

SMIRNOV, Ye.V., prof. (Leningrad, T-101, Kirovskiy prospekt 2, kv.36)
POPOV, S.D., dotsent

Continuous suction of the contents through a duodenal catheter in
surgery of the biliary tract. Vest. Khir. 91 no.10:3-8 0 '63.
(MIRA 17:7)

1. Iz kliniki gosptal'noy i voyenno-morskoy khirurgii (nachal'nik-
prof. Ye.V. Smirnov) Voyenno-meditsinskoy ordena Lenina akademii
imeni S.M. Kirova, Leningrad.

SMILANOV, Ye.I., prof. Voenno-meditsinskoy akademii, Kirovskiy prospekt 4, kv. 200

Role of roentgenological studies in the diagnosis of diseases
and lesions of the bile ducts. Vest. khir. 92 no.6:3-8 Ja '64.
(MIRA 18:5)

1. Iz khirurgicheskoy kliniki Voenno-meditsinskoy ordena Lenina
akademii imeni Kirova.

SMIRNOV, Ye.V., Prof.; POPOV, S.D., dotsent

Postoperative external drainage of the biliary tract through
biliary-duodenal anastomoses. Vest. khir. 94 no.1:7-13 Ja
'65. (MIRA 18:7)

1. Iz kliniki gospital'noy i voyenno-morskoy khirurgii (nachal'nik
prof. Ye.V.Smirnov) voyenno-meditsinskoy ordena Lenina akademii imeni
Kirova.

SMIRNOV, Ye.V., prof.; POPOV, S.D., dotsent

Causes of some errors and failures in ascending cholangiography.
Vest. khir. no. 6:47-53 '65. (MIRA 18:12)

1. Iz kliniki voyenno-morskoy i gospital'noy khirurgii (nachal'-
nik - prof. Ye.V. Smirnov) Voyenno-meditsinskoy ordena Lenina
akademii imeni Kirova.

5/056/60/018/02/20/061
3006/5011

24.6210

AUTHORS: ИИРАДОВ, Я. М., Торокко, А. Е., Воробьев, Г. С.,
Кирillov, A. P., Киселин, Е. А., Кудимов, А. А.,
Мавлюков, Ю. А., Сафин, А. А., Сидоров, В. П.,
Ситников, В. П., Чувапко, А. П.

TITLE: Channel for Antiprotons with a Momentum of 2.8 Bev/c
PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1962,
Vol. 36, No. 2, pp. 445-448

TEXT: The authors of the present paper describe a channel built for the investigation of the interaction of antiprotons in a cloud chamber. Antiprotons were produced by 9-Bev protons in a target. Fig. 1 shows a schematic representation of the channel described in the following. The antiprotons were identified from their velocity ($\beta = 0.77$) by means of a Čerenkov counter, each of which was provided with two photomultipliers of the type 93Y-35 (PMT-35) whose efficiencies are specified in Table 1. The efficiencies obtained with different coincidence combinations are given in Tables 2 and 3. Fig. 2 shows a block diagram of the electronic system, and respective data are supplied in Table 4. The efficiency of the scheme described with respect to antiprotons is found to be 50-60%. Some tests are briefly described next. By the system discussed here, the authors determined the ratio of the number of \bar{p} with momenta of (2.0-2.15) Bev/c to the number of all remaining particles (which were chiefly π^- -mesons) from the beryllium target (36g/cm²) under the angles 0 and 7°, and from a copper target (180 g/cm²) under 7° with respect to the primary proton beam (0.1 - 0.5 Bev). At an intensity of 10⁵ \bar{p} of the inner beam, an average of 1 \bar{p} was recorded within four minutes. Results:

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Angle target: proton beam particle number relative number of anti-
Intensity ber in the protons in the beam
channel

0°	Be	10 ⁹	1000	(1.03±0.15)·10 ⁻⁴
7°	Be	10 ⁹	~700	(1.57±0.18)·10 ⁻⁴
7°	Cu	10 ⁹	~700	(2.42±0.33)·10 ⁻⁴

The number of particles recorded in the channel agrees with data concerning Card 2/3

SMIRNOV, YE. V.

Channel for Antiprotons with a Momentum of 2.8 Bev/c
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ing 9-Bev proton interactions in emulsions (Ref. 4). The increase in the relative number of antiprotons in the transition from 0 to 7° in the laboratory system agrees with predictions made on the strength of the statistical theory, by considering pion absorption ($\sigma_{\pi} \sim 30$ -50 mb) and antiproton absorption ($\sigma_{\bar{p}} \sim 60$ mb) as well as the attenuation of the beam of primary protons ($\sigma_{in} \sim 30$ mb), the ratio of the differential production cross sections of \bar{p} and π^- -mesons with 2.8 Bev/c under 0° in the laboratory system is found to be $\frac{d\bar{p}}{d\pi^-} \sim 1.5 \cdot 10^{-4}$.

There are 2 figures, 5 tables, and 4 references: 3 Soviet, 1 Italian, and 1 International (CERN).

ASSOCIATION: Ob'yedineny Institute Yadernykh Issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: September 5, 1959

Card 3/3

SMIRNOV, YE. V.

VOYENKO, A. S., KULANOV, B. A. LIKHACHEV, M. F., LYURIMOV, L. I., MATULENKO, Yu. A.,
SAVICH, I. A. SMIRNOV, Ye. V., STAVINSKIY, V. S. TWIN-CHANG, Gut, TUAN-FU, Khe

"Inelastic Interactions of K^+ - Mesons with Hydrogen"

report presented at the Intl. Conference on High Energy Physics, Geneva,
4-11 July 1962

Joint Institute for Nuclear Research
Laboratory of High Energies, Dubna, 1962

SMIRNOV, E. V.

VOYENKO, A. S., KULAKOV, B. A., LINGACHEV, M. F., MATULENKO, Yu. A., LYUBIMOV, L. L.,
SAVIN, I. A., SMIRNOV, E. V., and STAVINSKIY, V. S.

"Elastic Scattering of η -Mesons on Hydrogen on the 180° Angle"

Report presented at the Intl. Conference on High Energy Physics, Geneva,
4-11 July 1962

Joint Institute for Nuclear Research
Laboratory of High Energies, Dubna, 1962

SMIRNOV, YE. V.

KURAKOV, B. A., LIKHACHEV, M. F., MATULENKO, Yu. A., SAVIN, L. A., SMIRNOV, Ye. V.
and STAVINSKIY, V. S.

"Total Cross-Sections of K^+ - Mesons with Hydrogen at the Momenta From
3, 0 to 5, 0 GeV/c"

report presented at the Intl. Conference on High Energy Physics, Geneva,
4-11 July 1962

Joint Inst. for Nuclear Research
Lab. of High Energies, Dubna, 1962

SMIRNOV, YE.V.

8/055/62/042/003/011/049
B104/B102

21.11.00

AUTHORS: Vovenko, A. S., Golovanov, L. B., Kulakov, B. A.,
Lyubimov, A. b., Mamulenko, Yu. A., Savin, I. A., Smirnov, Ye.V.

TITLE: Total π^- -p interaction cross sections at high energies

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42,
no. 3, 1962, 715 - 720

TEXT: $\sigma_t(\pi^-, p)$ was determined for proton momenta of 3.4, 3.9, 4.9, 7.0,
and 9.2 BeV/c. The experimental arrangement is shown in Fig. 1. The
total interaction cross section decreased between 3.5 and 7 BeV/c. Meas-
urements at higher energies have not clearly shown whether the decrease
of $\sigma_t(\pi^-, p)$ is only characteristic of the range investigated, or the be-
havior is an asymptotic one (Table). A comparison with other results has
shown that $\sigma_t(\pi^+, p)$ and $\sigma_t(\pi^-, p)$ are equal in the range of 4-5 BeV
within the accuracy attained. Assuming that $\sigma_{\parallel}/\sigma_{\perp} = (\text{Im}\lambda_{\parallel}^0/\text{Im}\lambda_{\perp}^0)^2$, the
charge exchange is estimated with the aid of relation

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Total π^- -p interaction cross...S/055/62/042/003/011/049
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$$4\pi k \operatorname{Im} A_n^0 = (1/\sqrt{2})[\sigma(\pi^-, p) + \sigma(\pi^+, p)]$$

$\sigma_{\pi^-} = 0.012$ and 0.003 , respectively. $A_{\pi^-}^0$ and $A_{\pi^+}^0$ are the amplitudes of the charge exchange processes ($\pi^0 p \rightarrow \pi^+ n$, $\pi^- p \rightarrow \pi^0 n$) and of the elastic scattering under the angle 0° , σ_{π^-} and σ_{π^+} are the total charge exchange cross section and the elastic scattering cross section. The two values of σ_{π^-} were obtained at $\sigma_y \approx 25.5$ millibarn with $\sigma_t(\pi^-, p) - \sigma_t(\pi^+, p) = 1$ millibarn, and $\sigma_t(\pi^-, p) - \sigma_t(\pi^+, p) = 2$ millibarn, respectively. The

data of other authors (G. von Dardel et al., Phys. Rev. Lett., 1, 127, 1961) are in good agreement with the results obtained here. I. Ya. Pomeranchuk and L. B. Okun' are mentioned. There are 2 figures, 1 table, and 17 references; 11 Soviet and 6 non-Soviet. The four most recent references to English-language publications read as follows: V. N. Gribov, Nucl. Phys., 22, 249, 1961; G. von Dardel et al., Phys. Rev. Lett., 5, 333, 1960; A. S. Vovenco et al., Proc. of the 1960 Ann. Intern. Conf. on High Energy Physics at Rochester, Univ. of Rochester, 1960, p. 443; V. S. Barashenkov et al., Nucl. Phys., 14, 522, 1960.

Card 2/3

S/056/62/042/003/011/049
B104/B102

Total π^- -p interaction cross...

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: October 10, 1961

Fig. 1. Experimental arrangement.

Legend: (T) target in the proton-synchrotron; (ML-7 (ML-7)) four-pole lenses; (LH-57 (SP-57)) magnet; (S₁, ..., S₃, S₄, ..., S_C) scintillation counters; (1) concrete; (2) lead.

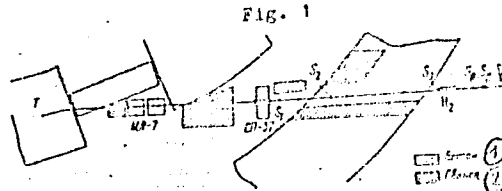


Table. Measurement results.

