BELYAYEV, P.P., kand.khimicheskikh nauk.

Rapid cleaning processes with the help of emulsifiers. Trudy
NIIKHIMMASH no.28:78-88 '59.   (MIRA 15:6)
(Metal cleaning)

18.7300

SOV/133-60-1-26/30

AUTHORS: Belyayev, P.P., Nikitin, B.A., Sukhov, S.I.

TITLE: Electrolytic Pickling of Sheets With Industrial
            Frequency a-c Current

PERIODICAL: Stal', 1960, Nr 1, pp 79-81 (USSR)

ABSTRACT: The authors propose a method of contactless
            electrolytic pickling by means of 50-cycle a-c current
            with the help of a device mounted in the hot plating unit.
            Calculations made by one of the authors (P.P. Belyayev,
            Transactions of Vil'nyus Conference Concerning Electro-
            chemistry, 1956, Publishing House of Lithuanian Academy of
            Sciences 1957) show that electrolytic pickling is poss-
            ible in low concentration solutions within $1 \cdot 10^{-4}$ sec.
            During experimental pickling in hydrochloric acid done
            by the Scientific Research Institute of Chemical Machi-
            nery (NIIKhIMMASh) the formation of a passive indissol-
            uble film was not observed, proving that lower acid

Card 1/5

Electrolytic Pickling of Sheets With
Industrial Frequency a-c Current

concentration can be used. The basic metal dissolved
50% less than in anodic treatment with d-c current.
After successful laboratory tests the method was veri-
fied under industrial conditions on an installation for
512 x 712 mm sheets. Pulling rolls moved the sheet at
6.1-11.3 m/min. Results are shown in table A.

Table A Results of experimental
chemical and electrolytic pickling
of sheets by a-c current.

Card 2/5

PARAMETERS	Serial Number of Borches					
	1	2	3	4	5	6
Current, a.	240	240	360	360	360	—
Voltage on electrodes, v	2,8	2,8	5,5	5,5	5,5	—
Current density on electrodes, a/dm² .	4	4	9	9	9	—
Pickling time, sec . . .	9	9	6	3,2	6	6
Acid Concentration, g/l .	23	20	17,2	17,2	17,0	17,0
Production of First-Grade Tin Plated Sheets, %	69	73	70	74	71	48

Electrolytic Pickling of Sheets With
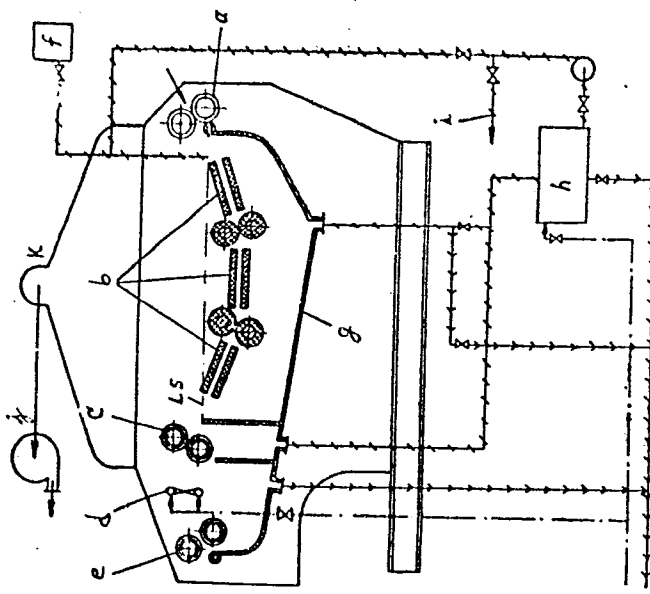Industrial Frequency a-c Current

77465
SOV/133-60-1-26/30

The sheets were free of imperfections, contrary to
pickling without current when 38% had surface flaws.
Tests with bright annealed hot and cold rolled sheets
were successful. Hydrogen and oxygen liberation due
to the electrolytic dissociation of water was not
observed. Based on industrial tests, the authors re-
commend a pickling unit, as shown in Fig. 3, to be
located between mechanized sheet feed and fluxing
machine in the hot tin-plating installation. Sheets
are fed to rollers (a) and pass two sections of electro-
lytic treatment between three sets of graphite electrodes (b)
The distance between the sheets and graphite plates is
70mm and the total length of sheet travel under the
current amounts to 840 mm. Time of treatment is calculated
from $t = 1 : v$, where t = time (min); 1 = length of sheet
travel (m); v = rate of sheet movement (m/min). With a
rate of sheet movement of 15 m/min, the treatment lasts
3.5 sec. The clean sheet passes through extraction
rollers (c), water jet (d), and water extraction rollers
(e). The pickling solution circulates through pressure

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Electrolytic Pickling of Sheets With   77465
Industrial Frequency a-c Current   SOV/133-60-1-26/30

Fig. 3.   Diagram of bath for electrolytic pickling by a-c Current.
          LS is level of solution (other explanations in text).

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Electrolytic Pickling of Sheets With
Industrial Frequency a-c Current

SOV/137-60-1-26/30

tank (f) (capacity: 0.3 m³), pickling bath (g) capacity:
1.2 m³), and reserve tank (capacity: .0 m³), from which
it may be transferred for regeneration along line (i).
The Fe content should not exceed 100 g/l. Contaminated
air is exhausted by fan (j) (capacity: 6000 m³/h) by
way of hood (k). The method is effective in cleaning
sheets, continuously moving strip, and wire as well as for
the treatment of inner and outer tube surfaces. Advan-
tages: (1) higher quality of product; (2) improved working
conditions; (3) decrease in manual labor; (4) saving in
power and chemicals. There are 3 figures; 1 table; and
4 Soviet references.

ASSOCIATION: Scientific Research Institute of Chemical Machinery
(NIIKhIMMASh)

Card 5/5

BELYAYEV, P. P.

"Kontaktlose Stromübertragung bei der chemischen und elektrochemischen Metallbearbeitung."

report presented at the VII Intl. Colloq. Ilmenau Inst. of Technology, Ilmenau GDR, 22-26 Oct '62.

L 39482-66   E T(m)/T/EWP(t)/ETI/EWP(k)   IJP(c)   DJ/JD/HW/GD

ACC NR: AP6002896   (A)   SOURCE CODE: UR/0286/65/000/024/0052/0052

AUTHOR: Nikolayeva, Z.V.; Belyayev, P.P.

ORG: none

TITLE: Method of obtaining grease for the rolling of metals. Class 23, no. 177015

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 24, 1965, 52

TOPIC TAGS: grease, metal rolling, petroleum product

ABSTRACT: A method of using oxidized petrolatum as grease for the rolling of metals is proposed.

SUB CODE: 11,13   /   SUBM DATE: 08Apr64

Card 1/1

83973

18 .12 15 only 2308

S/080/60/033/009/001/021
A003/A001

26.2240

AUTHORS: Budnikov, P.P., Belyayev, R.A.

TITLE: Beryllium Oxide and Its Properties

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol. 33, No. 9, pp. 1921-1940

TEXT: Beryllium oxide has a high refractoriness, favorable nuclear
properties and a good resistance to heat impact which make it suitable as struc-
tural material in nuclear, especially high-temperature, reactors. Its relatively
low vapor pressure permits it to be used in the vacuum technology at temperatures
of up to 2,000°C. The refractive index, microhardness, volumetric weight, thermo-
dynamic properties, etc were studied earlier (Refs 1, 3, 11, 16-19). The re-
sistance of BeO to stretching is lower than to compression (Tables 9-10, Figures
4-6). Articles made from BeO show a thermoplastic flow ("creep") starting from
a temperature of 1,000°C. BeO has a high specific electric resistance combined
with a high heat conductivity. At 630°C the electric resistance is $3.85 \cdot 10^8 \, \Omega \cdot$
cm, at 1,000°C $5.2 \cdot 10^6 \, \Omega \cdot$ cm (Ref 3). The magnetic susceptibility of BeO is zero.
The dielectric constant at room temperature is 7.35. The high heat-resistance
of BeO can be increased still further by adding 0.5% of a mixture of aluminum

Card 1/3

83973
S/080/60/033/009/001/021
A003/A001

Beryllium Oxide and Its Properties

oxide and zirconium oxide. It has been shown that the effect of radiation on BeO decreases with rising temperature. Among highly-refractive oxides BeO is one of the least volatile. Its volatility can be decreased still further by adding oxides of low volatility, like those of magnesium, calcium, strontium, barium, aluminum and silicon. This is explained by the formation of isomorphous and chemical compounds between the oxides and BeO. Beryllium oxide does not interact with hydrogen peroxide, SO_2, sulfur, bromine, and iodine. Below $700^\circ C$ there is no interaction with CS_2. Gaseous hydrogen halides do not react with calcinated BeO even at red heat. Beryllium oxide is easily dissolved in molten alkalis, alkali carbonates and pyrosulfates. It is resistant, however, to alkaline solutions. The reduction of BeO by carbon is the most difficult of all oxides. Under neutral or reducing conditions BeO is resistant to the action of iron or similar metals. Besides BeO the oxide Be_2O is known which is stable under normal conditions. The only chemical compound in the system $BeO-SiO_2$ is phenacite (Be_2SiO_4) which is dissociated to BeO and SiO_2 at $1,560^\circ C$. The following binary systems were studied: $BeO-TiO_2$ (Ref 49), $BeO-Al_2O_3$ (Ref 48), $BeO-UO_2$ (Ref 53), $BeO-Cr_2O_3$ (Ref 55) and various ternary systems (Refs 49, 50, 54, 57, 58, 59). BeO like all other Be compounds, is highly toxic, especially in highly

Card 2/3

83973

S/080/60/033/009/001/021
A003/A001

Beryllium Oxide and Its Properties

dispersed form, like fumes.. There are 17 figures, 23 tables and 61 references: 21 Soviet, 18 English, 15 American and 7 German.

