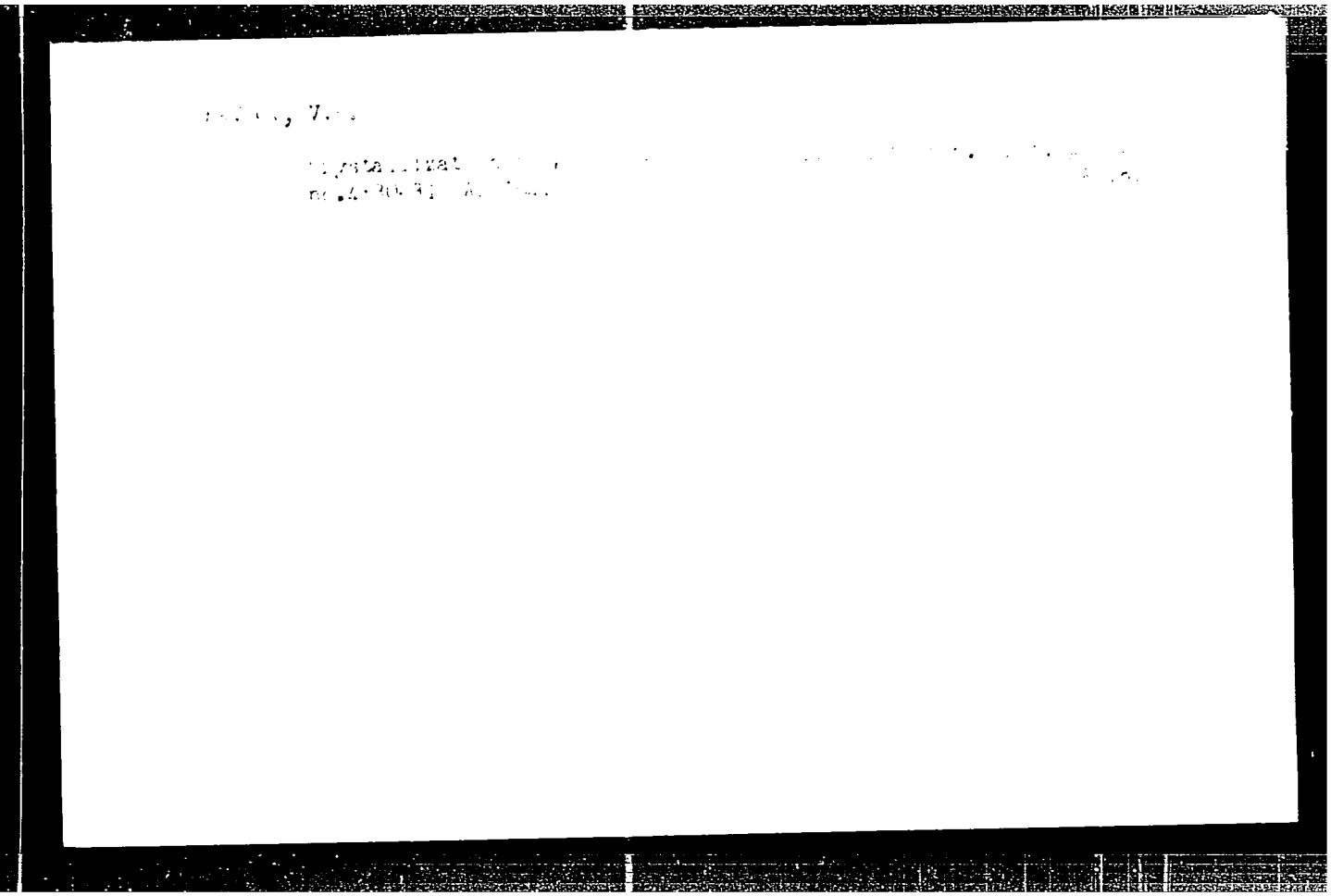
PAVLOV, V.P.

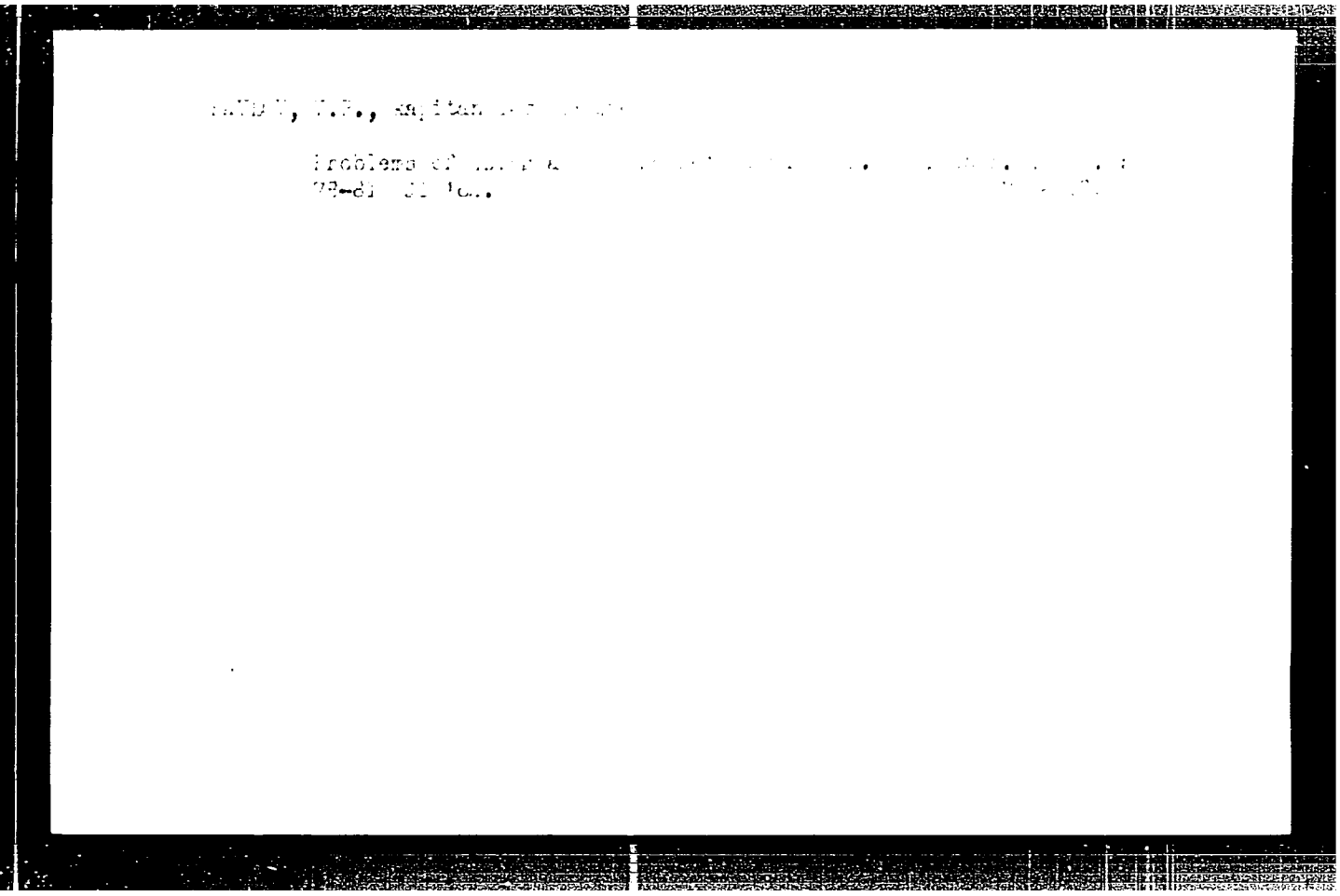
Technology of preparing magnesium cast iron. Lit. proizv. no. 2:37-38 F '61. (MIRA 14:4)

(Cast iron--Metallurgy)

PAVLOV, Vladimir Pavlovich; MEL'NIKOVA, Zh.M., red.

[Polymers and metals] Polimery i metall. Moskva, Znanie, 1965. 45 p. (Novoe v zhizni, nauke, tekhnike. XI Seriia: Khimiia, no.10) (MIRA 18:10)





PAVLOV, V.P.

Circulation of liquid in a bubble apparatus with periodical action. Khim. prom. 42 no.9:698-700 S '65. (MIRA 18:9)

PAVLOV, V.P.

Effect of residual magnesium on the form of the graphite in cast iron. Izv. vys. ucheb. zav.; chern. met. 7 no.7:187-194 '64 (MIRA 17:8)

L. Moskovskiy aviatsionnyy institut.

KUSHNAREV, D.M., kand.tekhn.nauk; PAVLOV, V.P., inzh.; ZEL'TSER, Yu.I.; CHEREPANOV, G.S.

Industrial testing of a machine for charging a hole with "igdanit." Gor. zhur. no.9:46-47 S '62. (MIRA 15:9)

1. Gosudarstvennyy institut gornokhimicheskogo syr'ya (for Kushnarev, Pavlov). 2. Gosudarstvennyy proyektno-konstruktorskiy institut avtomatizatsii rabot v ugol'noy promyshlennosti (for Zel'tser). 3. Institut gornogo dela im. Skochinskogo (for Cherepanov).
(Explosives) (Blasting—Equipment and supplies)

PAVLOV, V.P., inshener.

Joining wood lingitudinally with toothed tenons. Der. i lesokhim. prom. 3 no.10:5-8 O '54. (MLRA 7:11)

1. TSentral'nyy nauchno-issledovatel'skiy institut mekhanicheskoy obrabotki drevesiny.
(Woodwork)

PAVLOV, V.P., inzhener.

Testing skis made of one piece of Manchurian ash. Der.prom. 5 no.2:17 F '56. (MLRA 9:5)

1. Tsentral'nyy nauchno-issledovatel'skiy institut mekhanicheskoy obrabotki drevesiny.
(Skis and skiing)

PAVLOV, V. P. ~~Doc~~ Cand Tech Sci -- (diss) "Study of ~~the~~ longitudinal glued tongue-and-groove joints in lumber products. ~~pasted tooth-pin interconnections of lumber by length.~~"

Mos, 1957. 16 pp with ~~charts~~ drawings 22 cm. (Min of Higher Education USSR. Moscow Inst of Forest Engineering), 110 copies.

