

VORONKOV, M.G.; BIRYUKOV, I.P.

Problem of the additive scheme of calculation of a mean frequency in the nuclear quadrupole resonance spectrum of organylchlorosilanes. Teoret. i eksper. khim. 1 no.1:122-124 Ja '65.

~~Nuclear~~ quadrupole resonance spectra of chlorogermanes. Ibid.:124-126
(MIRA 18:7)

1. Institut organicheskogo sinteza AN Latvyskoy SSR, Riga.

BIRYUKOV, I.P.; VORONKOV, M.G.; BABICH, E.D.; ARKHIPOVA, T.N.; VDOVIN, V.M.;
~~NAMETKIN, N.S.~~

Nuclear quadrupole resonance of 1,1-dichloro and 1-methyl-1-chloro-1-silacycloalkanes. Dokl. AN SSSR 161 no.6:1336-1338
Ap '65. (MIRA 18:5)

1. Institut organicheskogo sinteza AN LatvSSR i Institut neftekhimicheskogo sinteza im. A.V.Topchiyeva AN SSSR.
2. Chlan-korrespondent AN SSSR (for Nametkin).

BIRYUKOV, I.F.; VORONKOV, M.G.; SAFIN, I.A.

Study of the induction effect of substituents in organochlorosilanes
by the nuclear quadrupole resonance method. Teoret. i eksper.
khim. 1 no.3:373-380 My-Je '65. (MIRA 18:9)

1. Institut organicheskogo sinteza AN Latvyskoy SSR, Riga.

BIRYUKOV, I.P.; VORONKOV, M.G.; MOTSAREV, G.V.; ROZENBERG, V.R.; SAFIN, I.A.

Nuclear quadrupole resonance method of studying organosilicon compounds containing Si-Cl and C-Cl bonds. Dokl. AN SSSR 162 no.1:130-132 My '65. (MIRA 18:5)

1. Institut organicheskogo sinteza AN Latvyskoy SSR i Kazanskiy fiziko-tekhnicheskij institut AN SSSR. Submitted November 17. 1964.

BIRYUKOV, I.P.; VORONKOV, M.G.; SAFIN, I.A.

Correlation between the mean frequency of the nuclear quadrupole resonance and the induction constant of substituents in organyl-chlorosilanes. Dokl. AN SSSR 165 no.4:857-859 D '65.

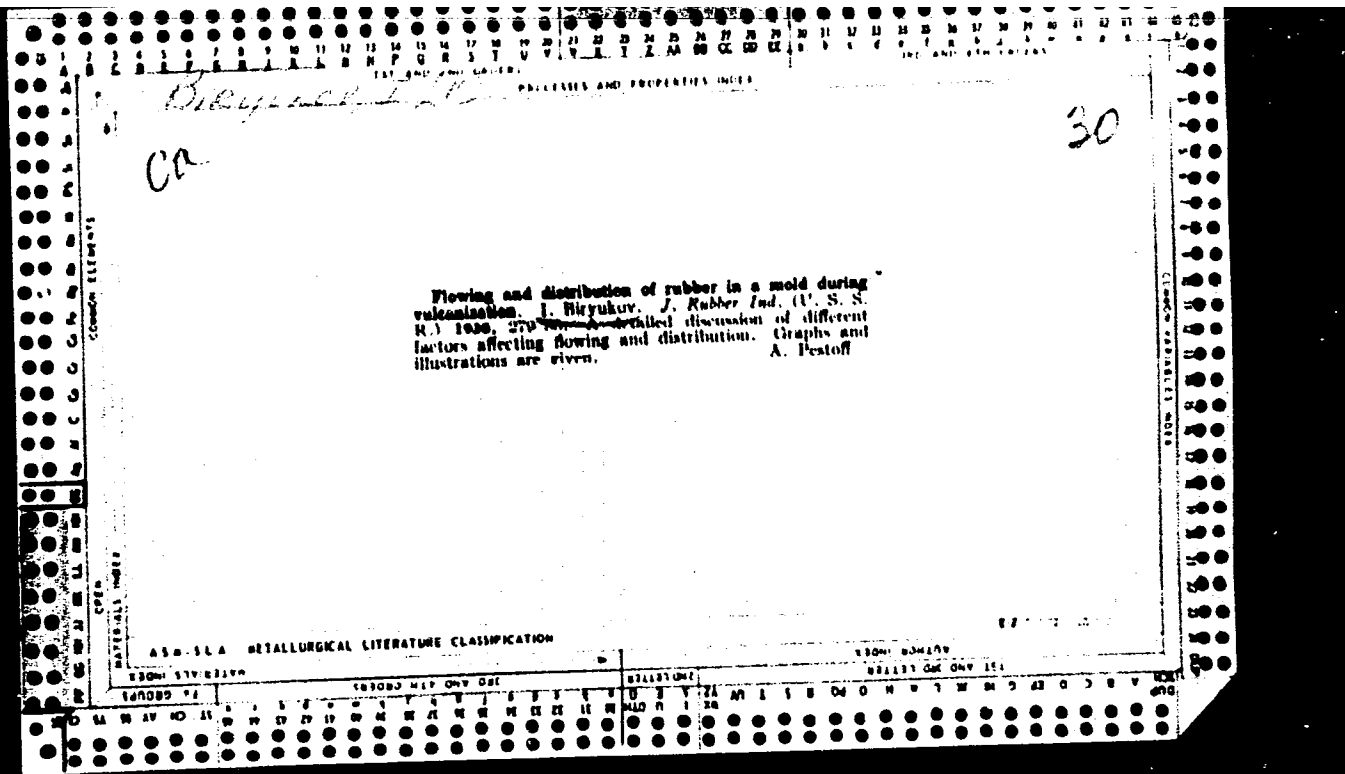
(MIRA 18:12)

1. Institut organicheskogo sinteza AN LatvSSR. Submitted April 12, 1965.

ACHARKAN, V.A.; BARS KOV, I.M.; BIRYUKOV, I.S.; BORODINA, L.Ya.; BRENNER, M.M.;
GOBELIK, B.Ye.; GUMEROV, M.N.; ZORKAYA, N.M.; IOYRYSH, A.I.;
KAYDALOVA, O.N.; KAPUSTIN, Ye.I.; LEBEDEVA, M.A.; LESHKOVSEV, V.A.;
LYSENKO, V.P.; MARKIN, A.B.; MIKHAYLOV, N.N.; NEST'YEV, I.V.; NECHAYEV,
N.V.; NIKOL'SKIY, A.V.; OSTROUKHOV, M.Ya.; PISARZHEVSKIY, O.N.;
POLUBOYARINOV, M.M.; POPOV, Yu.N.; PRASOLOV, M.A.; POKATAYEV, Yu.N.;
RIMBERG, A.N.; RYABOV, V.S.; SEMKOV, B.F.; SPERANSKAYA, Ye.A.; TAKOYEV,
K.F.; TRIFONOVA, G.K.; TROFINOVA, V.I.; SHAKHNAZAROV, G.Kh.; SHKAREN-
KOVA, G.P.; SEMERLING, K.G.; EYDEL'MAN, B.I.; MIKAE LYAN, E.A., red.;
MUKHIN, Yu.A., tekhn.red.

