

USSR

UDC 669.14.018.821

OKENKO, A. P., Candidate of Technical Sciences, KUL'KOVA, M. N., Engineer,
and CHERNYSHOV, G. V., Krasnyy Oktyabr' Plant

"Investigation of the Causes of Reduced Ductility in Ingots of Steel 08Kh19N10B"

Moscow, Stal', No 10, Oct 73, pp 934-935

Abstract: A comparative study of the microstructure and phase composition of sound and defective metal showed that failure during rolling in the range 1050-1180° C occurs by the stratification of lamellar phases of niobium carbonitrides and niobium oxides. In a defect-free metal there is only niobium carbonitride, which is thinner with a smaller number. The presence of niobium oxides testifies to the inadequate deoxidation with aluminum. A large quantity of the carbonitride phase is precipitated also in the 800-600° C interval as a result of soaking the ingots prior to setting. Addition of powdered aluminum during the refining period and guaranteed setting at 800° C made it possible to increase the hot ductility of 08Kh19N10B steel during rolling. I. I. TETERIN and V. I. KONONENKOV, Engineers, participated in this work. One figure, three bibliographic references.

1/1

- 49 -

Marine and Shipbuilding

USSR

UDC: 624.131.43+539.21.084-492.3

VDOVICHENKO, L. L., CHERNYSHOV, S. I.

"Experimental Investigation of the Effect Which the Size of the Specimen Has on the Compression Strength of Sea Ice"

V sb. Seysmostoykost' gidrotekhn. i port. sooruzh. Primor'ya. Ch. 1
(Seismic Resistance of Hydraulic and Port Structures of the Coastal Region--collection of works, Part 1), Vladivostok, 1971, pp 247-253
(from RZh-Mekhanika, No 7, Jul 72, Abstract No 7V545)

Translation: Experiments are done on compression of cubes of sea ice measuring 10, 20, 30, 45 and 60 cm on an edge. The salinity of the ice was from 4.3 to 8.3%, and the temperature of the specimens was about 4°C. The loading diagrams were similar for specimens of different sizes. Each such diagram consists of branches of rise and fall in loads. The duration of the rise in loads was as a rule 2.5 times that of the load fall-off. There was an increase in the time of rise and fall of loading with an increase in the dimensions of the specimen.

An appreciable reduction in compression strength is noted with an increase in specimen dimensions. For instance the 10-cm cubes had an

USSR

VDOVICHENKO, L. L., CHERNYSHOV, S. I., Seysmostoykost' gidrotekhn. i port. sooruzh. Primor'ya. Ch. 1, Vladivostok, 1971, pp 247-253

average compression strength of $19.3 \text{ kg}\cdot\text{cm}^{-2}$, which decreased to $3.2 \text{ kg}\cdot\text{cm}^{-2}$ for 45-cm cubes. A comparison of the rules governing change of strength of sea-water and fresh-water ice showed that the strength of sea ice decreases more intensively with an increase in the dimensions of the specimen than does the strength of fresh-water ice. It is concluded in this connection that the scale effect for sea ice cannot be estimated from relations found in studying river ice. K. F. Voytkovskiy.

2/2

Stress Analysis and Stability Studies

USSR

UDC 539.4:624

MIKHAYLOV, A. A., YELSUKOV, V. A., CHERNYSHOV, S. I.

"Actual Work of Masonry Walls Subjected to Seismic Effects"

V sb. Materialy 2-y Nauch.-tekhn. konferentsii Dal'morniproyekta (Materials of the Second Scientific and Technical Conference of Dal'morniprojekt), Vladivostok, 1971, pp 47-60 (from RZh-Mekhanika, No 10, Oct 71, Abstract No 10V632)

Translation: The article is devoted to experimental studies of the carrying capacity and deformations when compressed and uncompressed masonry courses of 40 x 120 mm blocks in grade 10 mortar are subjected to a horizontal load. Single-story models were made in the form of two walls measuring 300 x 300 x 40 mm with an inside spacing of 320 mm. Reinforced concrete plates served as floor and roof. Horizontal displacements of the floor plate were prevented by fastening it to a special metal frame. Vertical compression of the masonry was created by tension on rods 3 and 5 mm in diameter arranged in pairs outside of the masonry and on the inside surface of the walls. The tension was checked by strain gauges

1/2

USSR

MIKHAYLOV, A. A. et al., Materialy 2-y Nauch.-tekhn. konferentsii Dal'-morniiproyekta, Vladivostok, 1971, pp 47-60

with a 50 mm base cemented to the rods. Horizontal forces in the models were applied at the roof plate level both in the plane of the walls and perpendicular to them. It was found that vertical compression has an appreciable effect on the carrying capacity of the models. In the case of the 3 mm tension rods, no cracks appeared in the masonry until the model was destroyed. In the case of 5 mm tension rods, the structure was destroyed abliquely along the masonry joints. At the time of fracture, an increase was observed in horizontal deformations of models with tension rods by a factor of 9, and in the carrying capacity by a factor of 5.5 as compared with an uncompressed model. It is concluded that vertical compression of masonry walls has an overall positive effect on their carrying capacity. A. V. Cherkashin.

2/2

- 74 -

USSR

UDC: 621.373:530.145.6

POKROVSKIY, Ye. N., CHERNYSHOV, V. A.

"Experimental Study of Helium-Neon Laser Discharge in the Low Current Region"

Elektron. tekhnika. Nauchno-tekhn. sb. Elektron. SVCh (Electronic Technology. Scientific and Technical Collection. SHF Electronics), 1970, vyp. 8, pp 40-47 (from RZh-Radiotekhnika, No 11, Nov 70, Abstract No 11D278)

Translation: An investigation is made of the effect which the ballast resistance, shunting capacitance, length of the anode lead, length and diameter of the capillary and design of the active medium in a laser have on the minimum current of stable discharge arcing. Discharge instability in the low-current region is due to the development of oscillations in the plasma.
Resumé.

1/1

Psychology

USSR

UDC: 591.185.1:678.083

CHERNYSHEV, V. B., Chair of Entomology, Moscow State University

"Psychological Errors in Determining the Orientation of Living Objects"

Moscow, Zhurnal Obshchey Biologii, Vol 31, No 6, Nov/Dec 70, pp 742-748

Abstract: The orientation of living objects in relation to natural and artificial magnetic fields and polarized light was studied. The methods used involved: 1) determining the orientation of the object during an experiment in which the direction of the body axis and the angle of orientation were simultaneously measured against a round scale with north-south and east-west axes, 2) determining orientation during the experiment by fixation of the direction of the body axis in the form of a straight line, and measuring the orientation angles at the conclusion of the experiment using the round scale as the standard; 3) determining orientation by the so-called photography method, in which the direction of the body axis is determined by an outline of the object on a horizontal plane, and the orientation angles are measured simultaneously with determination of the direction of the body axis or after preliminary fixation of this direction. Dermestid beetles (*Dermestes sibiricus* Er.) and sunflower seeds were used as experimental objects. The objects were placed in Petri dishes with filter paper or rounded cardboard on which a round scale divided into degrees along the north-south and east-west axes

1/2

USSR

CHEPNYSHEV, V. B., Zhurnal Obshchey Biologii, Vol 31, No 6, Nov/Dec 70, pp 742-748

had been drawn. The experiments established errors, mainly of a psychological nature, which tended to distort the true picture of orientation. These errors were due primarily to the tendency of the results to concentrate in the area of the main axes of the round scale in the first method, practically random orientation in the second, and a similar accumulation of the results at every 5-10 degrees along the main axes in the third. The number of errors was smaller in the third method than in the other two. It was established that these methods cannot be used in scientific investigations where precise measurement results are sought.

2/2

USSR

UDC 624.07:534.1

CHERNYSHOV, V. N., PAVLOV, A. S.

"Experimental Study of Cylindrical Shells With an Initial Bend Under Combined Loading"

V sb. Prostranstv. konstruktsii v Krasnoyarsk. kraje (Three-Dimensional Structures in the Krasnoyarsk Region -- Collection of Works), Krasnoyarsk, 1972, pp 162-167 (from RZh-Mekhanika, No 3, Mar 73, Abstract No 3V309)

Translation: Qualitative results of an experimental study of the stability of smooth and waffled cylindrical shells with initial irregularities subjected to the action of a combination of external pressure and axial compression are presented. The waffled shells were prepared by the chemical milling method. Radial displacements were measured during the stepwise loading of the shell by a transducer of the potentiometric type. Initial and total bends were expanded into Fourier series and the amplitudes were obtained as functions of the external load for each of the harmonics. The value at which the rate of growth of the amplitude of one of the harmonics of the total bending became infinitely large was taken as the breaking load.

1/2

USSR
CHERNYSHOV, V. N., PAVLOV, A. S., Prostranstv. konstruktsii v Krasnoyarsk.
kraye, Krasnoyarsk, 1972, pp 162-167

It was established that the greatest effect on the magnitude of the breaking load out of the entire spectrum of initial defects is shown in the initial amplitude of the resonance harmonic. O. I. Terebushko.

2/2

- 119 -

USSR

UDC 624.07:534.1

CHERNYSHOV, V. N.

"Iteration Algorithms for Studying the Subcritical State of a Rod With an Initial Bend"

V sb. Prostranstv. konstruktsii v Krasnoyarsk. kraye (Three-Dimensional Structures in the Krasnoyarsk Region -- Collection of Works), Krasnoyarsk, 1972, pp 167-174 (from RZh-Mekhanika, No 3, Mar 73, Abstract No 3V328)

Translation: The possibility of the linearization of nonlinear differential equations for the equilibrium of elastic systems by an iteration process in matrix form with the substitution of an inverse nonsingular Jacobi matrix by an inverse matrix of the linearized equations is noted. An algorithm is constructed on this basis for solving a nonlinear differential equation expressing the subcritical state of a compressed rod with an initial bend. Comparative results of a solution obtained on the Minsk-22 computer on solving this problem in the nonlinear and linear formulation are presented and discussed, and represented in the form of graphs in dimensionless coordinates as a function of the initial bend and the compressive force. A. F. Anishchenko.

1/1

USSR

UDC 621.396.6-181.48

GORLOV, M. I., YEROKHIN, V. S., NEKRASOV, V. A., and CHERNYSHOV, V. V.

"Character of the Changes in the Noise Properties of DTL Type (Diode-Transformer Logical) Integrated Circuits Depending on Type of Testing"

Sb. tr. po poluprovodnikovym materialam, priboram i ikh primeneniyu (Collected Works on Semiconductor Materials, Instruments and Their Use), Voronezh, 1971, pp 182-188 (from RZh-Radiotekhnika, No 11, Nov 72, Abstract No 11 V223)

Translation: The authors analyze the results of tests performed on four sets of microcircuits with approximately the same noise level values for each set. The microcircuits were subjected to various types of influences: effect of humidity, thermocycling, tests for cold and heat resistance, and, in addition, all microcircuits were subjected to testing for 500 hours with respect to operational reliability at +125° under switching conditions. Original article: five illustrations, one bibliographic entry. N.S.

1/1

- 95 -

AA0043503

Chernyshov, U.A.