(KL, 21-57, 103)

PAVLOV, V.P., inzhener

Resistance of veneer tenon joints to compression and impact bending. Der. prom. 6 no.3:16-17 Mr '57. (MLRA 10:5)

1. TSentral'nyy nauchno-issledovatel'skiy institut mekhanicheskoy obrabotki drevesiny.
(Woodwork--Testing)

PAVLOV, V.P., sadovod-lyubitel' (Bugul'ma, Tatarskaya ASSR)

Black rot can be cured. Zashch. rast. ot vred. i bol. 8 no.6:55-56 Je '63. (MIRA 16:8)

(Bugul'ma--Apple--Diseases and pests)
(Bugul'ma--Canker (Plant disease))

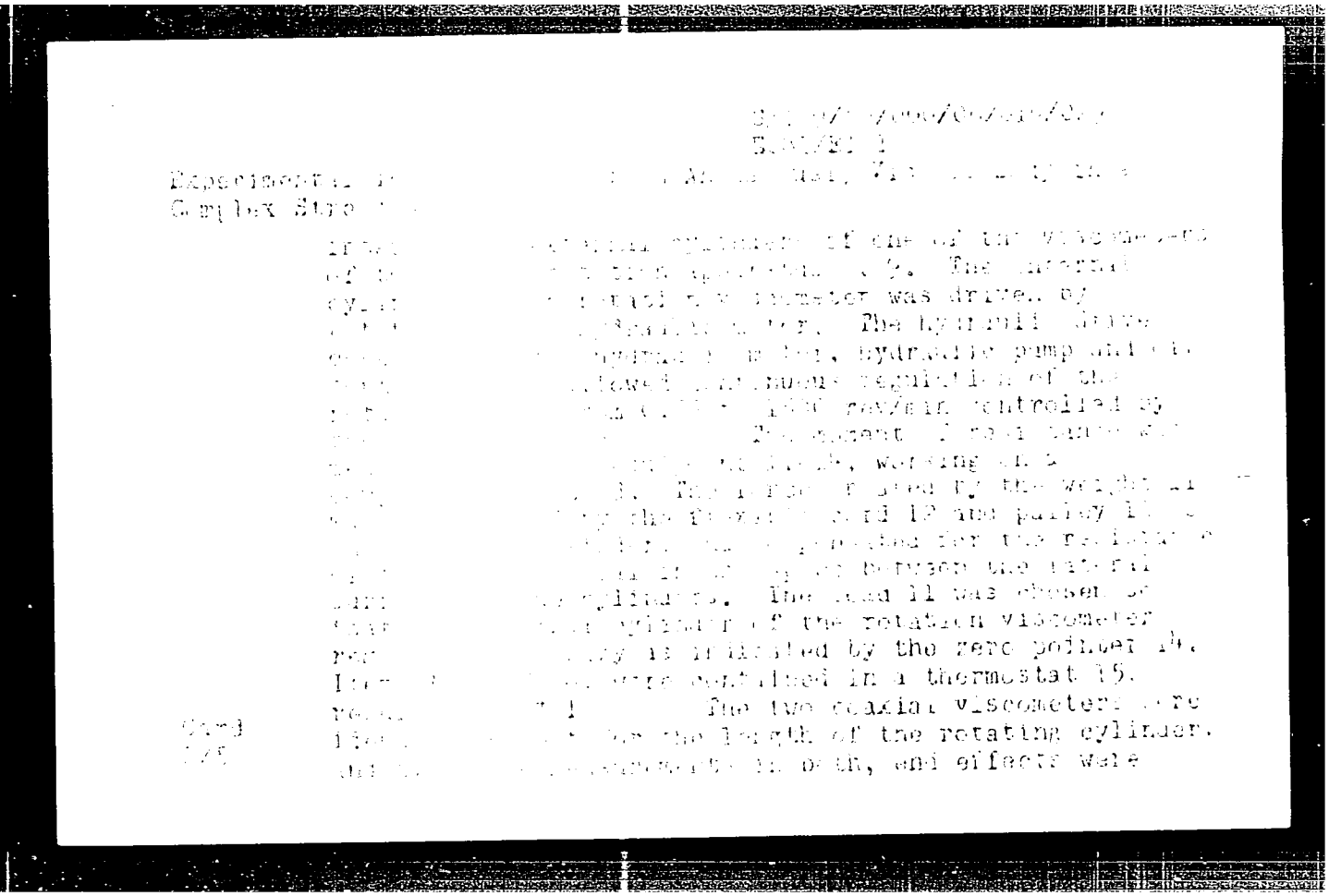
AUTHORS:

TITLE: [illegible] of an Anomalously Viscous [illegible] Stress Condition

PERIODICAL: [illegible]

ABSTRACT: [illegible] of previous work (Refs 1,2,3). The [illegible] were carried out on a lubricant grease containing [illegible] spindle oil, 12% calcium soap of cotton [illegible] water. For comparison, measurements were [illegible] on a high-resin extract of the [illegible] mineral oil processing, which is a high [illegible] and with Newtonian flow characteristics. The measurements were made in a double rotation viscometer, (Fig. 1) [illegible] hydraulic fluid supplied from an apparatus [illegible] pressure pumped to the tube 1 with precision [illegible] to the viscometric cylinder 3 where it [illegible] on the piston 4. The test material 5 fills the cylinder 3 and was forced by the piston 4 into the [illegible] the flexible hose 7 and the space between the

1/2



S/179/59/000/06/014/029
E081/E141

Investigation of an Anomalously Viscous Body in a
Stress Condition

eliminated. The twisting moment was measured as a function of rotation velocity, and at the same time an axial flow, varying between 1.48 x 10-3 and 1.82 cm3/sec was maintained through the viscometer. Control experiments on the circumferential flow were carried out in the rotation plasto-viscometer PVR-1 (Ref 3). The system is aralysed mathematically and expressions obtained for the mean axial deformational velocity, D_{10}, the circumferential deformational velocity, D_2, and the deformational velocity at the wall, D_1 (Eqs 1 and the two preceding equations). Graphs are given of log D_{10}, log D_1 and log D_2 against log r_1 and log r_2 at temperatures of 20, 35 and 50° (Figs 2, 3, 4); r_2 and r_1 are respectively the mean and the axial tangential stresses. Examination of the curves for the grease for the high resin extract and for the grease preconditioned at a deformation velocity of 5.1×10^4 sec^{-1} in a rotary homogeniser shows that the axial and circumferential flow have essentially the same characteristics. If the two flows are of the same order of magnitude, there is a strong

S/179/59/000/06/014/029
E081/E141

...tal Investigation of an Anomalously Viscous Body in a ...ress Condition

...influence of circumferential on axial flow. At low circumferential flows, there is practically no influence on axial flow. At high circumferential velocities, the axial flow of the anomalously viscous body becomes Newtonian. Some increase in circumferential viscosity is observed at high axial velocities. This effect diminishes if the temperature is raised, and also if the body is preconditioned by subjecting it to high deformational velocities. Figure legends are as follows. Fig 1 - Schematic arrangement of the apparatus for investigating flow of an anomalously viscous body under the action of two simple shears. Fig 2 - characteristic (continuous) and neutralised (dotted) flow curves for extract. Fig 3 - characteristic (continuous, dashed) and neutralised (dotted) flow curves for fatty grease. Fig 4 - characteristic (continuous) and neutralised (dotted) flow curves for fatty grease, the structure of which was broken down in a homogeniser at a deformation velocity $D = 5.1 \times 10^4$ sec-1. (In Figs 2-4 the dotted lines represent the curves $D_{10}(\tau_1)$ obtained for extract and

Experimental Investigation of an Anomalously Viscous Body in a Complex Stress Condition

grease with axial flow in the gap of the twin rotation viscometers. The continuous lines represent the curves $D\theta(\rho)$ obtained with circumferential flow of the extract in the twin rotation viscometers, and in the plasto-viscometer PVR-1. The units of shear are dynes/cm^2 and of deformation velocity sec^{-1}. The numbered points on the curves are identified in the table at the top of page 104 (in which Q = axial discharge).
Fig 5 - dependence of effective axial viscosity on circumferential deformation velocity for extract.
Fig 6 - curves of change of effective axial viscosity with circumferential deformation velocity for fatty grease at temperatures of 80, 65 and 20°. Fig 7 - curves of change of effective circumferential viscosity on circumferential deformation velocity (viscosity (sic!) for grease.
There are 7 figures, 1 table and 8 references, of which 5 are Soviet and 3 is English.

Card 5/5

SUBMITTED: June [illegible], 1959

ASTAKHOV, A.V.; PAVLOV, V.P.; PAVLOTSKIY, I.P.

Spectral representation of the n-partial summit function in the one-dimensional case. Nauch.dokl.vys.shkoly; fiz.-mat.nauki no.2:124-127 '59. (MIRA 13:3)

1. Moskovskiy gosudarstvennyy universitet.
(Potential, Theory of)

SAYFULLIN, M.S.; PAVLOV, V.P.

Evaluating the current oil yield of the flooded section of bed VI in the Ashit sector of the Arlan oil field. Geol. nefti. i gaza 8 no.10:27-31 O '64. (MIRA 17:12)

1. Neftepromyslovoye upravleniye Arlanneft'.

PAVLOV, V.P., kand. med. nauk

Indications and methodology for the intra-articular introduction of hydrocortisone in infectious nonspecific polyarthritis. Sov. med. 27 no.11:111-116 N '64. (MIRA 18:7)

1. Otdeleniye infektsionnykh poliartritov (zav. - prof. M.G.Astapenko) Nauchno-issledovatel'skogo instituta revmatizma (dir. - deystvitel'nyy chlen AMN SSSR prof. A.I.Nesterov) AMN SSSR, Moskva.

PAVLOV, V.P. (Moskva, 1-ya Pryadil'naya ul. d. 2/9, kv.38)

Changes in renal hemodynamics following mitral commissurotomy in patients with mitral stenosis. Grud.khir. 1 no.2: 18-25 Mr-Ap '59. (MIRA 16:7)

1. Iz kafedry fakul'tetskoy khirurgii (zav.-prof. A.A.Busalov) pediatricheskogo fakul'teta II Moskovskogo meditsinskogo instituta imeni N.I.Pirogova.
(MITRAL VALVE—SURGERY) (KIDNEYS—BLOOD SUPPLY)

LOSKUTOVA, L.T.; MAKOTINSKIY, M.P., kand. arkh.; RUDINA, M.A., arkh.; SHPANOV, I.A., arkh. Prinimal uchastiye LIVSHITS, A.M., inzh.; GROMOV, V.L., kand. tekhn. nauk, retsenzeng; KRASNOVSKIY, N.V., kand. tekhn. nauk, retsenzent; PAVLOV, V.P., kand. tekhn. nauk, retsenzent; PODZOROVA, N.G., inzh., retsenzent; POLOMIN, A.I., doktor tekhn. nauk, retsenzent; GURVICH, E.A., red.

[Catalog of finishing materials and elements] Katalog otdelochnykh materialov i izdelii. Moskva, Gosstroiizdat. Pt.8. [Wood and paper] Derevo i bumaga. 1962. 56 p. (MIRA 16:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut novykh stroitel'nykh materialov.

(Finishes and finishing)

KUSHNAREV, D.M.; PAVLOV, V.P.

Study of the danger of stray currents in using electric detonators with nichrome filament bridges. Vzryv. delo no.48/5:92-98 '62. (MIRA 15:9)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut gornokhimicheskogo syr'ya (GIGKhS).

(Blasting)

BUNIN, O.A.; MOSKVICHEV, N.T.; PLAKSIN, S.A.; Prinimali uchastiye: GORSHKOV, P.V.; SMIRNOV, V.M.; PAVLOV, V.P.; ISAYEV, A.P.; LAVROV, G.V.

Operation conditions of the dye aging and reducing apparatus. Tekst.prom. 22 no.10:64-67 O '62. (MIRA 15:11)

1. Ivanovskiy nauchno-issledovatel'skiy tekstil'nyy institut.

(Dyes and dyeing--Apparatus)

KUSHNAREV, D.M., kand.tekhn.nauk; PAVLOV, V.P., inzh.

Explosives with the simplest composition. Shakht.stroi. 6 no.11: 24-25 N '62. (MIRA 15:12)

1. Institut gornokhimicheskogo syr'ya.
(Explosives)

Pavlov, V.P.

report presented at the 1st All-Union Congress of Theoretical and Applied Mechanics, Moscow, 27 Jan - 3 Feb '60.