SUBMITTED: April 25, 1960

Card 3/3

S/063/61/006/006/003/006
A057/A126

AUTHORS: Budnikov, P. P., Academician, Belyayev, R. A.

TITLE: Systems with beryllium oxide and their practical application

PERIODICAL: Zhurnal vsesoyuznogo khimicheskogo obshchestva imeni D. I. Mendele--
             yeva, v. 6, no. 6, 1961, 629 - 635

TEXT: A review of investigations on systems of beryllium oxide with other
oxides is presented. These systems containing beryllium oxide became important
because of various valuable properties. Beryllium oxide is the best matrix for
uranium dioxide and thorium dioxide. Porcelain wares containing BeO have outstand-
ing heat resistance properties. Also many different glass types contain BeO, as
for instance the well known "Lindemann glass" which is especially suited for
x-rays. Production of these glasses started in the USSR in 1931. BeO-containing
glasses can have very different properties, such as a high dispersion factor, a
small refraction index, good transparency for ultraviolet rays, high resistivity
to water or chemical agents, etc. Two-, three-, four- and five-component BeO-con-
taining systems are cited with short discussions and corresponding references.
Among the five-component glass systems those published in the USA Patent 2, 584,

Card 1/2

Systems with beryllium oxide and...

S/063/61/006/006/003/006
A057/A126

974-5, Feb. 12, 1952 and J. Loeffler, Verres et rifract, 8, no. 3, 138 (1954) were cited. There are 2 figures, 1 table and 89 references: 20 Soviet-bloc and 69 non-Soviet-bloc. The references to the 4 most recent English-language publications read as follows: P. Murray, Nuclear Power, May, 89 (1959); C. E. Weitz, A. van Valkenburg, J. res. nation. bureau stand., 64 A, no. 1, 103 (1960); R. A. Potter, L. A. Harris, Ceramic laboratory, Metallurgy div. Oak Ridge National laboratory, operated by Union Carbide Nuclear Co for the Atom. Energy Commissions, 1958; E. H. Hamilton, G. W. Cleek, J. res. bureau stand., 60, 693 (1958).

ASSOCIATION: AN USSR (AS UkrSSR)

Card 2/2

BELYAYEV, Remir Aleksandrovich. Prinimal uchastiye DANILOV, Yu.I.;
    BUDNIKOV, P.P., akademik, red.; KALYUZHNAYA, T.P., red.;
    MAZEL', Ye.I., tekhn. red.

[Beryllium oxide, its properties and uses]Okis' berilliia;
svoistva i primenenie. Pod red. P.P.Budnikova. Moskva, Gos-
satomizdat, 1962. 238 p.   (MIRA 15:12)

1. Akademiya nauk Ukr.SSR (for Budnikov).
            (Beryllium oxide)

BELYAYEV, S.; CHERNOIVANNIK, A.

Mechanized production of ice cream. Sov. torg. 34 no. 1:51-53
Ja '61.   (MIRA 14:1)
                (Ice cream industry)

KURBATOVA, Ye.; BELYAYEV, S.; GENERALOV, N.

Universal mechanized line for processing swine and removing the butt of the hide. Mias. ind. SSSR 31 no.4:7-10 '60.

(MIRA 14:7)

(Pork industry)

BURTSEV, L.; BELYAYEV, S.

Great potentials for increasing the productive capacity. Mias.
ind.SSSR 33 no.2:5-10 '62.   (MIRA 15:5)

1. Gosplan SSSR (for Burtsev). 2. Vsesoyuznyy nauchno-issledo-
vatel'skiy institut myasnoy promyshlennosti (for Belyayev).
                        (Meat industry)

BELYAYEV, S.; GEROYEVA, M.

Alma-Ata Meat Combine during the years of the seven-year plan. Mias.ind,
SSSR 33 [i.e.34] no.2:28-29 '63.   (MIRA 16:4)

1. Nauchno-tekhnicheskoye obshchestvo pishchevoy promyshlennosti (for
Belyayev). 2. Alma-Atinskiy myasokonservnyy kombinat (for Geroyeva).
                        (Alma-Ata—Meat industry)

BELYAYEV, S.A.

Work with semiprofessional medical personnel in Kalinin Province.
Zdrav. Ros. Feder. 5 no. 4:41-42 Ap '61.   (MIRA 14:4)
          (KALININ PROVINCE—MEDICAL PERSONNEL)

BELYAYEV, S.F., inzh.

Designing transfer-machine lines for the food industry. Mekh.i
avtom.proizv. 16 no.4:6-10 Ap '62.   (MIRA 15:4)
              (Food industry--Equipment and supplies)

BELYAYEV, S.F., inzh.

Over-all mechanized lines for the processing of grapes. Mekh.i
avtom.proizv. 16 no.12:23-25 D '62.   (MIRA 16:1)
                    (Georgia—Wine and wine making)

ZASLOV, V.Ya., inzh.; PAVLOV, O.V., inzh.; BELYAYEV, S.G., inzh.

Mechanization of the erection of rod bolting. Gor.zhur.
no.5:46-48 My '62.   (MIRA 16:1)

1. Nauchno-issledovatel'skiy i proyektno-konstruktorskiy
institut gornogo i obogatitel'nogo oborudovaniya, Sverdlovsk.
                        (Mine roof bolting)

BELYAYEV, S.

Role of public participation in scientific and technical progress.
Mias.ind. SSSR 34 no.3:3-5 '63.
(MIRA 16:7)

1. TSentral'noye pravleniye Nauchno-tekhnicheskogo obshchestva
rabotnikov pishchevoy promyshlennosti.

ZASLOV, V.Ya.; MURZIN, G.A.; PAVLOV, O.V.; BELYAYEV, S.G.; ETINGOV, S.I.

Powered tool for installing roof bolting. Gor.zhur. no.4:55-58
Ap '64.   (MIRA 17:4)

1. Nauchno-issledovatel'skiy i proyektno-konstruktorskiy
institut gornogo i obogatitel'nogo oborudovaniya (for Zaslov,
Murzin, Pavlov, Belyayev). 2. Severoural'skiye boksitovyye
rudniki (for Etingov).

BITNER, Z.F.; LAVRENT'YEV, A.F.; BELYAYEV, S.L.

Increasing the service life of spindles. Metallurg 8
no.2:33 F '63.   (MIRA 16:2)

1. Chelyabinskiy metallurgicheskiy zavod.
        (Rolling mills—Design and construction)

BELYAYEV, S. I..

"Gastrophylosis of Horses and Its Control." Cand Vet Sci, Moscow Veterinary Acad, Moscow, 1953. (RZhBiol, No 8, Dec 54)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (12)
SO: Sum. No. 556, 24 Jun 55

BELYAYEV, S.M., veterinarnyy vrach.

Gastrophiliasis in horses and methods of controlling it.
Veterinariia 31 no.2:29-31 F '54.   (MLRA 7:2)
                                      (Horses--Diseases)

BELAYEV, S. M.

BELAYEV, S. M. --"Gastrophylesis of Horses and Measures Against it."*(Dissertation for Degrees in Science and Engineering Defended at USSR Higher Educational Institutions) Min of Higher Education USSR, Kharkov Veterinary Inst, Kharkov, 1955

SO: Knizhnaya Letopis', No. 25, 18 Jun 55

* Degree of Candidate in Veterinary Sciences

BELYAYEV, S. N.

SOV/137-58-8-16937

Translation from Referativnyy zhurnal, Metallurgiya. 1958, Nr 8, p 102 (USSR)

AUTHOR: Belyayev, S.N.

TITLE: Production of Individual Thin-sheet Piece Blanks of Wedge-shaped Cross Section by a Rolling Process (Polucheniye tonko-listovykh shtuchnykh zagotovok klinovidnogo secheniya meto-dom val'tsovki)

PERIODICAL: V sb.: Mashiny i tekhnol. obrabotki metallov davleniyem. (MVTU, 79). Moscow, Mashgiz, 1957, pp 22-37

ABSTRACT: A description is provided of a flow sheet for the production of blanks for the blades of clasp knives. The blank consists of a flat base and a cutting blade it is wedge-shaped in cross section. The blade is of shaped contour. Rolling was introduced in place of stamping to reduce the stresses of deformation. Sheet Al 1.4 mm thick and 5-10 mm wide was used in the experiment. The blank was cut on a guillotine and broken down between rolls. Calculations are adduced for the minimum running thickness of the blank, the contact area and the mean unit pressures. The experiments conducted confirm conclusions relative to the shape of the tool and yield data for the planning of the process procedure.
A.I.

Card 1/1
    1. Cutting tools--Production 2. Aluminum--Processing
    3. Rolling mills--Performance

BELYAYEV, S.N.

