ROGEL'BERG, I.L.; SHPICHINETSKIY, Ye.S.; BARANOVA, L.M.; PUCHKOV, B.I.

Technology of manufacturing and properties of nickel-tungsten alloys
in connection with their use for the manufacture of filamentary-
cathode tubes. Trudy Giprotsvetmetobrabotka no.18:233-242 '60.
(MIRA 13:10)

(Nickel-tungsten alloys)   (Electron tubes)

ROGEL'BERG, I.L.; SHPICHINETSKIY, Ye.S.; AGAFONOV, A.K.; PUCHKOV, B.P.

Some properties of oxygen and sulfur-bearing nickel for anodes.
Trudy Giprotsvetmetobrabotka no.18:243-253 '60.   (MIRA 13:10)
(Nickel--Metallography)   (Electrodes, Nickel)

DNESTROVSKIY, Nikolay Zel'manovich; POMERANTSEV, Sergey Nikolayevich
[deceased]; ZVEREV, V.V. [deceased]; SHPICHINETSKIY, Ye.S., kand.
tekhn. nauk, retsenzent; POSTNIKOV, N.N., inzh., retsenzent; RZHEZ-
NIKOV, V.S., red.; KOSOLAPOVA, E.F., red. izd-va; BERLOV, A.P., tekhn.
red.

[Brief manual on the treatment of nonferrous metals and alloys] Krat-
kii spravochnik po obrabotke tsvetnykh metallov i splavov. Moskva,
Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii,
1961. 410 p.   (MIRA 14:8)
          (Nonferrous metals)   (Metalwork)

S/680/61/000/020/007/013
D258/D302

AUTHORS: Rogel'berg, I. L., Shpichinetskiy, Ye. S., Puchkov, B.I. and Titova, A. S.

TITLE: Nickel alloys of high electrical resistivity for cathode filament bases in radio tubes

SOURCE: Moscow. Gosudarstvennyy nauchno-issledovatel'skiy i prosektnyy institut obrabotki tsvetnykh metallov. Sbornik nauchnykh trudov. no. 20, 1961, Metallovedeniye i obrabotka tsvetnykh metallov i splavov, 117-124

TEXT: The present work was aimed at developing Ni alloys suitable for the manufacture of filament bases in the so-called 'economical' radio tubes, Suitable alloys were required to possess electrical resistivities, of 42 microohms-cm at room temperature and of 114 microohm-cm (at least) at 850°C. 84 different alloys were prepared by quickly melting the charges in a high-frequency furnace. The products were subsequently reduced with C and Mg, poured in graphite forms, water-quenched from 1100°C, then rolled, annealed at

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S/680/61/000/020/008/013
D258/D302

AUTHORS: Shuichinetskiy, Ye. S., Rogel'berg, I. L., Luzenberg,
A. A., Golomolzina, Yu. A. and Agafonov, A. K.

TITLE: Investigating the darkening of nickel strip due to an-
nealing

SOURCE: Moscow. Gosudarstvennyy nauchno-issledovatel'skiy i pro-
yektnyy institut obrabotki tsvetnykh metallov, Sbornik
nauchnykh trudov, no. 20, 1961. Metallovedeniye i obra-
botka tsvetnykh metallov i splavov, 125-135

TEXT: The authors investigated the effect of composition and of
various technological factors on the occasional darkening of nickel
strip (grades $HП2$ (NP2) and $HKO2$ (NKO2)), occurring after heating
for 4 hours up to 780 - 800°C, annealing for 3 hours and cooling
to room temperature over 8 - 10 hours. Darkening was due to the
formation of a strongly adhering 10^{-5} - 10^{-6} cm thick film which
was found to consist of carbon. The effect of composition on dar-

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Investigating the darkening ...

S/680/61/000/020/003/013
D258/D302

kening was investigated on thinly rolled samples of darkened strip;
the specimens were electropolished and reheated in vacuo. They
were then slowly cooled or quenched from 780°C. Films were formed
on all slowly cooled specimens with more than 0.04% C and 0.04% Si,
but not on quenched specimens. Microscopic study showed that gra-
phitization usually started from the crystal boundaries. The in-
dividual effect of C and Si on darkening was studied with samples
annealed in vacuo and containing 0.02 - 0.2% of C, Si, Mg and oth-
er reducing agents. With samples containing C alone, the darkening
occurred at 0.07% C and more; the presence of Si raised the con-
centration limit by 0.01%. The effect of lubrication on darkening
was studied by coating samples with transformer oil prior to an-
nealing. The presence of oil enhanced darkening in samples con-
taining more than 0.04% C, while it had no adverse effect on sam-
ples with lesser concentrations. The chemical analysis of 253
plant-annealed rolls showed that no darkening occurred in rolls
containing 0.02 - 0.03% C, while 0.06% C caused intense darkening;
the total concentration of reducing agents was, qualitatively on-

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Investigating the darkening ...

S/680/61/000/020/008/013
D258/D302

ly, related to the extent of darkening. Application of various oils
in plant conditions always resulted in darkening; yet the removal
of these oils, prior to annealing, had little effect on preventing
it. No dependence could be established between the composition of
furnace gases and the extent of darkening. No change was observed,
on substituting hydrogen or water vapor to air in the furnace
space, or on annealing in vacuo at 10^{-3} mmHg. The latter treatment
even enhanced darkening. The laboratory treatment of quenching
showed equally good results when applied in plant practice. Thus,
rolls of nickel strip were cleaned, thinned, packed in Ni and Cu
foils, heated for 3 hours at $780^{\circ}C$, and quenched in water. Only two
out of ten quenched rolls showed traces of darkening in their midd-
le portions. Finally, Ni strip was annealed by continuously passing
it through an electrical furnace, under hydrogen, at $850^{\circ}C$, at a
rate of 3 - 5 m/min. This treatment completely prevented the oc-
currence of darkening, provided the strip was quenched immediately
on leaving the furnace. The film is assumed to be formed as a re-
sult of the decomposition of a supersaturated Ni-C solid solution.
The authors assume that in the course of annealing, carbonized oil

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Investigating the darkening ...

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D258/D302

diffuses into the metal and is taken up to the limit of C-content in the solid solution at 800°C (0.13% C). There are 4 tables, 5 figures and 5 references: 3 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-language publications read as follows: Metals Handbook, Nickel-Carbon, p. 1183, (1948); J. J. Lander, H. E. Kern and A. L. Beach, J. Appl. Phys. 23, 12, (1952).

Card 4/1

SHPICHINETSKIY, Ye.S.; ROGEL'BERG, I.L.; LUZENBERG, A.A.; GOLOMOLZINA, Yu.A.
AGAFONOV, A.K.; Prinimali uchastiye: MIZONOV, V.M.; GALAKTIONOVA,
G.A.; GAVRILOVA, N.G.; SAMSONOV, I.P.; KOPEYKA, E.I.; GLEBOV, V.P.

Investigating th darkening of nickel strips during annealing.
Trudy Giprotsvetmetobrabotka no.20:125-135 '61.   (MIRA 15:2)
    (Nickel--Heat treatment)   (Annealing of metals)

ACCESSION NR: AR4018342   S/0137/64/000/001/I101/I101

SOURCE: RZh. Metallurgiya, Abs. 1I662

AUTHOR: Shpichinetskiy, Ye. S.; Yemel'yanova, Yu. A.

TITLE: Processing indium and indium-tin alloys and their connection properties

CITED SOURCE: Tr. Gos. n.-i. proyekt. in-ta splavov i obrabotki tsvetn. met.,
vy*p. 21, 1963, 91-97

TOPIC TAGS: nonmetallic radio component , nonmetallic component joining, quartz
monocrystal, indium, tin, eutectic alloy, radio acoustics; salt monocrystal

TRANSLATION: Research was conducted on the possibility of having a stable connec-
tion of nonmetallic elements of special radio devices produced of quartz and salt
monocrystals, with the use of Al, Pb, Sn, Cd, and In and their alloys. Only
eutectic alloys of In with Cd, and especially with Sn provide sufficiently stable
connection and possess fully satisfactory acoustic qualities. An advantage of the
In-Sn alloys also is their low temperature of eutectics (117°) and their adaptabil-
ity to vacuum-solid soldering to glass. The possibility was demonstrated of obtain-
ing high-quality foil up to 2-3 microns in thickness out of In and its alloys with

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ACCESSION NR: AR4018342

Sn, without intermediate annealing at low speeds of rolling (1.2-2 meters/min).
To provide a strong good connection between nonmetallic elements of an instrument
and to provide the needed acoustical characteristics, an eutetic alloy of In with
48 plus-or-minus 2% Sn is recommended. A strong connection is achieved under con-
dition of heating the joined elements at a pressure of 20-25 kg/cm^2 at a tempera-
ture of 112 plus-or-minus 2° for 3-5 hours.

SUB CODE: *MM,EC*   ENCL: 00

Card 2/2

L 45079-65   EWP(e)/EWT(m)/EWP(w)/EPF(c)/EWP(i)/EWA(d)/EWP(v)/EPR/T/EWP(t)/EWP(z)/
EWP(b)   Pr-4/Ps-4/Pad   IJP(c)   JD/WW/HW/WH
ACCESSION NR: AP5009744   UR/0136/65/000/004/0070/0072

AUTHOR: Shpichinetskiy, Ye. S.; Khayutin, S. G.

TITLE: Study of the bonding of metals due to their joint cold rolling

SOURCE: Tsvetnyye metally, no. 4, 1965, 70-72

TOPIC TAGS: cold welding, cold rolling, metal bonding, microrelief, grain
orientation, adhesion, diffusion, microcracks, bimetal strip, nickel strip, copper
strip, stripping, metallographic investigation, spectral investigation

ABSTRACT: A three-layer nickel-copper-nickel strip was cold-welded by cold rolling
in order to investigate the concomitant adhesion, diffusion, and friction effects.
After the cold welding the nickel layers were mechanically stripped of the copper
and the increase in the content of copper in nickel, and of nickel in copper, was
spectrally investigated as a function of the roughing stress. This was followed
by metallographic investigations of the contacting surfaces between the two metals
immediately after their separation by stripping. Contrary to expectations the
metallographically observed deformation of the surface layer was too extensive to

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ACCESSION NR: AP5009744

be explained by the assumption that the extraction of particles from the surface of
the opposite layer plays a definite role in the formation of the surface microre-
lief. The surface of copper was found to have a cellular structure with cell di-
mensions of from 5 to 20 μ. The cells are arrayed in chains stretching in the
direction in which the nickel layer had been stripped off. If the nickel layer is
stripped off in different directions the surface of the copper will resemble the
pile of a fabric that is smoothed out in different directions. This indicates the
strength of the bonding between the cold-welded metals. This microstructure, how-
ever, is found only on a comparatively small part of the surface, owing to the
different state of the microrelief, different orientations of grains, the presence
of microcracks, and other factors which cause the localization of deformations in
the boundary layer during the stripping. As a result, despite the considerable
deformation of surface grains in copper, macroscopic deformation is practically
absent. Orig. art. has: 2 figures, 2 tables. Apparently, this type of fracture is
to be regarded as a particular case of ductile fracture of metals.

ASSOCIATION: None

SUBMITTED: Apr65   ENCL: 00   SUB CODE: MM, SS
Card 2/2   NO REF SOV: 002   OTHER: 000

SHPICHINETSKIY, Ye.S.; MACHUL'SKAYA, G.A.

Investigating changes in the composition and plasticity
of the copper-aluminum-magnesium alloy during hot pressure
working and during annealing. Trudy Giprotsvetmetobrabotka
no.24:314-323 '65.   (MIRA 18:11)

L 24430-66   EWT(m)/EWP(w)/T/EWP(t)/EWP(k)   IJP(c)   JD/HW/JH
ACC NR: AT6006484   SOURCE CODE: UR/2680/65/000/024/0314/0323

AUTHORS: Shpichinetskiy, Ye. S.; Machul'skaya, G. A.