35. N. M. Borodachev (Kuibyshev): On the solution of the dynamic contact problem for a half-space under conditions of axial symmetry.

36. J. Brilla (Bratislava). Anisotropic plates with discontinuous supports.

37. B. M. Bryude (Moscow): On the essential non-linearity of certain problems on column stability.

38. [illegible] (Kiev), A. V. Sarkisyan (Moscow): On the determination of safety factors under alternating random loads.

39. A. V. Burlakov (Khar'kov): An experimental investigation of creep of [illegible] diaphragm models.

40. G. F. Burmistrov (Saratov): On the stability of constructionally anisotropic circular ring plates.

41. [illegible], V. Petcu, S. [illegible] (Bucharest): The field of application of [illegible].

42. D. V. Vainberg (Kiev): The state of stress of lamellar systems of regular configuration.

43. V. V. Vainshtok (Moscow): Thixotropic properties of lubricants as basis of their rheological characteristics.

44. G. A. Van-Fo-Fy, O. E. [illegible] (Kiev): Application of Mathieu functions to the investigation of shells.

45. P. M. Varvak (Kiev): Determination of stresses and deformations in massive bodies.

46. B. V. [illegible] (Gor'kii): The flow of bitumens and filled bitumens in pipes.

47. I. N. Vekua, N. I. Muskhelishvili (Tbilisi): Applications of analytic functions in the theory of elasticity.

48. L. Ia. [illegible] (Tbilisi), V. V. Pinadzhian (Erevan): Experimental investigation of the behavior of eccentrically compressed short columns for long loading times.

49. G. V. Vinogradov (Moscow), A. A. [illegible] (Kazan), V. P. Pavlov (Moscow): Investigation of soft plastic bodies under combined states of stress.

50. G. V. Vinogradov, V. P. Pavlov (Moscow): Basic peculiarities of the mechanical properties of plastic lubricants.

51. [illegible] (Leningrad): Fundamentals of the linear theory of visco-elastic impact.

52. L. L. Vinokurov (Khar'kov): The solution of dynamic contact problems for foundations using a simplified model.

53. B. F. Vlasov (Moscow): On the equilibrium equations of thick elastic plates.

54. [illegible] (Iakutsk): The creep of ice and frozen soils under combined stresses.

55. M. P. Volarovich, G. Ia. Voronkov, E. P. Kovalevskii, G. L. [illegible] (Moscow): Studies of viscoelastic properties of porous bodies (e.g. peat) by the ultrasonic pulse method.

56. M. P. Volarovich (Moscow), A. Kh. Kim (Minsk): The plane flow of a visco-plastic medium between two planes forming an acute angle.

57. M. P. Volarovich, N. V. [illegible] (Moscow): Kinematics and dynamics of the flow of visco-plastic dispersed media past bodies of different shapes.

58. A. S. [illegible] (Moscow): On the analysis of a short closed cylindrical shell.

59. S. D. Volkov, Z. A. Klinskikh (Sverdlovsk): On the distribution of elastic constants in quasi-isotropic polycrystalline media.

60. I. I. Vorovich (Rostov-na-Donu): A statistical method in the stability theory of shells.

61. I. I. Vorovich (Rostov-na-Donu), A. S. Kosmodamianskii (Saratov): On stress concentration in a plane with an infinite number of holes.

62. [illegible] (Leningrad): Foundations of the general engineering theory of elastic beams.

63. S. S. Vialov (Moscow): The laws of deformation of ice.

64. S. S. Vialov (Moscow): The laws of motion of ice crusts and the theory of visco-plastic flow based on research in the Antarctic.

65. [illegible] (Leningrad): A method of obtaining polynomial stress and displacement functions.

66. K. Z. Galimov (Kazan): A contribution to the theory of the finite deformations of thin shells.

67. M. P. Galin (Moscow): The propagation of elastic-plastic bending and shear waves in the axisymmetrical deformations of shells.

Pavlov, V. P.

report presented at the 1st All-Union Congress of Theoretical and Applied Mechanics, Moscow, 27 Jan - 3 Feb '60.

201. [illegible] Mikhailov (Moscow): An experimental study of the load carrying capacity of thin-walled nickel tubes subjected to various combinations of tension, torsion, and internal pressure.

202. S. G. Mikhlin (Leningrad): Variational methods in the theory of elasticity.

203. A. A. Movchan (Moscow): The stability of motions of solids — Lagrange's theorem for solids and its inversion.

204. A. A. Movchan (Moscow): Axisymmetric supersonic flutter of a circular cylindrical shell.

205. N. F. Morozov (Leningrad): On the uniqueness of the solution of the problem of large deflections of a circular plate under rotationally symmetric loading.

206. G. M. Mchedlidze (Tbilisi): The determination of the deformation of trusses without diagonals.

207. Kh. M. Mushtari, I. G. Teregulov (Kazan): A theory of moderately thick plates and shells.

208. A. G. Nazarov (Erevan): Some problems in the theory of uniform stability.

209. U. K. Nigul (Tallin): Vibrations of an elastic circular cylindrical shell under concentrated impact loading.

210. U. K. Nigul (Tallin): More accurate equations of motion for circular cylindrical shells.

211. V. A. Nikitin (Leningrad): Approximate treatment of cylindrical shells under concentrated loads.

212. S. N. Nikiforov (Moscow): Redistribution of reactions at the edge of a simply supported rectangular plate under gradually increasing loading.

213. W. Nowacki (Warsaw): Some dynamical problems of thermoelasticity.

214. [illegible] (Moscow): Investigation of the viscous behavior of elastic, visco-plastic materials in vibrations.

215. Ia. [illegible], I. A. [illegible] (Odessa): Problems of the non-linear theory of elasticity.

216. I. F. [illegible] (Moscow): An application of [illegible] variational method to the design of [illegible] structures.

217. L. I. Ogurtsov (Leningrad): Complete computation of a wave field in homogeneous elastic media with parallel plane boundaries.

218. [illegible] (Riga): The method of electroplating and its applications.

219. W. Olszak (Warsaw): Two-dimensional problems in the theory of plasticity of non-homogeneous and anisotropic media.

220. [illegible] Osipov (Moscow): The state of stress in a deformed curved bar.

221. V. Ia. Pavilainen (Leningrad): A membrane theory for a toroidal shell.

222. V. P. Pavlov (Moscow): Creep, elastic properties and anisotropy of plastic lubricants.

223. G. V. Palchinskii (Kharkov): A practical method of designing reinforced concrete structures with reference to creep.

224. Ia. G. Panovko (Riga): The problem of structural damping.

225. P. I. Perlin (Moscow): An approximate method for solving elastic-plastic problems.

226. P. I. Perlin, L. A. Shofman (Moscow): Application of the theory of rigid, plastic solids to problems of metal forming.

227. A. G. Polozhii (Kiev): On the axisymmetric problem of the theory of elasticity.

228. D. E. Polshin (Moscow): A method for studying the plane field of relative volume strains in soils.

229. G. Ia. Popov (Novosibirsk): The application of some new methods of the theory of integral equations to the solution of contact problems of the theory of elasticity.

230. V. A. Postnov (Leningrad): Free and forced vibrations of frames taking into account shear deformations and energy dissipation.

231. [illegible] (Dnepropetrovsk): Investigation and calculation of internal friction in elastic members of vibrating machines.

232. W. Prager (Providence): An elementary discussion of definitions of stress rate.

233. [illegible] Prigorovskii (Moscow): Photoelastic investigation of stresses in three-dimensional layered models.

PAVLOV, V.P., inzh.

Work required by various methods of reinforcing prestressed concrete products in conveyer-line plants. Trudy NIIZHB no.27:133-149 '62. (MIRA 15:9)

(Prestressed concrete)

PROZOROVSKIY, G.N., kand.tekhn.nauk; PAVLOV, V.P., inzh.

Special problems in the industrialization of construction in villages. Izv. ASiA no.1:58-64 '60. (MIRA 13:9)
(Farm buildings) (Precast concrete construction)

PAVLOV, V. P., Cand Medical Sci -- (diss) "Function of the kidneys in the postoperative period." Moscow, 1960. 19 pp; (Second Moscow ord tn Medical Inst im. I. I. Pirogov); 250 copies; price not given; (KL, 22-60, 144)

VINOGRADOV, G.V. (Moskva); PAVLOV, V.P. (Moskva)

Elastic and strength properties of soft bodies. Izv.AN SSSR. Otd.tekh.nauk.Mekh. i mashinostr. no.2:134-141 Mr-Ap '59. (MIRA 12:5)

(Deformations (Mechanics))

PAVLOV, V.P.

LARCHENKO, Ye.G., kandidat tekhnicheskikh nauk; PAVLOV, V.P.

Answers to readers' questions. Geod. i kart. no.8:66-70 O '56.
(MIRA 10:1)
(Surveying)

PAVLOV V.P

BEREGOVSKIY, V.Ye.; VASILENKO, M.I.; VELIER, R.L.; VERBLOVSKIY, A.M.; VERNER, B.F.; VOYDALOVSKAYA, Ye.N.; VOL'SKIY, A.N.; GLAZKOVSKIY, A.A., GRANOVSKIY, B.L.; GREYVER, N.S.; GUDIMA, N.V.; DOLGOPOLOVA, V.I.; KARCHEVSKIY, V.A.; KOVACHEVA, Ye.B.; KUDRYAVTSEV, P.S.; LEBEDEV, A.Z.; LISOVSKIY, D.I.; LIKHNITSKAYA, Z.P.; MATVEYEV, N.I.; MEL'NITSKIY, A.N.; MIRONOV, A.A.; MIKHEYEVA, A.A.; MURACH, N.N.; OKUN', A.B.; OL'KHOV, N.P.; OSIPOVA, T.B.; PAVLOV, V.P.; ROTINYAN, A.L.; SAZHIN, N.P.; SEVRYUKOV, N.N.; SIDOROV, P.M.; SOBOL', S.I.; KHEYFETS, V.L.; TSEYNER, V.M.; SHAKHNAZAROV, A.K.; SHEYN, Yu.P.; SHEREMET'YEV, S.D.; SHERMAN, B.P.; SHISHKIN, N.N.; SHLOPOV, A.P.

Georgii Ivanovich Blinov. TSvet.met. 28 no.6:62 N-D '55.
(MIRA 10:11)

(Blinov, Georgii Ivanovich, 1911-1955)

S/128/61/000/002/007/009
A054/A133

AUTHOR: Pavlov, V.P.

TITLE: Technological problems in magnesium iron production

PERIODICAL: Liteynoye proizvodstvo, no. 2, 1961, 37 - 38

TEXT: The modification of iron with magnesium can easily be carried out in workshops where iron is poured into the molds with 70-kg ladles filled from the cupola by a mixer. After filling the mixer with iron the slag is removed and the magnesium foundry alloy is added with the aid of an iron rod held over the metal surface. The opening of the mixer is then covered and the magnesium foundry alloy is lowered to the bottom. During the modification the iron temperature drops by about 20 - 25°C. Gases are removed from the mixer through pipes connected to the fan system of the workshop. The method ensures magnesium modification to any required extent. It is safe, does not require special space in the workshop and can be integrated into the continuous conveyor casting system. There are 2 figures and 1 Soviet-bloc reference.