[U.S.S.R. as it is; a popular illustrated handbook] SSSR kak on est';
populiarnyi illiustrirovannyi spravochnik. Moskva, Gos.izd-vo polit.
lit-ry, 1959. 462 p. (MIRA 12:2)

(Russia)



1ST AND 2ND ORDERS PROCESSES AND PROPERTIES INDEX 30

QA

Coating chemical apparatus with rubber. I. V. Buyukov. *Chemtech and Rubber* (U. S. S. R.) 1940, No. 7, 39-43. —Data are given on mixes of Soyprene-Thiokol, Na-bivinyll and Thiokol-Na-bivinyll rubbers for coating chem. app., with open vulcanization in water at 100°. The effects of graphite, asbestos, Bakelite A and C and the plasticizer A. X. F. were investigated. Unvulcanized Na-bivinyll mixes had an unsatisfactory surface; the vulcanizates had poor phys.-mech. properties. Mxtd. contg. Bakelite C did not vulcanize. Soyprene mixes had an unsatisfactory shagreenlike surface, with bubbles and considerable settling. Thiokol mixes with graphite, lampblack and "white soot" (contg. 85.3% S₈ and 7.25% moisture) were porous after vulcanization. Exptl. conditions for coating various details with Soyprene-Thiokol and Na-bivinyll rubbers, with open vulcanization in water, are given. H. Z. Kamich

433-31A METALLURGICAL LITERATURE CLASSIFICATION

FROM SYNOPTIC SECTION SECTION SECTION

BIRYUKOV, I.V.

New packing materials. Mashinostroitel' no.10:26-29 0 '65.
(MIRA 18:10)

BIRYUKOV, I.V., inzh.

Improved traction drive of the MR1 electric train. Elek. i tepl.
tiaga 4 no.5:17-18 My '60. (MIRA 13:7)
(Electric railway motors)

MOLODIKOV, V.A., inzh.; BIRYUKOV, I.V., inzh.

Purpose of tests and measuring equipment. Trudy MIIT no. 121:4-8 '60.
(MIRA 14:4)
(Electric railroads)

BIRYUKOV, I.V., inzh.

Dynamics and reliability of the drive section of the ER1 electric
train. Trudy MIIT no. 121:98-121 '60. (MIRA 14:4)
(Railroad motorcars)

BIRYUKOV, I. V.

Cand Tech Sci - (diss) "Dynamics and strength of traction drive of the ER-1 electric train." Leningrad, 1961. 20 pp with diagrams; (Ministry of Railways USSR, Leningrad Order of Lenin Inst of Railroad Transport Engineers imeni Academician V. N. Obraztsov); 180 copies; price not given; (KL, 6-61 sup, 214)

BIRYUKOV, I.V., inzh.

Gyroscopic phenomena in the traction drive of the ER1 electric
train. Trudy MIIT no.135:66-77 '61. (MIRA 15:1)

(Electric locomotives)

(Clutches—Machinery)

ISAYEV, Igor' Petrovich; MOLODIKOV, Vasilii Aleksandrovich; BIRYUKOV,
Ivan Vyacheslavovich; LAZARYAN, V.A., doktor tekhn. nauk,
retsensent; PEROVA, A.A., kand. tekhn. nauk, red.;
VOROB'YEVA, L.V., tekhn. red.

[Fundamentals of programming and solving of traction and
dynamics problems of the rolling stock of electric railroads
by means of electronic computers]Osnovy programmirovaniia i
reshenie zadach tiagi i dinamiki elektropodvizhnogo sostava
na elektromykh vychislitel'nykh mashinakh. Moskva, Trans-
zheldorizdat, 1962. 185 p. (MIRA 15:10)
(Electric railroads—Management) (Electronic computers)

BIRYUKOV, I.V., inzh.; SAVCHUK, I.A., inzh.; BERLOVSKIY, G.O.

Rubberizing of apparatus and pipes with ebonite. Bum.prom.
37 no.11:28 N '62. (MIRA 15:12)

1. Trest po khimicheskoy zashchite metallov Glavmekhancmontazha
Ministerstva stroitel'stva predpriyatiy metallurgicheskoy i
khimicheskoy promyshlennosti SSSR.

(Protective coatings)

(Rubber, Synthetic)

20601

S/081/62/000/008/057/057
B158/B101

15.9300
AUTHOR:

Biryukov, I. V.

TITLE: The effect of polyethylene on the chemical stability of rubber

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 8, 1962, 604, abstract 6P380 (Vestn. tekhn. i ekon. inform. N.-i. in-t tekhn.-ekon. issled. Gos. kom-ta Sov. Min. SSSR po khimii, no. 2, 1961, 33-34)

TEXT: To increase the chemical stability of rubber coverings made of mixtures of natural rubber, СКБ (СКБ), and polyisobutylene, 110-160 parts by weight of polyethylene were introduced (per 100 parts by weight of rubber). The mixtures were pressed for 10 min at 150°C and 200 atm. with subsequent cooling to 70-80°C. The vulcanizates obtained were held for 60 hr at 55-60°C in 36% HCl and 50% H₂SO₄ parallel with similar vulcanizates without polyethylene. The mixtures with polyethylene swell 4 times less in HCl than mixtures without polyethylene. The stability of mixtures with polyethylene to 50% H₂SO₄ is lower, but to 87% H₂SO₄ is greater than for
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The effect of polyethylene ...

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B158/B101

mixtures without polyethylene. The mixtures with polyethylene do not swell in benzene, toluene or acetone after 50 days at ~20°C. The greatest stability to aggressive media is shown by mixtures containing polyisobutylene. [Abstracter's note: Complete translation.] ✓

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S/123/62/000/012/008/010
A004/A101

AUTHOR: Biryukov, I. V.