ORG: State Scientific Research and Design Institute of Alloys and Nonferrous
Metalworking, Moscow (Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy
institut splavov i obrabotki tsvetnykh metallov)

TITLE: Investigation of changes in composition and plasticity of copper-aluminum-
magnesium alloy as a result of high-temperature compression and annealing

SOURCE: Moscow. Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut
splavov i obrabotki tsvetnykh metallov. Trudy, no. 24, 1965. Metallovedeniye i
obrabotka tsvetnykh metallov i splavov (Metal science and the treatment of non-
ferrous metals and alloys), 314-323

TOPIC TAGS: aluminum alloy, copper alloy, magnesium alloy/ Br.AMg6-1, MO copper,
AV000 aluminum, Mg1 magnesium

ABSTRACT: The object of the investigation was to determine the cause of the
unsatisfactory performance of secondary electron emitters manufactured from the
alloy Br.AMg6-1 with 5.2--6.0% Al, 0.9--1.3 Mg, and the rest Cu. It was suspected

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L 24430-66
ACC NR: AT6006484   4/

that the failure in performance was due to burning off of magnesium during rolling
and annealing of the metallic filament. The alloy was prepared from copper MO,
aluminum AVOOO, and magnesium Mg1. The effect of annealing of the alloy specimens
after hot and cold rolling at different temperatures and in different ambient media
(air, ammonia, and vacuum) on the magnesium content and plasticity of the alloy was
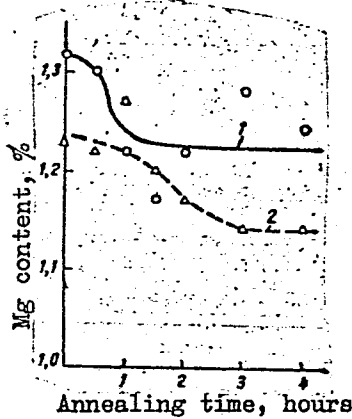investigated. The experimental results are presented in graphs and tables (see
Fig. 1).

Fig. 1. Change of the magnesium
content of a Br.AMg6-1 alloy ribbon
as a function of the annealing time
during annealing in air at 650C.
1 - 1.32% Mg; 2 - 1.23% Mg.

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ACC NR: AT6006484

It was found that, during preheating for purposes of hot rolling and during anneal-
ing in air, the magnesium in the alloy Br.AMg6-1 undergoes selective oxidation.
During subsequent etching of the ribbon, the magnesium oxide is dissolved, leading
to a depletion of the magnesium content of the alloy. Neither the degree of
compression nor the specimen thickness had any noticeable effect on the oxidation
process. To obtain a soft ribbon of a given magnesium content, annealing must be
carried out at 650C for a period of one hour in vacuum or in inert atmosphere, or,
if air contact during annealing is unavoidable, in limited contact with air. In
the latter case, the alloy should have a 1.3--1.4% initial magnesium content.
Orig. art. has: 9 tables and 5 graphs.

SUB CODE: 11/3/SUBM DATE: none/ ORIG REF: 004

Card 3/3

ACC NR: AP6033473   /000/018/0059/0060

INVENTOR: Gurovits, L. S.; Kiryukhin, J. G.; Shakhabmay...; ... O.; Shpichinetskiy, Ye.
S.

ORG: None

TITLE: Method for connecting a piezoelectric transducer to the acoustic conductor
of an ultrasonic delay line. Class 21, No. 185984 [announced by the State Scientific
Research and Design Institute of Alloys and Nonferrous Metal Processing (Gosudar-
stvennyy nauchno-issledovatel'skiy i proyektnyy institut splavov i obrabotki
tsvetnykh metallov)]

SOURCE: Izobret prom obraz tov zn, no. 18, 1966, 59-60

TOPIC TAGS: piezoelectric transducer, ultrasonic wave, circuit delay line

ABSTRACT: This Author's Certificate introduces a method for connecting a piezoelec-
tric transducer to the acoustic conductor of an ultrasonic delay line by using a
metallic matching layer. The bandwidth and thermal stability of the delay line are
increased, and mechanical and acoustic contact between the piezoelectric transducer
and acoustic line is improved by using an indium alloy for the joint containing 0.5-
25% thallium under a pressure of 20-25 kg/cm^2 at a temperature of 145-150°C and hold-
ing under these conditions for 3-6 hours.

SUB CODE: 09/ SUBM DATE: 16Aug65

Card 1/1   UDC: 621.374.5

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ACC NR: AP6032623   (N)   SOURCE CODE: UR/0126/66/022/003/0432/0437

AUTHOR: Khayutin, S. G.; Shpichinetskiy, Ye. S.

ORG: Giprotsvetmetobrabotka

TITLE: Specific features of plastic deformation of indium and its alloys

SOURCE: Fizika metallov i metallovedeniye, v. 22, no. 3, 1966, 432-437

TOPIC TAGS: indium thallium alloy, alloy bend test, alloy structure, plastic defor-
mation, indium, indium base alloy, thallium containing alloy

ABSTRACT: The plastic deformation of 99.998%-pure indium and indium-base alloys
containing up to 40% of 99.9995%-pure thallium has been investigated. Cast alloy
specimens were electrolytically polished and bent manually to 1—2% elongation at
room temperature. It was found that pure indium deforms by slip, without any
significant amount of twinning. Indium alloy with 1% thallium deforms by slip and
twinning, the amount of the latter increasing with increasing thallium content. De-
formation of an alloy with 35% thallium procedes by twinning only. However, indium
alloy with 40% thallium which has a face centered cubic lattice deforms by slip
without twinning. Twinning forms in indium deformed in liquid nitrogen at -196C with slip
lines observed at the same time. The tetragonal face-centered lattice in pure indium
changed into a face-centered cubic lattice in solid solutions containing over 35%
thallium. Orig. art. has: 6 figures.
SUB CODE: 11/ SUBM DATE: 13Jul65/ ORIG REF: 002/ OTH REF: 002

Card 1/1   UDC: 546.682:539.374

11 (2, 4)

PHASE I BOOK EXPLOITATION

SOV/2213

Groznyy. Neftyanoy nauchno-issledovatel'skiy institut

Khimiya i tekhnologiya pererabotki nefti i gaza (Chemistry and Technology of Petroleum and Gas Refining Processes) Moscow, Gostoptekhizdat, 1959. 278 p. (Series: Its: Trudy, vyp. 4) 2,500 copies printed.

Executive Ed.: T.D. Yefremova; Tech. Ed.: A.S. Polosina; Editorial Board: A.Z. Dorogochinskiy (Chairman), B.K. Amerik, G.I. Kaz'min, N.M. Kamakin, V.I. Lavrent'yev, Ye.S. Levchenko, and M.G. Mitrofanov (Deputy Chairman).

PURPOSE: This book is intended for petroleum engineers and technicians in scientific research institutes, planning organizations, and refineries.

COVERAGE: This collection of technical papers on oil and gas refining were originally discussed at the petroleum refining section of the Third GrozNII Scientific-Technical Congress in 1957. The articles have been published to help further the development of the petroleum

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Chemistry and Technology (Cont.)   SOV/2213

refining industry and petrochemical industry in the Chechen-Ingush
ASSR. The history and significance of the petroleum refining in-
dustry in the Groznyy region is outlined by A.Z. Dorogochinskiy
with emphasis on the interdependence of the refineries and the
aircraft, automobile and rocket manufacturing industries. Change
in modern engines demand a change in fuel and lubricating oil
properties. The increased use of jet aircraft makes the produc-
tion of high octane aviation gasoline less important than the
production of the new type of fuel, aviation kerosene, the yield
of which requires a quite different refinery run. Since crudes
recovered at the Karabulak-Achaluki fields represent a valuable
raw material for manufacturing lubricating oil and paraffin wax,
their properties have been thoroughly investigated and results of
analyses reviewed. The re-equipment of the fuel producing line
of refineries at Groznyy has been carried out on the basis of
findings obtained from tests and pilot plant operations, and a
number of reforming and platforming units have been built to up-
grade the low octane gasoline produced at Groznyy. Tests were
also conducted to ascertain the advisability of applying the
destructive distillation of residues, which yields solar fractions
badly needed for catalytic cracking unit as feed stock. Catalytic
cracking units of the 43-102 type were first put on stream in the

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Chemistry and Technology (Cont.)   SOV/2213

Groznyy refineries in 1952, and since that time continuous efforts
have been made to boost their processing capacity, and improve the
regeneration of catalysts. The authors make a number of sugges-
tions as to how the throughput of the above units might be in-
creased. The production of different types of pelleted and bead
catalysts, the contamination of catalysts and their reactivation
are discussed. The operation of a contact coking reactor, its
design, and products yielded by contact coking units are described.
The authors also deal with the manufacture of lubricating oils,
paraffin and ceresine wax and indicate way of improving their
properties. Electrical dehydration and desalting of crude oil and
of light products are discussed. The authors state that in recent
years extensive studies were made on the chemical conversion of
petroleum products, and particularly of gases. As a result, a
number of gas fractionators and compressors were built and installed
to produce phenol and acetone from propylene and benzene, to syn-
thesize ethyl alcohol and oxidize paraffinic hydrocarbons. An
article is devoted to problems of automating various processes and
developing the related control and gage instruments. The book

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Chemistry and Technology (Cont.)   SOV/2213

contains numerous tables with the characteristics of different
petroleum products obtained from refinery processing units, pilot
plants and petrochemical refinery sections. Each article is
accompanied by references.

TABLE OF CONTENTS:

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BORTSOVA, M.P.; GAMAYUNOVA, P.B.; POPLAVSKAYA, A.V.; SHPICHKO, N.P.;
      PAVLOV, G.D.; PODUNOVA, A.T.; LOVA, N.I.; ALEKSANDROVA, R.P.;
      ATARUKOV, A.G.; VOROB'YEVA, Ye.I.; GAN'YANTS, E.M.; GELLER, D.Ya.;
      PARSHINA, M.A.; FILINA, R.A.; CHUVELYAYEVA, Ye.S.

      Selecting demulsifiers for crude oils processed in Groznyi refineries.
      Trudy GrozNII   no.4:17-26   '59.   (MIRA 12:9)

    1.Groznenskiy neftyanoy nauchno-issledovatel'skiy institut (GrozNII)
    (for Pavlov, Podunova, Lova).
                (Groznyi--Petroleum--Refining)

5.4700

69665

AUTHOR: Muzychenko, L. A., Shpigar', N. P.,
           Kamneva, A. I.