UR 0482

Soviet Inventions Illustrated, Section I Chemical, Derwent, 1-70

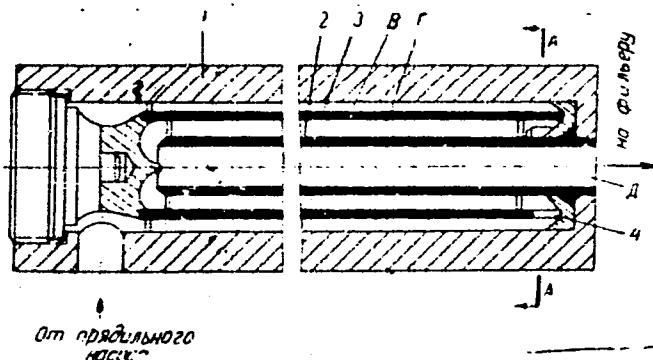
223991 IMPROVED HOMOGENEITY OF POLYMER MELTS
 for synthetic yarns is ensured by incor-
 porating a nozzle, consisting of two concentric
 finned tubes between the pump and the spinneret
 unit in a spinning block. The melt from the pump
 passes first into annular cavity B between the
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 This agitates the melt and heats it from both
 sides. During the passage of the melt, its film
 thickness is reduced and its viscosity equalised,
 ensuring a high degree of uniformity in all
 characteristics of the melt. The melt is then
 fed to the spinneret unit via cavity A
 5.5.67. as 1151538/28-12, SVIRID, S.A. et al.
 Synthetic Yarn Producing Machines Res. Inst.
 (20.11.68) Bul. 25/6.8.68. Class 29a, Int. Cl.
 D Old.

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19761895

AA0043503



AUTHORS: Svirid, S. A.; Semiletov, V. A.; Chernyshov, Yu. A.
Vsesoyuznyy Nauchno - Issledovatel'skiy Institut
Mashin dlya Proizvodstva Sinteticheskikh Volokon

24/3

19761896

USSR

UDC: 519.2

ADEL'SON-VEL'SKIY, G. M., BERKOVA, N. V., and ~~CHERNYSHOVA, I. I.~~

"Realization of a Method for Estimating the Error in the Determination of the Parameters of an Experimentally Specified Function of Many Variables"

Alma-Ata, v. sb. Vopr. obshch. i prikl. fiz. (Problems in General and Applied Physics--collection of works) "Nauka," 1972, pp 63-65 (from RZh--Matematika, 1972, No 6, Abstract No 6V137)

Translation: A description is given of algorithms and formulas of a program for computing a matrix of errors obtained in the processing of physical and chemical experiments. The most interesting part of the paper is the explanation of an approximation method for determining the matrix of second partial derivatives. Authors' abstract

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NITROGEN COMPOUND, ORGANIC SYNTHESIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
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STEP NO--UR/0409/78/000/004/0484/0488

CIRC ACCESSION NO--AP013-732

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USSR

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2/2

- 119 -

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CHERNYSHOV, V. N.

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USSR

UDC 621.396.6-181.48

GORLOV, M. I., YEROKHIN, V. S., NEKRASOV, V. A., and CHERNYSHOV, V. V.

"Character of the Changes in the Noise Properties of DTL Type (Diode-Transformer Logical) Integrated Circuits Depending on Type of Testing"

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Translation: The authors analyze the results of tests performed on four sets of microcircuits with approximately the same noise level values for each set. The microcircuits were subjected to various types of influences: effect of humidity, thermocycling, tests for cold and heat resistance, and, in addition, all microcircuits were subjected to testing for 500 hours with respect to operational reliability at +125° under switching conditions. Original article: five illustrations, one bibliographic entry. N.S.

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- 95 -

AA0043503

Chernyshov, Yu. A.

UR 0482

Soviet Inventions Illustrated, Section I Chemical, Derwent, 1-70

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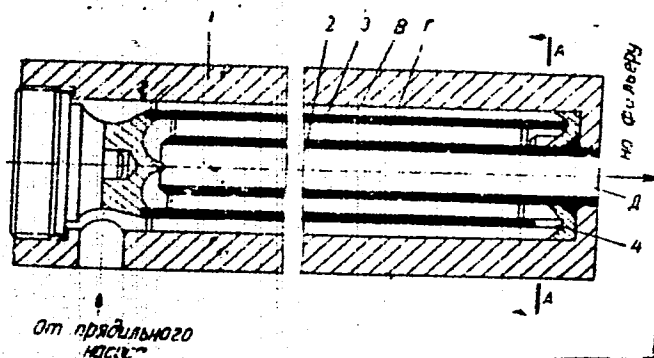
5.5.67. as 1151538/28-12, SVIRID, S.A. et al.
 Synthetic Yarn Producing Machines Res. Inst.
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19761895

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AUTHORS: Svirid, S. A.; Semiletov, V. A.; Chernyshov, Yu. A.
Vsesoyuznyy Nauchno - Issledovatel'skiy Institut
Mashin dlya Proizvodstva Sinteticheskikh Volokon

2/3

19761896

UDC: 519.2

USSR

ADEL'SON-VEL'SKIY, G. M., BEKETOVA, N. V., and CHERNYSHOVA, I. B.
"Realization of a Method for Estimating the Error in the Determination of the Parameters of an Experimentally Specified Function of Many Variables"

Alma-Ata, v. sb. Vopr. obshch. i prikl. fiz. (Problems in General and Applied Physics--collection of works) "Nauka," 1972, pp 63-65 (from RZh--Matematika, 1972, No 6, Abstract No 6V187)

Translation: A description is given of algorithms and formulas of a program for computing a matrix of errors obtained in the determination of deviations from estimates of parameters in the processing of physical and chemical experiments. The most interesting part of the paper is the explanation of an approximation method for determining the matrix of second partial derivatives.
Authors' abstract

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1/2 009 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--INDOLE CHEMISTRY. XV. CONVERSION OF ARYLHYDRAZONES OF DELTA
OXONITRILES INTO ALPHA CARBOLINES -U-
AUTHOR--(03)-YUDIN, L.G., KOST, A.N., CHERNYSHOVA, N.B.
COUNTRY OF INFO--USSR
SOURCE--KHIM. GETEROTSIKL. SOEDIN. 1970, (4), 484-8
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--INDOLE, ORGANIC NITRILE COMPOUND, HYDRAZONE, HETEROCYCLIC
NITROGEN COMPOUND, ORGANIC SYNTHESIS
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UNCLASSIFIED

2/2 009

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0134732

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A MIXT. OF 3.1 G
 4-METHYL,5-OXOCAPRONITRILE AND 2.7 G PHNHNH SUB2 WAS HEATED 3 HR ON A
 BOILING WATER BATH, THE SEPD. WATER REMOVED THE MIXT. EVAPD., 120 ML
 ACQH. ADDED TO THE RESIDUE, AND THE MIXT. REFLUXED 10 HR TO YIELD
 32.5PERCENT I (R EQUALS R PRIME3 EQUALS H, R PRIME1 EQUALS R PRIME2
 EQUALS ME), M. 262-3DEGREES (C SUB6 H SUB6); ACETYL DERIV. (R PRIME3) M.
 132-3DEGREES (ETOH). SIMILARLY WERE OBTAINED I (R, R PRIME1, R PRIME2,
 R PRIME3, M.P., AND PERCENT YIELD GIVEN): H, ME, H, H, 257-5DEGREES
 (SIC), 8; ME, ME, H, H, 260-2DEGREES, 7; ME, ME, ME, H, 268-9DEGREES,
 22.5; H, ME, H, AC, 110-11DEGREES, 93; ME, ME, H, AC, 121-2DEGREES, 85;
 ME, ME, ME, AC, 152-3DEGREES, 84. FACILITY: MOSK. GOS. UNIV.
 IM. LOMONOSOVA, MOSCOW,USSR.

UNCLASSIFIED

USSR

UDC 546.841.543.432.062

LUKIN, A. M., TITOV, V. I., (DECEASED), CHERNYSHOVA, T. V., and YEVDOKI-MOVA, N. N.

"Spectrophotometric Determination of Thorium with Chlorophosphonazo III in Phosphoric Acid"

Moscow, Zavodskaya Laboratoriya, Vol 39, No 10, Oct 73, pp 1174-1175

Abstract: In the determination of thorium with chlorophosphonazo III in phosphoric acid, the reaction takes place in the interval of 2-0.003 molar phosphoric acid with Beer's law observable up to concentrations of 20 micrograms/5 ml thorium for a reagent concentration of $2.5 \cdot 10^{-5}$ molar. This method makes it possible to increase the selectivity of thorium determination in comparison to Zr, Ti, Fe, and other metals and is also more selective than the method using hydrochloric acid. This method has been used for analysis of monazite ores. Two figures, one table, three bibliographic references.

1/1

Welding

USSR

UDC 621.791.75

CHERNYSHOVA, T. A., and KHUBRIKH, M. A.

"Intergranular Slippage in a Fused Zone of Welds Produced by the Electric Arc Under Continuous and Pulsed Welding Conditions"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 1, Jan/Feb 73, pp 120-123

Abstract: Uninterrupted welding of EI-435 alloy with tungsten electrodes in argon resulted in much more extensive slippage compared with pulsed welding. Slippage amounted to 1.09μ along the transverse grain boundaries and 1.07μ along the longitudinal boundaries of the central axial crystallites. These figures in the case of pulsed welding were 0.720μ and 0.590μ , respectively. The higher slippage produced by continuous welding is attributed to (1) much higher internal stresses within the high-temperature region, (2) slower cooling rate of the hardened metal, and (3) much smoother grain shapes. The intergranular slippage along transverse boundaries of crystallites grown next to the fused grains within the weld zone is larger than along the longitudinal grain boundaries. The shape of grains in both cases is determined by the cooling rate, which is much faster in the case of a pulsed welding.

1/1

UDC 621.791.052.01:548.5:669.245

USSR

SHORSHOROV, M. KH., Doctor of Technical Sciences, CHERNYSHOVA, T. A., Candidate of Technical Sciences, and LOSEVA, G. I., Engineer, Institute of Metallurgy imeni A. A. Baykov

"Grain Boundary Migration and Intergranular Slip in the Weld-Seam Metal of Nickel Alloy Joints"

Moscow, Svarochnoye Proizvodstvo, No 4, Apr 73, pp 6-8

Abstract: The effect of the type and concentration of alloying elements on the processes of boundary migration and intergranular slip was investigated in alloys of nickel with aluminum (up to 11 at. %) and niobium (up to 6.55 at. %). Alloying of nickel with Al and especially Nb lowers the slip magnitude. This is related to strengthening of the solid solution, i. e., to the increased shear strength in the grain volume and retardation of dislocation movement. Measurements of microhardness and lattice parameters showed that niobium strengthens the matrix more strongly than aluminum owing to large lattice distortions. Moreover, in the grains of the Ni-Nb solid solution, transverse slip is retarded in connection with the significant lowering of stacking fault energy. The effect of the type of alloying element on slip was also associated with grain boundary shape. In Ni-Al alloys the grain boundaries are even and smooth while in Ni-Nb alloys the Nb promotes formation of complex-

1/2

- 54 -

USSR

SHORSHOROV, M. KH., et al., Svarchnoye Proizvodstvo, No 4, Apr 73, pp 6-8

shape boundaries with a high degree of unevenness which prevent slip. Consequently, alloying of nickel with Nb helps prevent the formation of hot cracks for the reasons give above, while aluminum alloying increases growth of crack formation in relation to increased aluminum content. Two figures, 13 bibliographic references.

2/2

USSR

UDC 669:620.179.2

SHORSHOROV, M. Kh., ~~CHERNYSHOVA, T. A.~~, KRASOVSKIY, A. I.

"Testing of Metals for Weldability"

Ispytaniya Metallov na Svarivayemost' [English Version Above], Metallurgiya Press, Moscow, 1972, 240 pages.

Translation of Annotation: Weldability is one of the most important technological characteristics of a metal, used to evaluate its suitability for the manufacture of structures.