Simplifying the calculation of crosspiece travel for battery-
driven hydraulic presses. Kuz.shtam. proizv. 3 no.1:28-30 Ja
'61.   (MIRA 14:1)
                        (Hydraulic presses)

BELYAYEV, S.N., inzh; BOCHAROV, Yu.A., kand.tekhn.nauk,dotsent

Floating level regulator for a hydropneumatic microaccumulator.
Trudy MVTU no.111:83-89 '64.   (MIRA 17:9)

BELYAYEV, S.N., inzh.

Liquid pressure fluctuations in the working cylinder of a
hydraulic-screw hammer press. Trudy MVTU no.111:90-98 '64.
(MIRA 17:9)

YEZZHEV, A.S.; SKLADCHIKOV, Ye.N.; BELYAYEV, S.N.

Automatic presses for the tabletting of AG-4C molding materials.
Kuz.-shtam.proizv. 5 no.2:31-35 F '63.   (MIRA 16:2)
                      (Plastics machinery)

BELYAYEV, S.N.

Effect of the time of slide valve switching on the slider mo-
tion of a hydraulic press with storage battery. Kuz.-shtam.
proizv. 4 no.1:22-25 Ja '62.
(MIRA 17:3)

BELYAYEV, S.S.; GEMPEL', A.R.

Improving the cutting disks for cutting joiner's pins. Suggested by S.S.Beliaiev, A.R.Gempel'. Rats.i izobr.predl.v stroi. no.13:115 '59.
(MIRA 13:6)

1. Derevoobdelochnyy zavod No.1 tresta Stroydetal' 82 Glavleningradstroya.
(Woodworking machinery)

Yugoslavia/Physical Chemistry. Atom.

B-3

Abs Jour : Referat Zhur - Khimiya, No 7, 1957, 21930

Author   : Belyayev, S.
Inst   : None
Title   : Graphic presentation of magnetic moments of atoms

Orig Pub : Glasnik Khem. Drushtva, 1956, 21, No 1, 1-8
           (published in Serbo-Croatian with a German summary)

Abstract : Total magnetic moment of an atom g $\sqrt{I(I+1)}$ can be graphic-
           ally presented by g times elongated hypotenuse of a triangle
           with I and $\sqrt{I}$ for legs. This does not contribute anything
           new to the study of magnetic properties of atoms but gives a
           geometrical presentation of magnetic moments participating in
           formation of electron surfaces.

Card 1/1

-4-

BELYAYEV, S.T.

Category : USSR/Atomic and Molecular Physics - Statistical Physics   D-3
            Thermodynamics

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3435

Author   : Belyaev, S.T., Budker, G.I.
Title   : The Relativistic Kinetic Equation

Orig Pub : Dokl. AN SSSR, 1956, 107, No 6, 807-810

Abstract : The authors consider the problem of the relativistic invariance of the
            formulation of the kinetic equation and of the transformation properties
            of the distribution function. A vector F_k is introduced, which depends
            on the four coordinates x_k and on the four momenta p_k in such a manner
            that $\int F_k d^4 p = j_k \ (k = 1, 2, 3, 4)$

            where j_k is the usual four-vector of the particle flux and density. F_k
            satisfies the relationship $F_k = F u_k$, where u_k is the four-velocity of
            the particle, and $F(x,p)$ is called the scalar of the distribution func-
            tion. If the rest masses of the particles are equal, then $F(x,p)$ is
            related simply to the scalar $f(x,p)$, which coincides with the usual dis-
            tribution function. A relativistically invariant equation is obtained
Card   : 1/2

Category : USSR/Atomic and Molecular Physics - Statistical Physics   D-3
           Thermodynamics

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3435

for the function F for a system of non-interacting particles in an
electromagnetic field and for the case of a Coulomb interaction be-
tween particles. The latter case is considered under the condition that
the particle energy $E \ll \sqrt{137} \, L \, mc^2$, where L is the Coulomb logarithm.
The above equation leads to a relativistic equation for the
ordinary function f, but not in a relativistically-invariant form.
The authors also consider the problem of the energy transfer and
momentum transfer from one gas to another.

Card   : 2/2

BELYAYEV, S.T., ADIASEVICH, B.P., POLUNIN, Yu.P., ZAVOYSKIY, Ye.K.

"Sources of Polarized Particles."

paper submitted at the All-Union Conf. on Nuclear Reactions in Medium and Low
Energy Physics, Moscow, 19-27 November 1957.

AUTHOR: Belyayev, S. T.   56-2-21/51

TITLE: The Application of Quantum Field Theory Methods on a System
               of Bose Particles (Primeneniye metodov kvantovoy teorii
               polya k sisteme Boze-chastits)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958,
               Vol 34, Nr 2, pp 417-432 (USSR)

ABSTRACT: The present work develops further the method of the Kernel
               for a system of particles consisting of a great number N of
               interacting particles. This system has the following
               characteristic feature: In the ground state there is a
               great group of particles with the momentum $\vec{p} = 0$ (condensate),
               which forbids the use of the usual technique of quantum
               field theory. But with a great N the usual technique of the
               Feynman-graph can be used for the particles with $\vec{p} \neq 0$ and
               the condensate (which does not disappear at the beginning
               of interaction) can be regarded as a certain external
               field. The Kernel is expressed by three effective potentials
               Σ_{ik} (emission and absorption of a pair, and scattering) as
Card 1/3   well as by the chemical potential μ of the system (analogon

The Application of Quantum Field Theory Methods on a System   56-2-21/51
of Bose Particles

of Dayson's equation in electrodynamics). For the
determination of Σ_{ik} and μ a certain approximation is
needed. The present work calculates the magnitudes in the
approximation of small density. The author begins with the
formation of the problem as well as with the investigation
of the Feynman-graph. A system of N spin-less Bose-
-particles are investigated with the mass $m = 1$, which are
enclosed in the volume V. $N,V \rightarrow \infty$, but $N/V = n$ is
supposed to be finite. The Hamiltonian of the system is
also put down in detail. The next chapter deals with the
Kernel for the condensate: all of them deteriorate to single
factors each of which depends on   time argument only. The
one-particle condensate function is them closer investigated.
The following chapters of this work deal with some
characteristics of the condensate, the Kernel for a
particle with $\vec{p} \neq 0$, the connection of the Kernel with the
parameters of the system and the approximation of the
perturbation theory for Σ_{ik} and μ. The expression obtained
at the end of this work for the energy of the quasi
particles and for the mean occupation numbers in the ground
Card 2/3   state coincide with the results of a well-known work of

The Application of Quantum Field Theory Methods on a System   56-2-21/51
of Bose Particles

        Bogolyubov (reference 5). A mathematical suffix offers the
        proof for a theorem. There are 5 figures and 9 references,
        5 of which are Slavic.

ASSOCIATION: AS USSR (Akademiya nauk SSSR)

SUBMITTED: August 2, 1957

AVAILABLE: Library of Congress

        1. Base particles-Theory

Card 3/3

AUTHOR: Belyayev, S. T.   56-2-22/51

TITLE: The Energy Spectrum of a Non-Ideal Bose Gas
(Energeticheskiy spektr neideal'nogo Boze-gaza)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958,
Vol 34, Nr 2, pp 433-446 (USSR)

ABSTRACT: The present work determines the one particle Kernel for a
system of interacting Bose particles. By means of this Kernel
the energy spectrum of the excitations (quasiparticles) as
well as the energy of the ground state and the distribution
of the particles in this state on momentum are computed.
First the graphs corresponding to the effective potentials
are estimated. Every loop with more than two composed lines
introduces a small parameter β while the loops with two
composed lines do not contain this β. The next chapters deal
with an equation for the effective potential Γ, a Kernel of
first approximation, the second approximation for the Kernel,
the spectrum of the quasiparticles, the energy of the ground
state, the possibility of higher approximation, the high
excitations ($pf_0 \sim 1$) and the case of elastic spheres. For the

Card 1/2

The Energy Spectrum of a Non-Ideal Bose Gas   56-2-22/51

approximation investigated here the following mainly holds:
1) The interaction between the particles is not described
by a potential but by the exact amplitude of scattering,
which permits the investigation of strong interactions.
After the substitution of the potential by the amplitude
there remains the possibility to develop a perturbation
theory in relation to the amplitude. 2) Not the energy of
the quasiparticles (i. e. the denominator of the Kernel) is
expanded into a series but the effective potentials of
interaction Σ_{ik} and the chemical potential μ. The
connection of the Kernel with Σ_{ik} and μ is determined
exactly. The energy $\varepsilon_{\vec{p}}$ of the elementary excitations (quasi-
particles) in relation to the amplitude f is possible only
with high excitations, the states of the system situated
close to the ground can, however, in principle not be
obtained by means of the perturbation theory. There are 4
figures and 5 references, 3 of which are Slavic.

ASSOCIATION: AS USSR (Akademiya nauk SSSR)

SUBMITTED: August 2, 1957

AVAILABLE: Library of Congress
Card 2/2   1. Base particles-Energy-Spectrum analysis

BELYAYEV S. T.

BELYEV, S. T. and BUDKER, G. I.

"Multi-Quanta Recombination in an Ionized Gas." (Work carried out in 1955) pp. 41-49.