Card 1/1

VASIL'YEV, I.G., inzh. (Leningrad); PAVLOV, V.P., inzh. (Leningrad)

Two-channel electronic switch for the cathode oscillograph.
Elek.i tepl.tiaga 6 no.4:34-35 Ap '62. (MIRA 15:5)
(Oscillographs)
(Electric switchgear)

S/155/59/000/02/023/036

AUTHORS: Astakhov, A.V., Pavlov, V.P., Pavlotskiy, I.P. 16

TITLE: Spectral Representation of an n-particle Green Function in the Unidimensional Case

PERIODICAL: Nauchnyye doklady vysshey shkoly. Fiziko-matematicheskiye nauki, 1959, No. 2, pp. 124-127

TEXT: Spectral representations of arbitrary multi-particle Green functions are obtained in the case where the field functions only depend on the time (unidimensional model). The results confirm that it is principally possible to obtain the representations from the causality conditions and from the mass spectrum alone ; a direct application of the results is possible, e.g. in thermodynamics.

The authors thank N.N. Bogolyubov for the subject and the guidance, and A.A. Logunov, B.V. Medvedev, M.K. Polivanov for advices.

There are 7 references: 3 Soviet, 2 American, 1 Swiss and 1 Italian.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova (Moscow State University imeni M.V. Lomonosov)

SUBMITTED: March 21, 1959

Card 1/1

25478

S/020/61/139/001/010/018
B104/B231

24,6700

AUTHORS: Zav'yalov, O. I. and Pavlov, V. P.

TITLE: Matrix element of the reaction $\pi + N \to \pi + \pi + N$ at low energies

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 139, no. 1, 1961, 79 - 82

TEXT: The authors had two aims in mind when investigating the reactions mentioned in the title: to find expressions for the matrix elements, on the one hand, and, on the other hand, good results serve as argument for the primary conditions on the analytic behavior of the amplitudes in these processes. As is shown by the present work, well verified formulas are obtained by considering the closest singularities of the S-matrix. In addition, prospects are outlined for improving these formulas. The three reactions

$$\pi^- + p \longrightarrow \pi^+ + \pi^- + n; \qquad (1)$$

$$\pi^- + p \longrightarrow \pi^0 + \pi^0 + n; \qquad (2)$$

$$\pi^- + p \longrightarrow \pi^- + \pi^0 + p. \qquad (3)$$

Card 1/7

Matrix element of the reaction...

are examined and for simplifying the kinematic computations the nucleons are assumed to be scalar particles. p_1, p_2, p_3, p_4, and p_5 are the momenta of the π^+-meson, of the π^--meson (at the end of the reaction), of the neutron, of the π^--meson (at the initial stage of the reaction), and of the proton. The reaction (1) is described symbolically by $\hat{S} = \hat{1} + iA_1\delta(\sum p)/2\pi(\omega_1\omega_2\omega_3\omega_4\omega_5)^{1/2}$. The amplitude A_1 only depends on invariant combinations of the p_i. 15 invariants $u_{ik} = u_{ki} = (p_i + p_k)^2$ can be composed. The diagonal elements of the matrix u are related to the masses of the particles participating in the reaction by $u_{ii} = 4\,m_i^2$. The conservation of momentum imposes 5 relations on the remaining 10 invariants: $\sum_{T\neq k} u_{ik} = m_k^2 + \sum_l m_l^2$ $(k = 1,2,3,4,5)$. Thus 5 among 10 variables u_{ik} turn out to be independent. For an independent variable the authors choose the energy $s_1 = u_{23}$ in the center-of-mass system neutron -π-meson, the energy $s_3 = u_{12}$ in the center-of-mass system of the π^+- and π^--meson, the energy

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Matrix element of the reaction...

$s_3 = u_{13}$ in the center-of-mass system neutron and π^+-meson; u_{35} is chosen for the momentum transfer between the nucleons, and u_{14} for that between the mesons. As of late, the energy in the main channel of the reaction has been designated as $u_{45} = W$. In case of the threshold energy $W = (M + 2\mu)^2$ the following applies: $s_1^0 = s_2^0 = (M + \mu)^2$, $s_3^0 = 4\mu^2$. M and μ denote the masses of nucleons and mesons. If W exceeds the threshold energy the following applies: $s_{1,2} \geqslant (M + \mu)^2$, $s_3 \geqslant 4\mu^2$ and $s_1 + s_2 + s_3 = W + M^2 + 2\mu^2$ is positioned within the region marked in Fig. 1 by broken lines. It is moreover the authors' aim to obtain linear terms of a matrix element expansion according to relative momenta of such particles as are participating in the reaction. It is assumed that expression

$$A_1(s_1 s_2 s_3) = A_1(s_1^0 s_2^0 s_3^0) + \frac{s_1 - s_1^0}{\pi} \int_{(M+\mu)^2}^{\infty} \frac{\sigma_1(s')\,ds'}{(s' - s_1^0)(s' - s_1 - i\varepsilon)} + \tag{4}$$

$$+ \frac{s_2 - s_2^0}{\pi} \int_{(M+\mu)^2}^{\infty} \frac{\sigma_2(s')\,ds'}{(s' - s_2^0)(s' - s_2 - i\varepsilon)} + \frac{s_3 - s_3^0}{\pi} \int_{4\mu^2}^{\infty} \frac{\sigma_3(s')\,ds'}{(s' - s_3^0)(s' - s_3 - i\varepsilon)},$$

Card 3/7

Matrix element of the reaction...

represents a good approximation of A_1 near the threshold. σ_1, σ_2, and σ_3 are determined from the unitarity condition. In (4) the closest singularities are taken into account; not however the pole terms of the form $(s_1 - s_1^0)/(s_i - M^2)(s_i - M^2)$ nor the dependence of A_1 on the momentum transfer u_{ik}, which is, however, admissible in the approximation wanted in this case. It is shown that the assumption of A_1 being analytic with respect to the variables u_{ik} in the range of their values is justified. Finally the authors obtain

$$A_1(s_1s_2s_3) = A_1(s_1^0s_2^0s_3^0) + i\sigma_1(s_1) + i\sigma_2(s_2) + i\sigma_3(s_3) + \sum_{l=1}^{3} \frac{s_l - s_l^0}{\pi} \int \frac{\sigma_l(s')}{(s' - s_l^0)} \mathcal{P} \frac{ds'}{s' - s_l}. \quad (5)$$

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Matrix element of the reaction...

and

$$\sigma_1(s_1) = \frac{k_{23}}{\sqrt{k_{23}^2+\mu^2}+\sqrt{k_{23}^2+M^2}} A_1 f_S^+(\pi^- n \to \pi^- n); \quad (6a)$$

$$\sigma_2(s_2) = \frac{k_{13}}{\sqrt{k_{13}^2+\mu^2}+\sqrt{k_{13}^2+M^2}} (A_1 f_S^+(\pi^+ n \to \pi^+ n) + A_2 f_S^+(\pi^+ n \to \pi^0 p)); \quad (6б)$$

$$\sigma_3(s_3) = \frac{k_{12}}{2\sqrt{k_{12}^2+\mu^2}} \left\{A_1 f_S^+(\pi^-\pi^+ \to \pi^-\pi^+) + \frac{1}{2} A_2 f_S^+(\pi^-\pi^+ \to \pi^0\pi^0)\right\}. \quad (6в)$$

$A_1(s_1^0 s_2^0 s_3^0)$ is the amplitude of the reaction (1) with $W = (M + 2\mu)^2$. In addition $1/(x'-x-i\varepsilon) = \mathcal{P}/(x'-x) + i\pi\delta(x'-x)$, where $\mathcal{P}$ is the symbol of the principal value. Due to the fact that the relation $s = s^0 \sim k^2$ applies to the expression figuring under the integral of (5), the integral terms can be neglected and

$$A_1(s_1 s_2 s_3) = A_1(s_1^0 s_2^0 s_3^0) + i[\sigma_1(s_1) + \sigma_2(s_2) + \sigma_3(s_3)]. \quad (7)$$

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Matrix element of the reaction...

is obtained. Similar expressions can also be obtained for the reactions (2) and (3). (7) not only determines the amount of matrix elements but also their phase. The expression (4) leads automatically to correct expressions for the matrix elements with an accuracy up to the terms of second order of the relative moments. The authors thank A. A. Logunov and L. D. Solov'yev for discussions. There are 1 figure and 2 non-Soviet-bloc references.

ASSOCIATION: Matematicheskiy institut im. V. A. Steklova Akademii nauk SSSR (Institute of Mathematics imeni V. A. Steklov Academy of Sciences USSR)

PRESENTED: February 28, 1961, by N. N. Bogolyubov, Academician

SUBMITTED: February 23, 1961

Card 6/7

ACC NR: AP6025651 (A) SOURCE CODE: UR/0413/66/000/013/0101/0102

INVENTOR: Zhukov, Yu. A.; Maminov, Ye. K.; Yanushis, Yu. P.; Pavlov, V. P.

ORG: None

TITLE: A device for testing footwear under dynamic conditions. Class 42, No. 183467 [announced by the Military Academy of Rear Lines and Transportation (Voyennaya akademiya tyla i transporta)]

SOURCE: Izobretaniya, promyshlennyye obraztsy, tovarnyye znaki, no. 13, 1966, 101-102

TOPIC TAGS: footgear, test stand, wear resistance

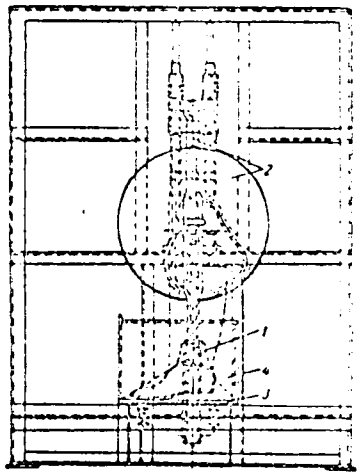
ABSTRACT: This Author's Certificate introduces: 1. A device for testing footwear under dynamic conditions. The unit consists of a movable last for the specimens of footgear to be tested, an attachment for controlling the pressure on the last, a drive with crankshaft, connecting rods and cam mechanism, removable abrasive surfaces and registration equipment. The machine components are mounted on a stand. The installation is designed for comprehensive testing of a number of properties of footgear, e. g. water resistance, sole durability and thermal insulation properties. The device is equipped with a platform which is driven with a reciprocating motion synchronized with that of the last. The abrasive surface or medium which interacts with

UDC: 620.16:685.31

Card 1/2

ACC NR: AP6025651

the footwear is located on this platform. 2. A modification of this device designed for testing performance characteristics both separately and in combination. Relay units are used for reciprocal connection of the starting and registration devices.



1--last; 2--drive;
3--abrasive surface;
4--platform

SUB CODE: 13, 15/ SUBM DATE: 10Mar65

Card 2/2

KOVTUN, G.P. [Kovtun, H.P.]; KRUGLYKH, A.A. [Kruhlykh, A.A.]; PAVLOV, V.S.

Determining the vapor pressure in metals from the vaporization rate. Ukr. fiz. zhur. 6 no.3:386-389 My-Je '61. (MIRA 14:8)

1. Fiziko-tekhnicheskiy institut AN USSR, g. Khar'kov.
(Vapor pressure)

PAVLOV, V.S.