S/153/60/003/01/005/058
B011/B005

TITLE: Approximative Method of Calculating the ΔH^{o}_{form} of Alkanes[1] and
           Their Radicals

TEXT: It is the purpose of this paper to develop a calculating scheme for the
standard heats of formation of alkanes and their radicals. The determination of
this heat is complicated for the saturated aliphatic hydrocarbons, but sometimes
impossible for the radicals. The usual calculating schemes (Refs 1-4) have many
shortcomings. Therefore, the authors suggested another dependence for the electric
negativity of carbon: $E_c = E_o + aI^n$ (1) where E_o is the electric negativity of the
carbon atom in methane (=1.190), a and n are empirical constants, and I is a
certain characteristic value calculated by the formula
$I = \sum E_{c_\alpha} + 0.38 \sum E_{c_\beta} + 0.16 \sum E_{c_\gamma}$ (2). $E_{c_{\alpha,\beta,\gamma}}$ are the values of electric negativity
of carbon atoms in the positions $\alpha-$, $\beta-$, and γ to the respective C-atom. The
authors proceed from the assumption made by G. V. Bykov that the fraction of the
electron cloud sent into the bond by the corresponding atom is proportional to the

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Approximative Method of Calculating the ΔH^0_{form} of
Alkanes and Their Radicals

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S/153/60/003/01/005/058
B011/B005

electronegativity of another atom which also participates in this bond. The electron charge of the bond is computed as the sum of fractions of the electron cloud sent into the bond by the two atoms. Bykov also assumed that the energy of the bond is proportional to its electron charge. On the basis of these two assumptions and with the use of equations (1) and (2), the authors computed the empirical coefficients a and n in equation (1), further the new values of the proportionality coefficients connecting the energies of the CH- and CC-bonds with their electron charges (Δ^n_{CH} and Δ^n_{CC}), and finally the values of the atomization

heat L_C of the carbon. All these 5 values were determined by solving the system of equations for determining the formation heats of methane, ethane, 2,2-dimethyl-propane, 2,2,3,3-tetramethylbutane, and the homologous difference. By simplification, the authors obtained the formula $\Delta H^0_{form} = 49.81 - \sum_i \tau_i$ Kcal/mol (3) where τ_i

are the corrections computed for each C-atom from table 1. The value q which forms part of τ_i is computed by formula (4): $q = 5.53 \sum N_i \cdot \Delta E$ Kcal/mol (4) where N_i is the index of the C-atom neighboring the respective atom (to be determined from table 2); ΔE is the difference between the electric negativity of the corresponding C-atom and that of a C-atom in methane. Except for very high q-values, the

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Approximative Method of Calculating the ΔH^{o}_{form} of   S/153/60/0u3/01/005/058
Alkanes and Their Radicals   BO11/BOC5

same computation may be carried out with the nomograph (Fig 1) and equation (5).
I is computed by a simplified formula (6). The authors computed the ΔH^{o}_{form} of
37 hydrocarbons on the basis of this scheme (Table 3). The method suggested is com-
pared in table 5 with that described by V. M. Tatevskiy (Ref 3). It may also be
used for computations of ΔH^{o}_{form} of other classes of compounds by Bykov's method.
V. V. Voycvodskiy is mentioned in the paper. There are 1 figure, 5 tables, and
6 references, 3 of which arc Soviet.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy institut im. D. I. Mendeleyeva;
                Kafedra tekhnologii pirogennykh protsessov (Moscow Institute of
                Chemical Technology imeni D. I. Mendeleyev; Chair of Technology of
                Pyrogenic Processes)

SUBMITTED: January 22, 1959

Card 3/3

BORTSOVA, M.P.; PAVLOV, G.D. [deceased]; FILINA, R.A.; MARTIROSOV, R.A.;
    SHPICHKO, N.P.; REVEZA, M.I.

    Plant experiments in the demulsification of Ozek-Suat oil and
    the preparation of demulsifiers. Trudy GrozNII no. 15:34-41 '63.
                                                    (MIRA 17:5)

SHMIGEL', A.M.   and   M.E. ARANOVSKII

Povyshenie ispol'zovaniia oborudovaniia v mekhanicheskikh tsekhakh. (Vestn. Mash.,
1950, no.10, p.62-68)

Improvement in the use of machine-shop equipment

DLC: TN4. V4

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of
     Congress, 1953.

TSURICHENKO, M.Ye.; GUSEV, I.N.; RUMYANTSEVA, Z.P., inzhener, retsenzent;
       SHPIGEL', A.M., inzhener, redaktor; MATVEYEVA, Ye.N., tekhnicheskiy
       redaktor.

       [Routing system in production calculation and work and time planning;
       from the practice of a machine-tool construction plant] Marshrutnaia
       sistema ucheta proizvodstva i operativno-kalendarnoe planirovanie; iz
       opyta zavodov stankostroeniia. Moskva, Gos.nauchno-tekhn. izd-vo
       mashinostroitel'noi lit-ry, 1954. 111 p.   (MLRA 8:5)
           (Machine-tool industry)

SHPIGEL', A.M., inzhener.

Practical aspects of the transition of a crane-building plant from
piece to serial production methods. Vest.mash.35 no.11:66-71 N
'55.   (Cranes, derricks, etc.)   (MLRA 9:2)

SHPIGEL', A.

"Reference book for inventors and efficiency promoters." Izobr.i rats. no.2:43-44   F '59.   (MIRA 12:3)

1. Nachal'nik knostruktorskogo byuro Moskovskogo zavoda "Pod"-yemnik."
          (Inventions) (Efficiency, Industrial)

SHPIGEL', A.

New plant manufacturing equipment for automatic production
lines. NTO no.7:13 Jy '59.   (MIRA 12:11)

1. Nachal'nik konstruktorskogo byuro, Pervogo Gosudarstvennogo
podshipnikovogo zavoda imeni L.M.Kaganovicha uchenyy sekretar'
pervichnoy organizatsii nauchno-tekhnicheskogo obshchestva.
                    (Automation)

SHPIGEL', A., inzh.

No oil ignition in tempering bathes. Posh.delo 6 no.10:10 O '60.
(MIRA 13:10)
(Metal industries--Fire and fire prevention)
(Tempering)

S/118/60/000/011/012/014
A161/A133

AUTHOR: Shpigel', A.M., Engineer

TITLE: Mechanization of management work and application of computers
               for production planning

PERIODICAL: Mekhanizatsiya i avtomatizatsiya proizvodstva, no. 11, 1960,
               46-51

TEXT: The Moskovskiy instrumental'nyy zavod "Kalibr" (Moscow "Kalibr"
Instrumentation Plant) has started calendar planning of production by the
use of calculating machines. The new organization is being introduced at
the plant by the Nauchno-issledovatel'skaya laboratoriya ekonomiki i organi-
zatsii proizvodstva Moskovskogo inzhenerno-ekonomicheskogo instituta im.
S.Ordzhonikidze (MIEI) (Scientific Research Laboratory for Production Econo-
mics and Organization of the Moscow Institute of Engineering Economics im.
S.Ordzhonikidze). The plant's computing station has four sets of 80-column
punchers, two card sorters, multiplying punchers and other completing ma-
chinery. Punchers can process numerical data only, and this means that all
in-documents have to be coded and all outgoing decoded. Great waste of time

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Mechanization of management work ...

S/118/60/000/011/012/014
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is caused by the absence of a standard code system in the country and long
designations - the "normal" standards of industry branch institutes have
designations reaching 12-15 signs including Arabic and Roman digits and
letters. The "Kalibr" is one of the major producers of tools and instru-
ments for the mechanical engineering industry in the country, and the amount
of planning work is fairly extensive. For instance, on 15 March 1960 there
were over 3,000 orders for a total of over 100,000 items of different types
and sizes of gages. Plans are being prepared for a year, for separate quar-
ters, and also for shorter periods and for separate production sections. At
uneven work load over the months the Planovo-dispetcherskiy otdel (PDO)
(Planning-Dispatcher Department) introduces changes. Calculations include
also labor requirements and wages. After experiments, the Research Labora-
tory has started to set up a plan of distribution of parts and operations
to work places and coordination of time tables throughout the entire produc-
tion cycle. The work requires many times sorting and tabulation. Such a
plan has been tried in a series-production section at the instrument shop
No.1. It took 8-9 work shifts to set up a plan for 250-300 items (parts),
corresponding to 1500-2000 operations which is too long. Measures are con-

Card 2/3

Mechanization of management work ...

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sidered to cut the time and improve the planning techniques. The conclu-
sion is made that an electronic digital computer is necessary. It is men-
tioned that calculations of the production program for the 1st quarter of
1960 for six mechanical assembly shops of the "Kalibr" revealed incomplete
utilization of equipment and a possible 10-25% output increase from same
production areas with release of a part of equipment at the same time. The
remaining equipment would then be loaded not to 40-75% but to 50-95%. The
article includes samples of calculation tables. There are 7 tables.

Card 3/3

VENGLINSKIY, V.V.; DENISENKO, K.V.; SOTSKOV, A.A.; SHPIGEL', A.M.;
    GORDON, Kh.I., inzh., retsenzent; SHAKHNAZAROV, M.M.,
    retsenzent; DAYON, A.Ye., inzh., red.; PETUKHOVA, G.N., red.
    izd-va; TIKHANOV, A.Ya., tekhn. red.

[Establishing technical norms in the instrument industry]
Tekhnicheskoe normirovanie truda v priborostroenii; spra-
vochnoe posobie. Moskva, Mashgiz, 1962. 511 p.
                                        (MIRA 15:9)
            (Instrument industry—Production standards)

SHPIGEL', A.N.

Clinical aspects of calculi of a diverticulum of the male urethra.
Urologiia 21 no.4:59-60 O-D '56.   (MIRA 10:2)

1. Iz khirurgicheskogo otdeleniya Opochetskoy rayonnoy bol'nitsy
(glavnyy vrach - zasluzhennyy vrach RSFSR S. Ya. Gen).
        (URETHRA--SURGERY) (CALCULI, URINARY)

SHPIGEL', A.N.

Indications for and complications and technique in kidney
biopsy. Sov. med. 28 no.10:96-101 O '65.   (MIRA 18:11)

1. Propedevticheskaya terapevticheskaya klinika I Leningradskogo
meditsinskogo instituta imeni Pavlova, laboratoriya klinicheskoy
i eksperimental'noy gematologii Instituta fiziologii imeni Pavlova
AN SSSR (zav. klinikoy i laboratoriyey- prof. A.Ya. Yaroshevskiy)
i nefrologicheskoye otdeleniye (zav.- kand. med. nauk Ye.A. Ar'yeva)
Bol'nitsy imeni Uritskogo (glavnyy vrach I.G. Savel'yev), Leningrad.

L 41018-65   EED-2/EWT(d)/T/EWP(1)   Pg-4/Pj-4/Pk-4/Pq-4   IJP(c)   GG/BB
ACCESSION NR: AP5008563
S/0286/65/000/006/0074/0074

AUTHORS: Kogut, A. I.; Shpigel', A. R.

TITLE: A device for determining the sign of the difference of two numbers. Class 42, No. 169292

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 6, 1965, 74

TOPIC TAGS: binary code

ABSTRACT: This Author Certificate presents a device for determining the sign of the difference of two numbers in the binary number system. The device includes an inhibit circuit for realization of the logic functions $a_i\bar{b_i}$ and $\bar{a_i}b_i$, where a_i and b_i are the orders of the input numbers (see Fig. 1 on the Enclosure). To simplify that part of the device which is used for determining the higher of the noncoincident orders, the outputs of the inhibit circuits are connected with the potential inputs of the diode-capacitor coincidence circuits. The pulsed inputs of the coincidence circuits are connected through the output of the interrogation signal. The output diodes are grouped in two groups, one of which corresponds to the case $a_i > b_i$, and the second to the case $a_i < b_i$. The output diodes are connected with

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L 41018-65
ACCESSION NR: AP5008563

the corresponding inputs of the sign trigger apparatus, whereupon the time
constants of the diode-capacitor gates are proportional to the number of the order
being compared. Orig. art. has: 1 figure.

ASSOCIATION: none

SUBMITTED: 15Feb64   ENCL: 01

NO REF SOV: 000   OTHER: 000   SUB CODE: DP, MA

Card 2/3

AUTHOR: Shpigel', A.Yu., Engineer   118-58-6-12/21

TITLE: A High-Speed Grab Carriage (Bystrokhodnaya greyfernaya telezhka)

PERIODICAL: Mekhanizatsiya trudoyëmkikh i tyazhëlykh rabot, 1958, Nr 6,
               pp 29-30 (USSR)

ABSTRACT: In 1957, the Moskovskiy zavod "Pod"yëmnik" (Moscow "Pod"yëmnik"
               Plant) turned out two types of high-speed grab carriages (hoist-
               ing capacity - 10 tons) of 2,500 mm and 3,300 mm gauges. The
               main parts of the carriage are: 1) the welded frame with the
               conveying mechanism; 2) the grab winch; 3) the electric control
               apparatus; 4) the operator's cabin; 5) the grab (volume - 5 cu m);
               6) the brush. The weight of the carriage is 22.3 tons (2,500 mm
               gauge) and 23.9 (3,300 mm gauge). The electric motor of the
               grab winch is of the type MT-62-10 (36 kw), and for the convey-
               ing mechanism of the type MT-51-8 (17.5 kw) and MT-52-8. The
               lifting speed is 40 m/min, the moving speed - 166 m/min, and
               the lifting height - 20 m. The use of these high-speed grab
               carriages saves the labor of 300 workers. There is 1 diagram.