"The Physics of Plasmas; Problems of Controlled Thermonuclear Reactions." Vol. III. 1958, published by Inst. Atomic Energy, Acad. Sci. USSR. resp. ed. M. A. Leontovich, editorial work V. I. Kogan.

Available in Library.

BELYAYEV S.T.

BELYEV, S. T.

"Kinetic Equations for Dilute Gases in Strong Fields." (work carried out in 1955); pp. 50-65.
"The Kinetics of an Ionized Gas in a Strong Magnetic Field." (Work carried out in 1955); pp. 66-85.

The Physics of Plasmas; Problems of Controlled Thermonuclear Reactions." Vol. III. 1958, published by Inst. Atomic Energy, Acad. Sci. USSR. resp. ed. M. A. Leontovich, editorial work V. I. Kogan.

Available in Library.

BELYAYEV S. T.

BELYEV, S. T. and BUDKER, G. I.

"Relativistic Plasma in Variable Fields," (Work - 1953); pp. 283-329.

"The Physics of Plasmas; Problems of Controlled Thermonuclear Reactions;" Vol. II. 1958, published by Inst. Atomic Energy, Acad. Sci. USSR. resp. ed. M. A. Leontovich, editorial work V. I. Kogan.

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BELYAYEV S. T.

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BUDKER, G. I. and BELYEV, S. T.

"Kinetic Equation for an Electron Gas for Rare Collisions." (Work - 1954); pp. 330-354.

"The Physics of Plasmas; Problems of Controlled Thermonuclear Reactions." VOl. II. 1958, published by Inst. Atomic Energy, Acad. Sci. USSR. resp. ed. M. A. Leontovich, editorial work V. I. Kogan.

Available in Library.

BELYAYEV, S. T.

"Field Theoretical Method for Collective Excitations in Fermi Systems."

report presented at the Intl. Conference on Many-Body Problems, Utrecht, 13-18 June 1960.

BELYAYEV, S.T.

21(7)   PHASE I BOOK EXPLOITATION   SOV/1243

Akademiya nauk SSSR. Institut atomnoy energii

Fizika plazmy i problema upravlyayemykh termoyadernykh reaktsiy,
    t. III. (Plasma Physics and the Problem of Controlled
    Thermonuclear Reactions, v. 3) [Moscow] Izd-vo AN SSSR,
    1958.. 362 p. 3,000 copies printed.

Resp. Ed.: Leontovich, M.A., Academician.

PURPOSE: This collection contains previously unpublished work of
    members of the Institut atomnoy energii (Institute of Atomic
    Energy) of the Academy of Sciences of the USSR. It is intended
    for scientists interested in this field.

COVERAGE: This book is the third of four volumes of previously
    unpublished work of the members of the Institute of Atomic
    Energy during the period 1951-58. The exploitation cards on the
    other volumes in this series have been released under the
    numbers 1241, 1242, and 1244.

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AVAILABLE: Library of Congress (QC794.A38)

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Belyayev, S. T.

SOV/89-7---18/25

21 (7), 21 (8)

AUTHOR: Rudakov, V. P.

TITLE: IX All-Union Conference on Nuclear Spectroscopy
(IX Vsesoyuznoye soveshchaniye po yadernoy spektroskopii)

PERIODICAL: Atomnaya energiya, 1959, Vol 7, Nr 4, pp 76-79 (USSR)

ABSTRACT: The IX All-Union Conference was held from January 26 to
February 2, 1959 at Kharkov. More than 300 participants heard
100 lectures, the most important of which dealt with the
following fields. Nuclear Theory. General problems of β-decay,
A. S. Davydov (MGU): Theoretical classification of low-energy
excited nuclear states. L. K. Peker: Deformed nuclei. L. K.
Biryukh, L. K. Peker, L. A. Sliv (LFTI): Coulomb energy
oscillations of deformed nuclei. ... V. ... nnumber
classes for β-transitions of the ft-values ... matrix
... (KhFTI): Calculation of the ft-values ... matrix
elements for β-transitions by means of the generalized nuclear
model. ... (IAE): Consideration of pair-correlation
in nuclei. ... (IAE): The application of the super-
conductivity model to nuclei for the purpose of calculating
their moments of inertia. P. E. Nemirovskiy (IAE): Problems of
the neutron stability of nuclei. ... (IAE): The
present stage in the theory of β-decay. ...
V. ... Measurement of the angular correlation between electrons and
neutrino in the decay of the neutron. Yu. Ya. Ichshar, I. A.
... (LFTI): Measurement of the correlation
between the transversal electron polarization and circular
polarization of γ-quanta occurring in the decay of
Sc[46] and Co[60]. Decay Schemes. γ-radiation of nuclei. ...
..., A. I. Faller, Yu. V. Gonchar, Ts. ...
A. E. L'vov, P. M. Malhov, S. P. Tsytko, P. G. Gorskin, A. S.
..., ... (Fiziko-tekhnicheskiy
Khar'kovskiy institut (Physico-technical institute, Kharkov))
The Si[28,29,30](p,γ), Ne[20](p,γ), S[32,34](p,γ), Ar[40](p,γ) and K[41](p,γ)
reactions. ... C. Akhazov, A. P. ..., S. M. Za...lin,
M. Kh. Lember, V. V. Rochnarotzevskiy, Z. M. ...
Leningradskiy fiziko-tekhnicheskiy institut (Leningrad Physico-
technical Institute): Investigation of the decay excitation
of the lower levels of some nuclei during their bombardment by
multiply charged ions (C, N, O, and Ne). A. A. Vorobyev, V. N.
Marin, V. I. Dokrzuvin, V. A. Fowler (IAE): New isotopes
..., Ho[153,155] and Ho[157], ... B. S. Dzhelepov, ...
Gorlinenko (LGU): Decay schemes of some new radioactive
isotopes, set up on the basis of beta-spectra of the coinci-
dence of the internal conversion electrons. Spectroscopy
Engineering. B. S. Dzhelepov, M. A. ..., ...
V. G. Chumin (RIAN): Experiences with double focusing. ...
S. V. ..., ... improved γ-spectrometer. A. F. ...
..., V. G. Shcherbin (IAE): Improved β-spectrometer. ...
Barchuk, V. I. Bairb, V. I. ..., ... (IYAN
UkrSSR): Magnetic spectrograph for heavy charged particles.
The representatives of the Ministerstvo radiotekhnicheskoy
promyshlennosti (Ministry of the Radio-engineering Industry)
gave a report about new multipliers. The Conference was
closed by B. S. Dzhelepov who stressed the fact that nuclear
tables and reference works ought to be published much more
quickly in order to be of real use to the experimenter.

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S/056/60/039/005/032/051
B006/B077

24.6200

AUTHOR: Belyayev, S. T.

TITLE: The Nature of the First Excited States of Even-even
              Spherical Nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,
              Vol. 39, No. 5(11), pp. 1387 - 1400

TEXT: The spectra of the excited states of even-even non-deformed
nuclei showed certain known rules governing position, spin, and parity
of the different levels and also transition characteristics and probabi-
lities; it is tried to use a model to describe these findings theore-
tically. The model of hydrodynamic surface oscillations shows a number
of shortcomings. The author showed already in a previous study that
when considering the nucleon pair correlation and the nucleon "quadru-
pole" interaction, a new type of oscillation of the spherical nucleus
appears which is not of hydrodynamic nature. These oscillations are re-
lated to the change of the configurations of the outer nucleons. The
energy, mass coefficient, and dependence of the oscillations on the

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The Nature of the First Excited States of   S/056/60/039/005/032/051
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filling of the upper shells has already been determined and correspond
qualitatively · to experimental results. The author examines the micro-
scopic structure of these oscillations and gives a detailed explana-
tion of their nature and a determination of the relationship with single-
particle representations. In order to clarify these interrelations only
interactions due to pairing are considered and quadrupole interactions
of the nucleons are regarded as possible collective excitations in any
type of interaction. The influence of polarizability of the core upon
the effective interactions of the nucleons with nucleons is studied.
The nature of the collective excitations and the condition for their
arising is examined for the special case of non-filled j-shells. The
results obtained are valid qualitatively also in the general case. The
investigations yielded the following results: According to the type of
interaction in spherical nuclei "bound" (correlated) states of pairs
with nonvanishing momenta as Cooper-type pairs as well as particle-hole
type pairs, etc can be formed. This possibility occurs only at pairing,
that is in the case of existence of a condensate of Cooper pairs with
zero momenta. Polarization of the core leads to a large increase of
effective quadrupole interactions between the outer nucleons which

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The Nature of the First Excited States of   S/056/60/039/005/032/051
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favors the production of bound states of particles and holes with $J = 2$
momenta. Macroscopically these excitations can be considered as oscilla-
tions of the quadrupole moment of the outer nucleons. The surface oscil-
lations which occur are only a result of the static polarizability of
the core and are not related to hydrodynamic surface oscillations. All
these results are not related to the calculations based on the j-level
model. Which of the possible bound states is realized, has to be cleared
phenomenologically. The author thanks V. M. Galitskiy and A. B. Migdal
for discussions. L. P. Gor'kov is mentioned. There are 3 figures and
13 references: 4 Soviet, 2 Danish, 4 US, 1 French, and 1 German.

SUBMITTED: June 21, 1960

Card 3/3

S/056/61/040/002/043/047
3102/3201

AUTHOR: Belyayev, S. T.