In this book, primary attention is given to methods of evaluating changes in the structure and mechanical properties of welded joints. Problems of the theory of phase and structural conversions, technological strength during welding, and various types of brittle rupture of welded joints are discussed. The criteria formulated for evaluation of weldability can be used to select methods, technologies, and modes of welding.

The book is designed for a broad range of engineers, technical personnel, and researchers involved in the development and production of structural materials and in the welding and heat treatment of metal structures. 125 Figures; 12 Tables; 151 Biblio. Refs.

Foreword

1/4

TABLE OF CONTENTS

5

USSR

SHORSHOROV, M. Kh., CHERNYSHOVA, T. A., KRASOVSKIY, A. I., Ispytaniya Metallov na Svarivayemost', Metallurgiya Press, Moscow, 1972, 240 pages.

Introduction	8
Chapter I. Structure and Properties of Welded Joints in Metals and Alloys	11
1. Phase and Structural Changes in Metals During Welding	11
2. Criteria for Selection of Technology and Mode of Welding and Subsequent Heat Treatment of Welded Joints	39
Chapter II. Methods of Estimating the Influence of Welding Mode and Subsequent Heat Treatment on Structure and Properties of Welded Joints	75
1. Methods of Studying Kinetics of Phase Conversions Under the Conditions of Thermal Cycles of Welding	76
2. IMET-1 Methods	84
3. Tests for Studying Influence of Technology and Mode of Welding on Properties and Structure of Zone of Thermal Effect	89
4. Testing of Resistance to Ageing	98
5. Methods of Determination of Mechanical Properties of Welded Joints	99
Chapter III. Tests of Welded Joints for Resistance to Formation of Hot Cracks	109
1. Mechanism and Condition of Formation of Hot Cracks	109

2/4

- 71 -

USSR

SHORSHOROV, M. Kh., CHERNYSHOVA, T. A., KRASOVSKIY, A. I., Ispytaniya Metallov na Svarivayemost', Metallurgiya Press, Moscow, 1972, 240 pages.

2.	Analysis of Methods of Determination of Resistance of Metal of Seam and Near-Seam Zone to Formation of Hot Cracks	113
3.	Methods of Mechanical Testing of Metals in the Brittleness Temperature Interval	115
4.	Determination of Resistance of Metal of Seam and Near-Seam Zone to Formation of Hot Cracks by Forced Deformation	117
5.	Technological Tests for Evaluation of Resistance of Welded Joints to Formation of Hot Cracks	132
6.	Some Examples of Estimation of Resistance of Alloys to Formation of Hot Cracks	147
Chapter IV. Testing of Welded Joints for Resistance to Formation of Cold Cracks		152
1.	Mechanism and Conditions of Formation of Cold Cracks During Welding	152
2.	Methods of Quantitative Evaluation of Resistance of Welded Joints to the Formation of Cold Cracks	159
3.	Technological Tests for Estimation of Resistance to Formation of Cold Cracks	164
4.	Comparison of Methods of Testing for Resistance to Formation of Cold Cracks	172

3/4

USSR
SHORSHOROV, M. Kh., CHERNYSHOVA, T. A., KRASOVSKIY, A. I., Ispytaniya
Metallov na Svarivayemost', Metallurgiya Press, Moscow, 1972, 240 pages.

Chapter V. Testing of Welded Joints for Resistance to Brittle Rupture	175
1. Basic Regularities in Formation and Development of Cracks	175
2. Criteria for Evaluation of Resistance of a Material to Formation and Development of Cracks	179
3. Methods of Testing of Resistance to Brittle Rupture Under Static Loading	185
4. Methods of Determination of Resistance to Brittle Rupture with Impact Loading	191
5. Methods of Initiation of Cracks in a Brittle Layer	197
6. Methods of Testing for Local Rupture of Metal in Near-Seam Zone with High Operating Temperature	203
7. Testing for Resistance to Corrosion Under Various Conditions	209
8. Examples of Estimating Resistance of Materials to Brittle Rupture	224
Chapter VI. Testing of Welded Units and Specimens of Standard Structures Under Conditions Imitating Operating Conditions	227
Bibliography	237

4/4

Welding

UDC 621.791.011

USSR

KANTOR, M. M., CHERNYSHOVA, T. A., IGNATOV, D. V., and
SHORSHOROV, M. KH., Moscow

"Electron Microscope Study of the Structure of Welded Joints
of the Alloy TsM-2A"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 2, Mar-Apr 71,
pp 97-100

Abstract: Electronmicroscope studies were made of the structure of welded joints of TsM-2A alloy, made by cathode ray welding in various modes. It is demonstrated that processes of crystallization of the welding bath and decomposition of the solid solution in the cast zone of welded joints can be controlled by changing the thermal cycles of welding. Decomposition of the solid solution with separation of molybdenum carbide along the grain boundaries was found in the cast formation of the second phase depends on the thermal cycles of welding. Decreasing the chemical heterogeneity of the cast metal by welding in severe modes or by holding at temperatures above the phase separation point can be used to prevent formation of the second phase.

1/1

welding

USSR

DEC 691.791.75

CHERNYSHOVA, T. A., and KHEBRIKH, M. A.

"Intergranular Slippage in a Fused Zone of Welds Produced by the Electric Arc Under Continuous and Pulsed Welding Conditions"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 1, Jan/Feb 73, pp 130-133

Abstract: Uninterrupted welding of EI-435 alloy with tungsten electrodes in argon resulted in much more extensive slippage compared with pulsed welding. Slippage amounted to 1.09μ along the transverse grain boundaries and 1.07μ along the longitudinal boundaries of the central axial crystallites. These figures in the case of pulsed welding were 0.72μ and 0.59μ , respectively. The higher slippage produced by continuous welding is attributed to (1) much higher internal stresses within the high-temperature region, (2) slower cooling rate of the hardened metal, and (3) much smoother grain shapes. The intergranular slippage along transverse boundaries of crystallites grown next to the fused grains within the weld zone is larger than along the longitudinal grain boundaries. The shape of grains in both cases is determined by the cooling rate, which is much faster in the case of a pulsed welding.

USSR

SHORSHOROV, M. KH., et al., Svarochnoye Proizvodstvo, No 4, Apr 73, pp 6-8

shape boundaries with a high degree of unevenness which prevent slip. Consequently, alloying of nickel with Nb helps prevent the formation of hot cracks for the reasons give above, while aluminum alloying increases growth of crack formation in relation to increased aluminum content. Two figures, 13 bibliographic references.

2/2

USSR

UDC 669:620.179.2

SHORSHOROV, M. Kh., CHERNYSHOVA, T. A., KRASOVSKIY, A. I.

"Testing of Metals for Weldability"

Ispytaniya Metallov na Svarivayemost' [English Version Above], Metallurgiya Press, Moscow, 1972, 240 pages.

Translation of Annotation: Weldability is one of the most important technological characteristics of a metal, used to evaluate its suitability for the manufacture of structures.

In this book, primary attention is given to methods of evaluating changes in the structure and mechanical properties of welded joints. Problems of the theory of phase and structural conversions, technological *strength during welding, and various types of brittle rupture of welded joints* are discussed. The criteria formulated for evaluation of weldability can be used to select methods, technologies, and modes of welding.

The book is designed for a broad range of engineers, technical personnel, and researchers involved in the development and production of structural materials and in the welding and heat treatment of metal structures. 25 Figures, 12 Tables; 151 Biblio. Refs.

TABLE OF CONTENTS

Foreword
1/4

5

USSR

SHORSHOROV, M. Kh., CHERNYSHOVA, T. A., KRASOVSKIY, A. I., Ispytaniya Metallov na Svarivayemost', Metallurgiya Press, Moscow, 1972, 240 pages.

Introduction	8
Chapter I. Structure and Properties of Welded Joints in Metals and Alloys	
1. Phase and Structural Changes in Metals During Welding	11
2. Criteria for Selection of Technology and Mode of Welding and Subsequent Heat Treatment of Welded Joints	11
Chapter II. Methods of Estimating the Influence of Welding Mode and Subsequent Heat Treatment on Structure and Properties of Welded Joints	39
1. Methods of Studying Kinetics of Phase Conversions Under the Conditions of Thermal Cycles of Welding	75
2. IMET-1 Methods	76
3. Tests for Studying Influence of Technology and Mode of Welding on Properties and Structure of Zone of Thermal Effect	84
4. Testing of Resistance to Ageing	89
5. Methods of Determination of Mechanical Properties of Welded Joints	93
Chapter III. Tests of Welded Joints for Resistance to Formation of Hot Cracks	
1. Mechanism and Condition of Formation of Hot Cracks	109
2/4	109

USSR

SHORSHOROV, M. Kh., CHERNYSHOVA, T. A., KRASOVSKIY, A. I., Ispytaniya Metallov na Svarivayemost', Metallurgiya Press, Moscow, 1972, 240 pages.

2. Analysis of Methods of Determination of Resistance of Metal of Seam and Near-Seam Zone to Formation of Hot Cracks	113
3. Methods of Mechanical Testing of Metals in the Brittleness Temperature Interval	115
4. Determination of Resistance of Metal of Seam and Near-Seam Zone to Formation of Hot Cracks by Forced Deformation	117
5. Technological Tests for Evaluation of Resistance of Welded Joints to Formation of Hot Cracks	132
6. Some Examples of Estimation of Resistance of Alloys to Formation of Hot Cracks	147
Chapter IV. Testing of Welded Joints for Resistance to Formation of Cold Cracks	152
1. Mechanism and Conditions of Formation of Cold Cracks During Welding	152
2. Methods of Quantitative Evaluation of Resistance of Welded Joints to the Formation of Cold Cracks	159
3. Technological Tests for Estimation of Resistance to Formation of Cold Cracks	164
4. Comparison of Methods of Testing for Resistance to Formation of Cold Cracks	172

3/4

USSR

SHORSHOROV, M. Kh., CHERNYSHOVA, T. A., KRASOVSKIY, A. I., Ispytaniya Metallov na Svarivayemost', Metallurgiya Press, Moscow, 1972, 240 pages.

Chapter V. Testing of Welded Joints for Resistance to Brittle Rupture	175
1. Basic Regularities in Formation and Development of Cracks	175
2. Criteria for Evaluation of Resistance of a Material to Formation and Development of Cracks	179
3. Methods of Testing of Resistance to Brittle Rupture Under Static Loading	185
4. Methods of Determination of Resistance to Brittle Rupture with Impact Loading	191
5. Methods of Initiation of Cracks in a Brittle Layer	197
6. Methods of Testing for Local Rupture of Metal in Near-Seam Zone with High Operating Temperature	203
7. Testing for Resistance to Corrosion Under Various Conditions	209
8. Examples of Estimating Resistance of Materials to Brittle Rupture	224
Chapter VI. Testing of Welded Units and Specimens of Standard Structures Under Conditions Imitating Operating Conditions	227
Bibliography	237

4/4

Welding

USSR

UDC 621.791.011

KANTOR, M. M., CHERNYSHOVA, T. A., IGNATOV, D. V., and
SHORSHOROV, M. KH., Moscow

"Electron Microscope Study of the Structure of Welded Joints
of the Alloy TsM-2A"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 2, Mar-Apr 71,
pp 97-100

Abstract: Electronmicroscope studies were made of the structure of welded joints of TsM-2A alloy, made by cathode ray welding in various modes. It is demonstrated that processes of crystallization of the welding bath and decomposition of the solid solution in the cast zone of welded joints can be controlled by changing the thermal cycles of welding. Decomposition of the solid solution with separation of molybdenum carbide along the grain boundaries was found in the cast formation of the second phase depends on the thermal cycles of welding. Decreasing the chemical heterogeneity of the cast metal by welding in severe modes or by holding at temperatures above the phase separation point can be used to prevent formation of the second phase.