TITLE: The causes of corrosion of the P -1 (R-1) electrolyzers and protection methods

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 12, 1962, 55, abstract 12B342 ("Vestn. tekhn. i ekon. inform. N.-i. in-t tekhn.-ekon. issled. Gos. kom-ta Sov. Min. SSSR po khimii", 1961, no. 11, 35 - 38)

TEXT: The author analyzes the causes of corrosion of metallic electrolyzers with mercury cathode. He presents the results of investigations for protecting them from corrosion. It is pointed out that the bath covers get out of commission owing to the destruction of the ebonite and subsequent metal corrosion by gaseous chlorine. For repairing single sections of the bath covers, devices with chrome-plated operating surface are suggested, these devices being fitted with a winding of nichrome wire. The author presents the investigation results on the selection of more dependable materials for protecting the baths than the 1751 grade ebonite used. For the bath protection he suggests the 1752 grade ebonite which contains

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The causes of...

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crude rubber with CKE (SKB) additives. To improve the protection of the equipment of mercury electrolyzers still further it is expedient to use ebonite on the base of 100% HK (NK) and a coating consisting of a layer of chloroprene glue, ebonite and rubber from chloroprene caoutchouc. The author describes a method of fixing the chloroprene-ebonite facing with chloroprene rubber glue. There are 7 figures.

[Abstracter's note: Complete translation]

Card 2/2

TOPIC TAGS: metal corrosion, anticorrosion coating, resist⁶

L 17786-66 EWT(m)/EWP(j)/T/ETC(m)-6 WW/DJ/RM
SOURCE CODE: UR/0117/65/000/010/0028/0029

ACC NR: AP6004656

AUTHOR: Biryukov, I. V.

ORG: none

TITLE: New sealing materials

SOURCE: Mashinostroitel', no. 10, 1965, 28-29

TOPIC TAGS: hermetic seal, polytetrafluoroethylene, graphite, fluid pump, thermal stability, chemical stability, friction coefficient, sealing device, pump

ABSTRACT: The use of polytetrafluoroethylene with additions of natural (argen-
tous) graphite and oil for making pump cups is examined. The cups are pressed
in collapsible molds (see Fig. 1) at room temperature under a pressure of from
2.5 to 15 kg/cm². The cups are obtained in the form of rings of rectangular
cross section. Seals of polytetrafluoroethylene operate well in such media as
benzene, toluene with an admixture of 75% sulfuric acid, pyrobenzol, kerosene,
tetrachloroethane with an admixture of carbon black, hexachloroethane, hydrogen
chloride, trichloroethylene, ethylene chlorhydrin, chlorine with an admixture
Card 1/2

6.44.55

26
35
B

2

UDC: 62-233:678.5

BIRYUKOV, I.V., kand. tekhn. nauk; MATVEYEVICHEV, A.P., inzh.

Use of analog computers in modeling the vertical dynamics of
the motor cars of ER2 electric trains. Trudy MIIT no.207:
113-127 '65. (MIRA 19:1)

SAMSONOVA, V.G., prof.; NOVITSKIY, R.I., dotsent; ADISMAN, M.A., inzh.;
BIRYUKOV, K.A., person.pensioner soyuznogo znacheniya; LAVRENT'YEV,
S.S., kand.fiziko-matematicheskikh nauk; TOLOKONSKIY, N.I., dotsent

Immortalize the memory of S.O.Maizel. Svetotekhnika. 7 no.6:28-29
Je '61. (MIRA 14:6)

(Maizel', Sergei Osipovich)

BIRYUKOV, L. (g.Aktyubinsk)

~~Why is the building materials industry lagging. From keep.no.9:32-33~~
8 '56. (Building materials) (MIRA 9:10)

30313

S/115/61/000/010/002/005
E198/E135

1.5000

AUTHORS: Simkin, G.S., Lukin, I.V., and Biryukov, L.I.

TITLE: Radio interferometer for measuring large lengths

PERIODICAL: Izmeritel'naya tekhnika, no.10, 1961, 8-10

TEXT: The KhGIMIP has elaborated a method using a two-beam radio interferometer on centimetre waves, designed for checking large inside gauges and fixed mark measures. The interferometer is based on Froome's apparatus for measuring the velocity of light. The operational principle of the instrument is illustrated in the diagram. The generator (2) radiates energy on centimetre waves along the wave guide to A, where it is divided; one beam goes outside through a lens mounted in a conical outlet (7), the other is directed in the opposite way to a closed limb (8) containing an interference attenuator. Both beams are reflected back to A, the outer one having met a plane mirror (5) placed at a variable distance, 6 to 20 m, and mounted on a carriage (4) which moves along the rails (6) in the direction of the beam. The two beams interfere at A and the corresponding effect is observed by means of an oscilloscope, which is the essential part of a detecting

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Radio interferometer for measuring ...

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system (9) shown surrounded by a dotted line. The frequency of the generator is stabilised in part (3) containing a volume resonator of high quality and checked in the measuring system (1) consisting of a highly stable quartz generator, operation on 100 kc/s, a frequency multiplier and a counter. As the instrument operates at two different distances between the outlet lens and the mirror (the difference being the distance measured), the amplitudes of the two reflected signals must be made equal without change of phase, which is ensured by the attenuator. The measuring carriage (4) moving along the axis of displacement is equipped with three microscopes, two of which serve to maintain the mirror in the required direction and the third being used for observing the marks on fixed mark measures. The measure tested is fixed along the rails on special blocks below the carriage. For measuring interior gauges two stays and a reading device are fixed to the rails. The principle of the instrument resembles very much that of an optical interferometer; it must however be mentioned that, as the frequency stability cannot be obtained as high as in the case of the latter, the frequency should be calculated depending on the

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X

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Radio interferometer for measuring ... S/115/61/000/010/002/005
 prevailing conditions, from the formula E198/E135

$$\lambda = \frac{c}{nf} \quad (1)$$

where: c - velocity of light; λ - wavelength; f - frequency;
 n - refractive index of air. The correct value of the length
 measured, L_X , reduced to normal conditions, can be obtained from
 the formula:

$$L_X = L_N + \Delta m \frac{\lambda}{2} - A_t \Delta L_t + c_n + \delta \quad (2)$$

where: L - nominal or approximate value of the length; $\Delta m \frac{\lambda}{2}$ -
 computed fraction of the length in mm; A - readings of
 the reading device; ΔL_t - correction for the linear expansion
 of the measure; c_n - correction for the refractive index of air
 and water vapour; δ - correction for diffraction. X
 Values of the refractive indexes, corrected for temperature and
 pressure, and diffraction have been taken from tables or worked
 out according to known formulae and nomographs were prepared and
 used for quick calculation of ΔL_t , c_n and δ . A series of
 Card 3/6

Radio interferometer for measuring ...