TITLE: Calculation of the moment of inertia of nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40,
             no. 2, 1961, 672-675

TEXT: The moment of inertia of deformed nuclei under consideration of super-
fluidity (Cooper-type pairing of nucleons) has been earlier calculated by the
author within the framework of the adiabatic perturbation theory (Math.-Fys.
Dan. Vid. Selsk., 31, 11, 1959); A. B. Migdal (ZHETF, 37, 249, 1959) has ap-
plied the method of the Green function to show that a perturbation-theoreti-
cal consideration of the rotational energy is insufficient, since the Cooper
pairs themselves are affected by rotation, which fact gives rise to an ad-
ditional component of the moment of inertia. As is shown here, a successive
application of the method of canonical transformation leads to the same
result. Nucleons in the deformed self-consistent field are described by the
Hamiltonian

$$(1), \quad H = \sum_{v_i}(\varepsilon_{v_i}' - \lambda) a_{v_i}^+ a_{v_i} - \frac{1}{2}\sum \langle 12|G|2'1'\rangle a_1^+ a_2^+ a_{2'} a_{1'},$$

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where $a^+_{\nu_1} \cdot (a_{\nu_1})$ denotes the production (destruction) operators of the nucleon

in the state $\nu_1 = 1$, $\mathcal{E}_\nu = \mathcal{E}_1$ denotes the energy of this single-particle

state, λ is the chemical potential of the system. The pairing is taken into account by introducing quasiparticles by a canonical transformation

$a_\nu = u_\nu \alpha_\nu + v_\nu \alpha^+_{\tilde{\nu}}$, $\alpha_\nu = u_\nu a_\nu - v_\nu a^+_{\tilde{\nu}}$, where $\tilde{\nu}$ is a state conjugate with time with

respect to ν and of the same energy; the transformation factors obey the

conditions $u_{\tilde{\nu}} = u_\nu$, $v_{\tilde{\nu}} = -v_\nu$, $u_\nu^2 + v_\nu^2 = 1$. An equivalent is the condition

of minimization of the quasiparticle vacuum state $(\alpha \Psi_0 = 0)$:

$\Psi_0 = \prod_{|\nu|} (u_\nu + v_\nu a^+_\nu a^+_{\tilde{\nu}}) \,|\, 0 \rangle$ (4). The calculation of the mean values with

(4) is equivalent to an independent averaging of operator pairs, e.g.

$$(5 \quad \langle a^+_1 a^+_3 a_{2'} a_{1'} \rangle_0 = \langle a^+_1 a_{1'} \rangle_0 \langle a^+_3 a_{2'} \rangle_0 - \langle a^+_1 a_2 \rangle_0 \langle a^+_3 a_{1'} \rangle_0 + \langle a^+_1 a^+_2 \rangle_0 \langle a_{2'} a_{1'} \rangle_0$$

where only the "diagonal" terms are non-vanishing $\langle a_1 a^+_1 \rangle = v_1^2$,

$\langle a^+_1 a^+_{\tilde{1}} \rangle_0 = \langle a_{\tilde{1}} a_1 \rangle_0 = u_1 v_1$. For determining the moment of inertia the lowest

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state of the system is sought with a fixed mean value of the projection of the moment onto an axis perpendicular to the nuclear axis. The term

$H_\omega = -\omega \hat{J}_x = -\omega \sum \langle 1|j_x|2\rangle a_1^+ a_2$ is added to the Hamiltonian ($\langle \hat{J}_x \rangle = J_x$); for the annihilation of the terms $\alpha\alpha$ and $\alpha^+\alpha^+$ in the total Hamiltonian $H' = H + H_\omega$ an additional canonical transformation is performed:

$\alpha_\nu \to \alpha_\nu(\omega) + \sum_{\gamma'} f_{\gamma\gamma'} \alpha_{\bar{\gamma'}}^+(\omega)$; the factors $f_{\gamma\gamma'}$ are related to the rotational term H_ω ($f_{\gamma\gamma'} \sim \omega$). They are regarded as being small and are considered only in first approximation; $f_{\gamma\gamma'} + f_{\bar{\gamma'}\bar{\gamma}} = 0$, $f_{\gamma\gamma} = 0$. For the new quasiparticles $\alpha_\nu(\omega)$ the vacuum state is given by (10); $(\Psi_\omega, \Psi_\omega) = \exp\left(\frac{1}{2}\sum_{\gamma\gamma'}|f_{\gamma\gamma'}|^2\right)$

the function (10) is not normalized: $(\Psi_\omega, \Psi_\omega) = \exp\left(\frac{1}{2}\sum_{\gamma\gamma'}|f_{\gamma\gamma'}|^2\right)$. For determining the factors $f_{\gamma\gamma'}$ it is necessary to determine the minimum of the mean value of the total Hamiltonian H' in the state (10). The diagonal terms

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$$\langle a_1^+ a_1 \rangle = v_1^2 + (u_1^2 - v_1^2) \sum_2 |f_{12}|^2,$$

(11)

$$\langle a_1^+ a_1^+ \rangle = \langle a_1 a_1 \rangle = u_1 v_1 - 2u_1 v_1 \sum_2 |f_{12}|^2$$

as well as the off-diagonal terms

$$\langle a_1^+ a_2 \rangle = (u_1 v_2 - v_1 u_2) f_{12}^{\bullet},$$

(12) $$\langle a_1^+ a_2^+ \rangle = \langle a_2 a_1 \rangle^{\bullet} = (u_1 u_2 + v_1 v_2) f_{12}^{\bullet}.$$ (12)

are non-vanishing ($f_{12}^* + f_{21} = 0$). By (11) and (12) it is possible to cal-
culate the mean values of H and Hω; one obtains

$$\langle H \rangle = W_0 + \frac{1}{2} \sum_{12} (E_1 + E_2)|f_{12}|^2 -$$

(14) (15),

$$- \frac{1}{2} \sum \langle 1\widetilde{2} | G | \widetilde{2}'1' \rangle (u_1 u_2 + v_1 v_2)(u_{1'} u_{2'} + v_{1'} v_{2'}) f_{12}^{\bullet} f_{1'2'} +$$

$$+ \frac{1}{2} \sum (\langle 1\widetilde{1}' | G | \widetilde{2}'2 \rangle - \langle 1\widetilde{1}' | G | 2\widetilde{2}' \rangle)(u_1 v_2 - v_1 u_2)(u_{1'} v_{2'} - v_{1'} u_{2'}) f_{12}^{\bullet} f_{1'2'},$$

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$$\langle H_\omega \rangle = -\omega \langle \hat{J}_x \rangle = -\omega \sum \langle 1 | j_x | 2 \rangle (u_1 v_2 - v_1 u_2) f_{12}^{\bullet},$$

Calculation of the ...

where W_0 is a term not containing f, E is the quasiparticle energy;

$$(16) \qquad E_1 = \sqrt{(\tilde{\varepsilon}_1 - \lambda)^2 - \Delta_1^2}.$$

$$\tilde{\varepsilon}_1 = \varepsilon_1 - \sum_2 (\langle 12|G|21\rangle - \langle 12|G|12\rangle) v_2^2, \quad \Delta_1 = \sum_2 \langle 1\bar{1}|G|\bar{2}2\rangle\, u_2 v_2.$$

The gap Δ in the quasiparticle spectrum characterizes the pairing. From a variation of $\langle H \rangle + \langle H_\omega \rangle$ with respect to f_{12} one obtains for f_{12} the integral equation

$$(E_1 + E_2) f_{12} - \sum_{1'2'} \langle 1\bar{2}|G|\bar{2}'1'\rangle (u_1 u_2 + v_1 v_2)(u_{1'} u_{2'} + v_{1'} v_{2'}) f_{1'2'} +$$

$$(17). \qquad + \sum_{1'2'} (\langle 1\bar{1}'|G|\bar{2}'2\rangle - \langle 1\bar{1}'|G|\bar{2}2'\rangle)(u_1 v_2 - v_1 u_2)(u_{1'} v_{2'} - v_{1'} u_{2'}) f_{1'2'} =$$

$$= \omega (u_1 v_2 - v_1 u_2) \langle 1|j_x|2\rangle. \qquad (17)$$

(14) can thus be represented in the form

$$(18). \qquad \langle H \rangle = W_0 + \tfrac{1}{2} \omega^2 \sum (u_1 v_2 - v_1 u_2) \langle 1|j_x|2\rangle f_{12}^* \omega^{-1}$$

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Calculation of the ...