               1. Overhead cranes--Characteristics

Card 1/1

SHPIGEL', A.Yu.

"Mechanization and automation in the machinery industry." Mashinostroitel'
no. 4:45 Ap '61.
(MIRA 14:4)
(Automation) (Machinery industry—Technological innovations)

SHPIGEL', A.Yu.

Special clutch coupling for cranes. Mashinostroitel' no.12:20
D '61.   (MIRA 14:12)
                (Clutches(Machinery))

SHPIGEL' I.S.

534.317.42 **2867**
Instrument for Relative Measurements of Constant Magnetic Fields.
I. S. Shpigel', M. D. Raizer & E. A. Myae.
(*Radiotekhnika i Elektronika*, Dec. 1956, Vol. 1,
No. 12, pp. 1515–1519.) The instrument,
which utilizes the magnetic resonance
absorption phenomenon, is designed for
relative measurements of weakly inhomo-
geneous magnetic fields. The maximum
measurable difference in the magnetic field
is $\Delta H_{max} = \pm 5\%$, where H is the field
strength. The error in ΔH is ± 3–4%.
Measurements were made of the injection-
field distribution ($H_0 = 150$ oersted) of the
new 10-kMev synchrophasotron of the
Academy of Sciences.

109-2-1-14/17

AUTHOR: Shpigel', L. S., Rayzer, M. D., and Myae, E. A.

TITLE: An Instrument for Relative Measurements of Alternating Magnetic Fields
(Pribor dlya otnositel'nykh izmereniy peremennykh magnitnykh poley)

PERIODICAL: Radiotekhnika i Elektronika, 1957, Vol 2, Nr 1, pp 111-119 (USSR)

ABSTRACT: A description of an instrument for relative measurements of time-
alternating slightly non-uniform magnetic fields, based on the phenomenon of
nuclear magnetic-resonance absorption, is presented. The instrument
measures full field distribution, including the residual magnetic field. The
maximum measurable difference of fields in two points $\Delta H_{max} = 3\%H_0$. Error
$\pm 3\% H_{max}$. Measurements are made at $H_0 \approx 160$ oersteds.
Particle accelerators and other engineering devices often require relative
measurements of time-alternating magnetic fields. The methods used so far
(ballistic, electron integrator, etc.) have one common shortcoming, viz., only
the alternating-field difference is measured and the residual field or a super-
imposed magnetization field is not included. The new instrument described in
the article is free from this shortcoming. The instrument has been developed
for measuring the injection field distribution of a 10-bev proton-synchrotron

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109-2-1-14/17

An Instrument for Relative Measurements of Alternating Magnetic Fields

magnet, AS USSR. As a block diagram, figure 2, shows the instrument con-sists of a high-frequency oscillator, two identical amplification and signal-forming channels, an integrating circuit, a power supply, and auxiliary units. As the field reaches a certain value, depending on the pre-set oscillator fre-quency, a signal of nuclear magnetic-resonance absorption appears. The sig-nal is selected by a pulse-height detector, amplified and shaped. The passband of the pre-amplifier is 1.5 - 6 kc. Signal-to-noise ratio at the pre-amplifier output is about 40. For accurate indication of the time moment when the field reaches a predetermined value, the signal is differentiated and amplified by a wideband amplifier. The upper limit of the passband is 100 kc. An additional time-selection circuit helps to suppress the effects of interference from other electronic equipment in the room. The voltage front induced in a velocity pick-up during the field change in the magnetic gap starts a phantastron delay circuit which, in 20-60 m/sec, triggers a univibrator which generates the gate pulse. The pulses from both trigger circuits (each about 1 μsec) are mixed and fed to a flip-flop circuit. A negative square pulse appears at the output of the latter circuit, its duration being equal to the time between the two field pulses. The

Card 2/4

An Instrument for Relative Measurements of Alternating Magnetic Fields

square pulse opens a tube integrator whose output is indicated by an indicating instrument. One field pickup and the velocity pickup are stationary; the second field pickup can be moved in the magnet gap. The field value sensed by the second pickup may be higher or lower than that at the point of the first pickup. The field non-uniformity sign is indicated by a special circuit. Some parts data and parameters of the high-frequency oscillator, field and velocity pickups, sign circuit, and integration circuit, are presented. Calibration of the instrument is explained. The overall error of the instrument is evaluated analytically and found to be equal to $\pm$ 3% H_{max}. The error of absolute field measurements is about 0.1%. The instrument was tested with the AS USSR proton-synchrotron, and the results of the measurements were found to precisely agree with those given by the ballistic-galvanometer method when an allowance for the residual field was made for the latter. Advice is offered for quick measurement of monotonic space-changing magnetic fields by means of a number of field pickups and an electron oscillograph. The authors are grateful to Professor V. A. Petukhov for his remarks in discussing the work and to A. N. Zinevich for his

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109-2-1-14/17

An Instrument for Relative Measurements of Alternating Magnetic Fields

part in building the instrument.

There are 7 figures and 4 references, one of which is Soviet, in the article.

ASSOCIATION: Fizicheskiy institut imeni P. N. Lebedeva AN SSR (the Institute of Physics imeni P. N. Lebedev, AS USSR)

SUBMITTED: June 1, 1956

AVAILABLE: Library of Congress

      1. Magnetic fields--Measurement   2. Laboratory equipment--Performance

Card 4/4

AUTHOR: SHPIGEL,I.S., RAYZER,M.D., MYAE,E.A.   PA - 2132
TITLE: On the Dependence of the Amplitude of the First Harmonic Vibration
             of a Signal of the Magnetic Resonance Absorption Capacity of the
             Nucleus of Magnitude of Detuning. (Zavisimost' amplitudy pervoy
             garmoniki signala yadernogo magnitnogo resonanznogo pogloshche-
             niya ot velichiny rasstroyki. Russian).

PERIODICAL: Zhurnal Tekhn. Fiz., 1957, Vol 27, Nr 2, pp 351 - 354 (U.S.S.R.)
             Received: 3 / 1957   Reviewed: 4 / 1957

ABSTRACT: In the present work the relation between the order of the ampli-
             tude of the first Harmonic Vibration and the detuning (the difference
             of frequency of the generator and Lamor's precession) was de-
             termined. The investigation was carried out for the system: substance
             to be investigated - high frequency generator - i.e. on the con-
             dition, that the absorption signal be not saturated, that the
             amplitudes of the modulating field and the breadth of the ab-
             sorption line be commensurable. The obtained approximated formula
             makes it possible to draw the following conclusions: The steepness
             of the dependence of the amplitude (of the first harmonic vibration
             of the envelope of the oscillation voltage of the generator) on
             the amount of detuning is inversely proportional to the voltage
             amplitude a_o, is dependent upon the parameters of the generator
             and the appearence of the characteristics of the generator lamp,
             as well as inversely proportional to the square of the signal line
Card 1/2   width. Dependence on the volume of the substance and on the

AUTHOR: SHPIGEL,I.S., RAYZER,M.D.; MYAE,E.A.   PA - 2139
TITLE: The Sensitivity of the Generator with Self-Excitation.
               (Chustvitel'nost' generatora v rezhime samovozbuzhdeniya,
               Russian).

ABSTRACT: The sensitivity of a generator with self-excitation and back-
               coupling, caused by its parameters and the conditions for the
               reception of the signal were investigated. The equation for
               such a generator is written down, the first approximation of
               the solution is derived, and the equation for the occurring
               oscillations as well as for its amplitude a_o are written down.
               The transition process of the generator from one oscillation
               process to a new one is investigated. The latter is caused by the
               modification of the quantity $|\delta_o|$ at the expense of a sudden
               introduction of an additional decrease $\Delta\delta_o$ at the moment t=0.
               Finally, the expression for the square of the oscillation ampli-
               tude of the generator during the transition process is obtained.
               Herefrom the absolute quantity of the modification of the volt-
               age of the generator in dependence on its parameters and on
               time is obtained. The equations obtained in this manner make it
               possible to draw the following conclusions: 1.) At $\Delta\delta_o$=const.
               the absolute and relative modification of oscillation voltage

Card 1/2

AUTHORS: Rayzer, M.D., Shpigel', I. S.   53-64-4-3/11

TITLE: Plasma Investigation by Means of Micro Radiowaves
             (Issledovaniye plazmy pri pomoshchi mikroradiovoln)

PERIODICAL: Uspekhi Fizicheskikh Nauk, 1958, Vol. 64, Nr 4, pp.
             641 - 667 (USSR)

ABSTRACT: In introduction the authors give a short survey on the
             development of the investigation of gas discharges be-
             ginning with the investigations in 1930/32 when Darrow,
             Appleton, Chapman and Chields published their first works
             on the measurement of plasma conductivity in the high-
             -frequency field (refs. 1-4), up to the recently found
             application of plasma in high-frequency conditions like
             attenuators and antenna commutators (Bradley, Arams,
             ref. 7,8). This work is divided into 6 chapters; in
             each chapter a survey on the present state of the respective
             investigations is given. Chapter 1: The conductivity and
             the dielectric constant of an ionized gas. Starting from
             the investigations by Al'pert, Ginzburg, Faynberg and
Card 1/3   Morgenau (General Theory of the Interaction of Electrons

in Plasma in the Presence of a High-Frequency Field)
the electron distribution function is discussed,
the interrelations between c_2 or $c_{3/2}$ resp. and σ_i/σ_r of x_1
($x_1 \sim \omega/\gamma^2$, Morgenau, ref. 10) as well as the dependence of
ω_{crit} and λ_{crit} on the electron density. Chapter 2:
The resonator method, The method is explicitly dealt with
in theory and practice. Various plants for the determination
of the plasma parameters are given in block - diagram
representation. In chapter 3 the wave guide method is
discussed in theory and practice; a block-diagram of an apparatus
which by means of a microwave bridge makes possible the
measurement of plasma parameters is discussed in detail. In
chapter 4 the cross modulation method is dealt with explicitly
in theory and practice, and also in this case a block-diagram
of such a plant is described. Chapter 5 deals with the
determination of the coefficients of ambipolar diffusion,
recombination and electron collision frequencies. Finally
chapter 6 gives the experimental result partly compared with
the results obtained in theory. A series of diagrams show
Card 2/3   the connections of the single coefficients of pressure,

Plasma Investigation by Means of Micro Radiowaves   53-64-4-3/11

density, energy and field quantities. The most important
experimental data concerning recombination are given in
table 2. There are 26 figures, 2 tables, and 55 references,
of which 3 are Soviet and 52 English.

Card 3/3

SOV/120-59-1-46/50

AUTHOR: Shpigel', I. S.