Legend: (1) momenta of π^- mesons, Bev/c; (2) $\sigma_t(\pi^-, p)$, millibarn; (3) muon admixture in the beam, %.

(1)	(2)	(3)
3.4	31.4 ± 0.7	12.4 ± 0.2
3.0	30.0 ± 0.5	12.8 ± 0.2
3.0	29.6 ± 0.6	13.3 ± 0.2
7.0	27.8 ± 0.8	6.5 ± 0.4
9.2	25 ± 4	

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 EPF(n)-2/EWF(j)/EWP(k)/EWT(d)/EWT(l)/EWT(m)/EWP(h)/ETC(f)/EWG(m)/T/EWP(l)/EWP(e)/
 ACC NR: AP6007826 SOURCE CODE: UR/0120/66/000/001/0139/0143
 EWP(v) IJP(c) AT/RM/WH/DJ

AUTHOR: Kozhukhov, I. V.; Muratov, Yu. V.; Rashevskiy, V. P.; Ryl'tsev, P. I.; Sarantsev, V. P.; Smirnov, Ye. V.

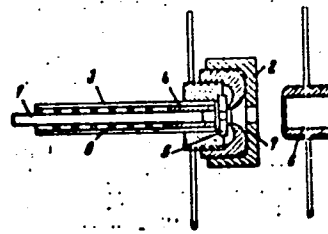
ORG: Joint Nuclear Research Institute (Ob'yedinennyy institut yadernykh issledovaniy)

TITLE: Use of a plasma gun for producing high electron-current peaks

SOURCE: Pribory i tekhnika eksperimenta, no. 1, 1966, 139-143

TOPIC TAGS: plasma gun, pulse shape

ABSTRACT: A new plasma-gun¹⁴ electron source (see figure) consists of three electrodes: discharge electrode 1, diaphragm 5, and extraction electrode 6 mounted on two stainless-steel disks. Plexiglas¹⁴ bushing 4 (active material) is fed by spring 8 toward the gap as the bushing end is burned up. The discharge electrode is insulated by porcelain bushing 3. The tungsten diaphragm has a 1-mm port. Insulated cathode 2 is intended for improving the extraction conditions and focusing; its insulation is designed to withstand a working voltage of 30 kv. The



plasma-gun electron source

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ACC NR: AP6007826

stainless-steel cylindrical extraction electrode is grounded. When a +17-kv "trig-atron" pulse is applied to the discharge electrode, a spark to the diaphragm evaporates some of the plexiglass and forms a plasma in chamber 7. An electric field extracts electrons from the plasma. An electron current of 200 amp was produced in 0.15-0.2-msec peaks when a constant d-c voltage was used for extraction. With a pulse extraction voltage (provided by a capacitor), an electron-current peak of 1 ka 10^{-6} sec has become possible. "In conclusion, the authors wish to thank P. F. Chernyayev for his great contribution to the construction of the experimental outfit."

Orig. art. has: 7 figures.

[03]

SUB CODE: 09 / SUBM DATE: 21Jul64 / ORIG REF: 002 / ATD PRESS: 4/223

Card 2/2

SMIRNOV, Ye. V. and LIVSHITS, G. L.

"Die-Block Steels and Methods of Heat Treatment," pp 42/48 in Modern Methods of Heat Treating Steel by Dom Inzhenera i Tekhnika imeni F. E. Dzerzhinskovo. Gosudarstvennoye Nauchno-Tekhnicheskoye Izdatel'stvo Mashinostroitel'noy Literatury, Moscow (1954) 404 pp.

Evaluation B-86350, 30 Jun 55

133-8-18/28

AUTHORS: Pridantsev, M.V. (Dr. Tech. Sc.) and Smirnov, Ye.V. (Eng.)

TITLE: The cause of local brittleness in technical iron sheets and methods of its elimination. (Ustraneniye mestnoy khrupkosti v listovom tekhnicheskoy zheleze).

PERIODICAL: "Stal'" (Steel), No. 8, 1957, pp. 736-740 (USSR).

ABSTRACT: In iron sheets (Armco type) produced by "Serp i Molot" Works localized brittleness was occasionally observed. The investigation described was carried out in order to establish causes of such brittleness and methods of its prevention. In the experimental part of the work, V.N. Torubarova, Z.P. Solov'yeva, R.M. Rozenblyum, E.M. Chistyakova and R.E. Grabarovskaya participated. Chemical composition and the content of gases in brittle and ductile specimens of technical iron (Table 1) did not show any substantial differences. Microphotographs of the above two types of specimens (Fig. 2) indicated some differences in grain boundaries which in brittle specimens were more strongly etched and somewhat thicker. Electron microphotographs (Figs. 3 and 4) indicated that thickening of grain boundaries of brittle specimens represents accumulations of some kind of inclusions. The nature of the brittle fracture (Figs. 5 and 6) indicated that this takes place along the grain boundaries. Annealing in asbestos and in

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The cause of local brittleness in technical iron sheets and methods of its elimination. (Cont.)

a vacuum of ductile specimens at various temperatures was carried out. In all specimens annealed above the critical point (900 C) brittleness was found while in those annealed below the critical point (870 C) brittleness was absent. On the assumption that brittleness is caused by oxide segregation annealing of specimens in a dry and wet hydrogen or dissociated ammonia atmosphere was tested. Annealing in a dry hydrogen atmosphere removed brittleness and considerably decreased the value of the coercive force while annealing in wet hydrogen did not remove brittleness (Table 2). The influence of annealing in a dry hydrogen atmosphere on the oxygen content and the value of coercive force was additionally tested on samples from a few melts (Table 3). Sheet specimens from some melts were cut in two parts and carbon, sulphur and oxygen contents in one part of the specimen were determined in the initial state and in another part after annealing in a reducing or oxidising medium and from the difference, changes in chemical composition were determined. The results obtained (Table 4) indicated that the removal of brittleness by annealing in dry hydrogen or dissociated ammonia

Card 2/3

MESHCHERINOVA, O.N., kand.tekhn.nauk; TRIFONOVA, T.N., inzh.; TORPANOVA,
G.A., kand.tekhn.nauk; SMIRNOV, Ye.V., inzh.; BABAKOV, A.A.,
kand.tekhn.nauk; KAROVA, Ye.N., inzh.; ZHADAN, T.A., inzh.;
TALOV, N.P., inzh.; TSYPKINA, Ye.D., kand.tekhn.nauk; DJONIN,
V.M., inzh.; DAVYDOVA, L.N., inzh.; PRIDANTSEV, M.V., prof.,
doktor tekhn.nauk, red.; LIVSHITS, G.L., kand.tekhn.nauk, red.;
BERLIN, Ye.N., red.izd-va; MIKHAYLOVA, V.V., tekhn.red.

[Steels with low nickel content; a handbook] Stali s ponizhen-
nym soderzhaniiem nikela; spravochnik. Pod red. M.V.Pridantseva
i G.L.Livshitsa. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po
chernoi i tsvetnoi metallurgii, 1961. 200 p.

(MIRA 14:12)

1. Direktor instituta kachestvennykh staley Tsentral'nogo
nauchno-issledovatel'skogo instituta chernoy metallurgii im.
I.P.Bardina (for Pridantsev).
(Nickel steel)

SMIRNOV, Ye.V., NEFEDOV, P. I., and IVANOV, V. M.

"On the Behavior of Liquid Drops in Immovable Highly Heated Gas Medium."

Report submitted for the Conference on Heat and Mass Transfer, Minsk, BSSR, June 1961.

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S/129/61/000/002/007/014
E193/E483

AUTHOR: Smirnov, Ye.V., Engineer

TITLE: Die Steels for Hot Extrusion of Deformation-Resistant Alloys

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1961, No.2, pp.31-35

TEXT: The object of the present investigation was development of a new steel, more suitable for the fabrication of tools (dies) for hot extrusion of tough alloys, with particular reference to the determination of the optimum carbon/alloying elements' ratio in this type of steel. Three varieties of steel, differing in their tungsten content (2, 5 and 10% W), were used in the experiments. The chemical composition of these steels and some other data, established in the course of preliminary experiments, are tabulated (Table 1). (Melts No.3 and 13 listed in this table represent 2 heat-resistant steels used in the USA; Rockwell hardness (C), heat-treated under optimum conditions as given in the table, was 45 to 50.) The results of the first series of experiments are given in the form of a histogram reproduced in Fig.2, showing hardness (Rockwell C) of all the alloys studied (vertical axis)
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Die Steels for Hot Extrusion of Deformation-Resistant Alloys

after quenching from temperatures indicated underneath the horizontal axis and tempering at 600°C for 2 h (part I of the histogram) or for 100 h at 600°C (part II). The mechanical properties of steels at room temperature are given in Table 2. The temperature dependence of σ_b , ψ and a_k of some of the experimental steels is illustrated in Fig.3. (Numbers given by the curves in this figure indicate the number of melt.) In the next series of tests, the wear resistance of the experimental steels was studied. At room temperature, a Skoda-Savin testing machine was used for this purpose. The test pieces (cooled with an 0.5% solution of sodium chromate) were pressed under a load of 15 kg against a tungsten carbide-titanium carbide disc, rotating at 675 rpm, and after 3000 revs the volume of the groove formed in the specimen was determined and used as a comparative measure of resistance to wear. At 500°C, a Suzuki testing machine, equipped with a tubular furnace, was used. In this case, ring-shaped specimens of experimental steels were rotated against similar rings made of a heat-resistant alloy ЭИ 617 (EI617), loss of weight after

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Die Steels for Hot Extrusion of Deformation-Resistant Alloys

20000 revs being taken as the comparative measure of wear resistance. The results indicated that in this respect, steels of group I and III are better at room temperature, steels of groups II and III being more wear-resistant at 500°C. Since low thermal expansion coefficient is a desirable property of a die steel, this characteristic was also determined and found to be lower in steels with a reduced carbon content (melts No.2, 3, 8, 13, 14).

Regarding the heat conductivity (determined at both room and elevated temperatures), it was highest in steels containing 5% W, lower in steels with 8 to 10% W and still lower in those containing 2% W and 5% Cr, their heat conductivity being 0.082 to 0.098, 0.064 to 0.077 and 0.055 to 0.077 cal/cm sec °C, respectively. Finally, the temperature dependence of hardness of the steels studied was determined. The results are given in Table 3.

On the basis of the results of the present investigation, two die steels 4X5B2ΦC1 (4Kh5V2FS) and 4X2B5ΦM1 (4Kh2V5FM) were recommended for full-scale industrial trials and subsequently used at a large number of Soviet plants. Their composition is given (Table 4).
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Die Steels for Hot Extrusion of Deformation-Resistant Alloys

The mechanical properties and recommended heat treatment of these two steels are given in the handbook of Machine-Building Materials (Vol.1, Mashgiz, 1959). Acknowledgments are made to Z.P.Solov'yeva, who participated in this work. There are 3 figures and 4 tables.