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B102/B201

If ω is eliminated one obtains $\langle H \rangle = W_o + \frac{1}{2} \mathcal{J}_x^2 / \mathcal{J}$, where $\mathcal{J}$ is the moment of inertia. $\mathcal{J}$ decomposed into components gives

$$\mathcal{J} = \mathcal{J}^{(1)} + \mathcal{J}^{(2)} + \mathcal{J}^{(3)},$$

(20) (22) $$\mathcal{J}^{(1)} = \sum_{12} \frac{|\langle 1 | I_x | 2 \rangle|^2}{E_1 + E_2} (u_1 v_2 - v_1 u_2)^2,$$ (20)

$$- \langle 1\bar{1}' | G | 2\bar{2}' \rangle) (u_1 v_2 - v_1 u_2)^2 (u_{1'} v_{2'} - v_{1'} u_{2'}) f_{1'2'} \omega^{-1}.$$ (22)

Taking account of rotation with the adiabatic perturbation theory yields only the first component $\mathcal{J}^{(1)}$; this method is equivalent to taking account only of the diagonal corrections to (11). $\mathcal{J}^{(2)}$ takes into account the effect of rotation upon the pairing and $\mathcal{J}^{(3)}$ describes the change of the self-consistent field of nucleons due to rotation. $\mathcal{J}^{(1)} \rightarrow 0$ for $\Delta \rightarrow \infty$, $\mathcal{J}^{(2)} \rightarrow 0$ for $\Delta \rightarrow 0$, and $\mathcal{J}^{(3)}$ give a correction to $\mathcal{J}$ of the order of $A^{-1/3}$. There are 3 Soviet-bloc references.
SUBMITTED: September 15, 1960
Card 6/6

S/056/62/042/006/026/047
B104/B108

AUTHORS: Belyayev, S. T., Zelevinskiy, V. G.

TITLE: "Anharmonic effects" of quadrupole oscillations of spherical
             nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42,
             no. 6, 1962, 1590 - 1603

TEXT: Deviations from the harmonic fundamental oscillations are studied
in the scope of the microscopic theory of collective excitations of
spherical even-even nuclei. The number of independent phenomenological
constants for describing the anharmonic corrections of quadrupole oscilla-
tions of spherical nuclei can be reduced considerably. In adiabatic
approximation, the perturbation $H^{(1)}$, i. e. the term of the Hamiltonian
containing three phonon operators, is determined by only one constant.
$H^{(2)}$ contains only three constants which can be approximated asymptotically
by one constant. All constants can be calculated for real nuclei. The
probability of electromagnetic E2 transitions is much more sensitive to

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B104/B108

the form of the anharmonic corrections than the energy of the nuclear
levels.

SUBMITTED: December 31, 1961

Card 2/2

BELYAYEV, S. T.

"A new derivation of nuclear collective Hamiltonians."

report submitted for Intl Conf on Low & Medium Energies Nuclear Physics, Paris, 2-8 Jul 64.

BELYAYEV, S.T.; ZELEVINSKIY, V.G.

Anharmonicity of the oscillations of spherical nuclei. Izv. AN
SSSR. Ser. fiz. 28 no.1:127-132 Ja '64.   (MIRA 17:1)

L 41007-65   EWT(m)   Peb   DIAAP

ACCESSION NR: AP5007699   S/0367/65/001/001/0003/0012

AUTHOR: Belyayev, S. T.

TITLE: A nucleon-phonon Hamiltonian for spherical nuclei

SOURCE: Yadernaya fizika, v. 1, no. 1, 1965, 3-12

TOPIC TAGS: spherical nucleus excitation, modified shell model, nucleon phonon
Hamiltonian, phonon propagator distortion

ABSTRACT: Lately, significant progress has been made in the theoretical ex-
planation of the spectra from spherical nuclei using the shell model and then
taking into account only the most substantial part of the residual nucleon in-
teractions (see, e.g., L. S. Kisslinger, R. A. Sorensen, Mat. Fys. Med. . . . .
Vid. Selsk., 32, 9, 1960; Rev. Mod. Phys., 35, 854, 1963). However, the pro-
blem related to the higher excited states is quite complex and the problem of
determining spectra from higher excited levels of the nucleus may be decomposed
into two sub-problems, 1) the investigation of the phonon types and the study of
their interaction with nuclei; and 2) the determination of the excitation spec-
trum within a model system consisting of phonons and, perhaps, of unbound nucle-

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ACCESSION NR: AP5007699

ons. In this paper, dealing with the first-mentioned subproblem, the author
obtained, using the Green function method, a Hamiltonian containing nucleons and
collective excitation-phonons for a spherical nucleus model with simple resi-
dual interaction between the nucleons (Cooper pairing + quadrupole interaction).
The distortion of the phonon propagator and of the nucleon-phonon vertex part
is investigated with other types of interactions present. The use of the
nucleon-phonon Hamiltonian significantly simplifies the investigation of many-
particle correlations in spherical nuclei. Orig. art. has. 4n formulas.

ASSOCIATION: None

SUBMITTED: 12Jun64   ENCL: 00   SUB CODE: NP

NO REF SOV: 003   OTHER: 003

Card 2/2

L 41008-65   EWT(m)   Peb   DIAAP
ACCESSION NR: AP5007700   S/0367/65/001/001/0013/0026

AUTHOR: Belyayev, S. T.; Zelevinskiy, V. G.

TITLE: The energy spectrum of odd A spherical nuclei

SOURCE: Yadernaya fizika, v. 1. no. 1, 1965, 13-26

TOPIC TAGS: odd spherical nucleus, collective nuclear motion, phonon nucleon model, phonon nucleon interaction, odd A nucleus, nuclear energy spectrum

ABSTRACT: Since the low excited states of spherical even-even nuclei can be described with sufficient accuracy by their collective motion (S. T. Belyayev, Mat.-Fys. Medd. Dan. Vid. Selsk., 31, 11, 1959; S. T. Belyayev, ZhETF, 39, 1387, 1960), the authors studied the excitations of odd - A spherical nuclei theoretically assuming that the basic interaction is that of the odd nucleon with collective excitations of the even core (phonons). Such an assumption is justified for adiabatic collective excitations. The phonon-nucleon interaction is not considered weak. Such a microscopic study (with a limited number of arbitrary constants) is of considerable importance since during the usual semi-empirical comparison of the model with the experimental results (see, e.g., B.

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L 41008-65
ACCESSION NR: AP5007700   /

D. Lawson, J. L. Uretzky, Phys. Rev., 108, 1300, 1957; A. de Shalit, Phys. Rev., 122, 1530, 1952; A. Braunstein, A. de Shalit, Phys. Lett., 1, 264, 1962), the number of arbitrary parameters coincides with the number of experimental facts and, consequently, the applicability of the model seems not be based on sufficiently firm grounds. In some limiting cases, analytical expressions for the Green functions are found here in the form of sums over an infinite number of pole terms. Physical consequences of the nucleon-phonon interactions in odd-A nuclei are discussed (isomeric level shift, quadrupole and magnetic nuclear moments, electromagnetic transition probabilities), and the authors conclude that one must be particularly careful when using the one-particle Green's function of the Fermi-liquid theory (containing only a single pole component) in place of the exact one-nucleon nuclear function. "D. P. Grechukhin pointed out to us that the average number of phonons may vary considerably due to the large difference in the spins of the ground and metastable levels." Orig. art. has 37 formulas and 7 figures.

ASSOCIATION: None

SUBMITTED: 12Jun64   ENCL: 00   SUB CODE: NP

NO REF SOV: 006   OTHER: 008

Card 2/2

L 11789-66   EWT(m)   DIAAP

ACCESSION NR: AP5020253   UR/0367/65/002/001/0051/0058

AUTHOR: Belyayev, S. T.; Zelevinskiy, V. G.

TITLE: Green's functions and transition probabilities in odd nuclei

SOURCE: Yadernaya fizika, v. 2, no. 1, 1965, 51-58

TOPIC TAGS: Green function, transition probability, fermion, phonon, ground state

ABSTRACT: Expressions are obtained for various Green's functions of odd nuclei. These expressions make it possible to calculate the nuclear characteristics for states having either a single-particle or a collective nature. The method consists in going over from averaging over the ground state of the odd nucleus to averaging over the neighboring nucleus. This makes it possible to eliminate the uncertainty connected with degeneracy in the ground state. Explicit equations are derived for the single-fermion, phonon, and two-particle Green's functions. Transition probabilities and mean values of the physical quantities are also derived for arbitrary low-lying states in odd nuclei. Orig. art. has: 34 formulas.

ASSOCIATION: None

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L 11789-66

ACCESSION NR: AP5020253

SUBMITTED: 22Feb65   ENC: 00   SUB CODE: 20

NR REF SOV: 005   OTHER: 000

HW

Card 2/2

L 20359-66   EWT(m)   DIAAP
ACC NR: AP6005873   SOURCE CODE: UR/0367/65/002/004/0615/0634

AUTHOR: Belyayev, S. T.; Zelevinskiy, V. G.

ORG: none

TITLE: The Green's function method in a simple nuclear model

SOURCE: Yadernaya fizika, v. 2, no. 4, 1965, 615-634

TOPIC TAGS: Green function, nuclear structure, phonon, nuclear shell model, nucleon interaction, phonon interaction

ABSTRACT: In order to check on the efficiency of the Green's function method in the theory of the Fermi liquid for finite systems with low-energy collective excitations, the authors consider a simple model of a spherical nucleus, wherein nucleons at one isolated level with large angular momentum $j \gg 1$ interact via exchange of collective excitations--quadrupole phonons (pairing between nucleons is assumed already to be accounted for). This is also the fundamental interaction in real nuclei for low-lying excitations. The limitation to a single level is quite close to reality for nuclei where the filled level has a parity different from that of the remaining levels of the given shell (for example, the proton $g^{9/2}$ level in the region of In^{115}). Since the nucleon-phonon interaction in the nucleus is too weak, it becomes necessary to use methods going beyond perturbation the-

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L 20389-66

ACC NR: AP6005873

ory. Consequently the authors use a previously proposed analysis (YaF v. 1, 17, 1965) of higher approximations for solving such a problem. In the present case the system of equations for the Green's functions can be made closed by using approximate relations of the Ward type, an investigation of the singularities of the electromagnetic transitions in a system with low-lying collective excitations becomes possible. The Green's function, the vertex parts, and the probabilities of the electromagnetic transitions are determined by means of general formulas previously obtained (YaF v. 2, 51, 1965) for transition between states of arbitrary nature. The results obtained are found to be incompatible with the usual assumptions of the Fermi-liquid theory, since the obtained spectrum of the quasiparticle is characterized not only by single-particle quantum numbers, but acquires an additional collective parameter, and the interaction connected with the phonon exchange is strongly retarded. Possible applications of the method to real nuclei with high spins are discussed. Orig. art. has: 2 figures and 94 formulas.