IVANOV, V.YE., KRUGLYKH, A.A., PAVLOV, V.S., KOVTUN, G.P. AND ARCHONENKO, V.M.

"Measurment of the vapor pressure of uranium containing compounds."

Report presented at the IAEA Symposium on the Thermodynamics of Nuclear Materials.
Vienna, Austria 21-26 May 1962

L 17855-63 EWT(m)/BDS AFFTC/ASD

ACCESSION NR: AP3003692 S/0048/63/027/007/ 0895/0899

AUTHOR: Pavlov, V.S.; Danilyan, G.V.; Korol'kov, I.Ya.

58
54

TITLE: Refinement of the decay scheme for In^{116} /Report of the Thirteenth Annual Conference on Nuclear Spectroscopy held in Kiev from 25 January to 2 February 1963/

SOURCE: AN SSSR, Izv, Seriya fizicheskaya, v.27, no.7, 1963, 895-899

TOPIC TAGS: isotope activation, nuclear spectrometry, decay schemes, In^{116}

ABSTRACT: The primary purpose of the work was to evaluate the feasibility of using a closed loop activation system for studying the decay of short-lived nuclides by means of a magnetic gamma-spectrometer, in view of the fact that magnetic recoil spectrometers are characterized by high accuracy for obtaining energy and intensity values, but have the drawback of low efficiency, so that in the case of short-lived isotopes several activations are necessary to study the full spectrum. The activation loop consisted of two stainless steel tubes - one used as the source, the other located in the neutron flux near the core of a heavy-water reactor - a centrifugal circulating pump, an expansion chamber and appropriate stainless steel connecting tubing. The loop geometry was such that the irradiation time was about 20 sec; the transit time from irratiation tube to source tube about 8 sec; the full cycle

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L 17855-63
ACCESSION NR: AP3003692

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time 50 sec. The total volume of the system was about 5 liters. In^{115} was selected for the test experiments; neutron capture by this isotope results in formation of In^{116} in the ground state (T = 13 sec) and an isomeric state (T = 54 min). The material was circulated in the activation loop in the form of a water solution of $In(NO_3)_3$ (150 g per 5 liters water solution). The neutron and gamma background was attenuated by one B_4C and 10 steel blocks with a total length of 1500 mm. The gamma-ray spectrum of In^{116} was measured in the range from 0.7 to 1.8 MeV in 13 keV steps (10 min counting at each field value). The 13-sec activity was distinguished by damping ~~the~~ the reactor for 5 min intervals. The energies and intensities of the detected gamma-rays are tabulated together with the energy values reported by other authors. A refined decay scheme is presented (see Enclosure). "In conclusion we take this opportunity to thank N.A.Burgov for useful discussions and A.I.Zubkov and G.V.Rotter for assistance in the work." Orig.art.has: 1 formula, 4 figures and 1 table.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki Goskomitota po mirnomu ispol'zovaniyu atomnoy energii SSSR (Inst. of Theoretical & Experimental Physics, State Committee on Peaceful Uses of Atomic Energy, SSSR)

SUBMITTED: 00 DATE ACQ: 02Aug63 ENCL: 01
SUB CODE: NS, SD NO REF SOV: 002 OTHER: 007

Card 2/3

KOVTUN, G.P.; KRUGLYKH, A.A.; PAVLOV, V.S.

Electron gun for determining the evaporation rate of non-volatile materials. Prib. i tekh. eksp. 9 no.2:130-132 Mr-Ap'64. (MIRA 17:5)

1. Fiziko-tekhnicheskiy institut AN UkrSSR.

PAVLOV, V.S.

Heat exchange in zonal glass furnaces. Stek. i ker. 18 no.2:8-11 F '61. (MIRA 14:3)
(Glass furnaces) (Heat--Transmission)

PAVLOV, V.S.

Treatment of corn seeds with new growth promoting substances before planting. Zemledelie 24 no.1:69-71 Ja '62. (MIRA 15:2)

1. Leningradskiy sel'skokhozyaystvennyy institut.
(Corn (Maize)) (Growth promoting substances)

S/185/61/006/003/005/010
D208/D302

18 7500 1555, 1455, 1454

AUTHORS: Kruglykh, A A, Pavlov, V.S. and Tyshinskyy, G P

TITLE: Grain growth in chromium

PERIODICAL: Ukrayinskyy fizychnyy zhurnal, v. 6, no. 3, 1961, 394-397

TEXT: The study of grain growth in chromium is of practical interest in connection with the use of chromium as a heat-resistant material. In literature there are data on the recrystallization of chromium of various degrees of purity, but there are none concerning grain growth. V.I. Arkharov, F.I. Shangarev (Ref. 1: FMM, 6, no. 1, 82, 1958); S.T.M. Johnstone (Ref. 2: Nature, 181, 806, 1957). In the present study, grain growth was investigated under isothermal annealing for the purpose of determining the rate of growth and the activation energy. Chromium was used with an admixture as specified in the table. The specimens were made of plates which were obtained by condensation in a high vacuum ($1 \cdot 10^{-6}$ mm Hg), on a tantalum surface at 500°C. The plates were rolled at room temperature so as

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Grain growth in chromium

to thin them by 30%. Then they were annealed for 10 hours in a vacuum at 900°C. Thus a near-equilibrium structure was obtained. The author stresses the fact that after the treatment the width of the dendrites was reduced from 50 to 30 μ (microns). After annealing at 900°C, the plates were again rolled at room temperature, and the growth was investigated (by metallographic methods) after annealing at temperatures of 900, 950, 1000, 1050 and 1100°C. The results show that the thermal fluctuations are greater at high temperatures than at low, and they lead to centers of recrystallization which are more numerous at 1100°C than at 1060°C. This explains the fact that the average size of the grains is smaller at 1100°C than at 1050°C. The linear dependence of D^2 on time shows that grain growth in chromium follows the statistical law $D^2 - D_o^2 = Kt$ (1) where $K = K_o e^{-\frac{Q}{RT}}$ (2). D_o - diameter of grain at $t = 0$, K - rate of growth, Q - activation energy which is numerically equal or nearly equal to the activation energy of self-diffusion at the boundaries of the grains, K_o equals 1 cm^2/sec in the investigated temperature range. D_o^2 was obtained by extrapolation. The rate of

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growth at various temperatures was calculated by Eq (1). The temperature dependence of K in coordinates $\lg K - \frac{1}{T}$ was linear. The obtained value of the energy of activation was 53 ± 5 kcal/g.atom, which is in agreement with B.S. Bokshtein, S.T. Kishkin (Ref. 5: Zav. Lab., 23, no. 3, 316, 1957) and Gondolf Pakston (Ref. 6: Arch. Eisenhüttenwesen, 30, no. 1, 55, 1959). The equations were taken from D. Burke, U. Tarnball (Ref. 3: UFM, 1, 368, 1956) and P. Feltham, (Ref. 4: Acta.Met., 6,.no. 8, 539, 1958). There are 4 figures, 1 table and 7 references: 3 Soviet-bloc and 4 non-Soviet-bloc. The references to the English-language publications read as follows: S.T.M. Johnstone, Nature, 180, 806, 1957; P. Feltham, Acta Met., 6, No. 8, 539, 1958.

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

SUBMITTED: July 1, 1960

Card 3/4

PAVLOV, U.S.

USSR/Solid State Physics - Mechanical Properties of Crystals and Poly-Crystalline Compounds E-9

Abs Jour : Ref Zhur - Fizika, No 1, 1958, 1083

Author : Gaydukov, M.G., Pavlov, U.A.

Inst : Institute of Physics of Metals, Ural' Branch Academy of Sciences, USSR.

Title : Relaxation of Stresses in Alloys of Aluminum with Magnesium.

Orig Pub : Fiz. metallov i metallovedeniye, 1957, 4, No 1, 123-130

Abstract : An investigation was made of the relaxation of stresses in alloys of aluminum with magnesium at a temperature range from 100 to 300 C with initial stresses of 300 g/mm^2. It was established that there is an increases in the relaxation stability of Al-Mg alloys, compared with pure aluminum. The increase in the relaxation stability is

Card 1/3

PAVLOV, V. S.

SEVERUD, Fred, M.; MERRILL, Anthony; SEMENOV, Yu.V. [translator]; D'YAKONOV, A.I., [translator]; LYUBIMOV, S.A. [translator]; VOLODIN, M.V., [translator]; RUSANOV, P.I., redaktor; PAVLOV, V.S., redaktor; GERASIMOV, Ye.S., tekhnicheskiy redaktor

[Protection for people, buildings and equipment from the atomic bomb. Translated from the English.] Protivoatomnaia zashchita liudei, zdanii i oborudovaniia. Perevod s angliiskogo IU.V.Semenova i dr. Moskva, izd-vo inostrannoi lit-ry, 1955. 292 p. (MLRA 9:3)

(Building, Bombproof) (Atomic bomb--Safety measures)

PAVLOV V.S.

ALIPOV, N.V. [translator]; LUSHNOV, N.P., red.; PAVLOV, V.S., red.; IOVLEVA, N.A., tekhn.red.

[Nuclear weapons. Translated from the English] Atomnoe orushie. Pod red. N.P.Lushnova. Moskva, Izd-vo inostr. lit-ry, 1957. 71 p. (MIRA 11:4)

1. Scotland. Home Department.
(Atomic weapons)

LAWSON,D.I.; ALIPOV,N.V. [translator]; PAVLOV,V.S., redaktor; BELEVA, M.A., tekhnicheskiy redaktor

[Fire and the atomic bomb. Translated from the English] Atomnaia bomba i pozhary. Perevod s angliiskogo N.V.Alipova. Moskva, Izd-vo inostrannoi lit-ry, 1955. 44 p. (MLRA 9:3)
(Atomic bomb)

STEPANENKO, M.G., doktor tekhn.nauk, prof.; PAVLOV, V.S.

Method of calculating tank glass furnaces with developed working end arrangements. Stek. i ker. 19 no.3:1-6 Mr '62. (MIRA 15:3)
(Glass furnaces)

KOVTUN, G.P. [Kovtun, H.P.]; KRUGLYKH, A.A. [Kruhlykh, A.A.]; PAVLOV, V.S.

Vapor pressure and the evaporation coefficient of nickel. Ukr. fiz.zhur. 7 no.4:436-438 Ap '62. (MIRA 15:8)

1. Fiziko-tekhnicheskiy institut AN UkrSSR, g. Khar'kov.
(Nickel) (Vapor pressure)

PAVLOV, V.S.; DANILYAN, G.V.; KOROL'KOV, I.Ya.

More precise definition of the In^{116} decay scheme. Izv. AN SSSR. Ser. fiz. 27 no.7:895-899 '63. (MIRA 16:8)

1. Institut teoreticheskoy i eksperimental'noy fiziki Gosudarstvennogo komiteta po mirnomu ispol'zovaniyu atomnoy energii SSSR.
(Indium isotopes--Decay) (Gamma-ray spectrometry)

PAVLOV, Ye.S.

Deep faults and the distribution of enodgenic mineralization in the Maritime Territory. Sov.geol. 7 no.2:18-29 F '64. (MIRA 17:3)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut mineral'nogo syr'ya.