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E198/E135

measurements have been carried out with success, although the conditions in which the work proceeded were difficult in some respects, e.g. the lack of a thermostatic installation which necessitated a number of additional precautions and supplementary calculations. However, the method proved to be reliable for the lengths up to about 30-40 m. To minimize the influence of the waves' reflection from the walls and other objects, adsorbers of wooden planks and shields were used, so placed as to disperse the incident energy as much as possible. Moreover, each measurement was made twice with a displacement equal to $\lambda/4$. The mean square error for all the results obtained amounted to $1.6 - 2.0 \times 10^{-6}$. Further improvement in the accuracy of measurement can be obtained by carrying out the process in thermostatic surroundings, improving the determination of the refractive index of water vapour and of the diffraction error, as well as further improvements in the construction of the particular parts of the radio interferometer. All these tasks are being currently worked on in the USSR. The aim is to achieve an accuracy not lower than $2 - 5 \times 10^{-7}$.

Card 4/6

YELISTRATOV, V.S.; BITYUKOV, L.P.; NASYROV, M.Sh.

Restoring the worn out parts of oil field equipment in the First
of May Oil Well Drilling Trust. Mash. i neft. obr. no.9:38-40
'64. (MIRA 07:11)

1. Trest "Pervomayburneft".

YELISTRATOV, V.S.; BIRYUKOV, L.P.

Starting gate with a remote control system with quickly replaceable wearing parts. Mash. i neft. obor. no.8:33-34 '65. (MIRA 18:9)

1. Trest "Pervomayburneft".

BIRYUKOV, L.T.
LOBANOV, N.I.; BIRYUKOV, L.T.

Determination of calcium and magnesium (absorbed bases). Pochvovedenie
no.4:94 Ap '57. (MIRA 10:7)

1. Laboratoriya otдела pochvovedeniya i Institut pochvovedeniya
Moldavskogo filiala Akademii nauk SSSR.
(Soils--Analysis) (Calcium) (Magnesium)

BIRYUKOV, L.T.; KOZYULYA, Yu.N.

Automatic machine for the welding of spades. Avtom. svar. 14 no.3:
88-94 Mr '61. (MIRA 14:2)

1. Artemovskiy mashinostroitel'nyy zavod "Pobeda truda."
(Spades) (Electric welding)

BIRYUKOV, M.D.

Death of aquatic birds due to water pollution by petroleum products
in the Emba Oilfields. Izv. AN KAZAKH. SSR. Ser. zool. no. 7:130 '48.

(MLRA 9:5)

(Emba Valley--Water birds)

BIRYUKOV, M. D.

"A New Gigantic Rhinoceros, the Pristinotherium, and Its Stratigraphic Significance." Cand Biol Sci, Inst of Zoology, Alma-Ata, 1953. (RZhGeol, Dec 54)

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

BIRYUKOV, M.D.

Entelodont (Entelodontidae) from middle Oligocene deposits in
the upper Zhilanshik Valley. Mat. po ist. fauny i flory
Kazakh. 3:11-19 '61. (MIRA 14:7)
(Dulygalyzhilanshik Valley--Ungulata, Fossil)

BIRYUKOV, N.D.

Swamp rhinoceros (Amyndontidae) from the middle Oligocene of
the Turgay Gates. Mat. po ist. fauny i flory Kazakh. 3:20-
29 '61. (MIR 14:7)

(Turgay Gates - Rhinoceros, Fossil)

BIRYUKOV, M.D.

Specific features of the skeleton of Allacerops from the Myrskaya-Sayek site. Mat. po Ist. fauny i flory Kazakh. 3:30-46 '61.

(MIRA 14:7)

(Turkey Gates—Rhinoceros, Fossil)

BIRYUKOV, M.D.

A new species of amynodont (Amynodontidae) from the Paleogene of
Kazakhstan. Mat. po 1st. fauny i flory Kazakh. 4:34-41 '63.

(Kain-Kerish, Mount— Rhinoceros, Fossil) (MIRA 16:9)

BERYUKOV, M.D.; KOSTENKO, N.N.

Concerning the "Chayly" mammalian fauna of the Zaynan Depression.
Vost. AN Kazakh. SSR 21 no.12:75-77 D '65. (MIRA 18:12)

BIRYUKOV, M.L., prof.; ZEFIROVA, N.P., kand.med.nauk

Work of the Gorkiy Pathoanatomical Society from 1954 to 1957.
Arkhn.pat. 20 no.11:87-89 '58. (MIRA 12:8)

1. Predsedatel' Gor'kovskogo obshchestva patologoanatomov (for Biryukov). 2. Sekretar' Gor'kovskogo obshchestva patologoanatomov (for Zefirova).

(PATHOANATOMICAL SOCIETIES)

BIRYUKOV, M.L.

Morphological characteristics of ependymal brain tumors and the
differential diagnosis between them and gliomas. Vop.diag.i
patomorf.nerv.zab. no.2:38-50 '59. (MIRA 15:8)
(BRAIN--TUMORS) (DIAGNOSIS, DIFFERENTIAL)

BIRYUKOV, M.L.

Genesis of rosettelike formations in the cavities and canals in
ependymal tumors. Vop.diag.i patomorf.nerv.zav. no.2:51-67 '59.
(MIRA 15:8)

(BRAIN--TUMORS)

BIRYUKOV, M.L.

Neuroepithelial cysts. Vop.diag.i patomorf.nerv.zab. no.2:68-72
'59. (MIRA 15:8)

(BRAIN--TUMORS) (CYSTS)

BIRYUKOV, M.L.

Cancer metastasis into a neurinoma of the cerebellopontile angle
following surgery. Vop.diag.i patomorf.nerv.sab. no. 2-118-125 '59.
(MIRA 15:8)

(BRAIN--CANCER)

BIRYUKOV, M.L.

Study of the cancerogenic properties of sylvan (2-methylfuran).
Trudy GIGT no.9:41-48 '62.^a (MIRA 17:9)

BIRYUKOV, M.L., prof.; ZLOTNIKOVA, Z.B., kand.med.nauk

Work of the Gorky Scientific Society of Pathologists in 1964.
Arkh. pat. 27 no.11:84-87 '65.

(MIRA 18:12)

1. Predsedatel' Gor'kovskogo nauchnogo obshchestva patologoanatomov (for Biryukov). 2. Sekretar' Gor'kovskogo nauchnogo obshchestva patologoanatomov (for Zlotnikova).

USSR / Cultivated Plants. Fruit Trees. Small Fruit ^M
Plants. Nut Trees. Tea.