ASSOCIATION: TsNIChM

Card 4/9

CHENOV, Ye.V.; BRYAN, Ye...; DZASLAVSKIY, D.F.

Die steel. Bldg. TSMOBI no.5:48 '61.
(Steel)

(MIRA 14:10)

L 59269-65 EWP(k)/EWA(c)/EWT(m)/EWP(b)/T/EWA(d)/EWP(w)/EWP(t) Pf-4 IJP(c)

MJW/JD/HW/JG

ACCESSION NR: AT5016057

UR/2776/65/000/039/0066/0072

AUTHOR: Smirnov, Ye. V.

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39
B+1

TITLE: Effect of cerium additions and vacuum remelting on the ductility and impact strength of high strength 4Kh2V5FM stamping steel

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii Sbornik Trudov, no. 39. Spetsial'nyye stali i splavy (Special steels and alloys), 66-72

TOPIC TAGS: cerium addition, alloy steel, heat resistant steel, metal mechanical property, impact strength, vacuum melting

ABSTRACT: Methods were studied for increasing the ductility and impact strength of 4Kh2V5FM alloy to eliminate cracking during press stamping operations. Ten melts were produced having the compositions: 0.40-0.45% C, 0.26-0.33% Mn, 0.19-0.47% Si, 2.37-2.57% Cr, 4.70-5.15% W, 0.75-1.27% V, 0.53-0.62% Mo, and Ce (0 to 0.12%). Each melt received a different deoxidizing treatment, and two melts were remelted in vacuum furnaces. The vacuum remelted materials had lower contents of Ce, gases, and nonmetallic inclusions. Heat treatment by appropriate annealing and cooling consti-

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ACCESSION NR: AT5016057

tuted the next stage in the processing. Sections of these materials were then used for obtaining macrostructures, and the vacuum processed steels showed much less porosity. Specimens were further treated by oil quenching after holding at 1070°C for 30 min, and tempering at 550, 600, 650, and 700°C. The room temperature mechanical properties for these treatments were tabulated. Further mechanical tests at higher temperatures (200-700°C) were conducted on samples heat treated for optimum properties (oil quench from 1070°C, tempered at 620°C). The use of Ce in 4Kh2V5FM, along with the use of clean charges for melting, do not show any effect on the ductility and impact strength of the steel in room temperature tests. The remelting of metals in vacuum arc furnaces reduces extracted gas, oxides and assorted nonmetallic inclusions, and increases the ductility and impact strength of samples in the fiber direction. Orig. art. has: 2 figures, 3 tables.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: MM

NO REF SOV: 004

OTHER: 003

Card 2/2

UDC: 621.785.796:621.787:621.785.78

AIZIPOV, B.V.; GAL'PERIN, Yu.M.; YERMAKOVA, N.M.; PERESTORONIN, S.A.;
SMIRNOV, Ye.Ye.

Effect of cardioplegic substances and artificial blood
circulation regimes on the restoration of heart activity
after prolonged anemia. Grud. khir. 2 no.4:108-113 J1-Ag
(MIRA 15:6)
'60.

1. Adres avtorov: Moskva, 3-ya Meshchanskaya, d.61/2,
Moskovskiy oblastnoy nauchno-issledovatel'skiy klinicheskiy
institut imeni M.F. Vladimirovskogo.
(BLOOD—CIRCULATION, ARTIFICIAL)
(HEART FAILURE) (CARDIAC RESUSCITATION) (CARDIOVASCULAR AGENTS)

ANTIPOV, B.V.; GAL'PERIN, Yu.M.; YERMAFOVA, N.M.; PERESTORONIN, S.A;
SMIRNOV, Ye.Ye.

Restoration of cardiac activity after prolonged arrest and anemia
of the heart in a surgically prepared experiment. Vest. khir. 85
no. 7:9-17 Je '60. (MIRA 14:1)

(HEART FAILURE)

SMIRNOV, Yu.

"Wonder alloy." Metallurg 8, no.4:29 Ap '63. (MIRA 16:3)
(Zubakin, Vasilii Nikolaevich) (Iron and steel workers)

ZARELUA, A.; SMIRNOV, Yu.

Essential and zero-dimensional mappings. Dokl. AN SSSR 148
no.5:1017-1019 F '63. (MIRA 16:3)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.
Predstavleno akademikom P.S.Aleksandrovym.
(Topology)

TATARINOV, P.M.; ARTEMOV, V.R.; MIKHAYLOV, N.P.; RUMYANTSEVA, N.A.;
SERGIYEVSKIY, V.M.; SMIRNOV, Yu.

Basic and ultrabasic rock formations in the Urals; critical
observations on an article by S.V. Moskaleva. Izv. AN SSSR.
Ser. geol. 30 no.5:135-143 My '65.

(MIRA 18:6)

1. Vsesoyuznyy nauchno-issledovatel'skiy geologicheskii
institut, Leningrad.

L 44568-66 EWT(1) SCTB DD/RD
ACC NR: AP6030912

SOURCE CODE: UR/0209/66/000/009/0068/0070

AUTHOR: Ioseliani, K. (Lieutenant colonel, Medical corps); Smirnov, Yu. (Major, Medical corps)

34
B

2

ORG: none

TITLE: Overcoming unfavorable emotions [Psychological training for pilots and cosmonauts]

SOURCE: Aviatsiya i kosmonavtika, no. 9, 1966, 68-70

TOPIC TAGS: flight psychology, flight physiology, *pilot training*

ABSTRACT: Methods of controlling the emotional states of pilots in flight are discussed and their importance is emphasized in view of the great nervous and emotional strain associated with piloting modern aircraft and spacecraft. Acquiring the ability to control emotional experiences is an important part of pilot and cosmonaut training. Psychological preparation must be conducted throughout the training period, since many of the unfavorable emotions associated with flight develop into conditioned reflexes and are hard to eradicate. Several methods for self-regulation of emotional states in flight conditions are recommended, including such elementary devices as listening to pleasant sounds and encouraging oneself with phrases like "I can,"

Card 1/2

L 44568-66

ACC NR: AP6030912

"I must," etc. Physical exercises, selected for their effect on the muscle groups most fatigued by prolonged static stress, have proved very effective. Each group of exercises is practiced before the flight and repeated every 3-4 hr during flight. Special muscle-relaxing exercises, consisting of a combination of stretching exercises, turns of the torso, exercises of various leg joints and breathing exercises, are used to remove emotional tension on complicated long flights. Pilots should be familiar with all varieties of breathing exercises, and the physiological and psychological effect of each on the organism (for instance, breathing deeply and exhaling slowly has a calming effect). Pilots should be trained to shift their thoughts at will to pleasant and successful flying experiences, thus overcoming unfavorable emotions arising during flight. [JS]

SUB CODE: 05, 06/ SUBM DATE: none/ ATD PRESS: 5080

Card 2/2 *5/17*

L 07008-67 EWT(1) GW

ACC NR: AN7001063

SOURCE CODE: UR/9009/66/000/140/0004/0004

AUTHOR: Smirnov, Yu.

19
17
B

ORG: none

TITLE: Automatic telescope ✓

SOURCE: Leningradskaya pravda, 15 Jun 66, p. 4, col. 2-4

TOPIC TAGS: astronomic telescope, TV telescope / AZT-11 astronomic telescope

ABSTRACT:

The Astronomical Instruments Design Bureau of the Leningrad Optical-Mechanical Plant (bureau chief G. V. Vasil'yev) is working on the new AZT-11 telescope. Specialists under the direction of the chief designer P. V. Dobychin now are working on the project. (AZT = astronomicheskii zerkal'nyy teleskop = astronomical mirror telescope) Two such instruments will be constructed: one for the Crimean Observatory and one for the Abastumani Observatory. The mirror diameter is 1.25 m. It will be used in making photoelectric measurements of starlight. The AZT-11 is completely automated. The observer will not be near the instrument, but at a central control panel within a glassed-in, air-conditioned room; the air conditioning is required to ensure reliable operation of electronic instruments. In most cases the AZT-11 will operate in accordance with a preformulated program on magnetic

Card 1/2

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L 09977-67 EWT(1)

ACC NR: AT6026763

SOURCE CODE: UR/3211/59/000/029/0113/0117

AUTHOR: Smirnov, Yu.

50
49

ORG: none

TITLE: A graphical method of solving the transcendental equation obtained in the study of wave interference in a waveguide with a dielectric that is loaded by an attenuator

15

SOURCE: Kuybyshev. Gosudarstvennyy pedagogicheskiy institut. Uchenyye zapiski, no. 29, 1959. Fiziko-matematicheskiye nauki (Physical and mathematical sciences), 113-117

TOPIC TAGS: graphic technique, electromagnetic wave interference, dielectric waveguide, dielectric constant, dielectric loss, microwave attenuator, successive approximation

ABSTRACT: A graphical method is proposed for solving the transcendental equation for wave interference in a waveguide filled with a dielectric and terminating in an attenuator. The expression for the reflection coefficient is

$$R = \frac{\gamma_0^2 - \gamma_1^2}{\gamma_0^2 + \gamma_1^2 + 2\gamma_0\gamma_1 \operatorname{ch} \gamma_1 l}$$

The reflection coefficient is assumed to be a complex number $R = A + iB$. After simple algebraic transformations,

$$\frac{i \gamma_1 l}{\gamma_1} = \frac{2\gamma_0(A+iB)}{\gamma_1^2 [1 - A - iB] - \gamma_0^2 [1 + A + iB]}$$

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L 09977-67

ACC NR: AT6026763

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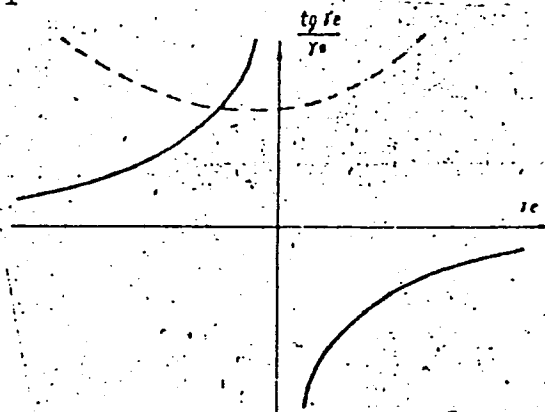
$$c_1 = \frac{c}{l}; \quad c = 2\gamma_0(A + iB)$$

$$D = \gamma_0^2[1 - (A + iB)]; \quad E = 1 + A + iB,$$

then

$$\frac{tg \gamma_1 l}{\gamma_1 l} = - \frac{i c_1}{D - \gamma_1^2 E},$$

which can be solved graphically for the propagation constant in the dielectric under study. A graph of the function $\frac{tg \gamma_1 l}{\gamma_1 l}$ is constructed (see Fig. 1),



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FIG. 1.