ACC NR: AP6036452 SOURCE CODE: UR/0370/66/000/006/0169/0172

AUTHORS: Kruglykh, A. A. (Khar'kov); Pavlov, V. S. (Khar'kov); Smirnov, Yu. N. (Khar'kov)

ORG: none

TITLE: Oxidation of zone-refined cerium

SOURCE: AN SSSR. Izvestiya. Metally, no. 6, 1966, 169-172

TOPIC TAGS: cerium, cerium oxide, oxidation kinetics, oxidation

ABSTRACT: The oxidation kinetics of cerium was studied as a function of the purity of the metal. The experiments were carried out in the temperature region of 150 - 300C. The mass increase of specimens was determined after the method of V. Ye. Ivanov, A. A. Kruglykh, V. S. Pavlov, et al (Opredeleniye uprugostey parov uranosoderzhashchikh soyedineniy. Sb. Termodinamika yadernykh materialov, Vena, 1962, 735). In addition, the microstructure and x-ray structure of the surface of the oxidized specimens were determined. The experimental results are presented in graphs and tables (see Fig. 1). It was found that the oxidation of 99.3% pure cerium follows a linear oxidation law, that of zone-refined cerium (zone-refined up to 200C) follows a parabolic law. The oxidation of high temperature zone-refined cerium (zone-refined above 200C) follows a linear law. The complete combustion of compact 99.3% Ce occurs at 300C. It is concluded that the removal of low-valence type metals from

Card 1/2 UDC: 669.655.691

ACC NR: AP6036452

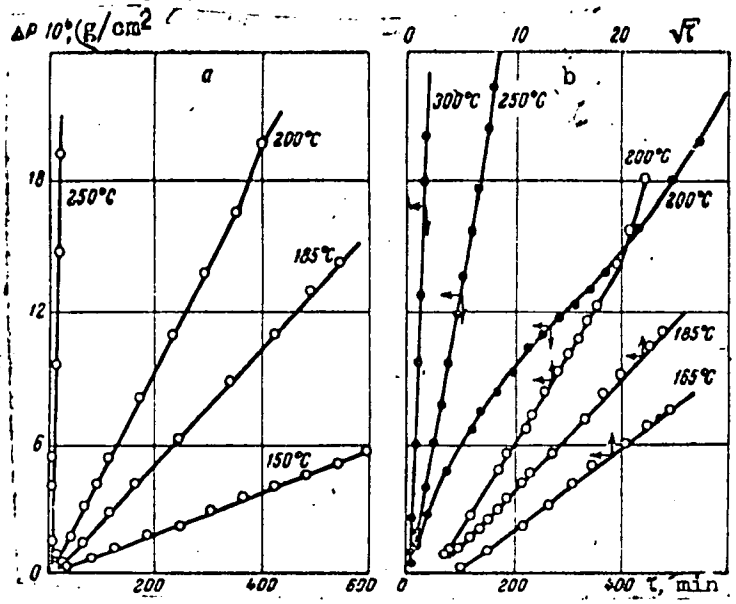

Fig. 1. Kinetic oxidation curves for the oxidation of 99.3% Ce. (a) - before and (b) - after zone-refining; ΔP - mass increase of specimen

cerium increases the stability of the metal towards corrosion. The authors thank G. N. Kartmazov for his help in the evaluation of the experimental results. Orig. art. has: 3 tables and 2 graphs.

SUB CODE: 11, 07 SUBM DATE: 16Apr65/ ORIG REF: 003/ OTH REF: 002

Card 2/2

15(2)
AUTHORS: Stepanenko M. G Pavlov V S. SOV/72-59 4 2/21

TITLE: On the Effect of a Blocking Device on the Thermal Balance of the Cooling Part of a Tank Furnace (Vliyaniye zagraditel'nogo ustroystva na teplovoy balans studochnoy chasti vannoy pechi)

PERIODICAL: Steklo i keramika 1959 Nr 4, pp 6-11 (USSR)

ABSTRACT: For the purpose of increasing the specific output of metal the melting temperature of the furnace must be increased Since the working temperature of the glass mass must, however, remain unchanged in this case, the processing part of the furnace had to be screened off However, it was found in this connection that the temperature of the flow of the glass mass to be processed was considerably lower. Since nothing else had been changed in the design of the furnace this could only be explained by the introduction of the lower colder glass mass into the flow to be processed which was confirmed by temperature measurements performed by the teplotekhnicheskaya laboratoriya Instituta stekla (Heat Engineering Laboratory of the Glass Institute) and foreign investigations (Ref 1) This might however, cause deterioration of the quality of the glass mass For this reason, investigations had to be carried

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out in order to find a design of screening which would guarantee an increased output of glass mass without a deterioration of the quality. In figures 1,2,3, and 4 the different types of furnaces with and without shuttle are shown and discussed The velocity of the upper layer of the glass mass was determined by using floats and the amount of the convection currents by using the A. A. Sokolov formula (Ref 2). In table 1 the technical and operational characteristics of the furnaces investigated are given and table 2 gives the thermal balances of the cooling parts of the tank furnaces In table 3 the balance of the glass mass in the range of the blocking devices of the furnaces is given Maximum specific temperature drops may be observed in tanks with deeply immersed shuttles and low screens This explains the opinions expressed by I I Tukh and M B Epel'baum (Ref 3) In table 4 the thermal balances of the flow to be processed in the range of the screening device of the furnaces investigated are given Figure 5 shows the dependence of the output of first-quality glass on the coefficient of the introduction of the metal. The investigations carried out of the furnace output as well as the operational

On the Effect of a Blocking Device on the Thermal Balance of the Cooling Part of a Tank Furnace SOV/72-59 4-2 2

and technical values are considered to be a beginning of the investigations of a screening device which makes it possible to find an optimum design and optimum operational conditions for increasing the fusibility of the tank furnaces without risks The influence exercised by the blocking device on the quality of the production must also be thoroughly investigated There are 5 figures 4 tables and 4 references 3 of which are Soviet

Card 3/3

VILNIS, K.K.; POLLYAK, V.V.; PAVLOV, V.S.

Specific amount of glass output as an indicator of the productivity of tank furnaces. Stek.i ker. 17 no.3:9-14 Mr '60.
(MIRA 13:6)

(Glass furnaces) (Glass manufacture)

STEPANENKO, M.G.; PAVLOV, V.S.

Ways of improving the productivity of pot furnaces for plate glass.
Stek.i ker. 18 no.8:12-15 Ag '61. (MIRA 14:8)
(Glass furnaces)

L 11436-67 EWT(1)/FCC GW/GD

ACC NR: AT6021020 SOURCE CODE: UR/0000/65/000/000/0096/0100

AUTHOR: Pudovkin, I. M.; Pavlov, V. S.; Reshetov, B. P.; Ryazantsev, G. A.; Tanichev, A. A.

ORG: none

TITLE: Some results of observations of secular variations in the geomagnetic elements of Kamchatka

SOURCE: AN SSSR. Institut fiziki Zemli. Nastoyashcheye i proshloye magnitnogo polya Zemli (The present and past of the earth's magnetic field). Moscow, Izd-vo Nauka, 1965, 96-100

TOPIC TAGS: geomagnetic field, geomagnetic drift, secular variation

ABSTRACT: Local and regional characteristics of secular variations in the geomagnetic field on Kamchatka were studied experimentally in 1961 and 1962. Regional differences in the average annual values of D, H, and Z are shown in Fig. 1. From these differences isopores are constructed. The variations ranged for δD from -5.5 to + 2.4; for δH from 3 to 41γ; and for δZ from -19 to + 22γ. The quantity D was measured with an accuracy of $\pm$ 1'. I, H with $\pm$ 5γ, and Z with $\pm$ 13γ. All three elements (δD, δH, δZ) clearly show the zonal structure of secular variations which agrees with the general orientation of the basic tectonic structure of Kamchatka. Local anomalies are illustrated in Fig. 2. According to these results, a complex morphological

Card 1/4

L 11436-67

ACC NR: AT6021020

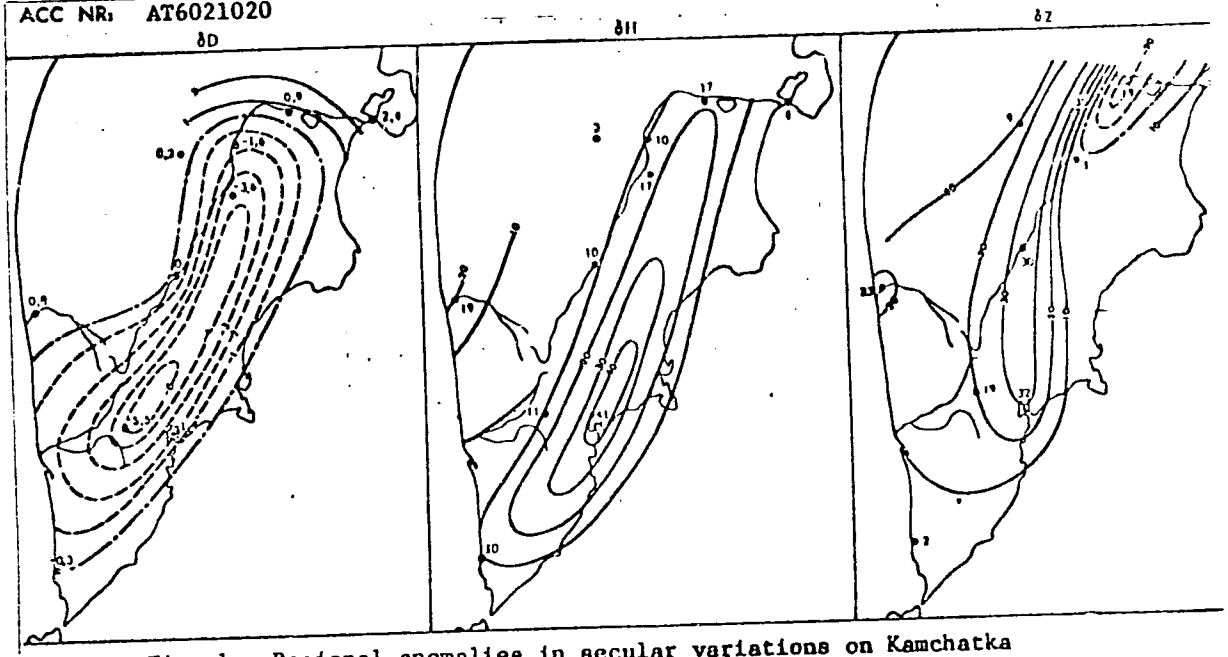

Fig. 1. Regional anomalies in secular variations on Kamchatka

Periods denote observation points; numbers near the periods show differences (1962-1961) for δD (in min), δH and δZ (γ)