1/1

USSR

UDC 539.4

LOSEVA, G. I., and CHERNYSHOVA, T. A., Moscow

"Boundary Migration and the Intergranular Slip in Weld Seams of Nickel"

Moscow, Fizika i Khimiya Obrabotki Materialov, No. 5, Sep-Oct 71, pp 143-146

Abstract: Quantitative investigation data of the migration of grain boundaries and the intergranular slip in weld seams of nickel are presented. The investigated specimens were of pure nickel, their seams were produced by electron-beam melting, and the grain slipping was investigated by help of an interferometer. The investigation results are discussed by reference to micro-photographs showing the migration of grain boundaries in the weld seam and of interference lines on the grain boundary. A diagram shows the slip dependence of the grain on its diameter. The dislocation structure of the weld seam where the migration passed shows that the migrating boundary "washes off" crystalline imperfections by producing a material with a corrected crystalline

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USSR

LOSEVA, G. I. and CHERNYSHOVA, T. A., Fizika i Khimiya Obrabotki Materialov,
No 5, Sep-Oct 71, pp 143-146

lattice. In the region where the boundary migration passed, the microhardness is 10 % lower than near the stationary boundary and somewhat lower than the hardness in the grain center. Four illustr., 11 biblio. refs.

2/2

- 43 -

USSR

UDC 669.295.046.43

RUBAN, N. N., DAVYDOVA, T. YA., CHERNYSHOVA, T. A., KOPYLOVA, YE. A.,
KOLDOBSKAYA, K. N.

"Solubility of Titanium Tetrachloride in Melts of Alkali and Alkaline-Earth Metals"

O rastvorimosti chetyrekhkhlorigostogo titana v rasplavakh shchelochnykh i shchelocno-zemel'nykh metallov, Institute of Metallurgy and Beneficiation, Kazakh SSR Academy of Sciences, Alma-Ata, 1970, 88 pp, ill, 11-entry bibliography (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 4G227DYeP)

Translation: The results of studying $TiCl_4$ solubility in melts made up of a mixture of chlorides of alkali and alkaline earth metals, which has significance in the processes of chlorinating raw material containing Ti and when purifying $TiCl_4$, are discussed. The solubility of $TiCl_4$ depends little on the temperature or the composition of the solvent. It depends to some extent on the duration of the experiments. According to infrared spectroscopic and petrographic analysis data, the solubility of $TiCl_4$ in a melt of chlorides of alkali and alkaline earth metals is directly related to the presence of residual water in it. There are 6 illustrations, 5 tables, and an 11-entry bibliography.

1/1

- 76 -

Welding

USSR

UDC 621.791.011

KANTOR, M. M., CHERNYSHOVA, T. A., IGNATOV, D. V., and
SHORSHOROV, M. KH., Moscow

"Electron Microscope Study of the Structure of Welded Joints
of the Alloy TsM-2A"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 2, Mar-Apr 71,
pp 97-100

Abstract: Electronmicroscope studies were made of the structure of welded joints of TsM-2A alloy, made by cathode ray welding in various modes. It is demonstrated that processes of crystallization of the welding bath and decomposition of the solid solution in the cast zone of welded joints can be controlled by changing the thermal cycles of welding. Decomposition of the solid solution with separation of molybdenum carbide along the grain boundaries was found in the cast formation of the second phase depends on the thermal cycles of welding. Decreasing the chemical heterogeneity of the cast metal by welding in severe modes or by holding at temperatures above the phase separation point can be used to prevent formation of the second phase.

1/1

1/2 032

UNCLASSIFIED

PROCESSING DATE--04DEC70

TITLE--REMOVAL OF ACETYLENE IMPURITIES FROM GASEOUS HYDROCARBONS,
POLYMERIZATION OF ACETYLENE ON A COPPER ALUMINUM SPINEL CATALYST -U-
AUTHOR--(03)-CHERNYUK, G.P., AGROSKIN, I.I., FLID, R.M.

COUNTRY OF INFO--USSR

SOURCE--NEFTEKHIMIYA 1970, 10(2), 201-8

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--POLYMERIZATION, ACETYLENE, CATALYST ACTIVITY, HYDROGEN,
ETHYLENE, COPPER, HEAT OF REACTION, CATALYST REGENERATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3006/0954

STEP NO--UR/0204/70/010/002/0201/0208

CIRC ACCESSION NO--AP0134672

UNCLASSIFIED

2/2 032

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0134672

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PREPN. OF THE CATALYST WAS DESCRIBED EARLIER (G. P. CHERNYUK, ET AL., 1970). THE CATALYST ACTIVITY DEPENDS LARGELY ON ITS ACTIVATION (OR REGENERATION) TEMP.; THE OPTIMUM IS 900DEGREES FOR 1-2 HR. DUE TO HIGH CATALYST ACTIVITY ITS SP. SURFACE AREA HAS LITTLE EFFECT ON THE REACTION RATE, AND SPACE VOL. VELOCITIES LESS THAN OR EQUALS TO 30,000 HR PRIME NEGATIVE ARE POSSIBLE ON THE SOLID BED CATALYSTS. THE CATALYST SHOULD CONTAIN 20-5PERCENT CU; LOWER AMTS. OF CU PROMOTE THE FORMATION OF H AND ETHYLENE AS WELL AS OF THE SOLID POLYACETYLENES (II). THE EFFECT OF TEMP. ON THE REACTION RATE CONST. IS GIVEN BY $K = 11.34 \exp(-5100/RT)$. THE POLYMN. ACTIVATION ENERGY AND THE EXOTHERMIC HEAT OF REACTION ARE 5 PLUS OR MINUS 1 AND 60-70 KCAL-MOLE RESP. THE HEAT OF I COMBUSTION IS 9-10 KACL-G, WHICH SUGGESTS THAT ON THE INDUSTRIAL SCALE THE FLUIDIZED CATALYST BEDS ARE NECESSARY FOR ADEQUATE HEAT DISSIPATION DURING BOTH THE POLYMN. AND REGENERATION CYCLES.

UNCLASSIFIED

1/2 023 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--EFFECT OF PHASE AND CHEMICAL TRANSFORMATIONS OF COMPONENTS OF
SAUSAGE MEAN ON ITS THERMOPHYSICAL CHARACTERISTICS -U-
AUTHOR-(02)-BABANOV, G., CHERNY, A.
COUNTRY OF INFO--USSR
SOURCE--MYAS. IND. SSSR 1970, 41(2), 31-4
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--FOOD, PROTEIN, THERMAL DIFFUSION, THERMAL CONDUCTIVITY
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY FICHE NO----FD70/605015/D07 STEP NO---UR/9086/70/041/002/0031/0034
CIRC ACCESSION NO--AP0140599
UNCLASSIFIED

2/2 023

UNCLASSIFIED

PROCESSING DATE--04DEC79

CIRC ACCESSION NO--AP0140599

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. EMPIRIC FORMULAS ARE GIVEN FOR THE
CALCN. OF THE COEFFS. OF THERMAL DIFFUSIVITY AND CONDUCTIBILITY AND OF
THE SP. THERMAL CAPACITY OF BEEF AND PORK MEAT AND OF PORK FAT SHOWING
THE HEAT EFFECT AT 20-80DEGREES. FACILITY: UKR. NAUCH, ISSLED.
INST. MYAS. MOLOCH. PROM., USSR.

UNCLASSIFIED

AA0040740

Chernyy, A.A.

UR 0482

Soviet Inventions Illustrated, Section I Chemical, Derwent,

1-70

242325 ARC IRONMAKING FURNACE hearth is asymmetrically convex so that it expands towards the charging window and narrows towards the notch, whilst the electrodes lie in the narrow portion to provide continuous iron making. The charge is fed in continuously into the bath (3) of molten metal and the charged lumps draw heat from the metal which has been produced by the arc between this and the electrodes (4). The position of the notch (6) ensures that the bath meniscus remains at a constant level. Surplus flows out thus to a teeming arrangement for re-pouring into cast product. Slag also runs off continuously thus keeping the bath clean and receptive to the heat from the arc. The hottest metal flows off continuously, some of it is turbulised near the periphery and returned to the bath to melt the slag component.

18

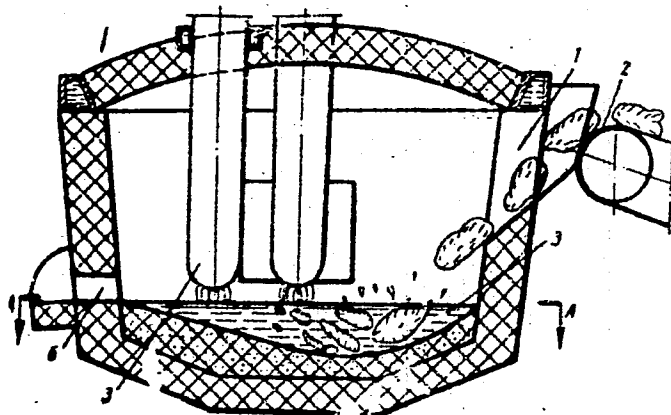
19.5.67 as 1157178/22-2. CHERNYI, A.A. et al. PENZA COMPRESSOR WORKS. (2.9.69) Bul 15/25.4.69. Class 31a¹. Int.Cl.F 27 b.

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AA0040740



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19750407

20

AA0040740

AUTHORS: Chernyy, A. A.; Grachev, V. A.; Marienbakh, L. M.; Ivanov,
D. P.; Kurbatskiy, I. L.; Sosnovskiy, Ye. D.; and Pavlenko,
N. S.

Penzenskiy Kompessornyy Zavod

19750408

3/3

AA0040704

CHERNYY A.A.

UR 0482

1-70

Soviet Inventions Illustrated, Section I Chemical, Derwent,

240946 IRON SMELTING IN A GAS-FIRED CUPOLA blows it with previously thermally cracked hydrocarbons during melting so as to promote assimilation by the iron of the carbon involved. This gas is thermally cracked by passing it round in conduits let into the cupola lining and thus emerges as a heated mix of carbon black and gaseous hydrogen. This is suitable for continuous carburising of the iron in the cupola. 1.2.66 as 1052704/22-2. GRACHEV, V.A. et al. (19.8.69) Bul 13/1.4.69. Class 31a. Int.Cl.B 22b. LD

AUTHORS: Grachev, V. A.; Chernyy, A. A.; Mariyenbakh, L. M.; and Kurbatskiy, I. L. 18

19750335

USSR

UDC: 621.791.76:621

SOROCHINSKIY, A. P., Candidate of Technical Sciences, KONVISHER, B. YA., RYNDENKO, V. V., and CHERNYY, A. SH., Engineers, Planning-Design Bureau of Electrohydraulics, Nikolayev

"Welding by the Electric Exploding of the Conductor"

Kiev, Avtomaticheskaya Svarka, No 9, Sep 73, pp 54-56

Abstract: Welding by the electric exploding of the conductor involves the following: electric energy is fed from the storage device (a capacitor bank) to current conductors where a wire explodes and forms a powerful shock wave which moves in a radial direction. Under the effect of the shock wave, the element being welded deforms and moves at a high rate of speed towards the surface of the fixed element. Welding takes place during the collision of the elements. Good joints were produced from sufficiently plastic uniform and differing materials. Factors which affect weld quality are indicated.