SUB CODE: 20/   SUBM DATE: 09Apr65/   ORIG REF: 005/   OTH REF: 004

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ACC NR: AP7011376

SOURCE CODE: UR/0367/66/004/005/0936/0952

AUTHOR: Belyayev, S. T.

ORG: Novosibirsk State University (Novosibirskiy gosudarstvennyy universitet)

TITLE: Coherent pairing fluctuations and collective 0^+ -excitations of nuclei

SOURCE: Yadernaya fizika, v. 4, no. 5, 1966, 936-952

TOPIC TAGS: excited nucleus, excitation cross section, particle interaction

SUB CODE: 20

ABSTRACT: The collective 0^+ excitations in nuclei, connected with the interaction in the particle-particle channel are investigated in the framework of the self-consistant time-dependent field method. Two classes of excitations with different time parities were found, both being coherent pairing fluctuations. The T-even branch (predicted earlier by Bohr and Mottelson) is characterized by weak E0-transitions to the ground state, whereas the T-odd branch has a large EC-transition probability. The excitation cross sections in the (t,p)-reaction are considered and they prove to be of the same order of magnitude for both types of branches. Orig. art. has: 8 formulas. [Based on author's Eng. Abst.] [JPRS: 40,393]

Card 1/1

0931 1770

EIN T, . . .

Fetus

Abdominal pregnancy of 25 years duration. Akush. & gin. No. 5, 1952.

VOINOV, A.P., professor; ZYSMAN, A.I., dotsent; KULIN, V.I.; BELYAYEV, ___
    S.V., arkhitektor; BELSHCHIK, N.P., inzh.; VOINOV, V.A.

    New designs of precast apartment houses built of spatial elements.
    Sbor.nauch.trud.Bel.politekh.inst.   no.81:15-60 '59.

                                                     (MIRA 13:5)
              (White Russia—Apartment houses)
              (Precast concrete construction)

BELYAYEV, S.V.; arkhitektor; VOINOV, A.P., prof., nauchnyy rukovoditel'

History of the utilization of plastic materials in construction
and architecture. Sbor.nauch.trud.Bel.politekh.inst. no.81:
61-79 '59.   (MIRA 13:5)
          (Plastics)

BELYAYEV, Sergey Vasil'yevich; ZABOYEVA, Iya Vasil'yevna; POPOV,
Vyacheslav Aleksandrovich; RUBTSOV, Dmitriy Mikhaylovich;
IVANOVA, Ye.N., doktor sel'khoz. nauk, prof., otv. red.

[Soils of the Pechora Industrial Region] Pochvy Pechorskogo
promyshlennogo raiona. [By] S.V.Beliaev i dr. Moskva,
Nauka, 1965. 110 p.   (MIRA 18:3)

BELIAEV, S. E.

Behaviour of Metals and Method of Testing at Low Temperatures. S. E. Beliaev (*Tehnika Vozdushnogo Flota* (*Tech. of Air Fleet*), 1936, (10), 97–106).—[In Russian.] The impact strength of Duralumin increases with decrease in temperature, being 3·15, 3·65, and 3·83 kg./cm.², respectively, at +20°, −40°, and −70° C.—N. A.

ASD-SLA METALLURGICAL LITERATURE CLASSIFICATION

BELYAEV, S.

9-156. **Effect of Method of Notching of "Menage" Specimens on Impact Testing of Steel.** S. E. Beliaev and T. K. Panar'ima. *Factory Laboratory (U.S.S.R.),* v. 13, April 1947, p. 500-501. (In Russian.) Specimens prepared by three methods. Lowest impact resistances shown for specimens prepared by abrasive-wheel cutting after hot working.
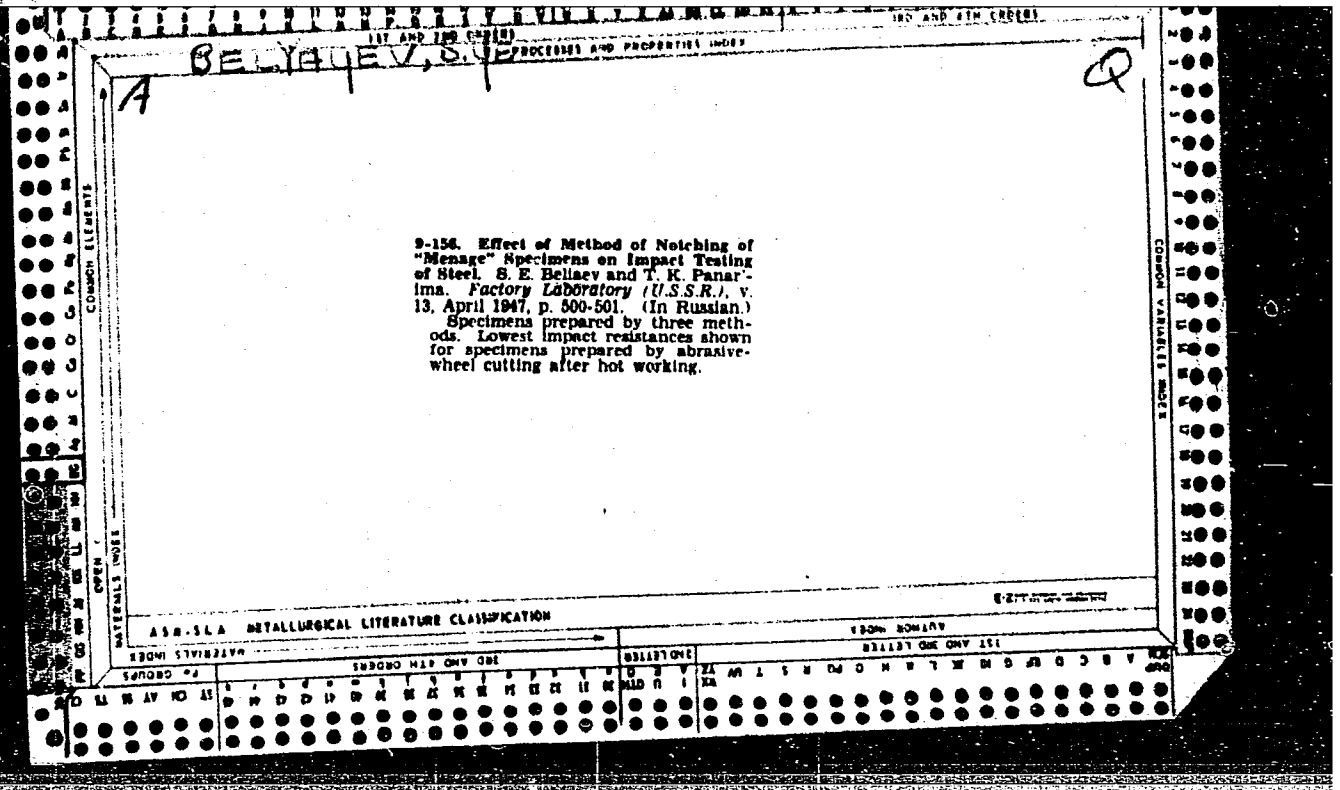
PROCESSES AND PROPERTIES INDEX

Bc

P4

Notch susceptibility [of metals] to cutting. N. N. Davidenkov and S.E. .... [Zavod. Lab., 1949, 15, 963—968 : J. Iron Steel Inst., 1949, 161, 364).—The impact susceptibility to cutting of metals is discussed in relation to the nature of the notch and specimen shape. The notch effect is defined as the ratio of the difference between the yield strength of a notched and a smooth specimen to the yield strength of the smooth specimen. This ratio may have a positive or negative value; methods of determining its sign and magnitude, and results of tests on a no. of steels and alloys subjected to various heat-treatments are discussed. A shape of specimen is proposed by use of which the sign of the above ratio can be determined from results of a single test for longitudinal fracture.   R. B. CLARKE.

all-Union Inst. - Aviation Materials,

METALLURGICAL LITERATURE CLASSIFICATION

USSR/Metals
Notch Test

Jul 49

"Influence of Size of Specimen on Notch Sensitivity of Steel and Light Alloys," S. Ye. Belyayev, All-Union Inst of Avn Materials, 7 pp

"Zavod Lab" No 7

Influence of specimen size has not been investigated sufficiently despite general knowledge of subject. Carried out tests on various types of steel and light alloy specimens of different cut (with and without notch and bending). Data plotted on graphs. Concludes that tensile strength and plasticity decrease considerably as specimen size increases (under complex loading).