Abs Jour : Ref Zhur - Biologiya, No 6, 1959, No. 25034

Author : Biryukov, M. P.; Savinykh, G. M.
Inst : State Public Library im. V. G. Belinskiy
Title : Horticulture in the Urals. Index of
Literature

Orig Pub : Gos. publichn. b-ka im. V. G. Belinskogo,
Sverdlovsk, 1957 (1958), 147 pp., 3 drawings

Abstract : No abstract given

Card 1/1

1. 10. 82. 11. 13.
BLOKH, I.G.; BIRYUKOV, M.S.; IVANOV, Ye.Ya.

Winning peat in stumpy bogs. Torf.prom. 32 no.3:11-13 '55.
(MIRA 8:6)

1. Moskovskiy torfyancy institut.
(Peat industry)

BIRYUKOV, M.V.

Digital pressure on the abdominal aorta as a method for controlling hypotonic hemorrhage. Akush.i gin. no.6:49-54 '61. (MIRA 14:12)

1. Iz kafedry akusherstva i ginekologii (zav. - prof. M.A. Romanov) Astrakhanskogo meditsinskogo instituta.
(ABDOMINAL AORTA) (HEMORRHAGE, UTERINE)

BIENHOI, M.

The glorious military traditions must be carefully preserved and enhanced. No 9.

Tankist. No 12, 1948.

CHIZHEVSKIY, V., inzh.-polkovnik; BIRYUKOV, N., inzh.-podpolkovnik; GALINSKIY,
V., inzh.

Determining the exact site of a hit. Voen.vest. 39 no.4:82-87 Ap
'60. (MIRA 14:2)

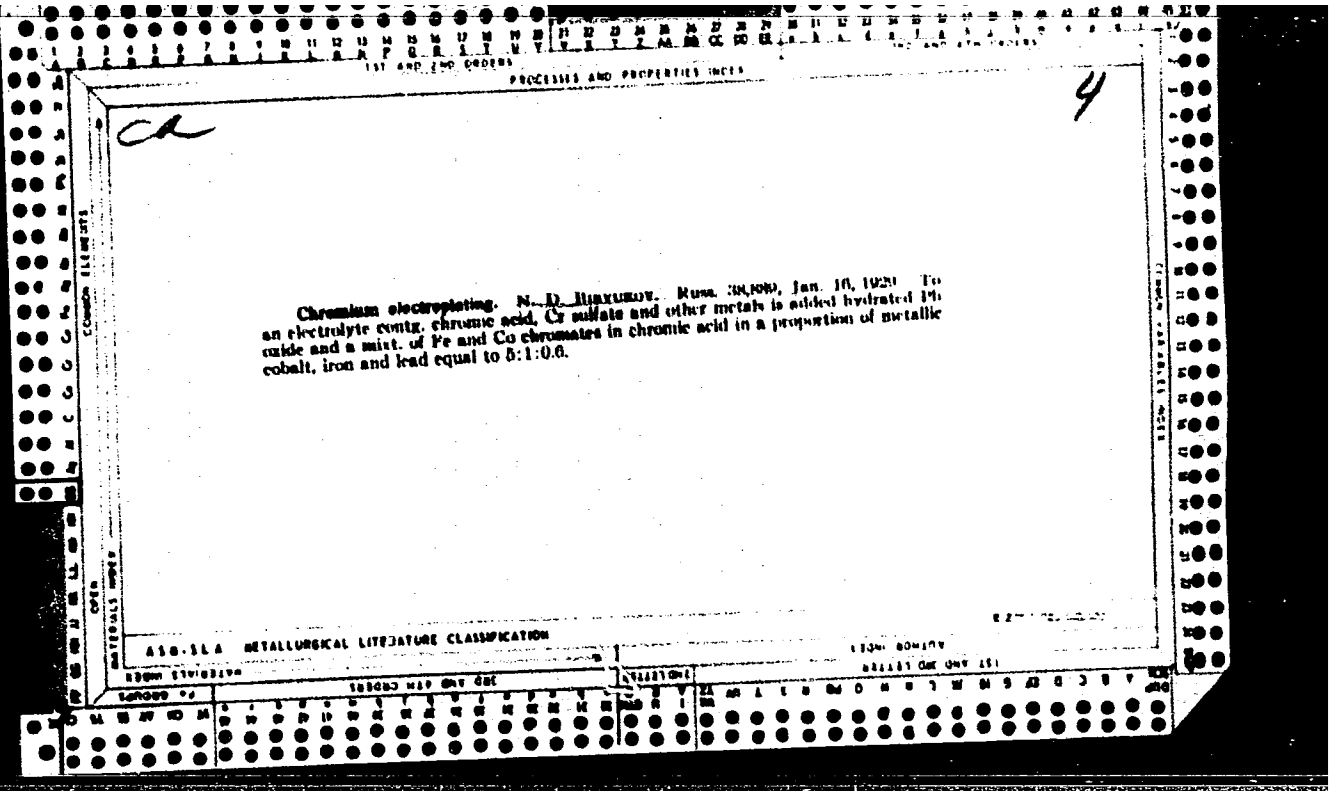
(Targets (Military science))