TITLE: A Fast Electrodynamic Vacuum Valve (Bystrodeystvuyushchiy elektrodinamicheskiy vakuumnyy klapan)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 1, p 151 (USSR)

ABSTRACT: In many cases it is necessary to introduce into a vacuum chamber a certain amount of gas (ion sources, plasma studies, etc). The distribution of pressure across the front of the gas wave should in such cases be very steep. The latter condition may be satisfied if the seal which separates the pressure and vacuum regions is opened suddenly and the aperture thus introduced is sufficiently large. A valve which will do this is shown in Fig 1. The vacuum chamber A is separated from the high pressure chamber B by a light metallic disc 1. The seal is achieved by good contact between the disc and the rubber ring 2 . At the pressure of about 1 atm in B the force acting on the disc is about 12 kg when the valve has the dimensions indicated in the figure. A plane coil 3 is placed under the three edges of the disc. The coil has five turns of copper strip 3.25 x 0.75 mm². At a given moment two 6µF capacitors charged to a voltage of 4.5 kv are discharged through the coil. The currents induced in the metallic disc interact with the current in the coil and the disc quickly

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SOV/120-59-1-46/50

A Fast Electrodynamic Vacuum Valve

flies away from the rubber ring. The disc is stopped by the rubber ring 5 . The disc moves through a few millimetres and the amount of gas let through is 1-2 cm^3 at atmospheric pressure. Preliminary measurements have shown that a circular slit 2 mm high is formed in 200 μsec, the maximum velocity of the disc being 3×10^4 cm/sec. There is 1 figure.

ASSOCIATION: Fizicheskiy institut AN SSSR (Physics Institute of the Academy of Sciences of the USSR)

SUBMITTED: January 6, 1958.

Card 2/2

10(4),24(3)

SOV/56-36-2-10/63

AUTHOR: Shpigel', I. S.

TITLE: Plasma Acceleration (Uskoreniye plazmy)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,
               Vol 36, Nr 2, pp 411-415 (USSR)

ABSTRACT: Following a number of investigations carried out by other
               authors (Refs 1-5) dealing with the single acceleration of
               plasma by electromagnetic forces, the present paper describes
               experiments carried out for the purpose of accelerating plasma
               in the vacuum by means of an axially symmetric non-uniform
               pulsed magnetic field. The experimental arrangement is
               represented schematically by figure 1. It consists essentially
               of a vacuum chamber, pulse device, pre-ionization device,
               acceleration coil, and control circuit. The vacuum chamber
               consisted of two coaxial cylinders; the one (interchangeable)
               was made of organic glass or pyrex (payreks) with a diameter of
               150 mm and a length of 500 mm, the other of copper, with the
               same diameter and a length of 700 mm. Pressure amounted to
               $(2 - 4) \cdot 10^{-5}$ Hg . One end of the copper cylinder was closed by
               means of a brass flange, the other was connected with a glass
Card 1/3   cylinder the other end of which was closed by means of a flange

Plasma Acceleration

of organic glass. Figure 2 shows the latter. It has an
electrodynamic valve developed by the author (Ref 6). The
oscillatory circuit (condenser TM 2, 7-50) had a frequency of
$\approx$ 120 kilocycles at voltages of from 10 to 24 kv. The generator
(500 W) operated at 15 megacycles. The following was measured:
a) The rate of acceleration of the plasma in the direction of
the z-axis (= direction of acceleration) and in the direction
of the radius. These measurements were carried out photo-
graphically by means of photorecorder SFR-2m . The corresponding
photographic reproductions are shown. Figure 3 shows the motion
of a plasma in air in the case of an exposure of τ = 280 micro-
seconds; figure 4 shows the motion of a plasma in helium at
τ = 220, 280 and 400 microseconds. Figure 5 finally shows a
radial picture, τ = 280μsec of a plasma motion in air.
Ion energies for nitrogen and oxygen were between 80 and 190 ev,
for hydrogen 40-120 ev and for helium 120 - 280 ev
b) The rate of frontal motion and the duration of pulses in a
plasma of given density was measured by means of an r-f pulse
generator (datchik)(densities of 10^{11}-10^{13}cm^{-3}) and a wave
guide, which records plasma densities of 10^{12}cm^{-3}. Figures 6-9
show the oscillograms recorded at various voltages and τ-values

Card 2/3

Plasma Acceleration   SOV/56-36-2-10/63

(air and helium). The measured dependence of the duration of
impulse of a plasma having a density of 10^{12} cm of z is shown
by figure 11, and figure 10 shows the corresponding oscillogram
at $n \geqslant 10^{12}$. The maximum in figure 11 is z = 35 cm and

T = 150 μ sec. The author finally thanks V. I. Veksler,
M. S. Rabinovich, and L. M. Kovrizhnykh for discussions,
E. D. Andryukhina for assisting in carrying out measurements,
and Ye. A. Smirnov for assembling the device. There are
11 figures and 6 references, 3 of which are Soviet.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR
               (Physics Institute imeni P. N. Lebedev of the Academy of
               Sciences, USSR)

SUBMITTED: August 23, 1958

Card 3/3

81681

S/057/60/030/05/10/014
B012/B056

AUTHORS: Andryukhina, E. D., Grebenshchikov, S. Ye., Rabinovich, M.S.,
Rayzer, M. D., Safronov, A. Ye., Shpigel', I. S.

TITLE: Some Characteristic Features of Inductive Gas Discharges

TEXT: The present paper was read at the 4th International Conference on
ionization processes held at Upsala in 1959. The authors carried out ex-
periments for the purpose of explaining the influence exerted by some
phenomena upon the dynamics of the plasma, which are described. The
experiments were carried out in axially symmetric homogeneous and non-
homogeneous magnetic fields within a wide frequency range under various
ratios between the inductive resistance and the effective resistance of
the plasma. The following of the phenomena mentioned were investigated:
the "capture" of the magnetic field by the moving plasma, the skin effect,
and the shock waves. Fig. 1 shows the oscillogram of the complete current
in a discharge in hydrogen, and Fig. 2 shows a slow-motion picture of the

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S/057/60/030/05/10/014
B012/B056

Some Characteristic Features of Inductive Gas
Discharge.

discharge. Measurements of current distribution showed that during the
first half-period of the field variation a re-distribution of the current
according to the vacuum chamber radius takes place. In Fig. 3a the device
for investigating the discharge in an axially symmetric field, the so-
called "magnetic mirror" is shown schematically. Fig. 3b shows the
dependence of the current generated by special windings upon radius R and
distance z. From the oscillogram in Fig. 4 it may be seen that the current
in the gas during the first half-period of the field change is due only to
the effective resistance of the plasma. The current polarity reversal
shown on the oscillogram and the instantaneous current distribution in
Fig. 6a indicating the existence of a considerable return current prove
the "capture" of part of the magnetic flux by the plasma. The investiga-
tions of the skin effect and of the shock waves described showed that in
the bare investigated configuration of magnetic system and vacuum
chamber a cylindrical shock wave is formed in the breakdown in the range
of $5 \cdot 10^{-1} \div 10^{-2}$ torr. During its motion it heats the gas and partly ionizes
it. With propagation of the wave the conductivity range increases, and
the currents generated within this range may, in the case of a skin
effect, compensate the entire exterior magnetic field in the larger part

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B012/B056

Some Characteristic Features of Inductive Gas
Discharge

of the chamber. At high discharge frequencies (300-700 kc/s) a
sufficiently high conductivity of the plasma is necessary in order that a
skin layer having a thickness that is smaller than the height of the
chamber, may occur. Such a conductivity is attained after the passage of
2 to 3 shock waves through the vacuum. At frequencies of 60-100 kc/s the
thickness of the skin layer is greater than the height of the vacuum
chambers used in the present investigation and some other papers (Refs. 4
and 5), and no effects were observed in the distribution of the current
on the walls and also no screening of the outer field. Evaluations show
that in the bare described experiments a qualitative relation

$\delta \sim \omega^{-1/2}$ is observed. No more accurate data could be found. δ is the
thickness of the skin layer, ω - the frequency of the external field.
Academician V. I. Veksler is thanked for discussing the paper with the
authors. There are 13 figures and 8 references: 5 Soviet and 3 English.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR Moskva
(Institute of Physics imeni P. N. Lebedev of the AS USSR,
Moscow)

KOVRIZHNYKH, L.M.[translator]; RAYZER, M.D.[translator]; SHPIGEL',
    I.S.[translator]; RABINOVICH, M.S., red.; BURTSEV, A.K.,
    red.; POTAPENKOVA, Ye.S., tekhn. red.

[Plasma physics and magnetohydrodynamics] Fizika plazmy i mag-
nitnaia gidrodinamika; sbornik statei. Moskva, Izd-vo inostr.
lit-ry, 1961. 302 p. Translated articles.   (MIRA 15:3)
        (Plasma (Ionized gases)) (Magnetohydrodynamics)

26. 2358

AUTHORS: Andryukhina, E.D., Safronov, A.Ya., and Shpigel', I.S.

TITLE: Characteristics of a Fast Vacuum Valve

PERIODICAL: Pribory i tekhnika eksperimenta, 1961,No.1,pp.174-177

TEXT: The last of the present authors has described an
electrodynamic vacuum valve in Ref.1. This valve is illustrated
schematically in Fig.1.   In this figure the disc 2 is brought
into motion by the forces F_i due to the interaction between a
current pulse in the coil 3 and the current induced in the disc.
As soon as the disc rises, gas passes from the region 5 into the
high vacuum region 1 and the disc returns under the action of the
force F_p which is due to the pressure of the gas. In this way
an adjustable gas "pulse" can be produced. The present paper
reports a simple theory of the valve and some of its experimentally
determined characteristics. The pressure distribution on the high
vacuum side was measured with the aid of a miniature ionization
gauge, having a working volume of 0.2 cm^3.   It was found that a
directed motion of the gas can be obtained with sufficiently long
channels, the gas velocity being higher than the velocity of sound.
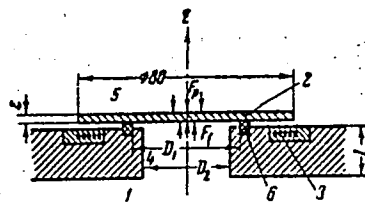Card 1/2

20711
S/120/61/000/001/053/062
Characteristics of a Fast Vacuum Valve. E032/E114
Space and time gas pressure distributions are given.
There are 9 figures and 5 references: 4 Soviet and 1 non-Soviet.
SUBMITTED: December 14, 1959

Fig. 1

Card 2/2

20666

24. 2120 (1049,1482,1502,1532)

26. 2321

S/057/61/031/001/011/017
B104/B204

AUTHORS: Moroz, Ye. M. and Shpigel', I. S.

TITLE: Calculation of the electrodynamic pushing out of a non-deform-
                ed plasma ring from a magnetic mirror trap

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 1, 1961, 78-83

TEXT: One of the methods of accelerating plasmatic formations is the
acceleration of plasma rings in magnetic mirror traps. A. I. Morozov
(Ref. 3) was the first to investigate this process theoretically; in
experimental investigations, a maximum energy transfer to the accelerated
ring presents difficulties. Detailed investigations showed that the
energy transferred to the ring depends on the ratio between the build-up
time of the magnetic field in the mirror trap and the interaction time
of the plasma ring with this field, as well as on the ratio between active
inductivity and the parasitic inductivity etc. For improving this
knowledge, the authors carried out calculations of the motion of a
perfectly conducting ring in the magnetic field of a mirror trap, which
is variable in time. Deformations of the ring radii and proximity effects

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Calculation of the electrodynamic ...   S/057/61/031/001/011/017
                                               B104/B204

were neglected. The two former assumptions increase the results, the
latter assumption diminishes them. Nonetheless, the results obtained
make it possible to estimate the dependence of the energy of the progres-
sive motion of the ring on the parameters of the experimental apparatus.
The authors studied a system of two rings, A and B; A produces the
magnetic mirror trap, and B is accelerated. If A is a metal ring, through
which an electric current flows, an opposed current is generated in the
plasma ring B. The electrodynamic repulsion thus produced moves B in the
direction of the x-axis (Fig. 1). On the basis of an idealized circuit
diagram, the coupling between the two rings is discussed, and the equation
of motion for the plasma ring

$$m\ddot{x} = - \frac{2\pi R}{c} I_2 H_r \quad (1)$$

is set up. Here, I_2 is the current in the plasma ring; H_r is the radial

component of the magnetic field generated by current I_1 in metal ring A at

the place of B; m is the mass of B. (1) is transformed into

$$\ddot{x} = - \frac{I_1^2}{2mc^2 L_2} \frac{dM^2}{dx} \quad (5); \quad I_1 \text{ is the current in A; } L_2 \text{ is the inductivity of}$$

Card 2/5

Calculation of the electrodynamic ...