USSR/Metals (Contd.)

Jul 49

plotted on graphs. Concludes that tensile strength and plasticity decrease considerably as specimen size increases (under complex loading).

62/49T87

62/49T87

BELYAYEV, S. Ye. and DAVIDENKOV, N. N.

"Toughening of Steel During the Precipitation of Carbides," ZhTF, 22, No. 1,
FP 40-43, 1952.

KELYAYEV S. YE.

Avdakyn nauk SSSR. Institut metallurgii imeni A.A. Baykova

Ustalost' metallov; materialy soveshchaniya po ustalosti metallov 22-24 sentyabrya 1958 g. (Fatigue of Metals; Materials of the Conference on Fatigue of Metals, September 22-24, 1958) Moscow, 1960. 157 p. 3,500 copies printed.

Resp. Ed.: I.A. Oding, Corresponding Member, Academy of Sciences USSR; Ed. of Publishing House: A.B. Chernov; Tech. Ed.: I.I. Dorokhina.

PURPOSE: This collection of articles is intended for mechanical engineers, metallurgists, and scientific research workers.

COVERAGE: The collection contains discussions relating to fatigue failure of metal, fatigue is finished parts, and methods for testing endurance. Included are a critical review of existing theories on metal fatigue, some data on physical regularity patterns, and features of steel failure caused by fatigue. Possibilities for applying a new criterion to the notch sensitivity of metals and high-strength steels are investigated. The mechanism of failure due to corrosion fatigue of metal is discussed along with pertinent experimental data. Also pressed are the results of testing the fatigue strength of such metal parts as large-size plates and various parts of machines used in the petroleum industry. Problems involved in testing metal for fatigue are examined. No personalities are mentioned. Each article is accompanied by bibliographic references, most of which are Soviet.

Card 4/4

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11-9-60

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S/124/61/000/008/041/042
A001/A101

AUTHOR: Belyayev, S. Ye.

TITLE: On notch sensitivity of high-strength steels

PERIODICAL: Referativnyy zhurnal. Mekhanika, no. 8, 1961, 55-56, abstract 8V488
              (V sb. "Ustalost' metallov", Moscow, AN SSSR, 1960, 72-79)

TEXT: The author investigated the effects of an axial-symmetrical notch,
a side notch, and a skewed notch, on the statical strength of over 20 grades of
structural steel with yield strength from 80 to 200 kg/mm^2. At room temperature
in the first case the notch always increased strength; in the second and third
cases, a decrease of strength was observed, which was the greater the higher the
strength of a smooth specimen and the lower its ductility. At test temperature
reduction, a decrease in the yield strength was observed also in the specimens
with an axial-symmetrical notch; this "temperature of notch sensitivity appear-
ance" is linearly related to strength reduction at skewing. The author deter-
mined also deformational notch sensitivity (ratio of constriction of a smooth
specimen to that of a symmetrically notched specimen) which turned out to be

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On notch sensitivity of high-strength steels   ? 3٫7   S/124/61/000/003/041/042
                                                       A001/A101

linearly related to strength reduction at skewing. This makes it possible to
judge on sensitivity to skewing without a special direct test.

                                                    N. Davidenkov

[Abstracter's note: Complete translation]

Card 2/2

BELYAYEV, S.Ye.

Method of determining the crack susceptibility of high-strength
materials during tensile tests. Zav. lab. 29 no.9:1119-1122 '63.
(MIRA 17:1)

L 47038-66   EWT(m)/EWP(w)/T/EWP(t)/ETI   IJP(c)   JD/JH
ACC NR: AT6024918   (A, N)   SOURCE CODE: UR/2981/66/000/004/0085/0106

AUTHOR: Anisimova, N. V.; Archakova, Z. N.; Belyayev, S. Ye.; Danilov, Yu. S.; Kish-
kina, S. I.; Petrov, Ye. A.; Plekhanova, N. G.; Ponar'ina, T. K.; Radetskaya, E. M.;
Strunin, B. M.

ORG: none

TITLE: Mechanical properties of VAD23 alloy

SOURCE: Alyuminiyevyye splavy, no. 4, 1966. Zharoprochnyye i vysokoprochnyye splavy
(Heat resistant and high-strength alloys), 85-106

TOPIC TAGS: aluminum alloy, solid mechanical property / VAD23 aluminum alloy

ABSTRACT: Sections and sheets of VAD23 alloy were tested in the artificially aged
state (16 hr at 170°C). From the standpoint of creep, stress-rupture strength and re-
covered strength, the properties of VAD23 are 20-25% higher than those of D16T under
long-term performance conditions at 125-150°C. In compression at temperatures up to
150-175°C, the yield points of sheets and sections of VAD23 are 10-20% higher than in
extension. From the standpoint of endurance and fatigue strength, VAD23 is not infer-
ior to V95 alloy. VAD23 has a high sensitivity to notching and sharp cracks; sheets
of VAD23 alloy display a high sensitivity to notching and cracking as compared to
pressed semifinished products. Orig. art. has: 12 figures and 14 tables.

SUB CODE: 11/ SUBM DATE: none / ORIG REF: 003/ OTH REF: 005
Card 1/1   vmb

ACC NR: AP7002435   SOURCE CODE: UR/0219/66/000/012/0034/0036

AUTHOR: Zakharova, G.V.; Yermakova, Ye. M.; Belyayev, S. Ye.

ORG: none

TITLE: Mechanical properties of niobium and its alloys at low temperatures

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 12, 1966, 34-36

TOPIC TAGS: niobium, niobium alloy, *mechanical* property/VN1 niobium alloy, VN2 niobium alloy, VN2A niobium alloy

ABSTRACT: Specimens of VN1 niobium and VN2 and VN2A niobium alloy, as-deformed, stress-relieved at 1100C, or recrystallization annealed at 1200C, were subjected to tensile and impact tests at temperatures from -253 to 20C. It was found that stress relieving had little or no effect on the mechanical properties of VN1 niobium. Recrystallization annealing lowered the tensile strength from 98 to 89 kg/mm^2, the yield strength from 95 to 88 kg/mm^2, and increased the elongation from 15 to 21% and the notch toughness from 19 to 25 kgm/cm^2 (tested at -196C), compared to as-deformed alloy. The microstructure of recrystallized VN1 niobium was

Card 1/3   UDC: 620.17:669.293:66.974

ACC NR: AP7002435

uniform and fine-grained. Alloying with molybdenum was found to raise the nil ductility transition temperature. Consequently, the molybdenum content in niobium alloys should not exceed 4%. Additional alloying of niobium-molybdenum alloys with zirconium significantly increased their ductility and notch toughness at -196C. Lowering the test temperature to -253C resulted in increased tensile and yield strength and decreased elongation and notch toughness in NV2A niobium alloy (see Fig. 1). The
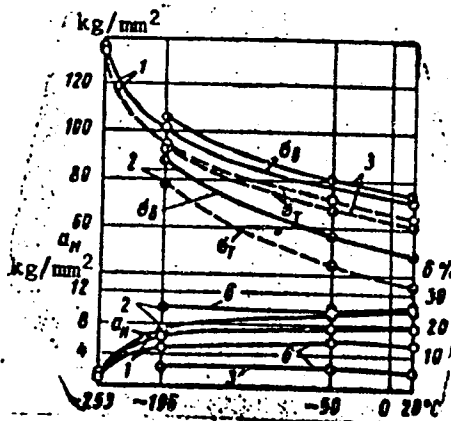

Fig. 1. Low-temperature mechanical properties of VN2A alloy (cold-rolled sheet)

1 - Annealed at 1000C for 30 min;
2 - annealed at 1300C for 1 hr;
3 - as rolled.

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ACC NR₁ AP7002435

sharp change in mechanical properties between -196 and -253C indicates
that the alloy has a tendency to embrittlement. Fracture of VN2 alloy
specimens was ductile at 20 and -196C, and brittle at -253. The results of
tests showed that VN2A niobium alloy can be used in structures operating
under multiaxial stresses at high and low temperatures.
                                                                    [WA-88]
                                                                    [TD]

SUB CODE: 11/   SUBM DATE: none/   ATD PRESS: 5114

Card   3/3

BELYAYEV, T.G.

Use of polymers in the construction of geological prospecting
machinery. Trudy TSKB no.5:88-90 '62.   (MIRA 18:7)

BELYAYEV, V., inzh.-kapitan 1 ranga

Armament of modern submarines (as revealed by foreign press data).
Voen.znan. 38 no.8:23-24 Ag '62.   (MIRA 15:8)
        (United States—Submarine warfare)
        (United States—Rockets (Ordnance))

BELYAYEV, V.

Conference on weak interactions. Atom. energ. 14 no.4:423 Ap
'63.
(MIRA 16:3)
(Nuclear reactions)

BELYAYEV, V.

How we train radio technicians. Radio no.3:10,12 Mr '60.

(MIRA 13:6)

1. Predsedatel' komiteta Dobrovol'nogo obshchestva sodeystviya armii, aviatsii i flotu Kirovskogo zavoda, Leningrad.
(Leningrad--Radio)

BELYAYEV, V. (g.Dnepredzerzhinsk)

In one of the streets of Dnepredzerzhinsk. Prom.keop.ne.9:26 8 '56.
(Dnepredzerzhinsk--Clothing industry)   (MIRA 9:10)