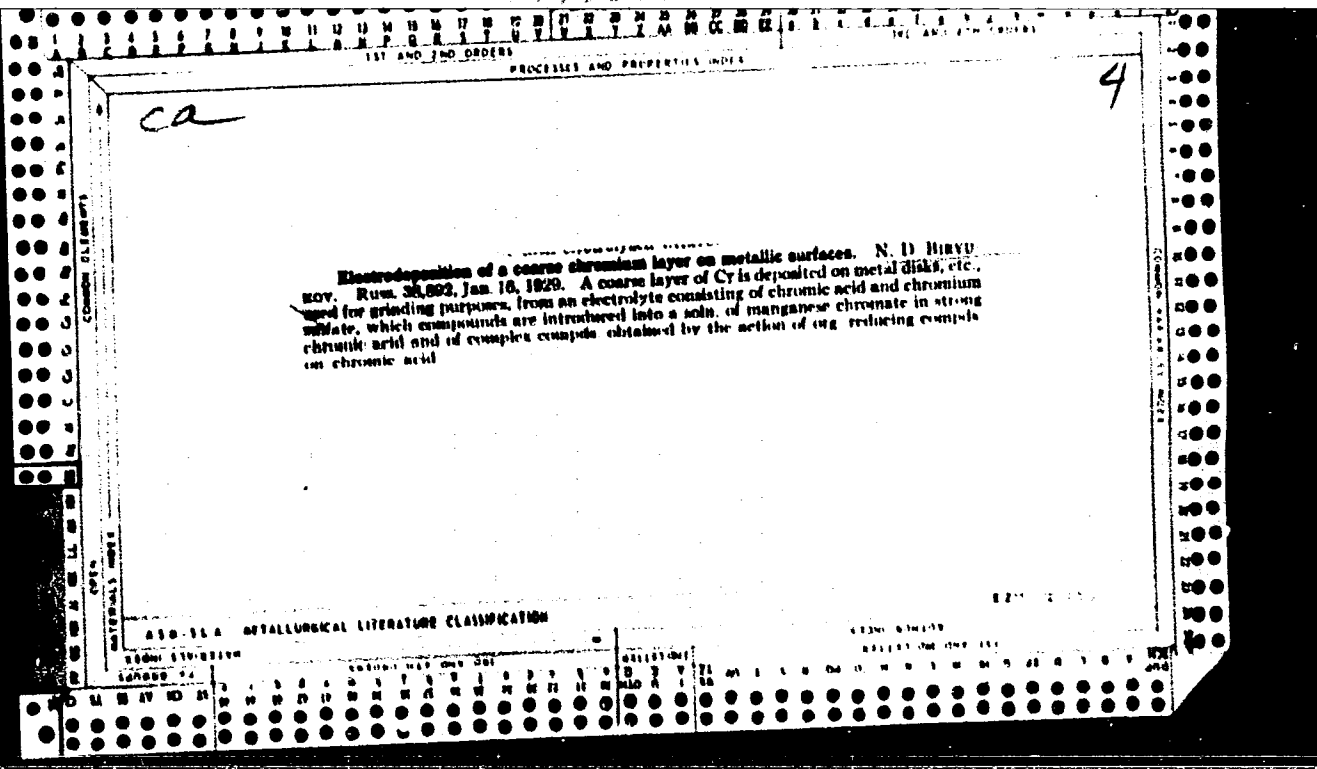
BIRYUKOV, N.

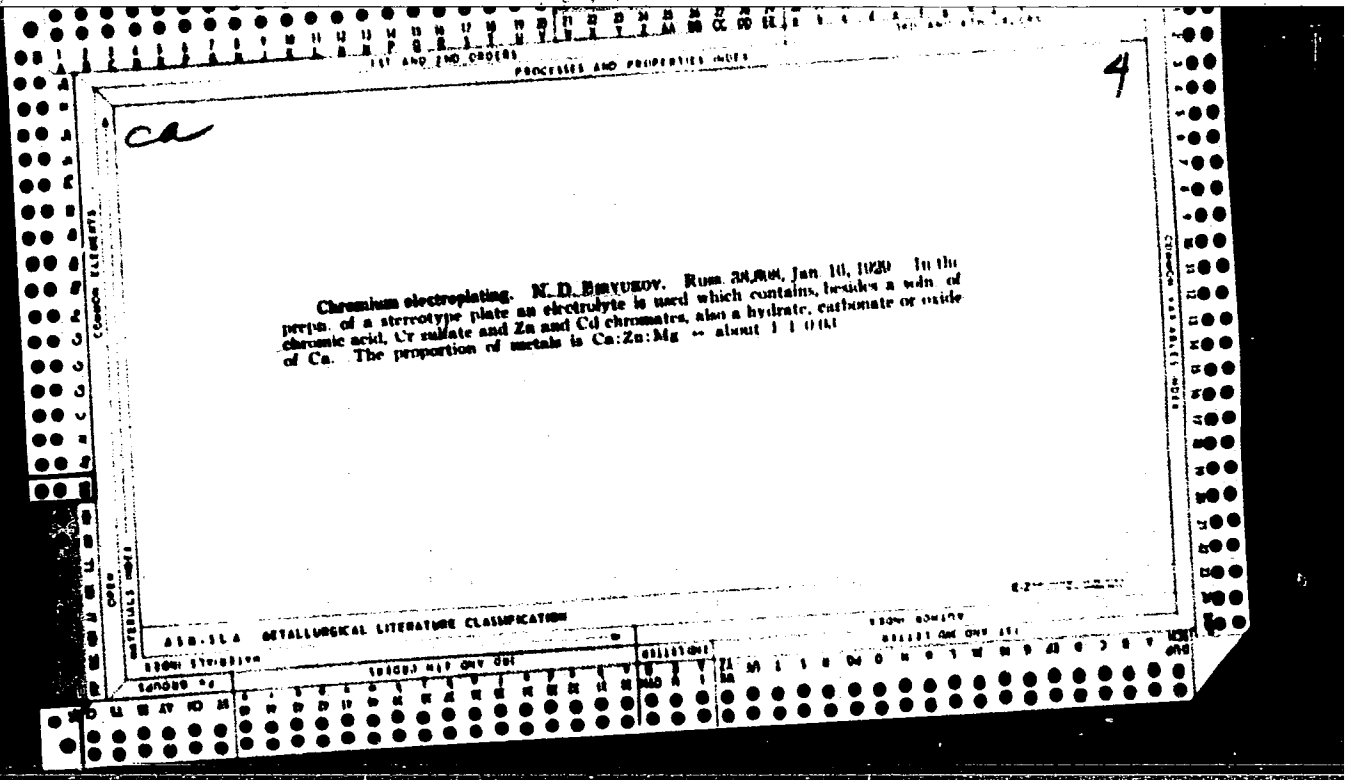
[The rebirth of German imperialism is a threat to the security of France] Vozrozhdenie germanskogo imperialisma - ugroza bezopasnosti Frantsii. Moskva, Gos.isd-vo poli. lit-ry, 1955.
166 p. (MLRA 8:12)
(Germany, West--Defenses)

BIRYUKOV, N., inzhener-polkovnik; ABRAMOV, Ye., inzhener

Audible and luminous imitator of firing operations. Voen. vest. 41
no.7:116-118 J1 '61. (MIRA 15:1)
(Shooting, Military--Equipment and supplies)