ACC NR: AT6026763

and the values of the constants C_1 , D , and E are determined experimentally. Then a second-order curve is constructed. The points of intersection of this curve with the graph of the function will be the roots of the transcendental equation. The real and imaginary parts of the dielectric constant are determined. The method is valid for dielectrics with negligible losses. The author thanks Candidate of Technical Sciences Ya. N. Kolli for consultation. Orig. art. has: 12 formulas and 1 graph.

SUB CODE: 09, 12/ SUBM DATE: none/ ORIG REF: 008/ OTH REF: 004

Card

3/3 ^{6/70}

DUKRINSKAYA, A.G.; SHIROV, Yu.A.; TIKHONENKO, T.I.; KISILEV, F.L.

Purification and concentration of Sendai virus by chromatography on TEAE-cellulose. Acta virol. (Praha) [Eng.] 9 no.1: 92 Ja '65

1. The Ivanovsky Institute of Virology, U.S.S.R., Academy of Medical Sciences, Moscow.

SMIRNOV, Yu.A.

Burning milled peat in boilers with limited heating surface.
Torf.prom.33 no.2:34-35 '56. (MLRA 9:6)

1.Komsomol'skiy torfotransport.
(Peat) (Boilers)

SOV/177-58-3-24/29

17(6)
AUTHOR:

Smirnov, Yu.A., Captain of Medical Service

TITLE:

The Use of Disinfecting Showers on Truck DDA-53 for Deactivating, Degassing, and Disinfecting Military Equipment

PERIODICAL:

Voyenno-Meditsinskiy Zhurnal , 1958, Nr 3, pp 87-89 (USSR)

ABSTRACT:

With simple adaptation the disinfection showers on truck DDA-53 can be used for deactivating, degassing and disinfecting arms, equipment and transport. For this purpose a transition coupling is used to join the collector of the deactivating unit of a mobile spray station type ARS-12D to the pressure hose of DDA-53. The coupling has a thread at one end and a female screw at the other, the thread being similar to that on the distribution pipe of ARS-12D. Three sketches of the coupling are shown. The coupling is fastened by a screw to the eight-nozzle collector of ARS-12D. Rubber washers are placed at the screw junction. The nozzles of the collector are joined by

Card 1/3

9.1300

SOV/112-60-2-6.856
80447

Translation from: Referativnyy zhurnal Elektrotehnika, 1960, Nr 2, p 327
(USSR)

AUTHOR: Smirnov, Yu.A.

TITLE: On a Possible Modification of the "Blackbody" in a Waveguide ✓

PERIODICAL: Uch. zap. Kuybyshevsk. gos. ped. in-t, 1958, Nr 21, pp 203 - 207

ABSTRACT: The essence of the proposed method for determining the electric characteristics of dielectrics as follows: two thin-dielectric plates, one of which has a direct contact with the short-circuiting piston, are placed in a waveguide. At a certain distance between the plates travelling wave conditions are established, and an expression for the propagation constant in a dielectric can be found. The accuracy of the method is in an inverse relation to the thickness of the plates. The advantages of the proposed method compared with others are the speed and the simplicity of measurements and calculations. ✓

Card 1/1

I.F.D.

93369

S/058/61/000/005/058/063
A001/A101

9.4300 (1144, 1137, 1155)

Smirnov, Ya.A

TITLE: The waveguide method of measuring permittivities of barium titanates

PERIODICAL: Referativnyy zhurnal. Fizika, no. 6, 1961, 394, abstract 6Zn534 ("Uchenye Zapiski Kazansk. gos. ped. in-ta", 1959, no. 29, 93 - 96)

TEXT: To measure high values of permittivity, the author proposes one of the possible designs of quarter-wave transformer connected before a sample of "infinite" length filling up the entire aperture of the waveguide. The transformer consists of a dielectric plate placed at a certain distance l from the sample. By varying l , the minimum of reflections from the sample can be achieved. Calculation formulas are presented.

Ivenov

[Abstractor's note: Complete translation]

Card 1/1

8/24/00/005/005/057/003
001/0101

9.4300

AUTHOR

Belin, V.I.

TITLE

On the waveguide method for measuring permeabilities of ferrites

PERIODICAL

Referativnyy zhurnal, Physics, no. 6, 1961, 394, abstract (Zb33)
"Dokl. zap. Kazhysheok. gos. ped. in.", 1959, no. 29, 91-102

NOTE

The author discusses two varieties of a method for measuring permeability and permeability of non-magnitized ferrites. In the first case, the measurements are successively carried out on a sample of "infinite" length and a sample of finite length shorted out at the output. In the second case, short circuit is removed and a sample line is loaded with a matched absorbing load. Calculation formulas are presented.

I. Ivanov

[Author's name - complete translation]

Card 1/.

9,1300

S/194/61/000/001/031/038
D216/D304

AUTHOR: Smirnov, Yu.

TITLE: Graphical method of solving the transcendental equation as obtained in the study of the interference of waves in a waveguide filled with a dielectric and loaded by an attenuator

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 1, 1961, 44, abstract 1 1350 (Uch. zap. Kuybyshevsk. gos. ped. in-ta, no. 29, 1959, 113-117)

TEXT: The equation is solved graphically for the case of a dielectric having $\tan \delta < 0.1$, the variables in the equation of the complex propagation constant are separated with a small error and the system thus obtained of two equations is solved by the method of consecutive approximations. 12 references. B

Card 1/1

L 16708-65 EWT(d)/EWT(1)/EPA(s)-2/EEC(k)-2/EEC-4/EEC(t)/EEC(b)-2 Po-4/Pq-4/
Pg-4/Pt-10/Pk-4/P1-4 ESD(gs)/ESD(dp)/ESD(t)/ASD(a)-5/AS(mp)-2/AFMD(t)/IJP(c)
ACCESSION NR. AR5000813 GG S/0058/64/000/010/H043/H043

SOURCE: Ref. zh. Fizika, Abs. 10Zh292

AUTHORS: Smirnov, Yu. A.

TITLE: Measurement of the permeability and permittivity of magnetodielectrics in a
traveling-wave field

CITED SOURCE: Uch. zap. Kuybyshevsk. gos. ped. in-t., vyp. 42, 1964, 89-93

TOPIC TAGS: dielectric constant, magnetic permeability, magnetodielectric, traveling
wave, ferrite, gyrotropy

TRANSLATION: A method is proposed for measuring the complex permeability μ
and permittivity ϵ . The sample is placed between the plunger and a transformer
consisting of two polystyrene plates, separated by an adjustable gap. The transformer
was used to attain maximum standing wave ratio, and the size of the gap was measured.

Card 1/2

L 16708-65

ACCESSION NR: AR5000813

In the second measurement, the plunger was replaced by an attenuator. Formulas are presented for the calculation of μ and ϵ . The values of the constants obtained with NiZn ferrites correspond to the data given by Kolli (RZhFiz. 1957, No. 5, 23508). The method is applicable for the measurement of the parameters of weakly gyrotropic media. N. Sedletskaya.

SUB CODE: EC

ENCL: 00

Card 2/2

MIL'MAN, P.I.; SMIRNOV, Yu.B.

Automation of the operations of chromate solution pickling in the
production of sodium dichromate. Khim.prom. 41 no.7:540-542 J1 '65.
(MIRA 18:8)

VARSHAVSKIY, S. L.; TOMILOV, A. P.; SMIRNOV, Yu. D.

Electrochemical method for preparing trialkyl phosphates. Zhur.
VKHO 7 no.5:598-599 '62. (MIRA 15:10)

(Phosphoric acid) (Electrochemistry)

FEOKTISTOV, L.G.; TOMILOV, A.P.; SMIRNOV, Yu.D.; GOL'DIN, M.M.

Nature of the cathodic breaking of the carbon-halogen bond, Elektro-
khimiiia 1 no.8:887-893 Ag '65. (MIRA 18:9)

1. Institut elektrokhimiiia AN SSSR.

TOMILOV, A.P.; SMIRNOV, Yu.D.; KALITINA, M.I.

Electrochemical chlorination of ethylene in anhydrous methyl
alcohol. Zhur.prikl.khim. 38 no.9:2123-2125 S '65.
(MIRA 18:11)

CHERNOV, Grigoriy Iosifovich; SMIRNOV, Yuriy Dmitriyevich; SVET,
Ye.B., red.; KUZNETSOVA, O.Ya., tekhn.red.

[Production of semikilled steel] Proizvodstvo poluspo-
koinoi stali. Cheliabinsk, Cheliabinskoe knizhnoe izd-vo,
1963. 59 p. (MIRA 17:3)

ALYM, L.A., inzh.; VAYNSHTEYN, O.Ya., inzh.; KEYS, N.V., inzh.; LUBENETS, I.A.,
inzh.; SMIRNOV, Yu.D., inzh.; FIRSOV, S.G., inzh.

Production of 1 St. 5ps semikilled steel for concrete reinforcements.
Stal' 23 no.4:320-321 Ap '63. (MIRA 16:4)
(Steel, Structural--Metallurgy) (Concrete reinforcements)

KOLOBOV, Mikhail Ivanovich; STROGANOV, Anatoliy Il'ich; ~~SILINOV~~,
Yuriy Dmitriyevich; SVEI, Ye.B., red.

[Selecting a method of steel pouring] Vyor sposoba raz-
livki stali. Cheliabinsk, Cheliabinskoe knizhnoe izd-vo
1962. 51 p. (MIRA 17:2)

TOMILOV, A.P.; VARSHAVSKIY, S.L.; KULIKOV, M.T.; SMIRNOV, Yu.D.

Electrochemical synthesis of hexamethylenediamine and amino
capronitrile. Khim. prom. 41 no.5:329-333 My '65. (MIRA 18:6)

SMIRNOV, YU. D.

Smirnov, Yu. D.

"Vegetative-trophic disorders in infectious lumbosacral radiculitis and their dynamics under the influence of complex treatment using therapeutic mud and hydrogen-sulfide baths." Min Health USSR. Central Inst of Spa Studies, Moscow, 1956. (Dissertation for the Degree of Candidate in Medical Science)

So: Knizhnaya letopis', No. 25, 1956

SMIRNOV, Yu.D.