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- 72 -

Stress Analysis and Stability Studies

USSR

UDC 621.1 + 622.258 + 626.131

A. A. VOVI, G. I. CHERNYI, A. G. SHENOV

Deformirovaniye szhimayemykh sred pri dinamicheskikh nagruzkakh (Deformation of Compressible Media Under Dynamic Loads), Kiev, "Naukova dumka", 1971, 175 pp, biblio, illus, 1,000 copies printed

The monograph considers the processes of deformation and irreversible deformation of loose materials. Results are given of theoretical studies of the dynamics of inelastic compressible media and the propagation of detonation waves in naturally deposited soils and research results on the measurement of deformation fields within the zones of influence of detonations. Equations of state of cohesive soils and metal powders are obtained experimentally for impulsive loading and various time parameters. The criteria for correspondence of experimental and theoretical research are discussed.

The monograph is intended for use by engineering-technical workers, teachers and students at the VIZ level.

The authors were helped by Academician G. S. Pisarenko in the work.

1/2

A.A.Vovk, G. I. Chernyy, A. G. Smirnov, Deformation of Compressible Media Under Dynamic Loads, Kiev, 1971, 175 pp, cont'd

Contents

Foreword	3
Chapter I. The Patterns of Deformation of Compressible Media	5
Chapter II. Experimental Studies of the Propagation of Elastic and Elastic Compression Waves During Explosions With Axial Symmetry	44
Chapter III. Study of the Deformation of Certain Loose Materials	83
Chapter IV. Fluctuation of Filtration and Other Characteristics of Cohesive Soils during Deformation.	135
Chapter V. Some Methods and Means of Varying the Parameters of Stress Waves	155
Bibliography	172

USSR

UDC 591.185.5:577.37:598.97+612.819.8.014.423.019

GOLUBEVA, T. B., CHERNYI, A. G., and IL'YICHEV, V. D., Soil Biology Faculty,
Moscow University imeni M. V. Lomonosov

"Total Responses of the Auditory Nerve in Relation to Parameters of Acoustic
Signals in the Owls *Asio otus* and *Athene noctua*"

Leningrad, Zhurnal Evolyutsionnoy Biokhimii i Fiziologii, Vol 6, No 2, Mar/Apr
70, pp 215-224

Abstract: The relationship of total responses of the auditory nerve to the frequency, intensity, duration, and sharpness of increase of sound signals, and also to the length of the interval between paired signals, was studied in the owls *Asio otus* and *Athene noctua*. To determine the response, the potential of the cochlea was measured bilaterally by means of permanently implanted electrodes. A maximum of sensitivity was found at 4-5 and 3-4 kc for *Asio otus* and *Athene noctua*, respectively, which corresponded to that established in studies of bird behavior, and was close to the frequency range of noises emitted by rodent prey. These noises are used by the owls to locate their prey (the source of high-frequency sound can be located more precisely than the source of sounds of lower frequencies). Characteristics of the sensitivity of hearing in owls with respect to frequency were related to morphological differences in their auditory systems,
1/2

USSR

UDC 613.6-07:612.143

ZUSMANOVICH, V. A., Institute of Labor Hygiene and Occupational Diseases, Krivoy Rog

"Type of Work and Arterial Pressure"

Moscow, Gigiyena Truda i Professional'nyye Zabolevaniya, No 3, 1970, pp 16-19

Abstract: The effect of physical and mental work on the incidence of arterial hypertension was studied in 6000 workers employed in the mining industry. The subjects were subdivided into groups according to their diurnal energy expenditures. It was determined that arterial hypertension occurred significantly more often among workers engaged in mental work than among those doing physical work. Subjects performing hard and medium-hard labor showed more arterial hypertension than those doing light physical work. The desirability of transferring miners with elevated blood pressure, operating within the "danger zone" or those with arterial hypertension to light physical work is questioned.

1/1

- 77 -

III. Mathematical Cybernetics
A. Theory of Controlling Systems

USSR

CHERNYY, D. YE.

"The Connection of Partial Mill and Moore Automata"

Izv. Vyssh. Ucheb. Zavedeniy. Matematika [News of Higher Educational Institutions. Mathematics], 1973, No 4, pp 113-119 (Translated from Referativnyy Zhurnal Kibernetika, No 9, 1973, Abstract No 9V428)

Translation: A method is suggested for conversion of a partial Mill automaton into an equivalent partial Moore automaton which continues it and vice versa. It is shown that if the initial automaton is reduced (that is its states are incompatible by pairs), the converted automaton is also reduced. The method suggested is a generalization of the method of Ibarra (see Russian translation in EI Tekhnich. Kibernetika, 1967, No 25) to cover the case of partial automata. Necessary and sufficient conditions are found for which the partial Mill automaton will be a Moore automaton with shifted label function.

I. Grunskiy

1/1

USSR

UDC 629.7.018.3

CHERNYY, G. G., Corresponding Member of the USSR Academy of Sciences,
CHERNYAVSKIY, S. Yu., Scientific Research Institute of Mechanics, Moscow
State University imeni M. V. Lomonosov

"Motion of Blunt Bodies at High Velocity in a Hydrogen-Oxygen Atmosphere"

Moscow, Doklady Akademii Nauk SSSR, Vol 212, No 2, 11 Sep 73, pp 316-319

Abstract: To determine the conditions of existence of a stationary detonation wave, an experimental study was done on the influence of pressure of a stoichiometric hydrogen-oxygen mixture $2H_2 + O_2$ and flight speed on the pattern of flow around a spherically blunted cylinder 12.7 mm in diameter. The models were fired from a gas gun into the mixture. The flow pattern was studied by the schlieren method using a spark light source with flash duration of 0.05 μ s. The pressure of the mixture was varied from 50 to 380 mm Hg, and model velocity was varied from somewhat less than the detonation velocity to values appreciably greater than the detonation velocity. Stationary flow conditions were observed at velocities below the detonation velocity (up to 2.88 km/s). An abrupt change in the flow pattern occurred when the model of the velocity was increased to 3.06 km/s

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USSR

CHERNYY, G. G., CHERNYAVSKIY, S. Yu., Doklady Akademii Nauk SSSR, Vol 212, No 2, 11 Sep 73, pp 316-319

with initial pressure of 186 mm Hg. The detonation wave does not arise in the flow zone in immediate proximity to the model but moves in the direction of flight of the model at the normal detonation velocity. Steady-state flow can be maintained with increasing velocity if only the pressure is increased simultaneously.

2/2

- 31 -

1/2 048 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--UNSTEADY ONE DIMENSIONAL MOTIONS OF INFLAMMABLE GAS MIXTURES WITH
THE FORMATION OF DETONATION TYPE WAVES -U-
AUTHOR--(04)--KORUBEYNIKOV, V., LEVIN, A., MEDVEDEV, S.A., CHERNYI, G.G.
COUNTRY OF INFO--USSR
SOURCE--MOSKOVSKII UNIVERSITET, VESTNIK, SERIJA L METEMATIKA, MEKHANIKA,
VOL. 25, MAR. - APRIL 1970, P. 125-134.
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS, PROPULSION AND FUELS
TOPIC TAGS--GAS, DETONATION, DETONATION SHOCK WAVE, SHOCK WAVE ANALYSIS,
REYNOLDS NUMBER
CENTRAL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1999/1491 STEP NO--UK/0055/70/025/000/0125/0134
CIRC ACCESSION NO--AP0123394
UNCLASSIFIED

2/2 048

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0123394

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THEORETICAL STUDY OF A GROUP OF PROBLEMS CONCERNING THE UNSTEADY ONE DIMENSIONAL MOTION OF REACTING GAS MIXTURES IN THE PRESENCE OF DETONATION WAVES. IT IS SHOWN THAT SUPERCOMPRESSED DETONATION WAVES, SUCH AS THOSE PRODUCED BY THE MOTION OF A PISTON OR DUE TO THE INFLUX OF EXTERNAL ENERGY, ARE TRANSFORMED INTO CHAPMAN-JOUQUET SELF SUSTAINING WAVES WHEN THE HEAT DISCHARGE ZONE IS INFINITELY THIN. A CONDITION IS FOUND UNDER WHICH A PLANE DETONATION WAVE FRONT WEAKENED BY A TRAILING REFRACTION WAVE CAN BE TRANSFORMED INTO A CHAPMAN-JOUQUET WAVE BY AN ELECTROMAGNETIC FIELD AT SMALL MAGNETIC REYNOLDS NUMBERS. A MATHEMATICAL CRITERION FOR THE ASYMPTOTIC CONVERSION OF A DETONATION WAVE WITH A DOUBLE FRONT STRUCTURE INTO A CHAPMAN JOUQUET WAVE IS DISCUSSED.

UNCLASSIFIED

Recorders and Transducers

USSR

UDC: 621.391.82:621.396.2

LUTSENKO, Ye. Ye., CHERNYI, G. P., BONDARENKO, V. P.

"A Device for Recording the Two-Dimensional Distribution Function of Pulse Noises in Communications Channels"

USSR Author's Certificate No 253117, filed 15 Apr 68, published 9 Mar 70, (from RZh-Radiotekhnika, No 2, Feb 71, Abstract No 2A281 F)

Translation: This Author's Certificate introduces a device which permits recording a two-dimensional distribution function of pulse noises (with respect to time rate) on magnetic tape with a high degree of reliability which is independent of the intensity of the pulse noise. A unit which shapes a pulse series is connected at the channel output between the output of the device and amplitude selectors with a common point which is connected to the input circuit through a circuit for isolating the noise voltage envelope. The number of pulses in the series is proportional to the maximum absolute value of the noise envelope which exceeds the operating threshold of the k-th selector, where k is the number of selectors which have operated. The device is connected to a channel which is not taken up with information. A. K.

1/1

CHERNYY, I.M.

HYDRAULIC JET FLOW OF AN IDEAL LIQUID
AND GAS-LIQUID MIXTURES

SPRS 57308
20 October 1972

Selected translations from Russian-language periodical Gidromekhanika, No 19, 1971, pp 3-9, 9-14, 14-24, Kiev.

CONTENTS	PAGE
Performance of a Reaction Engine With an Ejector Shroud (G. V. Logvinovich)	1
Numerical Solution to the Problem of Cooling a Hot Gas Bubble in Liquid (V. M. Ivchenko, et al.)	11
On the Theory of Gas-Hydraulic Propulsion Engines (I. M. Chernyy, et al.)	19

- A -
[I - USSR - R]

USSR

UDC 532.529.533.6

CHERNYI, I. M., PRIKHOD'KO, N. A., and MOKEYEV, Ya. G., Institute of Hydro-mechanics of the Academy of Sciences of the Ukrainian Soviet Socialist Republic

"To the Theory of Gas-Hydraulic Engine Installations"

Kiev, Gidromekhanika, No 19, 1971, pp 15-24

Abstract : The hydro-thermodynamic principles of the theory of the gas-hydraulic reaction engine of high speed vessels with gas-turbine engine in the capacity of generator gas producer are discussed by reference to the schema of a waterjet installation. On the basis of cited correlations, an analysis of the cumulative coefficient is presented with due regard for the principal internal losses of the engine. A formula characterizing the total efficiency η of the waterjet installation is deduced. The effect of a great number of parameters on the value of η is demonstrated and, particularly, the effect of the mixing coefficient is discussed and illustrated. It is concluded that under actual conditions the mixing with outboard water can result in an increase of the pull by up to 1.5—2 times at speeds of up to 50 m/sec. By further increase of speed, the relative gain in pull decreases. Three illustr., 24 formulas, nine bibliogr. refs.