PROCESSES AND PROPERTIES INDEX

18

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Chromic anhydride. N. D. BIRYUKOV AND S. YU. ZOLOTAROVSKAYA. *Zhiv. Prikladnoi Khim.* 4, 235-72(1931).—Ppts. of $KHSO_4$ and CrO_3 by interaction of conc. $K_2Cr_2O_7$ and H_2SO_4 follows a complicated curve having a small max. and min. with H_2SO_4 of 54-55% strength. Decompn. of $K_2Cr_2O_7$ with equal vols. of H_2SO_4 of variable concn. was studied. Weak acid ppts. first pure $KHSO_4$, while a stronger acid ppts. a mixt. of CrO_3 , $K_2Cr_2O_7$ and $KHSO_4$, and then only CrO_3 and $KHSO_4$. Zetznov's method (Pogg. Ann. 148, 488(1871); 148, 167(1872)) cannot yield large quantities of CrO_3 , as indicated by the diagrams. Expts. on a semi-com scale showed that best results are obtained by using 12 kg. $K_2Cr_2O_7$, 15.5 l. H_2SO_4 (d. 1.834) and 20.7 l. H_2O , and allowing 75-80 hrs. for slow crystn. CrO_3 is best purified from sulfate with $BaCrO_4$ and not with HNO_3 . A bibliography is given. V. KALICHNEVSKY

ASB-51A METALLURGICAL LITERATURE CLASSIFICATION

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Theory and Practice of Chromium Plating.—III. N. D. Brjukov and S. P. Makarieva (*Vestnik Metallopromishlennosti (Messenger Metal Ind.)*, 1934, 14, (8), 174-180).—[In Russian.] See *Met. Abs.*, this volume, p. 62. The electrolytic deposition of chromium is explained as follows: when equilibrium of the oxidizing-reduction process is reached during the electrolysis of solutions of chromic acid containing sulphuric acid, one atom of deposited chromium corresponds to one molecule of chromium oxide reduced. During reduction of CrO_3 at the cathode Cr_2O_3 is first formed and then CrO whether sulphuric acid is present or not. In the absence of this acid, the process proceeds much more slowly than in its presence, since the products of reduction form with the chromic acid insoluble compounds such as $\text{Cr}_2(\text{VO})_2$ and $\text{Cr}_2(\text{Cr}_2\text{O}_7)_2$, which retard diffusion towards the cathode. With sulphuric acid, however, soluble salts of type $\text{Cr}_2(\text{CrO}_4)_2 \cdot n\text{H}_2\text{O}$ are formed the SO_4 content of which depends on the amount of sulphuric acid in the electrolyte. The deposition of chromium on platinum in the absence of sulphuric acid is impossible, since the CrO produced by reduction is not protected from the oxidizing action of CrO_3 . The soluble sulphate formed in the presence of sulphuric acid is converted eventually into chromium sulphate, which is partly reduced to CrO , and this is partly reduced to metal and partly oxidised, forming a somewhat protective layer. In this case the electrolyte near the cathode consists of 3 layers, the internal containing Cr^{II} , the intermediate Cr^{III} , and the outside Cr^{VI} . The intermediate layer protects the internal one from the oxidizing action of the Cr^{VI} in the external layer, and thence makes deposition of metallic chromium possible. The thickness of these layers is reduced when hydrogen is evolved at the cathode.—D. N. S.

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1ST AND 2ND COLUMNS 3RD AND 4TH COLUMNS

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Theory and Practice of Chromium Plating.—E. N. D. Ritzkov, S. P. Makarieva, and A. A. Timochin (*Tekhnicheskii Metalloproizvodstvo (Messenger Metal Ind.)*, 1934, 16, 103-120).—[In Russian.] In operating the sulphuric-chromic acid plating bath with a high current density, the cathode yield is increased by intermittent working since the interruptions afford time for the complex $Cr_2(CrO_4)_2SO_4$ formed during the electrolysis to decompose again into sulphuric acid and chromium dichromate. The voltage changes at the electrode terminals are also affected by interruptions, the difference between the initial and final values being considerable after a long interruption. The curves showing the initial voltages in the individual experiments of a series against the life of the bath in amp.-hrs. always exhibit several maxima corresponding neither with the time of interruptions nor with the sulphuric acid concentration. The expression $K = \frac{\% \text{ current for depositing metallic chromium}}{\% \text{ current for reducing } Cr^{VI} \text{ to } Cr^{III} \text{ and } Cr^{II}}$ approaches a constant value of nearly 2 after the bath has been used for a definite number of amp.-hrs. depending on the concentration of sulphuric acid. Variation in the values of K are regular and the maxima correspond to maxima on the voltage curve. The rate of hydrogen evolution depends on the surface condition of the cathode and on the intervals between the experiments; after a long interruption, the rate alters in an ascending curve.—D. N. S.

A 88-36 A METALLURGICAL LITERATURE CLASSIFICATION

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1ST AND 2ND DEGREE 1962 AND PROPERTIES INDEX 3RD AND 4TH DEGREE

Theory and practice of chromium plating. I. N. D. Biryukov, S. R. Makarieva and A. A. Timokhin. *Vestnik Metalloprov.* 14, No. 4, 118-34(1934); *Chemie & Industrie* 32, 1353.—When a 3 M CrO₃ soln. contg. 0.2-0.6 g. H₂SO₄ per 65 cc. is electrolyzed, the yield of metallic Cr presents a const. max. which is reached after a certain time that is proportional to the concn. of acid and that also depends on the Cr^{III} concn. At the start of electrolysis anodic oxidation can be defined as the difference between 100% and the percentage of the current consumed by the evolved O₂, this definition corresponding in effect to the transformation Cr → Cr^{VI}; however, after passing a current of 25-30 amp./hr. per 80-90 cc. of electrolyte, "oxidation" already means the complementary formation at the anode of perchromic acid or its salts. The increase in Cr^{III} concn. concurrent with the decrease in free SO₄ ions (total sulfate concn. remaining const.) decreases the yield of Cr metal. The decrease in the total Cr concn. in the electrolyte is greater the greater the H₂SO₄ concn. In plating Cr from a CrO₃ bath there is always an excessive reduction of Cr^{VI} to Cr^{III}, so that for every part of Cr deposited an approx. equiv. amt. of CrO₃ is reduced to Cr₂O₃. As a result of the 3 cathodic processes, evolution of H₂, deposition of Cr and reduction of CrO₃ to Cr₂O₃, the total amt. of reduction, as well as that of CrO₃ to Cr₂O₃, decreases even at the first electrolysis, in spite of the fact that the concn. of H₂SO₄ does not vary appreciably. II. *Vestnik Metalloprov.* 14, No. 6, 103-90 (1934); *Chemie & Industrie* 32, 1354.—If a H₂CrO₄ + H₂SO₄ bath is electrolyzed under a high c. d., the length of time which elapses between the tests plays a very important part in all processes; the longer the intervals, the higher the current efficiency. Toward the end of electrolysis, decompn. reactions take place between Cr₂(SO₄)₃ and Cr₂(CrO₄)₂SO₄, resulting in the liberation of H₂SO₄ from the complex and formation of Cr₂(Cr₂O₇)₃. As the time interval between tests increases, the e. m. f. at the terminals rises and the cond. falls proportionately. The e. m. f. curve has 5 max. which are independent of the Cr^{III} and H₂SO₄ concns. and also of the time intervals, and which depend only on the rise in cathodic potential, being closely related to the kinetics of cathodic processes. The rate of evolution of H₂ does not remain const. during a test. When there is equil. between the oxidation and reduction processes in the electrolyte, the rate of evolution of H₂ depends on the initial condition of the surface. When the Cr is deposited on polished Cr, the rate is relatively slow at first but soon increases to reach a practically const. value in about 20 min.; this is due to the fact that the polished Cr gradually becomes coated with a film of dull Cr, the surface of which finally becomes uniform. On dull Cr the over-voltage of H₂ is smaller, which accounts for the increase in the rate of evolution of H₂ toward the end of electrolysis. When plating is carried out on dull Cr, the rate of evolution of H₂ does not vary, because the structure of the surface of the metal does not vary. The rate of evolution of H₂ is inversely proportional to the potential at the terminals of the cell on account of the variations in cathodic potential. A. P.-C.