Vegetative trophic disorders in the clinical picture of lumbosacral radiculitis [with summary in French]. Zhur.nevr. i psikh. 57 no.10: 1258-1263 '57. (MIRA 10:12)

1. Nevrologicheskoye otdeleniye (zav. - prof. N.S.Chetverikov)
TSentral'nogo instituta Kurortologii (dir. - kandidat meditsinskikh nauk G.N.Pospelova)

(NERVES, SPINAL, diseases,

lumbosacral radiculitis causing autonomic trophic disord. (Rus))

(AUTONOMIC NERVOUS SYSTEM, diseases,

trophic disord. caused by lumbosacral radiculitis (Rus))

SMIRNOV, Yu.D.

Vegetative disorders in lumbosacral radiculitis and their response
to compound treatment employing mud applications and hydrogen
sulfide baths. Vop.kur. fizioter. i lech.fiz. kul't. 23 no.6:553-554
N-D '58 (MIRA 11:12)

(NERVES, SPINAL--DISEASES)
(BATHS, MOOR AND MUD)
(HYDROGEN SULFIDE--THERAPEUTIC USE)

SMIRNOV, Yu.D.; SHPIL'BERG, B.M.

Pulseless disease or Takayasu's Syndrome (progressive panarteritis obliterans) Zhur. nevr. i psikh. 59 no.1:58-60 '59. (MIRA 12:3)

1. Nevriologicheskoye otdeleniye (nauchnyy rukovoditel' (prof. Z.L. Iur'ye 4-y gorodskoy klinicheskoy bol'nitsy, Moskva.

(AORTA, dis.

aortic arch synd., Takayasu (Rus))

(ARTERIES,

same)

SMIRNOV, Yu.D., kand.med.nauk; YEGOROVA, M.S. (Moskva)

Prognosis of subarachnoid hemorrhage. Vop.neirokhir. 24 no.6:
29-35 N-D '60. (MIRA 14:1)

1. Nevrologicheskoye otdeleniye 4-y gorodskoy klinicheskoy bol'nitsy.
(BRAIN--HEMORRHAGE)

SMIRNOV, Yu.D.

Clinical aspects and course of aneurysms of the cerebral vessels.
Zhur. nevr. i psikh. 65 no.4:508-515 '65.

(MIRA 18:5)

1. Kafedra nervnykh bolezney (zaveduyushchiy - prof. N.S. Chetverikov)
TSentral'nogo instituta usovershenstvovaniya vrachey, Moskva.

SMIRNOV, V. D.

133-9-14/23

AUTHOR: Tageyev, V.M., Candidate of Technical Sciences and Smirnov, Yu.D., Engineer.

TITLE: Prevention of the Formation of "Whiskers" during Crystallization of Steel Using Additions of Rare Earth Elements. (Predotvrashcheniye obrazovaniya "usov" pri kristallizatsii stali s pomoshch'yu redkozemel'nykh elementov)

PERIODICAL: Stal', 1957, No.9, 823 - 828 (USSR).

ABSTRACT: The influence of admixtures of rare earth elements on non-uniformity of the distribution of sulphur and other admixtures during crystallization of steel was investigated. Experimental ingots of H40 steel melted in acid-induction furnaces were cast in sand moulds. The dimensions and composition of experimental ingots is given in Table 1. The rare earth alloy containing up to 43% of cerium, about 5% of iron (remaining lanthanum and other rare earth metal) was added in a proportion of 0.05 - 0.2% either to the ladle or placed in pieces on the bottom of the mould. Simultaneously, a control ingot without the alloying addition was cast from the same melt. For the determination of the distribution of inclusions radio-active isotopes of S^{35} and P^{32} were used in addition to the usual chemical and metallographic analyses. Radio-active elements were added as Card1/3 elemental sulphur and red phosphorous in sealed steel tubes and

133-9-14/23

Prevention of the Formation of "Whiskers" during Crystallization of Steel Using Additions of Rare Earth Elements.

in such amounts that their activity at the time of exposure was 0.1 and 0.01 m Curies/kg, respectively. The fixation of the distribution of radio-active elements radiograms of longitudinal and transverse cross-sections of ingots were made. The exposure time varied between 15-20 days. The radio-active phosphorous was added to all ingots, sulphur only to some of them. Characteristic data on the macrostructure of the experimental ingots are given in Table 2. Negatives of some of the radiograms obtained are shown in Figs. 1 - 7. It was established that alloying of 0.1 - 0.2% of rare earth elements with deoxidised steel prevents or decreases the segregation of sulphur and other admixtures (possessing different solubilities in solid and liquid phases) in the form of whiskers. This is due to precipitation of the sulphide phase at an earlier stage of crystallisation, thus sharply decreasing the diffusion redistribution of sulphur in the two-phase zone of ingots. During the crystallisation, a considerable proportion of sulphur in the form of sulphide inclusions is distributed along the axis of dendrites with the corresponding decrease of its concentration in inter-axial spaces with a subsequent decrease in the dendritic non-uniformity of steel (more

Card2/3

SOV/137-58-7-14457

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 7, p 75 (USSR)

AUTHORS: Markaryants, A.A., Solntsev, P.I., Smirnov, Yu.D.

TITLE: Degasification of Steel Under Vacuum in the Manufacture of Forgings (Degazatsiya stali pod razrezheniyem pri proizvodstve pokovok)

PERIODICAL: Trudy Nauchno-tekhnicheskogo obshchestva chernoy metallurgii, 1957, Vol 18, pp 582-591

ABSTRACT: The degasification of 34KhN3MF steel was accomplished by means of pouring the molten metal from one ladle into another under vacuum; 6 to 7.5 minutes were required to transfer 20-22 tons of metal. The vacuum apparatus was composed of a chamber with an intermediate casting device, a heat exchanger equipped with a filter, three vacuum pumps, and three reserve containers for the creation of preliminary vacuum as well as for accelerated removal of gases. Ingots weighing 18.9 and 13.4 tons, made of steel the properties of which it was desired to investigate, were converted into rotor-type forgings. The macrostructure of the latter exhibited no peculiarities whatever. Compared with stock prepared from regular ingots, the

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SOV/137-58-7-14457

Degasification of Steel Under Vacuum in the Manufacture of Forgings

overall quality of the plastic properties of metal in the internal zones of forgings prepared from vacuum-treated ingots was significantly higher. The influence of the vacuum is most apparent in the magnitude of relative shrinkage. Vacuum degasification of steel reduces the harmful effects of hydrogen, and its employment is advisable when it is desired to effect a leveling of plastic properties of the metal without resorting to protracted periods of tempering.

Ye.K.

1. Steel--Forging
2. Steel--Degasification
3. Vacuum systems--Applications

Card 2/2

X MARKANYANIS, A. A. and SMIRNOV, Yu. D.

"Some Questions of the Theory and Practice of Steel Degassing,"
paper presented at Second Symposium on the Application of Vacuum Metallurgy.

1-6 July 1958 Moscow

SMIRNOV, Yu. D.: Master Tech Sci (diss) -- "Investigation of the process of producing and developing zonal chemical non-homogeneity in steel ingots and castings". B. m. (unidentified), 1958. 27 pp, 120 copies (KL, No 5, 1959, 151)

SOV/123-59-15-60471

Translation from: Referativnyy zhurnal. Mashinostroyeniye, 1959, Nr 15, p 223 (USSR)

AUTHORS: Tageyev, V.M., Smirnov, Yu.D.

TITLE: Investigations of the Process of Non-Axial Heterogeneity Formation in Steel Bars and Castings

PERIODICAL: V sb.: Zatverdevaniye metallov. Moscow. Mashgiz, 1958, pp 352 - 373

ABSTRACT: Tests with bars (B) of grade 40 steel were carried out. Two B solidified in the crucible of a 1-ton induction furnace after its having been switched off, while one of the furnaces was tilted through an angle of 45° . Eight B of 1.8 - 6 tons weight were cast into sand molds from the same steel charge, smelted in a 25-ton acid open-hearth furnace. One of the B was case in a horizontal position, the rest vertically. In some cases diaphragms of a molding mixture were put across the B with an opening of 150 mm in diameter in order to obtain an increased shifting of the steel in the region of the diaphragm; a rarefaction was created in the interior of the head section of B in order to obtain an intensified gas liberation of air pressure on the B up to 3.5 at. For the examination of the metal flow radioactive W^{185} , S^{35} and P^{32} were from time to time introduced into it. Based on the

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Trans. of 2nd Conf. on Theory of Casting Processes 1956,

SMIRNOV Yu. D.

СЛНТОК И СВОЙСТВА СТАЛИ

- Д.Ф.Черныш Исследования влияния электромагнитного облучения вращающейся части слитков на поведение водорода и свойства металла.
- К.С.Прозверов
Л.И.Кручинин Распределение неметаллических включений в слитках заливочной стали.
- Ю.А.Некляцкий
Н.Г.Гардышев
В.Я.Ваня Качество затвердевания мезоэвтектических сплавов в неустойчивых, неметаллических и водородсодержащих формах.
- В.Г.Груев Структурообразование в зависимости от температурного поля жидкой стали.
- С.А.Чернышев
В.К.Некляцкий
А.С.Лобода Влияние толщины слитка на качество слитков из сплавов на железной основе.
- В.Г.Кузнецов
С.М.Гурьев Поведение включений в слитках сплавов.
- В.М.Тегеев
Ю.Д.Смирнов О связи диаметра и зонной неоднородности водородности слитков и отливок в процессе кристаллизации стали.
- В.М.Тегеев
Ю.Д.Смирнов Влияние выжимки слитков при кристаллизации на водородность слитков и отливок.
- А.М.Мерзлов
В.С.Резерман Моделирование системы турбулентности в слитках заливочной стали.
- Ю.А.Некляцкий
В.П.Каленко Потенциально новые методы при электромагнитной обработке.

report submitted for the 5th Physical Chemical Conference on Steel Production, Moscow-- 30 Jan 1959.

18.3200, 18.5200

77615
SOV/133-60-2-15/25

AUTHORS: Markaryants, A. A., Smirnov, Yu. D., Men'shikov, A. D.,
Yemel'yanov, B. F.