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II. Combinatory Analysis and Graph Theory

A. General Combinatory Analysis Theory

USSR

UDC: 519.1

MIRKIN, B. G., CHERNYY, L. B.

"Some Problems of a Space of Partitions"

Novosibirsk, Mat. analiz ekon. modeley--sbornik (Mathematical Analysis of Economic Models--collection of works), Ch. 3, 1972, pp 126-147 (from RZh-Kibernetika, No 5, May 73, abstract No 5V426 by A. Lapshin)

Translation: The authors consider the problem of measuring the proximity between different partitions of a finite set of objects. On the basis of some fairly natural conditions the authors introduced a system of requirements to be satisfied by the measure of proximity of partitions, and showed that this system of requirements uniquely characterizes the unknown measure of proximity, namely the Hamming distance between the contiguity matrices of the partitions. A number of expressions are introduced which relate the distances between partitions to specific features of different types. It is found in particular that the mutual relations of ordered

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USSR

MIRKIN, B. G., CHERNYY, L. B., Mat. analiz ekon. modeley, Ch. 3, 1972, pp 126-147

and unordered partitions in the resultant space do not appear sufficiently natural; this shows that the measure of proximity found by the authors should be used very carefully in the presence of arbitrary features, although this does not preclude its use for features of identical type.

The appendix gives an α -program for calculating the measure of proximity between qualitative features of arbitrary type in accordance with formulas given in the article.

2/2

- 38 -

USSR

TSAREGRADSKIY, L. Ye., CHERNYY, N. Ye., MAKSIMENKO, A. A.

"Tree-Type File Processing Subroutines for the Minsk-22 Digital Computer"

Avtomatiz. Upr. Prom. Predpriyatiyami [Automation of the Control of Industrial Enterprises -- Collection of Works], Kiev, Tekhnika Press, 1972, pp 107-110 (Translated from Referativnyy Zhurnal Kibernetika, No 4, 1973, Abstract No 4V646, by the authors).

Translation: Problems of the organization of tree-type files encountered in development of automatic control systems are studied. A set of standard programs for processing of tree-type files is described. In particular, the set includes the operations of formation of information retrieval files, as well as certain other standard file processing operations. The problem of placement of information in the file is presented as a "knapsack problem."

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USSR

UDC 621.735.043.016.3:669.14.018.252.3

CHERNYY, YU. E., ALISTRATOV, L. I., BEREZIN, A. A., GALKIN, A. A., KOVIKO, V. S., KULIKOV, N. I., SPUSKANYUK, V. Z., and SHOKMAN, A. D.

"Industrial Introduction of Technique of Hydropressing of Tool Billets From Steels R18, R12, R9"

Moscow, Kuznechno-Shtampovochnoye Proizvodstvo, No 8, Aug 71, pp 11-12

Abstract: Experimental investigations at Dnepropetrovsk Physicotechnical Scientific Research Institute, Academy of Sciences Ukrainian SSR, showed that the cold plastic deformation of billets of high-speed steels R18, R12, and R9 by the hydropressing method results in significant refinement and more uniform distribution of the carbide phase. Investigations of R18 steel billets following hydropressing, annealing, and heat finishing showed an increase in the mechanical properties and thermostability of the steel, while production tests of 10-mm-diameter reamers showed a 60-70 percent increase in tool durability. Hydropressing of cylindrical round-section billets from R18, R12, and R9 bars up to 30 mm in diameter has been introduced at one of the

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USSR

CHERNYY, YU. F., et al., Kuznechno-Shtampovochnoye Proizvodstvo, No 8, Aug 71, pp 11-12

Donetskaya Oblast plants. A model P479 hydraulic press is used for billet deformation. The hydropressing setup consists of a high-pressure multilayer container, rod and die with gasketing, an upper and lower plate, and a centerer and fastener. The tool billet hydropressing process provides for the preparation of initial billets, straining of the billets, and their subsequent treatment. Kh12M steel (HRC 57-59) is used for the die. The economic advisability of using the technique of high-speed steel hydropressing for the fabrication of tool billets is based mainly on the increased tool durability as a result of the improved structure and physicomechanical properties of the steel after deformation. There is a saving in high-speed steels because the billet comes as close as possible to the tool size.

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- 20 -

Forming

USSR

UDC: 621.777.01:669.14.253

CHERNYY, Yu. F., SPUSKANYUK, V. Z., and LYADSKAYA, A. A.

"Cold Plastic Deformation of R18 Steel by the Hydroextrusion Method"

Moscow, Kuznechno-shtampovochnoye proizvodstvo, No. 5, 1971, pp 12-13

Abstract: This article gives the results of investigations into the conditions of hydroextrusion of R18 steel rods, the structure and characteristics of the steel after the deformation, and the strength of an instrument made of the extruded rods. The extruded specimens were made in machines mounted on hydraulic presses, model P474A, providing a stress of 100 tons, and model DO⁴³⁷, with a stress of 500 tons. The machine consists of a high-pressure container, a piston, and matrices with gaskets for centering and fixing the produced material. During the experimentation, the pressure in the operating cylinder of the press is recorded through a manometer and a recording device. From these data and the results of load calibration, the specific stress of the extrusion process, i.e., the pressure on the transverse cross section of the container opening, is computed. Initially, the steel used was R18, hot-rolled and annealed; it was then tempered by heating to 730-770° C
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CHERNYY, Yu. F., et al, Kuznechno-shtampovochnoye proizvodstvo,
No. 5, 1971, pp 12-13

for one hour and cooling in oil. The mechanical qualities of the rods, measuring 20-35 mm in diameter, were measured after deformation and determination of the hydroextrusion stresses. It is stated that the techniques of hydroextrusion of high-speed steel rods with a diameter of up to 30 mm have been introduced into the production processes of one of the Donetsk Oblast enterprises.

2/2

- 29 -

USSR

UDC 533.95:538.4

KUKSA, Yu. G., SMIRNOV, A. S., KHMARA, I. S., and CHERNYY, Z. D.

"Action of Electrodynanic Three-Dimensional Forces Under Pulse Excitation

V sb. 7-ye Sovesch. po magnit. gidrodinamike. T. 3 (Seventh Conference on Magnetohydrodynamics. Vol 3 -- Collection of Works), Riga, "Zinatne," 1972, pp 61-64 (from RZh-Fizika, No 11, Nov 72, Abstract No 11G16)

Translation: Several magnetoacoustic quantities are evaluated theoretically, particularly forces excited in the action of a pulsed field on liquid metal in a crucible placed in an inductor. The action of magnetic field pulses on zinc and aluminum in a ceramic crucible after the cooling curve enters the horizontal segment was analyzed in accordance with the theoretical data. The pulse duration of the action was 10 μ sec and the pulse repetition frequency varied in the range 0.16-2 Hz. It was found from an analysis of the data that pulse electrodynamic action is assisted by reduction of the grain; however, the degree of reduction depended on the frequency, and the optimum was within the limits 0.16-1 Hz. A uniform distribution of porosity over the entire volume of the metal was observed in all modes. Also tested were resonance conditions for pulsed action on the crystallization of steel castings. In this case resonance and reduction in grain size was observed at a pulse repetition frequency of 25 Hz. V. L.

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USSR

UDC 534.2.001.5

CHERNYY, Z. D., and SHKARLET, YU. M.

"Theoretical-Experimental Investigation of the Electrodynamic Method of Producing Different Types of Ultrasound Waves in Metals"

Tr. NII Introskopii (Transactions of the Scientific Research Institute of Introscopy), Vyp 6, 1972, pp 3-12 (from Referativnyy Zhurnal -- Metrologiya i Izmeritel'naya Tekhnika, No 9, 1972, Abstract No 9.32.502)

Translation: It is reported that the investigation of the possibility of producing different types of ultrasound waves and of the conditions for obtaining them in samples is one of the basic problems to be studied with the new electromagnetic-acoustic converter in ultrasound defectoscopy. The electrodynamic method of producing elastic waves in nonmagnetic electrical conducting isotropic samples by means of a constant or variable magnetic field is considered. In order to carry out appraisable calculations and to obtain optimal converter sensitivity, an expression was found for the electrodynamic amplitude, intensity and stress, consisting of a superposed roll in the constant magnetic field obtained by different orientations of the latter. (7 illustrations, 4 bibliographic entries)

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- 5 -

USSR

UDC 615.917:547.234.9'222.2

ABRAMOVA, ZH. I., CHERNYI, Z. KH. and BOLTUSHKINA, L. A., Institute of Labor Hygiene and Occupational Diseases, Leningrad

"Pathogenesis of Granosan Intoxication"

Moscow, Gigiyena Truda i Professional'nyye Zabolevaniya, No 11, 1972, pp 21-24

Abstract: The effect of granosan was studied by subcutaneous injection of 5 mg/kg twice a week into male white rats weighing 180-240 grams and intraperitoneal injection into male mice weighing 18-25 grams of 5 mg/kg daily for 20 days. The threshold of electrical stimulation was measured, the behavioral effect of phenamine, apomorphine and reserpine was studied and urinary levels of 5-hydroxyindole acetic acid, epinephrine and norepinephrine were studied. Serotonin levels were measured in brain and stomach tissues. It was observed that changes included increased irritability, lessened effect of phenamine, apomorphine and reserpine action compared to controls, and altered tryptophan, serotonin and catecholamine metabolism, although no change in norepinephrine levels in the brain was found.

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USSR

UDC 577.1:615.7/9

ABRAMOVA, ZH. I., CHERNYY, Z. KH.

"Mechanisms of Adaptation to Industrial Poisons. The Role of Blood Circulation of Catecholamines and Serotonin in the Formation of Protective Adaptive Reactions"

V sb. Nauch. osnovy sovrem. metodov gigiyen. normirovaniya khim. veshchestv v okruzhayushchey srede (Scientific Principles of Modern Methods of Hygienic Normalization of Chemicals in the Environment -- collection of works), Moscow, 1971, pp 105-110 (from RZh-Biologicheskaya Khimiya, No 13, Jul 72, Abstract No 13F2139)

Translation: This is a brief survey. Data are presented on the basis of which the authors draw the following conclusions regarding the possible mechanisms of the formation of protective adaptive reactions of the organism to the effect of extremal stimuli, including those of a chemical nature: neuro-reflex and neurohumoral means of mobilizing the physiological reserves are insured by the monoamine-energy structures supporting the ergotropic and trophotropic functions; the increase in circulation of the pyrocatechinamines (especially noradrenalin) and serotonin is the basic triggering mechanism of mobilizing the reserve possibilities of the organism.

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- 75 -

USSR

BOLTUSHKINA, L. A., ABRAMOVA, Zh. I., PROKHOROV, V. N., and CHERNYI, Z. Kh.

"Ulcerogenic Effect of Chlorophos"

V sb. Nauchn. sessiya, posvyashch. itogam raboty Leningr. NII gigiyeny truda i prof. zabolevaniy za 1968-1969 gg., 1970. Tezisy dokl. (Scientific Session Devoted to the Results of the Work of the Leningrad Scientific Research Institute of Labor Hygiene and Occupational Diseases for 1968-1969, 1970: Summaries of Papers -- Collection of Works), Leningrad, 1970, pp 29-30 (from RZh-Farmakologiya, Khimoterapevticheskiye Sredstva, Toksikologiya, No 4, Apr 71, Abstract No 4.54.709 by M. M. AVKHIMENKO)

Translation: Chlorophos in a dose of 150 mg/kg for 10 days was administered internally to male rats. Findings: change in acidpepsin factor; positive Pauls' index; inhibition of blood cholinesterase activity; insignificant changes in serotonin content of subcortical brain formations and gastric tissues. Under the combined action of chlorophos and ulcerogenic factors (reserpine 5 mg/kg, atropin 500 mg/kg, stress) destructive lesions of the gastric wall were more pronounced. The authors conclude that chlorophos affects the gastrointestinal tract.