20666

S/057/61/031/001/011/017
B104/B204

B; M is the interaction factor between the two rings. The time dependence of I_1 is obtained by integration of the differential equation for electric resonant circuits, and thus

$$\ddot{x} = -\frac{U^2 t^2 c^2}{2m} \frac{d}{dx} \left(\frac{1}{L}\right) \quad (8)$$

is obtained. U is the input voltage; L is the total inductivity of the system; and t is the time. For the purpose of integrating this differential equation, the authors proceed to the following reduced parameter:

$$\xi = x/2R, \quad \lambda = L_o L_1, \quad \mu = M/\sqrt{L_1 L_2}, \quad \psi = d\mu/d\xi, \quad \tau = \sqrt{Uc/2R\sqrt{mL_1}}.$$

Solution is then carried out with $L_1 = L_2$. Fig. 4 shows $(d\xi/d\tau)_{max}$, ξ_{max}, and τ_{max} as functions of λ with $\xi = 0.02$ for different conditions. It is noted that these results have been obtained on the assumption of U = const. This makes particular demands on the capacitor battery. For the capacity of this battery, the authors obtain the relation

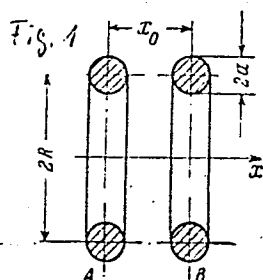Card 3/5

20666

Calculation of the electrodynamic ...   S/057/61/031/001/011/017
                                                B104/B204

$$c \gg \frac{m}{U^2} \left(\frac{dx}{dt}\right)^2_{max}$$ (19).   Finally, a numerical example is calculated.

There are 4 figures and 6 references: 5 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR Moskva
               (Institute of Physics imeni P. N. Lebedev AS USSR, Moscow)

SUBMITTED: May 24, 1960

Fig. 1
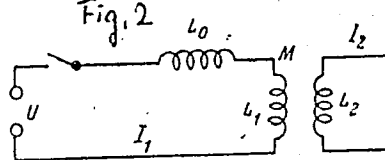
Legend to Fig. 1:   Arrangement of the conducting rings.

Card 4/5

20666

Calculation of the electrodynamic ...

Legend to Fig. 2:
Idealized scheme of the experimental
system.

Fig. 2

Legend to Fig. 4:
Dependence of $d\xi/d\tau)_{max}$,

ξ_{max}, and τ_{max} on λ for

$\xi = 0.02.$ Curves 1: $\xi_0 = 2\xi$;

Curves 2: $\xi_0 = 5\xi$; Curves 3:

$\xi_0 = 10\xi$; Curves 4: $\xi_0 = 20\xi$.

$\xi_0 = x_0/2R.$

Fig. 4
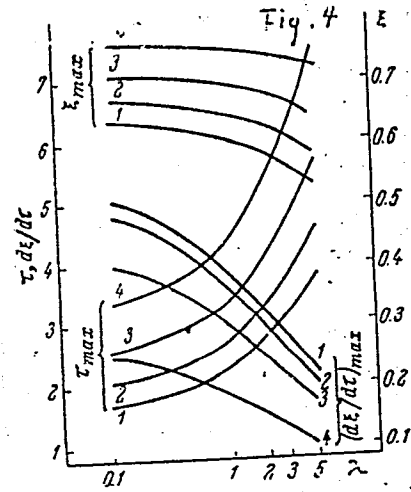
Card 5/5

ACCESSION NR: AT4025317   S/0000/63/000/000/0263/0269

AUTHORS: Batanov, G. M.; Ivanovskiy, M. A.; Fedyanin, O. I.; Shpi-gel', I. S.

TITLE: Use of a luminescent probe to record a moving plasma

SOURCE: Diagnostika plazmy* (Plasma diagnostics); sb. statey. Moscow, Gosatomizdat, 1963, 263-269

TOPIC TAGS: plasma, plasma diagnostics, luminescent probe, plasma-scope, moving plasma configuration, plasma electron image, plasma ion image, plasma configuration

ABSTRACT: The luminescent probe ("plasmoscope") method developed by L. I. Yelizarov and A. V. Zharinov and reported by them at the Nuclear Fusion Conference in Salzburg (4--9 September 1961) is used to study the transverse motion of a plasma jet in a magnetic field in the presence of translational velocity perpendicular to the sur-

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ACCESSION NR: AT4025317

face of the screen. The results are compared with data obtained by local density measurements. The characteristics of the apparatus and of the plasma are described. It is concluded that at a plasma density $\sim 10^{11}$ cm^{-3} and a translational beam velocity $\sim 10^7$ cm/sec the luminescent probe yields correct information on the plasma configuration in a longitudinal magnetic field. Reflection of the plasma from the screen surface does not distort the results, and there is no luminor persistence. The density of the measured plasma is not confined to the condition that the grid cell dimension be smaller than the Debye radius. To obtain a sharp image it is merely necessary that the pulse on the grid be of sufficient magnitude. If the screen is not illuminated by the plasma radiation, it is possible to obtain an ion image without using electron secondary emission. Orig. art. has: 6 figures.

ASSOCIATION: None

Card 2/4

GRIDNA, V.P., mlad. nauchn. sotr., starshiy bibliograf; RAYZER,
M.D., kand. fiz.-mat. nauk; KOLESNIKOV, V.N., kand. fiz.-
matem. nauk; ANTROPOV, Ye.T., ml. nauchn. sotr.; SHPIGEL',
I.S., kand. tekhn. nauk, otv. red.; KOVRIZHNYKH, L.M.,
kand. fiz.-matem. nauk, otv. red.

[Plasma physics; bibliographic index, 1955-1961] Fizika
plazmy; bibliograficheskii ukazatel', 1955-1961. Moskva,
Nauka, 1964.   354 p.   (MIRA 17:11)

1. Moscow. Fizicheskiy institut. Biblioteka.

VORONOV, G.S.; POPRYADUKHIN, A.P.; SHPIGEL', I.S.

    Gas delay line. Prib. i tekh. eksp. 9 no.3:200-203 My-Je '64
                                 (MIRA 18:1)

ACCESSION NR: AP4037614   S/0056/64/046/005/1915/1917

AUTHOR: Batanov, G. M.; Ivanovskiy, M. A.; Shpigel', I. S.

TITLE: Particle losses and configuration of plasma jet moving through a curvilinear magnetic field

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 5, 1964, 1915-1917

TOPIC TAGS: plasma, plasma in curved field, plasma in homogeneous field, plasma particle loss, plasma jet nucleus, plasma jet tongue, plasma ion distribution

ABSTRACT: Unlike in earlier investigations, the parameters of a plasma jet passing through a curvilinear magnetic field were studied further by letting the jet continue to move in a homogeneous magnetic field. The plasma jet moved from the gun first in a homogeneous field (3 kOe) for 50 cm, then through a curved field of 6 cm radius, and then again through a 120 cm homogeneous field (1 kOe). The plasma density was approximately $10^{12} cm^{-3}$ and the electron temperature 5 -- 10 eV. The measurement procedures are described briefly. The tests have shown that some 1--2 microseconds following its passage through the curved field the plasma jet acquires a "tongue" in which the plasma drifts towards the chamber walls, along with the

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ACCESSION NR: AP4037614

main "nucleus" of the plasma jet, which continues to move along the magnetic field and has a high density (dielectric constant close to 1000). This is in qualitative agreement with the dependence of the ion distribution on the magnetic field (cf. figure) and is confirmed by measurement of the electric field near the plasma jet "nucleus." Orig. art. has: 2 figures.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Physics Institute, AN SSSR)

SUBMITTED: 03Jan64   ENCL: 01

SUB CODE: ME   NR REF SOV: 002   OTHER: 094

Card 2/3

L 33165-65   EPA(w)-2/EWT(l)/EEC(t)/EPA(sp)-2/T/EWA(m)-2   Po-4/Pi-4/Pz-6/Pab-10
IJP(c)   AT

AUTHOR: Batanov, G.M.; Ivanovskiy, M.A.; Shpigel', I.S.

TITLE: Motion of a plasma jet in a toroidal magnetic field

TOPIC TAGS: plasma jet, plasma polarization, plasma stability, inhomogeneous magnetic field

ABSTRACT: The motion in a magnetic field with strongly curved lines of force of the plasma bursts from a 5 kV spark plasma gun, with molybdenum electrodes and mica insulation, was comprehensively investigated, using different techniques. The inhomogeneous magnetic field was produced in the intersection region of a 12 cm diameter, 180 cm long main tube and a 5 cm diameter, 50 cm long side tube intersecting it at right angles. Longitudinal magnetic fields were maintained in both tubes by solenoids; in most of the experiments the field was 1.2 kOe in the main tube and 3.6 kOe in the side tube. The plasma gun was mounted at one end of the side tube. The bursts from this gun were long compared with the radius of curvature of the magnetic lines of force in the intersection region, and they according-

Card 1/3

L 33165-65

ACCESSION NR: AP5005224

ly behave as jets. The cross section configuration of the plasma jet in the uniform field region was observed with a luminescent screen provided with a pulses ion accelerating grid. The ion distribution was measured with a 3 mm diameter screened probe, and the total number of ions was measured with a large screened probe. The electron temperature and electric field in the plasma were measured with a miniature double probe and the polarization of the jet was measured with a hemispherical double grid probe filling the entire cross section of the tube. The electron density near the gun was determined by the microwave cut-off method. In a uniform magnetic field of 4 kOe the electron density at 2 to 8 cm from the gun remained above 10^{12} cm^{-3} for 50 to 80 microsec, and at 18 cm from the gun, for about 13 microsec. The electron temperature was between 5 and 10 eV, the total number of ions in a burst was approximately 5×10^{14}, and the velocity of the leading edge of the jet was 2×10^{7} cm/sec. It was found that a small dense core of the jet followed the magnetic lines of force with some accuracy, but that a tongue of plasma was ejected transversely to the field from the outer portion of the jet and along its entire length. The polarization field developed only in the outer region of the jet, and in the core the initial radial electric field was maintained. The reason for this is obscure. The velocity with which plasma was ejected transversely to the

Card 2/3

L 33165-65
ACCESSION NR: AP5005224

magnetic field decreased with increasing magnetic field strength. Providing the
side tube with a conducting liner did not result in an appreciable decrease in the
polarization of the jet. This is ascribed to the small density of the ion current
flowing in the conducting wall. Orig.art.has: 8 figures.

ASSOCIATION: none

SUBMITTED: 06Apr64   ENCL: 00   SUB CODE: ME,EM

NR REF SOV: 003   OTHER: 005

Card 3/3

L 60355-65   EWT(l)/EWT(m)/EPF(n)-2/EWG(m)/EPA(w)-2/EWP(t)/EWP(b)   P##6/
Po=4/Pi=4   IJP(c)   JD/AT

ACCESSION NR: AP5018303   UR/0057/65/035/007/1242/1249
                                           533.9

AUTHOR: Andryukhina, E. D.; Shpigel', I. S.