TITLE: Production of Rotor Shaft Forgings From Vacuum-Cast
Ingots

PERIODICAL: Stal', 196., Nr 2, pp 148-152 (USSR)

ABSTRACT: In light of attempts to minimize the hydrogen
content in metal of large forgings for critical parts,
the authors investigated TV-9 rotor forgings made
from vacuum-cast ingots, and by way of comparison,
from regularly produced ingots. Acid open-hearth
34KH13MFA steel was used. The following persons
participated in the study: S. Ye. Rabkin, A. P.
Morozov, A. N. Solomin, B. A. Lavrent'yev, et al.
(1) Vacuuming: a special installation consisted of
2 vacuum chambers, 17 and 36 m³, and 3VN-6G-type
pumps. Minimum pressure of 1 to 3 mm mercury

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Production of Rotor Shaft Forgings From Vacuum-Cast Ingots

7701b
SOV/133-60-2-15/25

column was maintained at the initial stage (from 15 to 20 min) and residual pressure of 25 to 40 mm mercury column toward the final period of degassing. An intermediate ladle was placed on the chamber lid. A 45-50 mm diam rubber cord secured air-tightness between chamber lid and ladle bottom. To reduce splashing by the hot metal jet from the intermediary ladle, a 280-300 mm diam, 300 mm long tube was attached to the lid aperture. Splashing was further reduced by increasing the ingot diam. Much attention was given to the riser lining to prevent lining pieces from entrapment in the ingot. The authors recommend accelerated teeming which also reduces ingot defects. (2) Characteristic of rotor forgings: Originally the workpieces were forged by two upsetting operations and two intermediate annealings followed by quenching from 950 and from 860° C and final annealing and tempering to remove hydrogen. The method of casting ingots under vacuum not only removes hydrogen but decreases the number

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Production of Rotor Shaft Forgings From Vacuum-Cast Ingots

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of oxide-silicate inclusions. Sequence of tests: Duplexing in 25 ton basic and 25 ton acid open-hearth furnaces. Four 13.4-ton test ingots were cast. Composition of melts, numbers 9,063 and 9,066 in %:

C	Mn	Si	P	S	Cr	Ni	Mo	V	Cu
0.35	0.44	0.29	0.015	0.018	1.42	3.21	0.36	0.13	0.15
0.38	0.42	0.28	0.014	0.018	1.43	3.24	0.36	0.13	0.14

Casting and degassing rates:

Melt numbers Ingots	<u>9063</u>		<u>9066</u>	
	1	2	1	2
Time, min - sec				
casting until riser	6-40	5-00	6-30	5-30
total casting	11-19	8-55	10-20	9-10
degassing	8-00	-	7-45	7-35

Card 376

Production of Rotor Shaft Forgings From Vacuum-Cast Ingots

7701
SOV/133-00-2-15/25

Pressure in vacuum chamber				
during casting, mm mercury column:				
initial period	3	-	3	7
during metal rising to feeder	27	-	30	31
final period	33	-	43	43
Serial number of forgings	4616	4617	4844	4845

Forging 4,617 (see table above) produced without degassing showed the same properties as the other forgings produced by simplified process, i.e., by two upsetting operations followed by quenching from 860 and tempering with omission of two intermediary annealings (saving 160-180 hr) and quenching from 950° C (saving 50-55 hr). Final annealing of all 4 forgings was done in the regular manner (see Fig. 3):

Card 4, 8

Production of Rotor Shaft Forgings From Vacuum-Cast Ingots

77615
SOV/133-60-2-15/25

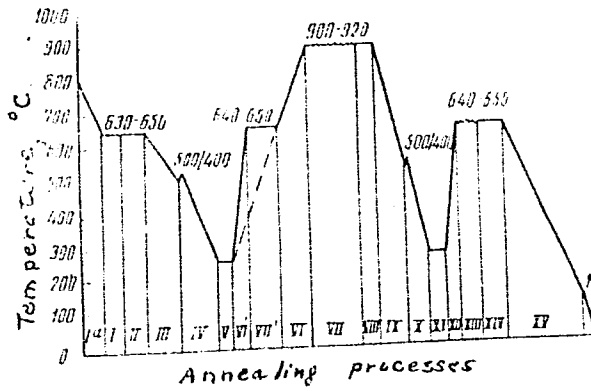


Fig. 3. Annealing diagram for rotor TV-9 forgings.

Card 5/6

Production of Rotor Shaft Forgings From
Vacuum-Cast Ingots

77815
SOV/133-00-2-15/25

After preliminary machining the forgings were heat-treated and tested for hardness. Macrostructural and ultrasonic tests showed no defects. All test forgings met the technical requirements. (3) Possible structural changes and deterioration of properties in steel along the cross sections of forgings were investigated. The authors found that plastic properties of specimens taken from the inside of the forgings made from ingots treated according to the new method were considerably higher; rotors made from ingots degassed under vacuum were endowed with excellent plastic properties and impact strength. Neither microstructure, hardenability, nor mechanical properties were impaired. Along with recommending the above new process the authors suggest the elimination of special tempering for the purpose of hydrogen removal (lasting 100 hr) since it enhances plastic properties only very slightly. Experiments are being conducted to remove hydrogen from basic open-hearth steel for large-scale use in critical parts. There are 8 figures; 1 table; and 1 Soviet reference.

Card 6/6

Smirnov, Yu.P.

MASS I BOOK EXPIRY/TATION SOV/4248

Abdank's work USSR. *Emulsiya po "tisho-himicheskim osnovam proizvodstva stali*
Primeneniyem vakuum y metallurgii (Use of Vacuum in Metallurgy) Moscow, Izd-vo
AN SSSR, 1960. 316 p. Eruda slizh insertov. 4,500 copies printed.

Sponsoring Agency: *Abdank's work USSR. Institut metallurgii Lening A.I. Baykova.*
Emulsiya po tisho-himicheskim osnovam proizvodstva stali.

Resp. Ed.: *A.M. Samarin, Corresponding Member, Academy of Sciences USSR; Ed. of*
Publishing House G.M. Motovskiyi Tech. Ed. 510, Motovsk.
Pumps; This collection of articles is intended for technical personnel interested
and is recent studies and developments of vacuum steelmaking practices and equip-

ment.
CONTRIBUTORS: The book contains information on steel making in vacuum induction fur-

naces, and vacuum arc furnaces, production processes in vacuum, and the use of
steel and alloys. The vacuum booster pumps is also analyzed. Contributors are
vacuum furnaces and their use with some of the articles and will appear in the table
mentioned in connection with some of the articles from English. Some of the
of Ceramics. These articles have been translated from English.

Kozlov, I.P., and S.I. Nikitich. Effect of Vacuum Treatment (in a Ladle) 127
of the Carbonless Ferronitride on the Amount of Its Oxide Inclusions
Metodye i Rezul'taty Fiziko-khimicheskogo issledovaniya 137

PART IV. DECLASSIFICATION OF STEEL AND ALLOYS

Kozlov, I.P., A.I. Laktionov, and A.M. Samarin. Vacuum Treatment of Bessemer
Steel 145
Kuznetsov, M.P., and G.B. Puzanov. The Effect of Vacuum Treatment in Ladle
on the Properties of Bessemer Kall Steel 151

Lyubimov, A.I., and V.D. Podolov. The Effect of Vacuum Treatment in Ladle
on the Weldability of Bessemer Constructional Steel 156

Olya, A.M., G.A. Sidorov, I.I. Anshelov, E.A. Tsvetov, I.A. Danilov, and
K.G. Zaporozh'ev. Use of Vacuum for Improving the Quality of Alloy Steels
Metallurgiya, A.I., and Yu.D. Ginzburg. Some Theoretical and Practical Prob-
lems of Steel Degassing 166

Chernov, B.M., A.P. Tsvetkov and Ye.I. Kishinev. The Effect of Vacuum
Treatment of Heat Treating on the Quality of Alloy Steels (The results of
performance of heat treatment metallurgical plants of the USSR)
Yevel'skiy, M.I., in Zaporozh'ev) with the participation of members
of the USSR Academy of Sciences, Yevel'skiy, M.I., Bolev, V.M., Yan' A.M., Yan'
Yevel'skiy, M.I., Koshcheyev, I.M., Bolev, V.M., Yan' A.M., Yan'
Yevel'skiy, A.I., Kishinev, P.I. Zhalev, V.I. Vainovskiy and G.P. Pechenchenko] 169

Polakovsky, M.Y., E.A. Samoylov, A.M. Gilyev, L.L. Isakov, K.Z. Shchegolevich,
E.M. Danilov and Ye.M. Shifrin. Heat Treatment of Molten Transformer
Steel and of Alloy Steels (A.S. Shchepin, L.J. Klimanov, P.G. Pechenkov,
V.I. Maslyev, Y.Ye. Pashchenko and P.M. Minner participated in the work)
Yevel'skiy, D.K., L.M. Koshcheyev and M.I. Anshelov. Investigation of Vacuum-
Treated Steel for casting 205

Belanger, G., and Z. Kishinev. Construction of People's Republic, Pison Plant
Heat Treatment of Steel for Raising the Quality of Aluminum Alloys
(Metalurgy) 211

Chukhrov, G.I. Polish People's Republic, Institute of Iron Metallurgy in Gliwice
Vacuum Melting and Pouring of Alloyed Carbon Steel 219

Berliner, V.S., R.A. Kravtsov and A.M. Samarin. Desulfurization of Molten
Iron Alloys in Vacuum 223

Vashkov, A.P., and I.I. Kozlov. Destruction of Nonmetallic Inclusions
in the Vacuum Treatment of Steel 230

Priglas, B.G., B.A. Larsson and Y.M. Samarin. Investigation of the
Effects of Steel Decarburization in Vacuum by Means of a Fast Spectrometer
Metallurgiya, A.I., O.A. Yezhov and B.M. Ismailov. The Effect of Hydrogen and
Sulfur on the Activity of Silicon in Molten Cast Iron 248

Kuznetsov, M.P. Investigation of Gas Liberation and Penetrability of Ceramics
in Vacuum 251

S/133/61/000/006/005/017
A054/A129

AUTHOR: Smirnov. Yu. D.

TITLE: News in brief

PERIODICAL: Stal', no. 6, 1961, 518

TEXT: The Chelyabinskiy nauchno-issledovatel'skiy institut metallurgii (Chelyabinsk Scientific Research Institute of Metallurgy) in cooperation with the Chelyabinsk metallurgicheskiy zavod (Chelyabinsk Metallurgical Plant) has carried out tests to insulate the riser of 2.6- and 4.5-ton ingots by means of light-weight fireclay bricks. When the simplest of test methods was applied, by insulating the dozzle with light-weight bricks, the yield of flawless ingots of ball-bearing steel increased by 2%, that of stainless steel by 4%. A new structure for the dozzle and a new, more economical shape of bricks to be used for ingots of various weights have been designed. ✓

Card 1/1

VORONOV, F.D., prof.; MOROZOV, A.N., prof., doktor tekhn.nauk;
SELIVANOV, N.M., kand.tekhn.nauk; SMIRNOV, Yu.D., kand.tekhn.nauk;
RABINOVICH, Ye.I., kand.tekhn.nauk; CHERNOV, G.I., inzh.;
TRACHENKO, I.A., inzh.; BIKTAGIROV, K.K., inzh.; FILIPPOV, V.M.,
inzh.; KUSTOBAYEV, G.G., inzh.