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1/2 022 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--STEROLS IN FUNGI OF THE FAMILY BOLETACEAE -U-
AUTHOR--(02)-CHEROTCHENKO, YU.P., SHIVRINA, A.N.
COUNTRY OF INFO--USSR
SOURCE--MIKOL. FITOPATOL. 1970, 4(2), 187-93
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--FUNGUS, PROCESSED PLANT PRODUCT, AQUEOUS SOLUTION, SOLVENT
EXTRACTION, CHEMICAL PURIFICATION, STEROL, IR SPECTRUM, UV SPECTRUM
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY FICHE NO----FD70/605001/E12 STEP NO--UR/9063/70/004/002/0187/0193
CIRC ACCESSION NO--AP0139385
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0139385

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AIR DRIED, HOMOGENIZED FUNGI SUILLUS BOVINUS, S. VARIEGATUS, AND LECCINUM AURANTIACUM WERE EXTG. WITH ETH. IN A WATER BATH. THE EXT. WAS SAPONIFIED WITH 5PERCENT ALC. KOH SOLN. FOR 4 HR. AFTER SHAKING SEVERAL TIMES WITH ET SUB2 O, THE ET SUB2 O EXT. WAS EVAPD. IN VACUO. THE RESIDUE WAS DISSOLVED IN C SUB6 H SUB6 AND TRANSFERRED TO A COLUMN FILLED WITH AL SUB2 O SUB3. THE STEROL COMPS. WERE SEPD. BY ELUTION WITH PETROLEUM ETHER, C SUB6 H SUB6, ET SUB2 O, ET SUB2 O-MEOH (1:1), AND MEOH. THE ELUATES SHOWING A LIEBERMANN BURCHARD COLOR REACTION FOR STEROLS WERE COMBINED. THE STEROLS WERE SEPD. BY USUAL METHODS AND RECRYSTD. FROM VARIOUS SOLVENTS. ALL 16 STEROLS SEPD. WERE DERIVS. OF ERGOSTEROL. BY UV AND IR SPECTRA AND H. P. DETN., ERGOSTEROL, 5,DIHYDROERGOSTEROL, AND 22,DIHYDROERGOSTEROL WERE IDENTIFIED. FACILITY: BOT. INST. IM. KOMAKOVA, LENINGRAD, USSR.

UNCLASSIFIED

"Protection Against Quantum Amplifier Saturation by the Pulse Modulation Pumping Method"

Moscow, Radiotekhnika i elektronika, No 8, 1972, pp 1628-1631

Abstract: The essence of the method for protecting quantum paramagnetic amplifiers from saturation by test pulses in pulse radio relay communication is given in an earlier paper by the second of the authors named above, published in the same journal (11, 13, 1968, p 2019). The function of the present paper is to show that the transient process of steadying the inversion coefficient can be fully or at least substantially eliminated in the amplifier itself by varying the initial value of the coefficient. A possible method of realizing this variation, by regulating the duration of the pauses in the amplifier operation, is examined. The results of an experimental study of the repeated inclusion of pumping as a method of eliminating slow transient processes are presented, and an oscillogram of these processes in a ruby amplifier is reproduced. A description of the experimental apparatus is given

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USSR

UDC: 621.375.8

SMIRNOVA, T. A., CHEPRAK, N. T., and SHAMPAROV, Ya. L.

"Special Case of UHF Ruby Quantum Amplification"

Gor'kiy, Izvestiya VUZ--Radiofizika, No 10, 1972, pp 1583-1584

Abstract: This brief communication reports the experimental observation of simultaneous inversion of the 1-2 and 3-4 level populations in ruby at a wavelength of approximately 4 cm. The quantum paramagnetic amplifier used in the experiments had an amplification factor of $G = 20$ dB and a band width of $\Delta f = 1.5$ MHz, and a resonator completely filled with dielectric. The pumping wavelength was 1.5 cm and the magnetic field intensity $H = 1.7$ kOe. The possibility of obtaining the population inversion in the Zeeman levels of the 1-2 and 3-4 transitions by the use of a pumping frequency coinciding with the 1-4 transition frequency had been predicted in an earlier paper (N. B. Karlov, et al, Kvantovyye usiliteli -- Quantum Amplifiers -- Institut nauchnoy informatsii AN SSSR, Itogi nauki, seriya Fizika, 1966).

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- 15 -

USSR

UDC 539.89 +
532.78

BERTMAN, A. A., YEPANCHINTSEV, O. G., Academician SAMARIN, A. M. (deceased),
CHERPOV, D. B. and SHENYAYEV, A. Ya., Institute of Metallurgy imeni A. A. Baykov,
Academy of Sciences USSR

"Structure and Properties of Cast Iron Crystallized under High Pressure"

Moscow, Doklady Akademii Nauk SSSR (Proceedings of the Academy of Sciences USSR),
Vol. 195, No. 1, p 67-70, 1970

Abstract: Experiments have shown that pressures of the order of 1000 atmospheres applied to melts during cooling markedly affect crystallization of metal and improves its structure. This is especially true for alloys, including cast iron, having so-called colloidal microinhomogeneities. The structure and properties of cast iron melted and crystallized under pressures of 3 to 30 kbar are studied. Barothermic tests were made on gray cast iron having the eutectic composition of 3.8% C, 2% Si, 0.3% Mn, 0.25% S, and 0.15% P. The sample was heated to 1200°C under 30 kbar pressure. The test pressure was applied by a 200-ton press and was reached in 3 minutes, whereupon the sample was heated. The sample melted at approximately 1190°C and was held at 1200°C for 1 to 2 minutes. Then the sample was cooled slowly (~ 3 deg/sec) or rapidly (~ 200 deg/sec) to room temperature.
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USSR

BERTMAN, A. A., et al, Doklady Akademii Nauk SSSR, Vol. 195, No. 1, pp 67-70, 1970

Pressure was then removed. The initial structure of the samples was perlitic, with branching inclusions of graphite. After barothermic processing, the graphite inclusions disappeared. Slowly-cooled samples exhibited a structure typical of pre-eutectic white cast iron with primary austenitic dendrites and ledeburite. Elevated pressure noticeably increases the quantity of austenite and produces a fine structure. Metallographic analysis showed a dark component at the boundaries of the austenite dendrites and fine inclusions of a light phase. The dark phase was enriched with Si; and the light, with Mn. Both contained carbon. The structure of the fast-cooled sample resembled tempered steel and had dark needle-like components reminiscent of martensite. The hardness of the slowly-cooled samples increased by a factor of almost 3 as compared to the original metal, and wear resistance increased sharply. Orig. art. has 8 refs.

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- 146 -

USSR

UDC 546.26:546.45:543.226

YEVSEYEVA, T. I., CHERSTVENKOVA, YE. P., NIKOL'SKIY, V. A., and DRNISOVA, V.I.

"Determination of Free Carbon In Metallic Beryllium"

Moscow, Zavodskaya Laboratoriya, No 4, 1973, pp 397-400

Abstract: A thermogravimetric study was made of the rate of burn out of metallic beryllium and its carbide. The analysis was done in air on a thermobalance with continuous weighing with slow warm-up of the furnace up to 1120° C. The beryllium carbide produced by caking of metal oxide with carbon black contained 7.4% O, 6.4% free C, and 33.3% bound C. The free C was found to oxidize more rapidly and at a lower temperature than carbon carbide. The suggested method of determining free C in metallic beryllium is based on burn up of a weighed sample of the material in a stream of oxygen with subsequent gas-chromatographic measurement of the separated carbon dioxide. The quantity of carbon carbide in any of residues after direct determination of free carbon was found to be equal to its initial content. Results of the activation analysis confirm the accuracy of the method. Three figures, three tables, eight bibliographic references,

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USSR

UDC 536.46:533.6

ZARKO, V. Ye., MIKHEYEV, V. F., ORLOV, S. V., KHELEVNOY, S. S., CHERTISHCHEV, V. V.

"On the Characteristics of the Ignition of Gun Powder by a Hot Gas"

V sb. Goreniye i vzryv (Combustion and Explosion -- Collection of Works), Moscow, "Nauka", 1972, pp 34-37 (from RZh-Mekhanika, No 3, Mar 73, Abstract No 3B933)

Translation: Combustion characteristics are investigated under conditions of conductive and convective heat transfer from a hot gas and the limits of applicability of the thermal theory are determined. The objects of investigation were nitroglycerine gun powder and compressed nitrocellulose. It is shown that there exists a region of condition in which ignition is determined preferentially by the parameters of the solid-phase reactions for substances with a complex reaction mechanism (in the solid and gas phases). The preponderance of gas-phase reactions is achieved under conditions of conductive heating by a rise in pressure (due to ballasting of the reaction mixture by inert gas); under conditions of convective heating it is due to intense escape of gaseous products of

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USSR

ZARKO, V. Ye., et al, Gorennye i vzryv, Moscow, "Nauka", 1972, pp 34-37

the decomposition of the high-speed gas flow. The second method of heating is less suitable for the study of nitroglycerine gunpowders and other explosives, the melting temperature (softening, liquefaction) of which is lower than the ignition temperature. 5 ref. Authors' abstract.

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- 53 -

USSR

UDC: 669.295'293:669.788

MIKHEYEVA, V. I., CHERTKOV, A. A., Moscow

"The Hydrogenation of Alloys of Titanium with Niobium"

Moscow, Izvestiya Akademii Nauk SSSR, Metally, No 6, 1973, pp 96-100.

Abstract: The authors studied the hydrogenation of Ti-Nb system alloys and certain properties of the hydride phases formed. It was established that the absorption of hydrogen by alloys containing up to 79 at. % Nb remains practically constant and corresponds to 2 g.at H/g.at Me. For hydrogenated alloys containing less than 79 at. % niobium, a face-centered cubic lattice similar to that of CaF_2 was established, while further increases in the concentration of niobium cause the appearance of a second phase with a body-centered cubic structure similar to niobium monohydride. The products of hydrogenation of alloys with up to 79 at. % Nb, characterized by the maximum absorption of hydrogen and face-centered cubic structure, can be looked upon as solid solutions of substitution of titanium dihydride and niobium dihydride.

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USSR

UDC 778.37

VANYUKOV, M. P., YEVDOKIMOV, S. V., NILOV, YE. V., and CHERTKOV, A. A.

"A Laser With Periodic Modulation of Quality for High-Speed Filming"

Moscow, Kvantovaya Elektronika, No 3, 1971, pp 108-110

Abstract: This brief article examines a laser which emits individual series of light pulses at a wavelength of 530 nm at a repetition frequency of the pulse train of 15 kHz. The authors examine the design of a quality modulator of a master oscillator operating on neodymium glass. They describe the theoretical circuit of the radiation converter and cite the results of testing the oscillator. Figure 1 shows the master oscillator operating at a wavelength of 1060 nm and describes the operating elements. The quality modulator is an optico-mechanical system consisting of rotating rectangular prisms. The radiation frequency converter operates in visible radiation, since the photographic film used has a comparatively low sensitivity in the infrared band. The supply unit consists of 20 condensers, $\pm 00 \mu f$ each, and 20 inductance coils of $40 \mu h$. This supply source ensures laser operation at a repetition frequency of 1/60 Hz. The required power does not exceed 500 w. The authors found that the radiation has the form of ordinary gigantic pulses from the laser. Their duration is 40-50 nsec and the scatter in amplitudes of the 1/2

USSR

VANYUKOV, M. P., et al., Kvantovaya Elektronika, No 3, 1971, pp 108-110

pulses does not exceed 20-25% for the first 10-12 pulses. With a pumping energy of 2000 J the total energy of the series of 30 pulses comprised 16 J at a wavelength of 1060 nm. After converting the radiation to the second harmonic, the total energy of the series of light pulses was 2.1 J at a wavelength of 530 nm. The authors mention that the frequency of pulse repetition obtained in the series is not maximal for equipment of this type. With increase in frequency, the efficiency of such an oscillator is improved and tends toward the value of the efficiency in a mode of free oscillation. The article contains 2 figures and a bibliography of 6 entries.