TITLE: Investigation of a titanium plasma source

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 7, 1965, 1242-1249

TOPIC TAGS: plasma source, titanium, hydrogen plasma

ABSTRACT: The authors have investigated the operation under different condi-
tions of a titanium plasma source of the type described by F.H.Coensgen, W.F.
Cummings, and A.E.Sherman (Phys. Fluids, 2 (4), 350, 1959) in order to determine
how to improve the purity of the hydrogen plasma obtainable from it. The
source contained a 50 mm stack of 20 titanium disks 19 mm in diameter which were
outgassed and saturated with hydrogen. A 1.6 microfarad capacitor charged to
10 kV or less was discharged through the stack. The period of the discharge
circuit was 3.9 microsec. The plasma was analyzed with a time of flight mass
spectrometer provided with an electrostatic gate so that the plasma could be
sampled at different parts of the cycle, and with a large (10 cm diameter) three-
electrode probe. It was found that the hydrogen content of the plasma jet in-
creased with decreasing duration of the current pulse. The energy of the hydro-

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L-60355-65

ACCESSION NR: AP5018303

genions was considerably greater than that of the impurity ions, and the trans-
verse velocity of the hydrogen ions was an order of magnitude less than that of
the impurity ions. There results, accordingly, a self-purification of the plas-
ma as it travels from the source. There were two peaks in the energy distribu-
tion of the hydrogen ions; at 25 cm from the source the high energy group con-
tained 30% of the total number of protons produced by the source. "In conclu-
sion, the authors express their sincere gratitude to S.N.Popov, who developed
the present model of the source, and also to N.I.Alinovskiy for assistance in
performing some of the experiments and O.G.Golovanov for participating in setting
up the apparatus." Orig. art. has: 1 formula, 6 figures, and 2 tables.

ASSOCIATION: Fizicheskiy institut im. P.N.Lebedeva AN SSSR, Moscow (Physics
Institute, AN SSSR)

SUBMITTED: 08Aug64   ENCL: 00   SUB CODE: ME

NO REF SOV: 001   OTHER: 003

Card 2/2

L 25377-65   EWT(1)/EWG(k)/EPA(sp)-2/T/EEC(t)/EPA(w)-2/EWA(m)-2   Pz-6/Po-4/Pab-10/P1-4
IJP(c)   AT

ACCESSION NR: AP5004389   S/0056/65/048/001/0151/0157

AUTHOR: Rukhadze, A. A.; Shpigel', I. S.

TITLE: Stabilization of plasma flute instability by an inhomogeneous electric field

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 1, 1965, 151-157

TOPIC TAGS: plasma instability, flute instability, plasma hydrodynamics

ABSTRACT: The authors propose to stabilize flute instability of a plasma by means of an inhomogeneous electric field, and investigate the conditions for such stabilization by using two-fluid hydrodynamics of a plasma. It is shown that the flute instability can be stabilized either by the inhomogeneous field which is produced in the plasma itself by the decrease in the particle density towards the plasma boundary, in which case the inhomogeneous field is usually concentrated on the plasma surface, or by an electric inhomogeneous field produced in the plasma by artificial means. An approximate criterion is derived for the magnitude of the azimuthal component of the polarization field necessary

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L 25377-65
ACCESSION NR: AP5004389

to stabilize the flute instability. Quantitative relations are derived for an
inhomogeneous plasma with plane or cylindrical geometry. Dispersion relations
for the spectra of the flute oscillations are derived in the geometrical-optics
approximation, and local criteria for the stabilization of the flute instabili-
ties are established. Effective stabilization is shown to be possible when the
dimension of the inhomogeneity of the electric field is smaller than the char-
acteristic dimension of the plasma inhomogeneity (i.e., the transverse plasma
dimension), if the field itself is larger than or comparable with the thermal
field. The stabilization does not depend on the sign of the electric field and
is due to the fact that the field is capable of deforming the flute within a
time that is much shorter than the time necessary for the flute instability to
develop. It is stated in the conclusion that some experimentally observed
stabilizations of flute instability in various devices may be connected with the
stabilization mechanism described in the present article. "The authors thank
M. S. Rabinovich, V. P. Silin, and I. S. Danilkin for valuable advice and dis-
cussion." Orig. art. has: 17 formulas.   [02]

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR
(Physics Institute, Academy of Sciences, SSSR)

Card 2/3

L 25377-65

ACCESSION NR: AP5004889

SUBMITTED: 03Jun64   ENCL: 00   SUB CODE: ME, EM

NO REF SOV: 008   OTHER: 004   ATD PRESS: 3181

Card 3/3

3C

L 35592-65   EPA(w)-2/EWT(1)/EEC(t)/EPA(sp)-2/T/EWA(m)-2   Pi-4/Po-4/Pz-6/Pab-10
             IJP(c)   AT   S/0020/65/160/006/1293/1295
ACCESSION NR: AP5007656

AUTHORS: Batanov, G. M.; Berezhetskiy, M. S.; Grebenshchikov, S. Ye.; Zverev,
N. M.; Popryadukhin, A. P.; Rabinovich, M. S.; Sbitnikova, I.S.; Shpigel', I.S.

TITLE: Magnetic surfaces and plasma containment in the helical field of a
stellerator with external injection

SOURCE: AN SSSR. Doklady, v. 160, no. 6, 1965, 1293-1295

TOPIC TAGS: stellerator, plasma trapping, plasma injection, magnetic field,
helical magnetic field, resonance excitation, controlled fusion

ABSTRACT: Magnetic surfaces and external injection techniques in a 10 000-oersted
longitudinal field stellerator (1200 mm large diameter and 100 mm small diameter)
are discussed briefly. The parameter ε, equal to the ratio fundamental harmonic
of field over longitudinal field, varies within the limits of 0.71-0.33, and the
helical winding is at 45°. To verify the existence of magnetic surfaces, a
pulsed electron gun is used as well as a 3 x 3 mm^2 probe. The results show an
unperturbed magnetic surface at ε = 0.40, a resonance excitation of the second
kind at ε = 0.37 with an external undisturbed surface, and an internal undisturbed

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L 35592-65   0

ACCESSION NR: AP5007656

surface with a resonance of the third kind at $\varepsilon = 0.39$. The external injection was accomplished by means of four plasma spark injectors operating simultaneously for 0.4μ sec. Oscillograph studies indicate that the time for attaining a steady state distribution in density across the chamber corresponds to R/v_T, where R is the large chamber radius and v_T is the ionic thermal velocity. Comparing density distributions in the helical field to those of a toroidal field, the distinct influence of the former on the density distribution becomes obvious. Orig. art. has: 2 figures.

ASSOCIATION: none   SUB CODE: OP

SUBMITTED: 09Jul64   ENCL: 00

NO REF SOV: 004   OTHER: 002

Card 2/2

L 33387-66   EWT(1)/ETC/T   IJP(c) AT

ACC NR: AP6015310   (A, N)   SOURCE CODE: UR/0057/66/036/005/0881/0891

AUTHOR: Kossyy, I.A.; Shpigel', I.S.; Dorofeyev, Ye.V.

ORG: Physics Institute im. P.N.Lebedev, Moscow (Fizicheskiy Institut)

TITLE: Investigation of a conical induction plasma source

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 5, 1966, 881-891

TOPIC TAGS: plasma gun, plasma source, plasma jet

ABSTRACT: A two-stage electrodeless conical plasma gun was investigated in an effort
to achieve a more efficient induction plasma source and to learn something about the
operating mechanism of conical plasma guns. A diagram of the apparatus is shown in the
figure. The capacity of C_2 and C_3 was 0.6 and 2.8 μF, respectively, and both capaci-
tors were charged to a maximum potential of 22 kV. The auxiliary cone was 7 cm long
with base diameters of 2.4 and 4 cm; the main cone was 20 cm long with base diameters
of 4.7 and 11.4 cm. The distribution of both the longitudinal and radial components
of the magnetic field in the main cone was measured with a ≤ 2 mm diameter magnetic
probe, and the distribution of neutral gas on the axis of the system was determined
with an ionization manometer. The properties of the plasmas were determined with a
double electrostatic probe. The plasma source operated most efficiently when dis-
charge through the main cone was delayed until plasma from the auxiliary cone had

Card 1/3   UDC: 533.9.07
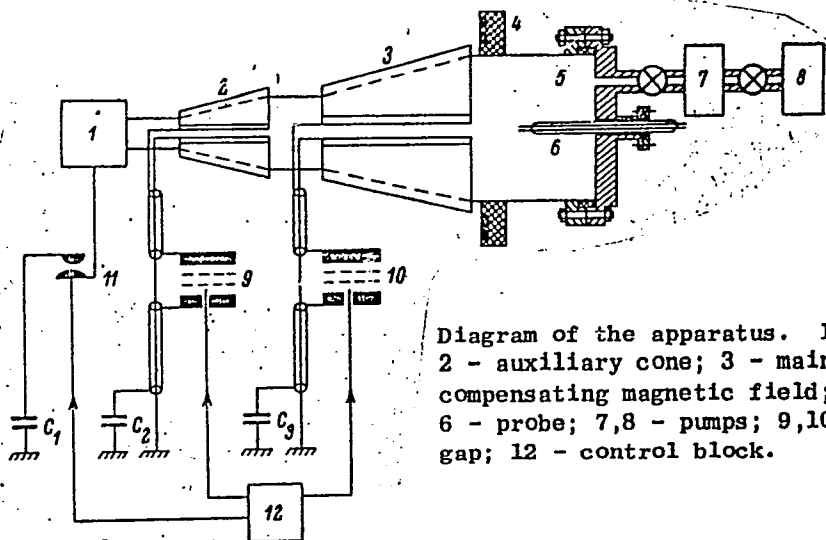
L 33387-66

ACC NR: AP6015310

Diagram of the apparatus. 1 - quick-acting valve;
2 - auxiliary cone; 3 - main cone; 4 - winding for
compensating magnetic field; 5 - vacuum chamber;
6 - probe; 7,8 - pumps; 9,10 - vacuum gaps; 11 -
gap; 12 - control block.

reached it. Under these conditions a current sheet was formed in the main cone
0.28 microsec after initiation of the discharge (the period of the oscillating dis-
charge was approximately 2 microsec), whereas in single-stage operation the current
sheet was not formed until the third half-period. The charged particle density in

Card 2/3

L 33387-66

ACC NR: AP6015310

the plasma at the mouth of the gun was 3×10^{14} cm^{-3} and the electron temperature was 13 eV; the conductivity of the plasma in the main cone was of the order of 10^{14} cgs units. The plasma left the gun as a jet with a velocity of the order of 10^6 cm/sec, preceded by a leader in which the velocity exceeded 10^7 cm/sec. The charged particle density in the plasma produced by optimum two-stage operation was an order of magnitude greater than that in the plasma produced by single-stage operation with the same discharge energy. It is concluded that preliminary ionization considerably improves the operation of conical induction plasma guns. The processes taking place during operation of the gun are discussed briefly. Magnetic flux was entrained by the currents induced in the plasma, and during the second half-period the magnetic field on the axis of the gun was directed oppositely to the external field. Orig. art. has: 7 formulas, 9 figures, and 1 table.

SUB CODE: 20/   SUBM DATE: 13Mar65/   ORIG REF: 008/   OTH REF: 012

Card 3/3

L 04610-67

ACC NR: AP6033416

reduces admixtures. The effect of the magnetic field is explained by the reduction of the diffusion of the plasma in the instrument's channel and, consequently, the reduction of gas generation on the titanium surface. Orig. art. has: 3 figures.

SUB CODE: 20/ SUBM DATE: 29Nov65/ ORIG REF: 002/ OTH REF: 001/ ATD PRESS: 5100

Card   2/2

L 10407-67   EWT(l)   IJP(c)   AT

ACC NR: AT6033031   SOURCE CODE: UR/2504/6../132/000/0007/0019

AUTHOR: Batanov, G. M.; Grebenshchikov, S. Ye.; Ivanovskiy, M. A.; Sbitnikova, I. S.;
Fedyanin, O. I.; Shpigel', I. S.