Making St. 3ps capped steel in Magnitogorsk Metallurgical
Combine open-hearth furnaces. Stal' 22 no.8:716-718 Ag '62.
(MIRA 15:7)

1. Magnitogorskiy metallurgicheskiy kombinat i Chelyabinskiy
nauchno-issledovatel'skiy institut metallurgii.
(Magnitogorsk--Open-hearth process)

S/133/62/000/007/006/014
A054/A127

AUTHORS: Smirnov, Yu.D.; Chernov, G.I.

TITLE: At the Chelyabinskiy nauchno-issledovatel'skiy institut metallurgii
(Chelyabinsk Scientific Research Institute of Metallurgy)

PERIODICAL: Stal', no. 7, 1962, 620

TEXT: In cooperation with the Magnitogorskiy metallurgicheskiy kombinat (Magnitogorsk Metallurgical Combine) a technology for semi-killed steel has been developed, in which reduction is effected only by silicon added in the furnace or the ladle. High-quality 7-ton ingots of Ст. 3сп (St.3ps) steel can be produced by this technology. As to chemical composition, the new grade is similar to killed steel; the surface of rolled sections is satisfactory and requires less finishing than the Ст. 3сп (St.3sp) killed steel. The yield of serviceable product for rolled sections increased by 9%, the production costs were cut by 2.55 rubles/ton. In rolled sections with diameters under 30 mm the strength and ductility are in accordance with ГОСТ 380-60 (GOST 380-60) for killed steel, at sub-zero temperatures and after mechanical aging, however, the notch toughness values are not equal to those of killed steel. Therefore, the new

Card 1/2

S/133/62/000/007/007/014
A054/A127

AUTHORS: Smirnov, Yu.D.; Bogatenkov, V.F.

TITLE: At the Chelyabinskiy nauchno-issledovatel'skiy institut metallurgii
(Chelyabinsk Scientific Research Institute of Metallurgy)

PERIODICAL: Stal', no. 7, 1962, 620 - 621

TEXT: In cooperation with the Chelyabinskiy metallurgicheskiy zavod (Chelyabinsk Metallurgical Plant) and Chelyabinskiy politekhnicheskiy institut (Chelyabinsk Polytechnic Institute) the conditions were studied of blowing oxygen into open-hearth furnace baths through tuyeres in the crown with 6 orifices during smelting. When oxygen was blown through in amounts of 5.8 - 7.4 m³/ton, at a rate of 1,000 - 1,200 m³/h, the smelting time was reduced by 45 - 49 min, the specific fuel consumption by 4.7 - 9.2%, the total specific oxygen consumption by 1.2 - 4.5 m³/ton. The hourly output of the furnace increased by 6.2 - 9%. ✓

Card 1/1

S/133/62/000/007/008/014
A054/A127

AUTHORS: Smirnov, Yu.D.; Bokov, I.I.

TITLE: At the Chelyabinskiy nauchno-issledovatel'skiy institut metallurgii
(Chelyabinsk Scientific Research Institute of Metallurgy)

PERIODICAL: Stal', no. 7, 1962, 621

TEXT: Tests were carried out to determine the effects of the phosphorus content and the smelting technology applied by various metallurgical plants on the quality of cables produced at the Beloretskiy metallurgicheskiy kombinat (Beloretsk Metallurgical Combine). A sulfur content of 0.007 - 0.045% and a phosphorus content of 0.012 - 0.026% did not affect the properties of the wire and service life of the cable. An increase of the phosphorus content of the steel to 0.042% reduced the wear resistance of the wire and the service life of the cable by 30 - 40%. The rupture of wires during drawing is caused by surface defects, axial porosity, combined with liquation and local heating.

Card 1/1

I 47155-66 RUP(M)/RUP(R)/RUP(U)/SP1

SOURCE CODE: UR/0137/65/000/009/VOL4/VOL4

ACC NR: AR6000433

AUTHORS: Saved, F. I.; Smirnov, Yu. D.; Khasin, G. A.25
BTITLE: Segregation defects in ingots of arc vacuum smelting

SOURCE: Ref. zh. Metallurgiya, Abs. 9V302

REF SOURCE: Sb. Teoriya i praktika metallurgiya. Vyp. 7. Chelyabinsk, 1964, 59-68

TOPIC TAGS: arc furnace, vacuum arc furnace, metal melting

ABSTRACT: On the basis of literature and experimental data, an explanation is given for the appearance of segregation defects in ingots derived from vacuum arc smelting. The degree of dendritic segregation in one or the other ingot zone depends on the conditions of liquid metal supply to the 2-phase region. During worsening of feeding, the dendritic inhomogeneity may increase. After decrease of power during arc melting, the width and branching of the 2-phase region rapidly increases and the metal supply to the depths of this region is interrupted. In different regions of 2-phase, different conditions arise, giving rise to heterogeneity. During the formation process of different heterogeneity forms, an important role is played by shrinkage displacements of the enriched liquid of the 2-phase region which are determined by the character and extent of the 2-phase zone, feeding conditions, magnitude of alloy shrinkage, as well as the liquid metal composition of the 2-phase

UDC: 669.18-412:621.746.6.001

Card 1/2

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ACC NR: AR6000433

zone. For segregation of nonaxial heterogeneity, the smelting of a metal that tends towards segregation must be carried out at minimum current strength. It is necessary to program the electric current strength which insures the maintenance of a maximum possible temperature gradient in a liquid vat during the whole smelting process. 5 illustrations. D. Kashayeva [Translation of abstract]

SUB CODE: 11

Card 2/2

61-

SMIRNOV, Yu.D.

Minor intrusions of basic and ultrabasic rocks of the diamond-bearing regions in the western slope of the Central Urals. Inform.sbor. (MIRA 15:3)
VSEGEI no.16:75-85 '59.
(Ural Mountains--Rocks, Igneous)

SMIRNOV, Yu.D.; KUKUSHKIN, A.I.

Relationship between the mute strata of the Bashkir anticlinorium
and those in the zones of the Ural-Tau. Mat.VSEGEI.Ob.ser. no.28:
9-18 '60. (MIRA 14:6)

(Bashkiria—Geology, Stratigraphic)

KUKHARENKO, A.A.; SMIRNOV, Yu.D.

Stratigraphy and conditions of formation of the lower Paleozoic
of the western slope of the Central Urals. Mat.VSEGEI.Ob.ser.
no,28:51-66 '60. (MIRA 14:6)
(Ural Mountains--Geology, Stratigraphic)

SMIRNOV, Yu.D., KUKHARENKO, A.A.

Peridotites from the basin of the Uls River (Northern Urals) and
their relation to the kimberlite group. Uch. zap. IGU no.291:64-90
'60. (MIRA 13:7)

(Uls Valley--Peridotite)

SMIRNOV, Yu. D.

Pre-Cambrian and Paleozoic intrusions in the western slopes of
the Northern, Central, and Southern Urals. Mat. VSEGEI no. 67:
3-57 '61. (MIRA 15:12)
(Ural Mountains—Rocks, Igneous)

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1965. ...

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SMIRNOV, Y. F.

BALASHOV, V.V., DOROFEYEV, G.F., KALITKIN, N.N., KAMINSKI I, A.K.,
SHIROKOV, Yu.M., SMIRNOV, Yu.F. and TUMANOV, K.A.

"Method of the Light Nuclei Levels Calculation,"

paper submitted at the All-Union Conf. on Nuclear Reactions in Medium and Low
Energy Physics, Moscow, 19-27 Nov 57.

Moscow State Univ. and Lebedev Physics Inst. Acad. Sci. USSR

24(5). 213)

AUTHORS: Neudachin, V. G., Smirnov, Yu. F. SOV/56-36-1-25/62

TITLE: The Genealogical Coefficients in the Generalized Nuclear Model (Genealogicheskiye koeffitsiyenty v obobshchennoy modeli yadra)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 1, pp 186-192 (USSR)

ABSTRACT: The present paper describes a general investigation of the problem and determines a general formula for the calculation of the genealogical coefficient. The first part of this paper deals with the number of independent states. A nucleon in the nucleus is characterized by the charge and, in addition, by 4 quantum numbers, e. g. by $n_1 j_1 \Omega$, where Ω denotes the projection of the angular momentum of the nucleon on to the symmetry axis of the nucleus. The actual shape of this set of quantum numbers is not of essential importance for the here discussed problem (it is here denoted by N). First, the case is investigated in which all N_i are different. Next, a pair with equal N_i is assumed. Finally, the case with k homogeneous pairs N contained in the total number $n \gg 2k$ is

Card 1/2

The Genealogical Coefficients in the Generalized
Nuclear Model

SOV/56-36-1-25/62

investigated. The second part of the present paper deals with the genealogical coefficients and their calculation. By means of the genealogical coefficients it is possible to express the complete antisymmetric wave function of n nucleons in form of a linear combination of the antisymmetric wave functions of $n - 1$ particles (which are vectorially connected with the wave function of the n -th particle by way of the isobaric spin). The genealogical coefficients are calculated by the method developed by P. J. Redmond (Ref 6). The calculation is described step by step. A table contains the genealogical coefficients for $n = 3$ and $n = 4$. There are 2 tables and 6 references.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Institute of Nuclear Physics of Moscow State University)

SUBMITTED: June 24, 1958

Card 2/2

16.8300,24.6000

76996
SOV/56-37-6-36/55

AUTHORS: Neudachin, V. G., Smirnov, Yu. F., Yudin, N. P.