2/2

- 58 -

Radiobiology

USSR UDC 617-001.28-06:616.441-089.87)-092.9-089:616.419-089.843

CHERTKOV, I. L., Professor, NEMENOVA, N. M., Professor, NOVIKOVA, M. N.,
KOTLYAROV, A. M., MALANINA, V. N., UDALOV, G. A., ROGACHEVA, L. S., and
SHEPSHELEVICH, L. I., Laboratory of Myelo-Hemotherapy of Acute Radiation
Sickness, Pathological Anatomy Laboratory, and Cytological Laboratory,
Central Institute of Hematology and Blood Transfusion, USSR Ministry of
Health, Moscow

"Transplantation of Allogeneous Bone Marrow to Thymectomized Irradiated
Monkeys"

Moscow, Problemy Gematologii i Perelivaniya Krovi, Vol 16, No 3, Mar 71,
pp 45-53

Abstract: Since transplantation of allogeneous bone marrow to irradiated
animals for the purpose of alleviating radiation sickness gives rise to
a secondary disease due to differentiation of the transplanted tissue into
lymphocytes which enter into an immunological reaction with the host, a
study was performed in which thymectomized monkeys were irradiated with
800-1,000 r and then given allogeneous bone marrow transplants. The thymec-
tomy did not prevent the development of the secondary disease, but made it
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USSR

CHERTKOV, I. L., et al., Problemy Gematologii i Perelivaniya Krovi, Vol 16,
No 3, Mar 71, pp 45-53

considerably milder and promoted regeneration of hematopoiesis of the
donor type. Histological examinations indicated that bone marrow stem
cells play an important role in the development of the secondary disease.

2/2

- 19 -

Radiobiology

USSR

UDC 612-001.28-092.9-089:616.419-089.843-06.616-018.13

UDALOV, G. A., and CHERTKOV, I. L. Central Institute of Hematology and Blood Transfusion, Moscow

"Chromosome Aberrations in Bone Marrow Donor Cells Transplanted to Irradiated Monkeys"

Moscow, Byulleten Eksperimentalnoy Biologii i Meditsiny, Vol 71, No 2, Feb 71, pp 97-101

Abstract: Baboons and rhesus monkeys were irradiated with γ -rays in a dose of 800-100 r for 1 1/2-2 hours and then given transplants of autologous or allogenic bone marrow in amounts of $2-5 \cdot 10^3$ viable, nucleus-containing cells per kg of body weight. Females were used as donors and males as recipients in the allogenic transplantation. Since allogenic bone marrow produces in monkeys a pronounced secondary disease with differentiation of hemopoietic lymphoid cells and rapid allergic breakdown of the emerging immunocytes, this portion of the study was conducted with thymectomized monkeys (operation was performed 1 1/2-3 months prior to the experiments). No pronounced secondary illness developed in these animals. It was found that 10-15 days after irradiation, up to one third of the hematopoietic donor cells exhibited

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USSR

UDALOV, G. A., et al, Byulleten Eksperimentalnoy Biologii i Meditsiny, Vol 71, No 2, Feb 71, pp 97-101

structural chromosome lesions: chromatid and isochromatid fragments. Within three weeks, the number of injured cells was reduced. Similar damage to hematopoietic cells was observed also after autotransplantation of bone marrow. It is proposed that chromosome aberrations are caused by viral infections, which are quite probable under the conditions of acute radiation sickness.

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Hydrobiology

USSR

CHERIKOV, V., Special Correspondent of Pravda in Krymskaya Oblast.

"Are There 'Intellectuals' in the Sea?"

Moscow, Pravda, 13 Sep 73, p 6

Translation: Perhaps he was fated to solve the riddle of dolphin language, but he did not manage to do it. And possibly he did not manage to prove the opposite, that the suppositions concerning the intellect of these mysterious animals are unfounded. Either way, had he lived longer he would certainly have contributed something to our knowledge of dolphin life...

Arkadiy Sergeyevich Shein -- he was called the man of a thousand ideas. He was simply brimming with ideas. And the memory he left behind him was of a man rich in talent.

Shein loved the sea, and many of his inventions were linked to it. He directed a laboratory of hydroacoustics, grew enormous crystals artificially, and used them to create various acoustic effects.

I recall how Arkadiy Sergeyevich dragged us away to the sea in order to actually show us the new acoustical device he had thought up. A gale was blowing and evening was coming, and we did not want to leave the comfortable laboratory

1/8

USSR

CHERTKOV, V., Pravda, 13 Sep 73, p 6

at all. But you could not get around his temperment! We gave in. And then when we were on the deck in the whistling wind, he said:

"I am trying to solve the riddle of dolphin language..."

In recent years I have had an opportunity to talk with many scientists who were investigating the life of the dolphins, their body which is extraordinarily perfect for swimming, and their matchless "living locator," which is capable of finding a three-millimeter ball in a swimming pool. All of them recognized the resourcefulness of these animals, but as soon as things came to a question of whether they are intelligent creatures, the answer invariably followed: "Long years of observation have not confirmed this, although..."

In fact, there is a great deal that is winning in the behavior of dolphins. Upon meeting them, one is amazed at many things. Several years ago I chanced to spend time with sailors in the North Atlantic. Once, not far from Newfoundland I believe, we noticed a great movement in the ocean. The dolphins were passing. There were so many of them, both large and small, that it all resembled some kind of grandiose marine migration.

Everyone poured out on deck. The dolphins were already rubbing against the side and jumping high above the waves, plainly not wanting to part with the humans.

2/8

- 28 -

USSR

CHERTKOV, V., Pravda, 13 Sep '73, p 6

"Kostya, play something, they love it," someone asked the cook.

He ran and got his accordian and the strains of "The Waves of the Amur" floated over the ocean. The "stupid" gulls continued their tiresome screeching behind the stern, breaking their wings in the battle for scraps, but the dolphins, they were suddenly transformed. They gathered in a group at the bow of the ship, as if taking the first rows in a theater, and began to whistle. What were they expressing? Was it ecstasy or were they trying to catch the melody? In any case, they were plainly not indifferent to music.

"Look, they are talking with us," everybody said.

Probably it was this episode that sharpened my interest in dolphins. And when I had an opportunity, I tried to meet people who were studying the life and habits of the "intellectuals of the sea."

But are they intellectuals? Studying the structure of the cerebral cortex of dolphins, V. Kesarev, associate at the Brain Institute of the Academy of Medical Sciences, came to the conclusion that this structure is primitive and "monotonous." The brain of dolphins is large in weight because of the strongly developed subcortical formations "which are related to the work of the sonar apparatus and processing aural information, while in the human the weight is in the cortex."

3/8

USSR

CHERTKOV, V., Pravda, 13 Sep 73, p 6

Human attention to dolphins became especially great in connection with the experiments of the American biologist John Lilly, who began his studies of dolphins about 10 years ago. He is the one who proclaimed the dolphins "intellectuals of the sea."

The scientist was amazed that he was able to teach one of his dolphins several English words and even certain phrases such as: "more," "upward," and "talk louder"...But after all, talking parrots are also well-known. There are even phenomenal ones. I knew a Leningrad machinist who had a parrot that delivered whole tirades, and they were even recorded for radio.

Lilly was unable to teach the dolphin to speak in English, but his work gave impetus to further study of these animals.

Does this mean that we will never establish oral contact with the dolphin? But then, we do not demand that dog speak with us in human language. "But the dolphins are the dogs of the sea," I was told by Anatoliy Titor, a young scientist at the Karadag Biological Station who has conducted experiments with dolphins for several years.

"It would seem to be true that dolphins can be trained rapidly," Anatoliy says. "But it is not. There have been cases where we were not able to get

4/8

USSR

CHERTKOV, V., Pravda, 13 Sep 73, p 6

anything for two months even though we suggested something elementary to them such as coming at a signal...Any mongrel dog would have understood what was wanted of it."

I know that many will find that this destroys the pretty fairy tale of the dolphins. But we also love our four-legged friends, who have performed many services for humanity. They were the experimental animals for Academician Pavlov, they were the first to fly in space, they have dragged children from fires and wounded men from the field of battle, and they protect the borders...The dolphin too can be domesticated and used extensively in the sea. It is possible that he will be just as much a friend to humans as the dog has been. The American aquanauts have already used a dolphin as a courier. Worthwhile work will be found such as finding sunken ships, protecting people against sharks, and driving schools of fish into nets...There is plenty of work in the sea, where man is penetrating more and more often.

Dolphins are surprisingly contactable and good-natured. They often make friends with people and, as with many mammals and birds, it is easy to get them to respond to artificially produced signals. Once a dolphin named Gyus escaped from the dolphin station. In captivity he had kept to himself and been a little
5/8

USSR

CHEPTEKOV, V., Pravda, 13 Sep 73. p 6

bit wild. Suddenly a report came from Yevpatoriya that Gyus was roaming near the children's beach and, causing panic among the mothers, had begun to play with the young swimmers. Finding himself in freedom, the dolphin had not left the coast; he was drawn to people. And when he was captured in order to be returned to his place, he fought; he did not want to leave the children. If it had not been for Nikolay Baryshnikov, a man who loved these creatures and is now preparing a book about them, we do not know what would have happened to Gyus.

Nikolay began to whistle like a dolphin. And I must say that in his sound signals he even caught the individual nuances. With this he has often embarrassed experimenters who have rushed to record the whistles, thinking that they were coming from the animals. So Nikolay began to "talk" with Gyus, who calmed down.

Of course, there could not be any conversation between them. They simply loved one another and Gyus was listening in order to imitate the voice of Nikolay Baryshnikov, who had elicited a response to an artificially produced signal.

Experiments have been underway at dolphin stations for a long time but there are still many mysteries. One of them was revealed by Anatoliy Titov, who

6/8

- 30 -

USSR

CHERTKOV, V., Pravda, 13 73, p 6

was mentioned above. There were cases where dolphins stopped using echolocation, and for long times. That was strange. Nature had given them a perfect location apparatus so that it would work constantly; it carried precise information on surrounding objects and even helped find food at night. It would seem that life without it would be unthinkable. But suddenly they "switch it off." For a time...

The refinement of dolphin movements is amazing. Shipbuilders even try to give their vessels the shapes of the dolphin body. By the way, the well-known American atomic submarine Thresher had a dolphin-like shape. There has been an attempt to put a soft cushion resembling dolphin skin on a torpedo. According to reports from foreign sources the experiment proved successful; drag was significantly diminished.

Doctor of biological sciences Yuriy Glebovich Aleyev, who works at the Institute of Biology of the Southern Seas of the Academy of Sciences Ukrainian SSR, tells many interesting things about dolphins. Once he was conducting an experiment in the hydrodynamic channel with the simple, good-natured creature among the dolphins -- the Azov dolphin or porpoise. The dolphin moved along the channel, and a tracking photo apparatus above the water followed him. If the

7/8