ORG: none

TITLE: Injection of a plasma into a closed magnetic trap with a two phase helical
field

SOURCE: AN SSSR. Fizicheskiy institut. Trudy, v. 32, 1966. Fizika plazmy (Plasma
physics), 7-19

TOPIC TAGS: plasma injection, magnetic trap, helical magnetic field

ABSTRACT: A plasma injected into a closed magnetic trap must have the following
properties: 1) it must be sufficiently homogeneous in composition (hydrogen or
deuterium), it must contain a minimum number of impurities, and the percent ionization
must be close to 100; 2) its temperature must be high enough to exclude loses due to
normal diffusion in the magnetic field; 3) it must have a high conductivity to
eliminate polarization due to the toroidal effect; 4) the plasma, filling the toroidal
trap, must not contain marked longitudinal electric fields. The article presents the
results of an investigation of several methods of injection. The experiments were
carried out in laboratory scale models. The first method tested was injection of the

Card 1/2

L 10401-67

ACC NR: AT6033031

plasma into a "programmed" magnetic field; this method is based on the irreversible change in the configuration of the magnetic field into a determined region of a closed field. The behavior of a plasma was studied under rapid compression by an external azimuthal magnetic field. The method proposed in the article involves injection of the plasma along the tube of the lines of force of a magnetic field extracted from the volume of the trap. Particular attention is paid to the problem of the movement of a sufficiently dense plasma ($n = 10^{12}-10^{13}$ cm^{-1}) in a curvilinear magnetic channel. The article concludes with a consideration of the collision of plasma flows in the transverse magnetic field of the trap. "In conclusion the authors consider it their duty to thank M. S. Rabinovich for his continuing interest in the progress of the work and for his helpful discussions of the experimental results and of the selection of the basic directions of the investigation. They also thank all their coworkers who took part in setting up the physical equipment and in carrying out the experiments: Ye. P. Aleksandrov, M. S. Berezhetskiy, N. M. Zverev, Iu. G. Krutikov, N. V. Perov, as well as all the workers of the workshop headed by V. P. Solov'yev." Orig. art. has: 13 figures.

SUB CODE: 20/ SUBM DATE: none/ ORIG REF: 015/ OTH REF: 007

Card 2/2

L 10406-67   EWT(1)   IJP(c)   AT

ACC NR: AT6033032   SOURCE CODE: UR/2504/66/032/000/0020/0028

AUTHOR: Berezhetskiy, M. S.; Grebenshchikov, S. Ye.; Zverev, N. M.; Shpigel', I. S.

ORG: none

TITLE: Toroidal magnetic trap of the stellarator type with external injection of the plasma

SOURCE: AN SSSR. Fizicheskiy institut. Trudy, v. 32, 1966. Fizika plazmy (Plasma physics), 20-28

TOPIC TAGS: magnetic trap, plasma injection

ABSTRACT: The vacuum chamber of the magnetic trap under consideration was in the form of a torus with a diameter of 120 cm and a cross section diameter of 10 cm. A magnetic field of the stellarator type (without taking the toroidal character into account) has the following form:

$$\Phi = H_0 z + \frac{1}{\alpha} \sum_{k=0}^{\infty} H_p I_p (p\alpha r) \sin p (\varphi - \alpha z), \qquad (1)$$

$$p = n (2k + 1),$$

Card 1/2

L 10404-67   EWT(1)/EWT(m)/EWP(v)/EWP(k)/EWP(t)/ETI   IJP(c)   JD/HM/AT

ACC NR: AT6033034   SOURCE CODE: UR/2504/66/032/000/0039/0045
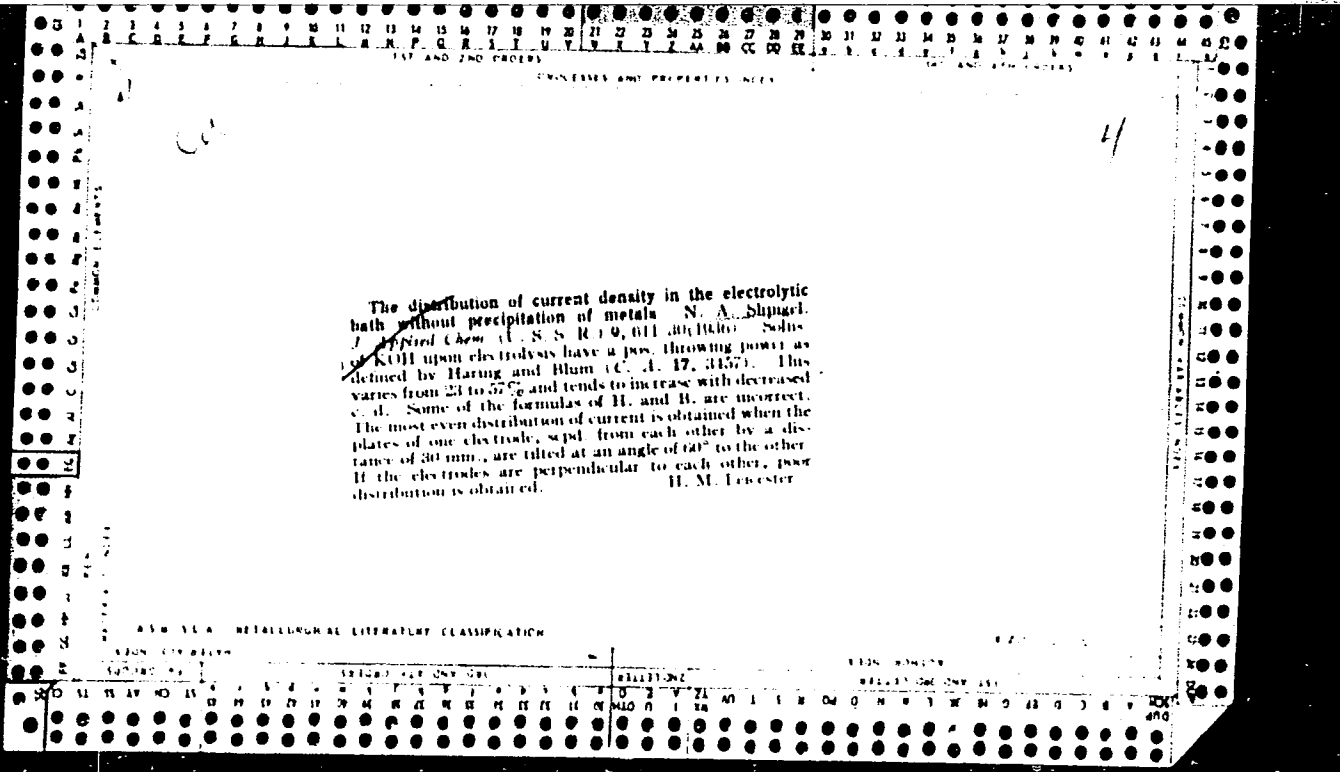   52

AUTHOR: Andryukhina, E. D.; Shpigel', I. S.

ORG: none

TITLE: Investigation of a titanium plasma source. 2. Mass composition, energy spectrum, and purification of the plasma

SOURCE: AN SSSR. Fizicheskiy institut. Trudy, v. 32, 1966. Fizika plazmy (Plasma physics), 39-45

TOPIC TAGS: plasma source, titanium, plasma jet, plasma structure

ABSTRACT: The article is a continuation of a previous article which demonstrated that, for the titanium plasma source in question, the parameters of a plasma generated by a titanium source (density, total number of particles, distribution of particles with respect to energy) depend essentially on the electrical operating conditions of the source. The present article gives data on the mass composition of the plasma, the dynamics of the occurance of impurities, and the structure of the plasma jet. The investigation was done using a mass spectrometer. The plasma source operated under aperiodic or oscillating discharge conditions. In the first case, a damping resistance of corresponding magnitude was introduced into the discharge circuit. The capacitance feeding the source was 1.65 microfarads. The wave impedance of the discharge circuit

Card 1/2

The distribution of current density in the electrolytic bath without precipitation of metals. N. A. Shpigel. *J. Applied Chem.* (U.S.S.R.) 9, 611 (1936). Solns. of KOH upon electrolysis have a pos. throwing power as defined by Haring and Blum (C. A. 17, 3457). This varies from 23 to 57% and tends to increase with decreased c. d. Some of the formulas of H. and B. are incorrect. The most even distribution of current is obtained when the plates of one electrode, sepd. from each other by a distance of 30 mm., are tilted at an angle of 60° to the other. If the electrodes are perpendicular to each other, poor distribution is obtained.   H. M. Leicester

SHATOV, M. L.

"The Diffusion of Current in Solution," Zhur. Obshch. Khim. 10 No. 23-24, 1940.
State Institute of Nitrogen, Moscow, Received 9 June 1940

Report N-110, 3 Jan. 1952.

Shpigel, N. A.

Electrolytic apparatus for treating lead flotation concentrates. N. A. Shpigel. USSR

PHASE I BOOK EXPLOITATION   SOV/2216

5(4)

Soveshchaniye po elektrokhimii. 4th, Moscow, 1956.

Trudy...; [sbornik] (Transactions of the Fourth Conference on Elect-
rochemistry; Collection of Articles) Moscow, Izd-vo AN SSSR,
1959. 868 p. Errata slip inserted. 2,500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Otdeleniye khimicheskikh
nauk.

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PURPOSE: This book is intended for chemical and electrical engi-
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various aspects of electrochemistry.

COVERAGE: The book contains 127 of the 138 reports presented at
the Fourth Conference on Electrochemistry sponsored by the Depart-
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branches of electrochemical kinetics, double layer theories and
galvanic processes in metal electrodeposition and industrial elect-
rolysis. Abridged discussions are given at the end of each divi-
sion. The majority of reports not included here have been
published in periodical literature. No personalities are mentioned.
References are given at the end of most of the articles.

Standar, V.V., G.Z. Kir'yakov, G.N. Znamenskiy, S.A. Alekseyev,
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rovsk Institute of Chemical Technology imeni P.E. Dzerzh-
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SHPIGEL'BURD, I.Ya., kand.tekhn.nauk

Elastic plastic calculation of press fits of disks.   Izv.vys.ucheb.
zav.; mashinostr. no.1:70-80 '61.   (MIRA 14:4)

1. Novosibirskiy elektrotekhnicheskiy institut.
                (Elastic plates and shells)

ALABUZHEV, P.M., prof., doktor tekhn.nauk; SHPIGEL'BURD, I.Ya., kand.tekhn.
   nauk, dotsent

   "Engineering mechanics" by S.Timoshenko and D.H. Young. Translated
   from the English. Reviewed by P.M. Alabuzhev, I.IA.Shpigel'burd.
   Vest. mash. 41 no. 5:87 My '61.   (MIRA 14:5)
                       (Mechanics, Applied)
           (Timoshenko, S.)   (Young, D.H.)

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S/200/62/000/008/001/002
D234/D308

13.9570

AUTHORS:

Alabuzhev, P. M., Shpigel'burd, I. Ya. and
Borisova, A. N.

TITLE:

Motion of a gyroscopic pendulum having no complete symmetry, placed on a fixed base, in the absence of frictional forces in the base

PERIODICAL:

Akademiya nauk SSSR. Sibirskoye otdeleniye.
Izvestiya, no. 8, 1962, 11 - 21

TEXT: The authors consider the motion of a gyroscopic pendulum having a static and dynamic unbalance with respect to the polar axis. The inertia of the Cardan suspension rings is not taken into account. Three coordinate systems (one fixed with respect to space, one fixed with respect to the pendulum and one "half-moving") are introduced. The motion of the pendulum is determined by three angles, α, β, φ. Generalized Euler equations are formulated and the following simplifications made: $\sin \alpha = \alpha$, $\sin \beta = \beta$, $\cos \alpha = \cos \beta = 1$, $\dot{\varphi}$ is large in comparison with $\dot{\alpha}$ and $\dot{\beta}$, the asymmetry of the

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