Card 2/4

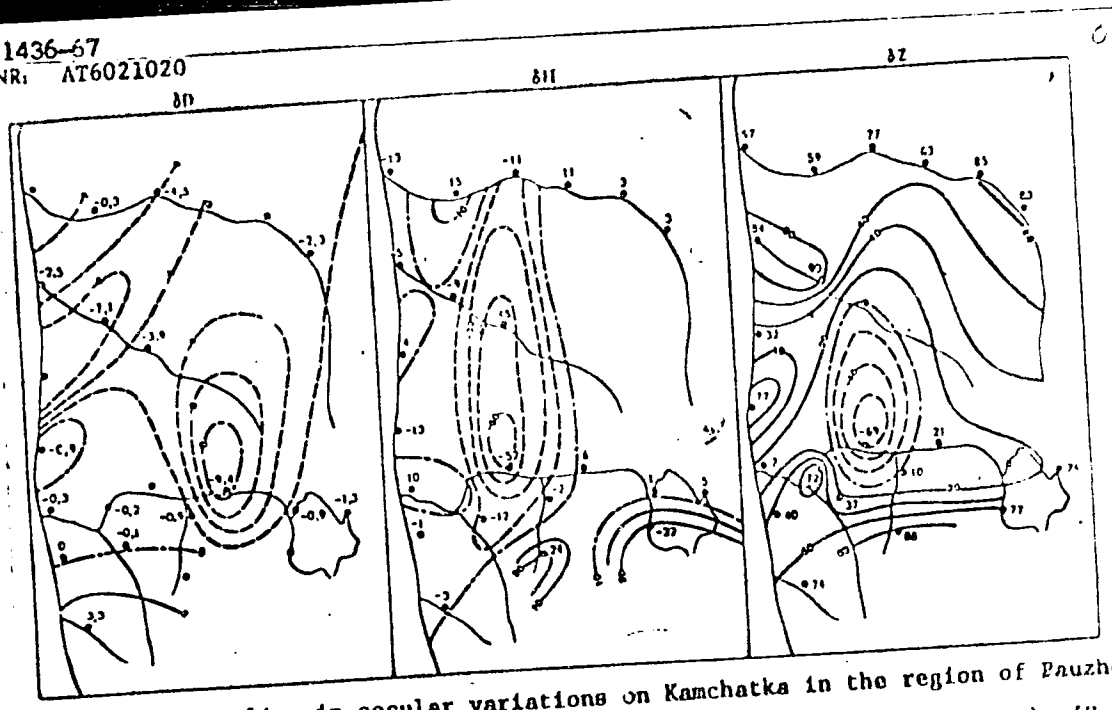

Fig. 2. Local anomalies in secular variations on Kamchatka in the region of Pauzhetka

Periods denote observation points and differences (1962-1961) for δD (in min), δH and δZ (in γ)

Card 3/4

L 11436-67

ACC NR: AT6021020 O

structure of secular variations exists on Kamchatka. Both local and regional anomalies are present. Further studies into the anomalous character of secular variations by magnetodynamic methods are recommended. Orig. art. has: 2 figures.

SUB CODE: 08/ SUBM DATE: 21Sep65

Card 4/4

L 32607-66 EWT(m)/EWP(t)/ETI IJP(c) JD/JG/GD

ACC NR: AT6010591 SOURCE CODE: UR/0000/65/000/000/0163/0168

33

B+1

AUTHOR: Amonenko, V. M.; Kruglykh, A. A.; Pavlov, V. S.; D'yakov, I. G.; Balenko, E. P.

ORG: Physicotechnical Institute, AN SSSR (Fiziko-tekhnicheskiy institut AN SSSR)

TITLE: On the possibility of purifying cerium by zone recrystallization

SOURCE: AN UkrSSR. Fazovyye prevrashcheniya v metallakh i splavakh (Phase transformations in metals and alloys). Kiev, Naukova dumka, 1965, 163-168

TOPIC TAGS: metal zone refining, cerium, recrystallization, zone melting

ABSTRACT: The object of the study was to determine the distribution of impurities (lanthanides, silicon, magnesium, iron, and copper) in cerium during zone melting of the latter. The process was carried out at 3×10^{-6} mm Hg on cerium which had first been remelted for one hour at 1423K at the same pressure. The molten zone was produced by electron bombardment, and its travel rate was varied from 5 to 0.15 mm/min. The refining process turned out to be most efficient at a rate of 0.5 mm/min. However, zone melting is not effective in removing other rare earth metals from cerium. Iron, copper, and silicon impurities are driven to the end of the ingot and have a distribution coefficient $K < 1$. After ten passes, the iron content decreases by a factor of 5, and the silicon and copper contents decrease by a factor of 10. Magnesium is removed chiefly by vaporization as the zone moves

Card 1/2

Card

L 32066-66 EWT(m)/EWP(t)/ETI IJP(c) JD/JG

ACC NR: AP6013334 SOURCE CODE: UR/0363/66/002/004/0578/0581

AUTHOR: Amonenko, V.M.; Kruglykh, A.A.; Pavlov, V.S.; Mosova, L.N.

ORG: Physicotechnical Institute, Academy of Sciences UkrSSR (Fiziko-tekhnicheskiy institut Akademii nauk UkrSSR)

TITLE: Purification of cerium by electric transfer combined with zone melting

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 4, 1966, 578-581

TOPIC TAGS: cerium, metal zone refining, metal zone melting

ABSTRACT: To determine whether cerium can be purified by combining electric transfer with zone melting, molten cerium samples were refined by passing a current of 5.3 A/mm^2 in a vacuum for 50 — 150 hr. Iron, silicon, copper, and oxygen impurities were found to move to the cathode. The experiments were then repeated in helium; after 200 hr, the amount of impurities remaining in the cathodic and middle portions of the sample dropped below the sensitivity limit of spectral analysis. The samples were then subjected to zone melting, whose effectiveness was found to increase when an electric current (6 A/mm^2) was passed through the metal. The amount of impurities thus dropped from 0.245% in the

Card 1/2 UDC: 546.655

PAVLOV, V.S.

Application of growth promoting substances to corn. Bot.; issl. Bel. otd. VBO no.6:41-48 '64. (MIRA 18:7)

S/117/60/000/006/003/010
A004/A002

AUTHOR: Pavlov, V.S.

TITLE: Spiral Boring Tools

PERIODICAL: Mashinostroitel', 1960, No. 6, p. 21

TEXT: The author reports on new high-speed and carbide-tipped spiral boring tools which, in contrast to those manufactured abroad and by Soviet plants (e.g. "Frezer"), distinguish themselves by a more simple manufacturing technology. The new high-speed steel boring tools do not undergo mechanical tooling but are cast by the dispensable pattern method with insignificant tolerances for the grinding of the main back and auxiliary angles. For operations at higher rates and for the machining of materials with a higher degree of hardness, another tool design has been developed. This cutting tool has a monolithic carbide bit and is designated for the boring of 15-20 mm apertures and for threading operations. The tip is fastened with the aid of copper solder. Another design of spiral boring tool was developed for the machining of apertures in the range of 20-25 mm and more and for the cutting of internal threads. The tools are fitted with carbide bits of the T15-K6 grade (for steel) and BK-8 (VK-8) grade (for cast iron).

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S/117/60/000/006/003/010
A004/A002

Spiral Boring Tools

Since only the front edge of these bits is ground - the back angles of the tool are permanent as they form an Archimedean spiral and screw line - the life of these tools exceeds that of ordinary boring tools by 5 - 6 times and results in savings of carbide. The author describes a simple device for the grinding of spiral boring tools. There are 4 figures.

Card 2/2

L 51443-65 EPA(s)-2/EWT(m)/EPF(n)-2/EWP(t)/EWP(b) Pt-7/Pu-4 IJP(c)
JD/WW/JW/JG
ACCESSION NR: AP5011069 UR/0185/65/010/004/0432/0435

AUTHOR: Kruhlykh, A. A. (Kruglykh, A. A.); Kovtun, H. P. (Kovtun, G. P.); Pavlov, V. S.

TITLE: Saturated vapor tension of erbium, samarium, and ytterbium

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 10, no. 4, 1965, 432-435

TOPIC TAGS: vapor tension, erbium, samarium, ytterbium, rare earth element, effusion method, sublimation heat, sublimation entropy

ABSTRACT: Continuing an earlier investigation of the vapor tension of gadolinium and dysprosium (Ukr. fizychn. zh. v. 9, no. 10, 1964) the authors determine the saturated vapor tension of erbium, samarium, and ytterbium in the temperature ranges 915--1180, 484--721, and 390--494C respectively by the Knudsen effusion method, in which the difference between the weights of the effusion cell before and after the experiment is determined. The effusion chamber and the oven used to heat it are shown in Fig. 1 of the Enclosure. The experimental results fit well the following equations: $\log P_{мм} = 6.9 - (13230/T)$, $\log P_{мм} = 7.4 - (8703/T)$, $\log P_{мм} =$

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L 51443-65
ACCESSION NR: AP5011069

= 8.5 - (7745/T) for erbium, samarium, and ytterbium respectively. The sublimation heat of erbium, samarium, and ytterbium were determined on the basis of these equations to be 60.53, 39.8, and 35.4 Kcal/mol respectively. The respective sublimation entropies are 18.4, 20.7, and 25.6 cal/mol-deg. Orig. art. has: 2 figures, 2 formulas, and 5 tables.

ASSOCIATION: Fizyko-tekhnichnyyi instytut AN URSR, Kharkiv [Fiziko-tekhnichnyy institut AN UkrSSR, Khar'kov] (Physicotechnical Institute AN UkrSSR)

SUBMITTED: 11Jun64 ENCL: 01 SUB CODE: GP, TD

NR REF SOV: 002 OTHER: 003

Card 2/3

L 51443-65
ACCESSION NR: AP5011069

ENCLOSURE: 01

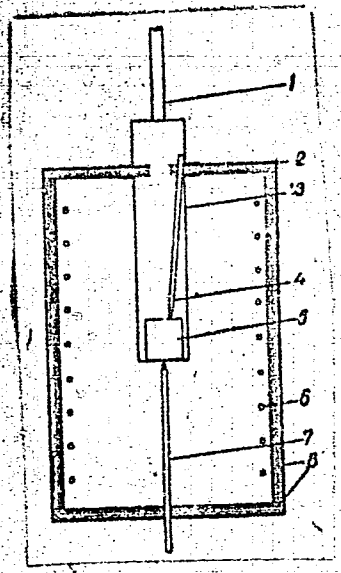

Fig. 1. Diagram of oven for effusion-chamber

1 - Movable rod, 2 - oven cover with screens, 3 - container for effusion chamber, 4 - Pt-PtRh thermocouple, 5 - effusion chamber, 6 - oven heater, 7 - chromel-alumel thermocouple, 8 - oven shield

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ACCESSION NR: AP4040990 S/0279/64/000/003/0158/0160

AUTHOR: Amonenko, V.M. (Kharkov); Krugly*kh, A.A. (Kharkov); Pavlov, V.S. (Kharkov); Tikhinskiy, G.F. (Kharkov)

TITLE: Evaporation rate of components in thermal dissociation of yttrium and lanthanum beryllides

SOURCE: AN SSSR. Izvestiya. Metallurgiya i gornoye delo, no. 3, 1964, 158-160

TOPIC TAGS: yttrium, yttrium beryllide, lanthanum, lanthanum beryllide, beryllide dissociation, beryllium vapor pressure, thermal dissociation

ABSTRACT: The evaporation rates of components of yttrium and lanthanum beryllides during thermal dissociation of yttrium beryllide at 1040—1290C and lanthanum beryllide at 1080—1270C have been determined. YBe_{13} and $LaBe_{13}$ beryllides were prepared by sintering 99.95%-pure beryllium powder with powders of 99.8%-pure yttrium or 99.4%-pure lanthanum. From the analysis of x-ray diffraction patterns, chemical analysis of the condensate, and calculated values of the vapor pressure of yttrium, beryllium, and lanthanum, it is concluded that both beryllides

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KRUGLYKH, A.A. [Kruhlykh, A.A.]; PAVLOV, V.S.; TIKHINSKIY, G.F. [Tykhins'kyi, H.P.]