TITLE: Clustering of Nucleons in Light Nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki,
1959, Vol 37, Nr 6, pp 1781-1783 (USSR)

ABSTRACT: The equivalence of wave functions of the shell theory with LS-coupling for states with a higher symmetry of the orbital part and the antisymmetrized wave functions composed of wave functions of nucleon clusters, was demonstrated with the aid of the permutation group theory. The total wave function $\psi([\alpha] LST)$ for the system with whole orbital momentum L, spin S, isobaric spin T, and Young's scheme for orbital part of the wave function $[\alpha] \equiv [\alpha_1, \alpha_2, \dots, \alpha_m]$ was expressed as follows:

$$\psi([\alpha] LST) = A \Phi(L[\alpha] r) \chi(ST[\tilde{\alpha}]\tilde{r}). \tag{1}$$

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Clustering of Nucleons in Light Nuclei

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SOV/56-37-6-36/55

(where A is antisymmetrization operator; r is symbol allowed a given $[\alpha]$; $[\tilde{\alpha}]$ and \tilde{r} are symbols analogous to $[\alpha]$ and r, but for conjugated concept). The above equation is equivalent to the usual expression:

$$\psi([\alpha]LST) = \sum_r \Phi(L[\alpha]r) \chi(ST[\tilde{\alpha}]\tilde{r}). \quad (2)$$

(cf. H. A. Jahn, H. van Wieringen, Proc. Roy. Soc., A69, 600, 1956). The following relation was obtained for the spin-orbital functions corresponding to Young's scheme with maximal symmetry (in which only α_m can be < 4):

$$\chi(ST[\tilde{\alpha}]\tilde{r}_0) = \chi(S_1 = 0T_1 = 0[\tilde{\alpha}_1]1234) \chi(S_2T_2[\tilde{\alpha}_2]5678) \dots \times \\ \times \chi(S_mT_m[\tilde{\alpha}_m]n - \alpha_m, n - \alpha_m + 1, \dots, n) = \sum_{\tilde{r}} C_{\tilde{r}} \chi(ST[\tilde{\alpha}]\tilde{r}). \quad (4)$$

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Clustering of Nucleons in Light Nuclei

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From these relations the following expression was obtained for the equivalence of wave functions with LS-coupling:

$$\phi((\alpha|LST) = A\Phi(L)\chi(S_1T_1[\alpha_1]1234)\chi(S_2T_2[\alpha_2]5678)\dots \times \chi(S_mT_m[\alpha_m]n-\alpha_m, n-\alpha_m+1, \dots, n). \quad (5)$$

This relation was applied to the calculation of the wave function of the ground states in Be^8 and B^{10} . There are 8 references, 2 Soviet, 4 U.K., 1 Swiss, 1 U.S. The U.S. and U.K. references are: J. K. Perring, T. H. Skyrme, Proc. Phys. Soc., A69, 600 (1956); K. Wildemuth, Th. Kannelopoulos, Nucl. Phys., 7, 150 (1958); 9, 449 (1959); H. Jahn, Proc. Roy. Soc., A209, 502 (1951); S. J. Biel, Proc. Phys. Soc., A70, 866 (1957); G. Raeah, Phys. Rev., 63, 367 (1943).

Card 3/4

Clustering of Nucleons in Light Nuclei

76996
SOV/56-37-6-36/55

ASSOCIATION: Institute Nuclear Physics at the Moscow State University,
USSR (Institut yadernoy fiziki Moskovskogo gosudarstven-
nogo universiteta, SSSR)

SUBMITTED: July 18, 1959

Card 4/4

S/048/61/025/002/001/016
B117/B212

AUTHORS: Balashov, V. V., Neudachin, V. G., and Smirnov, Yu. F.
TITLE: Structure of light nuclei
PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, v. 25,
no. 2, 1961, 170-188

TEXT: The present paper was read at the 10th All-Union Conference on Nuclear Spectroscopy (Moscow, 1960), and also at the 11th Annual Conference on Nuclear Spectroscopy (Riga, January 25 to February 2, 1961). The authors summarize the progress in the development, concerning the theory of light nuclei and mainly deal with two aspects which underly their description of the theory of light nuclei: 1) Utilization of a modern shell model to calculate the characteristics of ground states and least excited states; 2) The question of consistency of various models of light nuclei. The first chapter deals with the manybody aspects of the shell theory. A theoretical argumentation of the shell model is not given; the model is only treated as a semi-empirical method providing a simple explanation of experimental data, and at the same time furnishing a means for predicting lower-excited nuclear

Card 1/5

S/048/61/025/002/001/016
B117/B212

Structure of light nuclei

states. The authors discuss various elementary questions concerning the formalism of the shell model, i.e., introducing concepts and symbols which are generally used in publications on this subject, but have not yet entered the Russian literature. The first chapter deals with the following questions: Construction of wave functions belonging to the shell theory (Refs. 2-7), application of the shell model to calculate energy spectra of light nuclei (Refs. 5-8); electromagnetic moments and transitions in light nuclei (Refs. 16-22). The second chapter deals with the alpha association and shell model (Refs. 2, 23-28); it is shown that the alpha-particle model of nucleus and the shell model are much closer interrelated than has hitherto been assumed, and that they do not exclude each other. In chapter three ("Collective motion and shell model"), the authors mention papers (Refs. 29-40) which deal with the creation of new and more complicated models. They had to be developed from the collection model (drop model) and the shell model, since the range of application of the two aforementioned models alone is rather narrow. Finally, the authors deal with a number of experimental problems. The solution of such problems has become urgent since the theory of light nuclei develops steadily and rapidly. In order to clarify the characteristics of nucleon interactions it is, above all, necessary to

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S/048/61/025/002/001/016
B117/B212

Structure of light nuclei

perform a systematic investigation of light nuclei. This is necessary for a precise explanation of the shell model and a determination of its relation to other models. At first, such an investigation might be limited to a small number of nuclei, but the results obtained should be very complete. From a theoretical point of view, and regarding the present experimental possibilities, the nuclei at the end of the p-shell with $A = 13, 14$ and 15 , and also the B^{10} nuclei, up to now already thoroughly enough studied, are of special interest: According to the authors, the following special problems seem to be promising: 1) Levels in Li^7 ; 2) calculation of levels in Li^7 ;

- 3) nature of the excited O^+ levels in C^{12} , O^{16} , Ne^{20} , and other nuclei;
- 4) investigations of E2-transitions near Mg when T is changed; 5) experimental spectrometric problems which are of interest for the theory of photo-nuclear reactions (Ref. 44): a) stripping (d,p) and (d,n) reactions forming single-body levels of the final nucleus; b) inverse stripping (p,d) reactions during which the nucleon is "pulled out" from the inner shell of the nucleus, i.e., Mg^{24} etc.; c) elastic proton scattering on up to 8-Mev nuclei. Ref. 45 brings an example for such experiments. G. Lipkin, Yu. M. Shirokov, K. A. Tumanov, V. Yu. Gonchar, Ye. V. Inopin, and S. P. Tsytko are mentioned. There are 2 tables and 45 references: 11 Soviet-bloc.

Card 3/5

S/O48/61/025/002/001/016
B117/B212

Structure of light nuclei

ASSOCIATION: Nauchno-issledovatel'skiy institut yadernoy fiziki
Moskovskogo gos. universiteta im. M. V. Lomonosova
(Scientific Research Institute of Nuclear Physics of Moscow
State University imeni M. V. Lomonosov)

Ядро	J, T	Классификация в схеме LS	Классификация в схеме jj	Ядро	J, T	Классификация в схеме LS	Классификация в схеме jj
He ³	3/2, 1/2	P[1]: ²² P _{1/2}	P _{1/2} : ³ 1/2 1/2	B ¹¹	3/2, 1/2	P ⁷ [43]: ²² P _{1/2}	P _{1/2} : ³ 1/2 1/2
He ⁴	0, 0	P ² [2]: ³¹ S ₀	P _{1/2} : ³ 01	C ¹²	0, 0	P ⁸ [44]: ¹¹ S ₀	P _{1/2} : ⁸ 00
Li ⁶	-1, 0	P ² [2]: ¹³ S ₁	P _{1/2} : ² 10	C ¹³	1/2, 1/2	P ⁹ [44]: ²² P _{1/2}	P _{1/2} : ¹ 1/2 1/2
Li ⁷	3/2, 1/2	P ³ [3]: ²² P _{1/2}	P _{1/2} : ³ 1/2 1/2	N ¹⁴	1, 0	P ¹⁰ [44]: ¹³ S ₁	P _{1/2} : ² 10
Be ⁸	0, 0	P ³ [4]: ¹¹ S ₀	P _{1/2} : ⁴ 00	N ¹⁵	1/2, 1/2	P ¹¹ [44]: ²² P _{1/2}	P _{1/2} : ³ 1/2 1/2
Be ⁹	3/2, 1/2	P ³ [4]: ²² P _{1/2}	P _{1/2} : ³ 1/2 1/2	O ¹⁶	0, 0	P ¹² [44]: ¹¹ S ₀	P _{1/2} : ⁸ 00
Be ¹⁰	3, 0	P ⁶ [42]: ¹³ D ₃	P _{1/2} : ⁶ 30				

Legend to Table 1:
1) Nucleus; 2) classification in the LS-scheme; 3) classification in the jj-scheme.

Tab. 1

Card 4/5

S/048/62/026/008/017/028
B104/B102

AUTHORS: Matkhiz, Z., Neudachin, V. G., and Smirnov, Yu. F.

TITLE: The lower levels of O^{17} and F^{17} in the α -nuclear model

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 8, 1962, 1060 - 1069

TEXT: The O^{17} nucleus is considered to be a tetrahedron having α -particles in its four corners there and with the last neutron moving in its field. The Hamiltonian of this system has the form $H = H_{rot} + H_{vibr} + H_p + H_{v-p}$,

where $H_{rot} = \frac{\hbar^2}{2Y} (\vec{J} - \vec{j} - \vec{L})^2$ is the rotation energy of the nucleus, J the total angular momentum in the given state, j the angular momentum of the neutron, \vec{L} the mean angular momentum of the F_2 vibrations of the α -particles of the core; H_{vibr} is the vibration energy of the core, H_p the single-particle Hamiltonian. $H_{v-p} = V_0 \delta(r - R_0) \sum_p Q_{\beta p} Y_{\beta p}^{l=2}(0, \varphi)$. (A) gives the

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binding energy between nucleons and vibrating core. A nuclear level diagram (Fig.) is plotted, and the level shifts due to core vibrations are examined.

The quadrupole moment of the O^{17} ground state with a coupling constant $C = 0.7$ is determined to be -0.027 barn. The lifetime of the first excited state ($1/2^+$) is $1.6 \cdot 10^{-10}$ sec. These data agree well with experimental results (Ref. 9, F. Ajzenberg-Selove, T. Lauritsen, Nucl. Phys., 11, 1 (1959); R. A. Kamper et al., Proc. Phys. Soc. A, 70, 697 (1957)). The nucleon is weakly coupled with the core. There are 1 figure and 1 table.

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