Vapor pressure of solid yttrium. Ukr. Fiz. zhur. 9 no.2: 214-215 F'64 (MIRA 17:7)

1. Fiziko tekhnicheskiy institut AN UkrSSR, Khar'kov.

S/126/60/00 /01/ /0
E091/E1/1

AUTHORS: Kruglykh, A.A., [illegible], V.S. and Tikhinskiy, G.F.

TITLE: Recrystallization of Beryllium

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol , No 1, pp 14c-15? (USSR)

ABSTRACT: High-purity beryllium (99.9%), distilled in high vacuum was used in this work to investigate recrystallization. This beryllium contained the following impurities: 10^{-3}% Cu; 10^{-3}% Fe; 10^{-3}% Al; 10^{-3}% Mn; 10^{-4}% Ni, 2×10^{-3}% Si; 10^{-4}% Mg; [illegible] $\times 10^{-3}$% Ti and 1×10^{-3}% Cr. The specimens were made in the form of plates, 0.5 mm thick, by condensation of beryllium vapours in high vacuum (approximately 10^{-6} mm Hg) on a molybdenum heating at a temperature of 250 °C. In order to ensure uniform structure, the plates were subjected to deformation by 30% along the width by repeated rolling at room temperature in air (the reduction in area in each rolling was approximately 0.3%), followed by annealing at 700 °C for 15 hours. In order to study recrystallization, the specimens were again deformed by 35% along the width by rolling under the same conditions in two directions at

Card 1/2

[illegible]

S/126/60/00[illegible]/0[illegible]/0[illegible]/0[illegible]
E0[illegible]1/E[illegible]

Recrystallization of beryllium

right-angles to each other. The structure of the specimens after these treatments is shown in Figs [illegible] and Fig [illegible]. Fig [illegible] shows the dependence of the duration of the recrystallization process on the temperature of isothermal annealing after the final deformation. Fig 4 shows the dependence of the average grain diameter on the time of isothermal annealing in logarithmic coordinates. On the basis of the above experiments the activation energy of recrystallization of beryllium deformed by [illegible]% along its width was found to be 21 ± [illegible] kcal/g atom. The activation energy of grain growth in finely crystalline beryllium is [illegible] ± [illegible] kcal/g atom.

Card 2/2

There are [illegible] figures and [illegible] references, of which [illegible] are Soviet and 2 English.

ASSOCIATION: Khar'kovskiy fiziko-tekhnicheskiy institut AN USSR (Khar'kov Physico-Technical Institute, Ac. Sc. Ukr.SSR)

SUBMITTED: August 1[illegible], 19[illegible]

S/032/60/026/05/47/063
B010/B008

18.7400

AUTHORS: Amonenko, V. M., Kruglykh, A. A., Pavlov, V. S., Tikhinskiy, G. F.

TITLE: Manufacture of a Beryllium Foil

PERIODICAL: Zavodskaya laboratoriya, 1960, Vol. 26, No. 5, pp. 625-626

TEXT: Beryllium foils of a thickness of 20-300 μ are used for the manufacture of X-ray counter tube windows. With the existing methods for the manufacture of such foils there is the difficulty of obtaining foils which are sufficiently plastic at room temperature. A method according to which beryllium is deposited by vaporization on a polished molybdenum lamella in vacuum (approx. 10^{-6} mm Hg) is described. The beryllium is deposited by vaporization on the preheated molybdenum lamella from a BeO-crucible at 1300-1550°C in vacuum and then treated thermally (in vacuum). The dependence of the plasticity of the finished beryllium foil on its thickness (Fig. 1), on the temperature of condensation (Fig. 2) and the length of the thermal aftertreatment (Fig. 3) was investigated. Vacuum tight and plastic foils are obtained

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KRUGLYKH, A.A. [Kruhlykh, A.A.]; PAVLOV, V.S.; TIKHINSKIY, G.F. [Tykhins'kyi, H.P.]

Grain growth in chormium. Ukr. fiz. zhur. 6 no.3:394-397 My-Je '61. (MIRA 14:8)

1. Fiziko-tekhnicheskiy institut AN USSR, g. Khar'kov.
(Chromium--Metallography)

S/185/62/007/003/014/015
D299/D301

AUTHORS: Kovtun, H.P., Kruhlykh, A.A. and Pavlov, V.S.

TITLE: On determining the vapor pressure of metals by the rate of evaporation from a cylindrical crucible

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 7, no. 3, 1962, 336 - 337

TEXT: The dependence of the rate of evaporation on the ratio of the length to the diameter d of the crucible, was investigated for silver (= 0.15) and chromium (= 0.5); is the coefficient of evaporation. Molybdenum crucibles were used, with different /d. From a formula, obtained by the authors in an earlier investigation, it follows that if the ratio /d is sufficiently large, the vapor pressure can be determined by the formula

$$P = \frac{G}{S \cdot K}\sqrt{\frac{2\pi RT}{M}}. \qquad (2)$$

Card 1/3

where G is the rate of evaporation, S -- the evaporation surface and K -- Clausing's coefficient. A figure shows the dependence of the rate of evaporation on /d. It was found that, from a certain value of /d on, the rate of evaporation changes only insignificantly at constant temperature. There exists, for various metals, a certain ratio /d, for which the vapor pressure is expressed by formula (2). For chromium, this value is /d $\geq$ 8.5. In order to verify this assumption, the vapor pressure of chromium was measured at temperatures of 1200 - 1350°C. The evaporation took place simulataneously from 2 cylindrical crucibles, with /d = 8.5 and /d = 4.5, respectively. The rate of evaporation was found to be practically equal in both the long- and the short crucible. A figure shows the temperature dependence of the vapor pressure, calculated by the rate of evaporation from the crucibles with /d = 8.5. By processing the results by the method of least squares, the following equation for the vapor pressure of chromium in the temperature range of 1200-1350°C is obtained: $\lg P = 10.890 - 20830/T$, which is in good agreement with the results of other investigators. There are 2 figures, 1 table and 5 refer-

On determining the vapor pressure ...

ences: 4 Soviet-bloc and 1 non-Soviet-bloc. The reference to the Englisr language publication reads as follows: M.G. Rossman, J. Jarwood, J.Appl. Phys., 5, 7, 1954.

ASSOCIATION: Fizyko-tekhnichnyy instytut AN URSR (Physicotechnical Institute of the AS UkrRSR), Kharkiv

SUBMITTED: December 1, 1961

Card 3/3

37190
S/185/62/007/004/014/018
D407/D301

18.1150

AUTHORS: Kovtun, H. P., Kruhlykh, A. A., and Pavlov, V. S.

TITLE: Vapor pressure and evaporation coefficient of nickel

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 7, no. 4, 1962, 436-437

TEXT: The vapor pressure and the coefficient of evaporation of nickel were determined by the method of evaporation from a cylindrical crucible and by Knudsen's effusion method. The first method was described in an earlier work by the authors. Thereby, the vapor pressure was calculated by the formula

$$P = \frac{G}{S}\left[\frac{1}{K} - 1 + \frac{1}{\alpha}\right]\sqrt{\frac{2\pi RT}{M}} \quad ,$$

Card 1/3

observed. The results obtained by the first and second method were in good agreement. This led to the conclusion that the coefficient of evaporation of nickel does not differ appreciably from unity. There are 1 figure and 9 references: 4 Soviet-bloc and 5 non-Soviet-bloc. The 4 most recent references to the English-language publications read as follows: H. L. Johnston, A. L. Marshal, J. Amer. Chem. Soc., 62, 1382, 1940; G. Bryce, J. Chem. Soc., 1917, 1936; I. P. Hirth and G. M. Pound, J. Chem. Phys., 26, 1216, 1957; I. P. Hirth and G. M. Pound, J. Phys. Chem., 64, 619, 1960.

ASSOCIATION: Fizyko-tekhnichnyy instytut AN URSR (Physico-technical Institute of the AS UkrRSR), Kharkiv

SUBMITTED: September 23, 1961

Card 3/3

AMONENKO, V.M.; KOVTUN, G.P.; KRUGLYKH, A.A.; PAVLOV, V.S.

Absorption of air by aluminum oxide. Ukr. khim. zhur. 29 no.10:1109-1110 '63. (MIRA 17:1)

1. Khar'kovskiy fiziko-tekhnicheskiy institut AN UkrSSR.

ACCESSION NR: AP4033131 S/0120/64/000/002/0130/0132

AUTHOR: Kovtun, G. P.; Krugly*kh, A. A.; Pavlov, V. S.

TITLE: Electron-beam gun for determining rate of evaporation of low-volatility materials

SOURCE: Pribory* i tekhnika eksperimenta, no. 2, 1964, 130-132

TOPIC TAGS: electron beam gun, low volatility, low volatility material, vaporization rate, evaporation rate

ABSTRACT: Unlike J. Pierce's ideal system (J. Appl. Phys., 1940, 11, 548), the gun described in the present article has both cathode and anode in the form of two semiplanes at an angle of 135°. Three guns (see Enclosure 1) have a common anode 1 and separate cathodes 2 with moly lead-ins 3. Slits 4 (55x5 mm) serve to pass the electron beams, while slit 5 (40x6 mm) is intended for viewing. Channels 6 pass cooling water. Max electron current, 1-1.5 amp

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ACCESSION NR: AP4033131

at 8-10 kv. Specimens of up to 8 x 30 mm are acceptable. Tungsten and graphite specimens were heated up to 3,000C. The gun is recommended for studying the evaporation rate, vapor pressure, recrystallization, cyclic thermal treatment, and other high-temperature problems. Orig. art. has: 2 figures and 1 table.

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

SUBMITTED: 30May63 DATE ACQ: 11May64 ENCL: 01

SUB CODE: PH NO REF SOV: 000 OTHER: 003

Card 2/2

ACCESSION NR: AP4029844 S/0279/64/000/002/0177/0179

AUTHOR: Kovtun, G. P. (Khar'kov); Krugly*kh, A. A. (Khar'kov); Pavlov, V. S. (Khar'kov)

TITLE: Vapor pressure of solid beryllium

SOURCE: AN SSSR Izv. Metallurgiya i gornoye delo, no. 2, 1964, 177-179

TOPIC TAGS: vapor pressure, beryllium, evaporation, Langmuir method, Knudsen method, sublimation

ABSTRACT: Since the purity and technology of beryllium have been improved, it has become necessary to know the temperature dependence of vapor pressure for the purest types. The authors have determined the vapor pressure of beryllium the over-all purity of which considered non-metallic impurities at not less than 99.95%. The Fe, Si, Al, Cr, and Ni impurities did not exceed 0.001% for each component. The calculation for the vapor pressure was conducted by the following formula (using Knudsen's method)

$$P = \frac{G}{K}\sqrt{\frac{2\pi RT}{M}} \qquad (1)$$

ACCESSION NR: AP4029844

in Langmuir's method $$P = \frac{G}{\alpha}\sqrt{\frac{2\pi RT}{M}} \qquad (2)$$

where P is the vapor pressure, G is the vaporization rate; K is Clausing's coefficient α is the vaporization coefficient. Orig. art. has: 3 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 13Jul63 DATE ACQ: 30Apr64 ENCL: 00

SUB CODE: ML NO REF SOV: 000 OTHER: 003

Card 2/2