1ST AND 2ND DEGREE 1962 AND PROPERTIES INDEX 3RD AND 4TH DEGREE

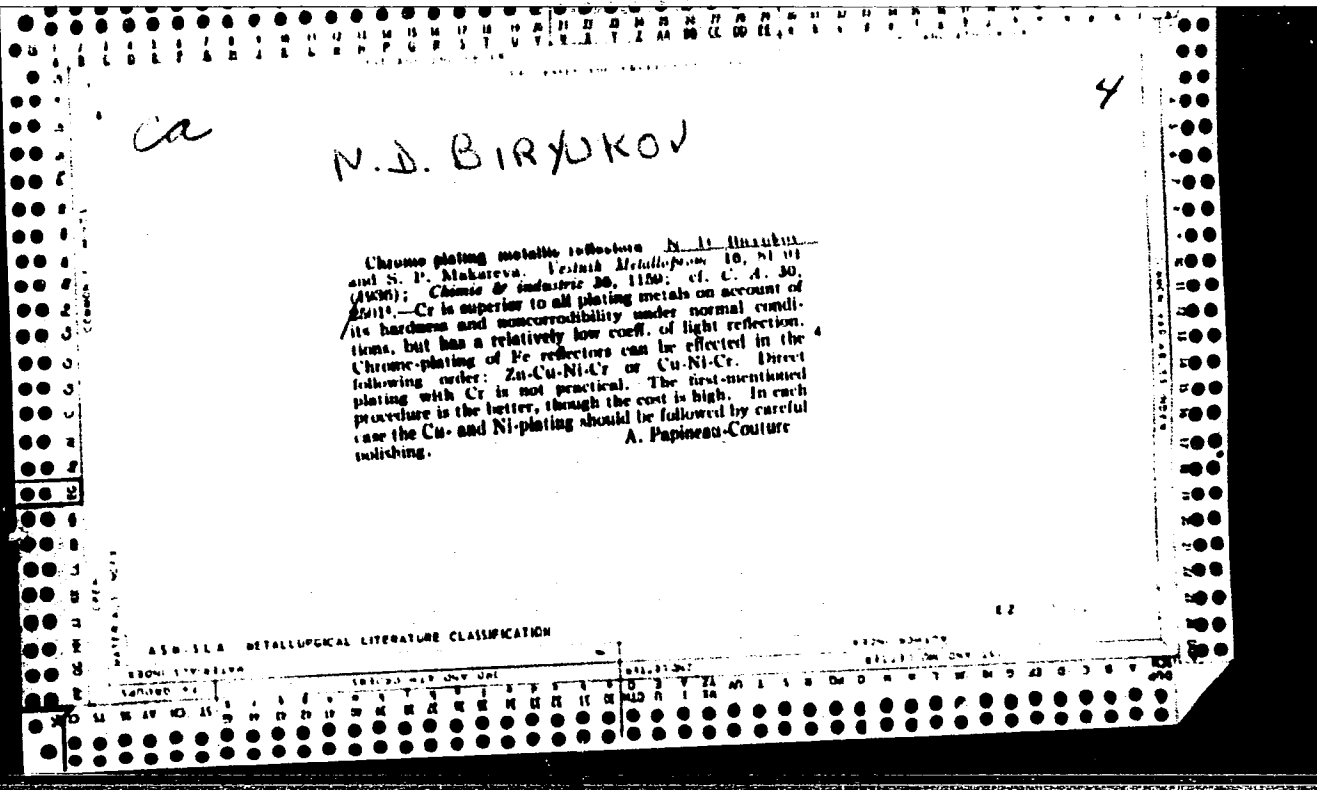
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Theory and Practice of Chromium Plating.—IV. N. D. Brinkov and S. P. Makarieva (*Vestnik Metalloproizvodnosti (Messenger Metall Ind.)*, 1934, 14, (11), 146-152).—[In Russian.] In the chromic acid plating bath all acids which form soluble chromous and chromic salts and which do not produce secondary reactions at either electrode, have a similar action to sulphuric acid in determining the range of bright chromium plating. Addition of a soluble sulphate also has a similar effect to sulphuric acid, since the following reaction occurs: $2H_2CrO_4 + K_2SO_4 \rightleftharpoons K_2Cr_2O_7 + H_2SO_4 + H_2O$. Addition of chromic salts to the bath markedly affects the reducing action at the cathode by forming a protective layer in its neighbourhood without the use of a strong acid; similar effects may be obtained by addition of cations of such metals as nickel, copper, zinc, or iron, an optimum effect being obtained at a certain concentration in each case. The more electropositive the added metal the greater is its activity and the lower the concentration required for the maximum effect. Better current yields may be obtained at lower temperatures, since the rate of oxidation of chromous ion is thereby decreased. The effect of pulsating currents is explained thus: deposition of chromium and evolution of hydrogen ceases when the electrolyte is stirred by the hydrogen evolution so that the protective layer around the cathode is disturbed, and the hydrogen is consumed by reducing the chromic acid outside the protective layer. For chromium to be produced the rate of reduction of hexavalent and trivalent chromium to the divalent form must be greater than the rate of oxidation of divalent to trivalent chromium, and the chromic acid must be reduced chemically and not at the cathode.—D. N. S.

ASB-15A METALLUM



CA

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Complications and errors in the practice of electroplating. N. D. Shvaytsov. *Korrosiya i Borba s Nei* 5, No. 3-4, 73-85(1966).—Practical procedure at different electroplating establishments in Russia. C. S. Shapiro

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

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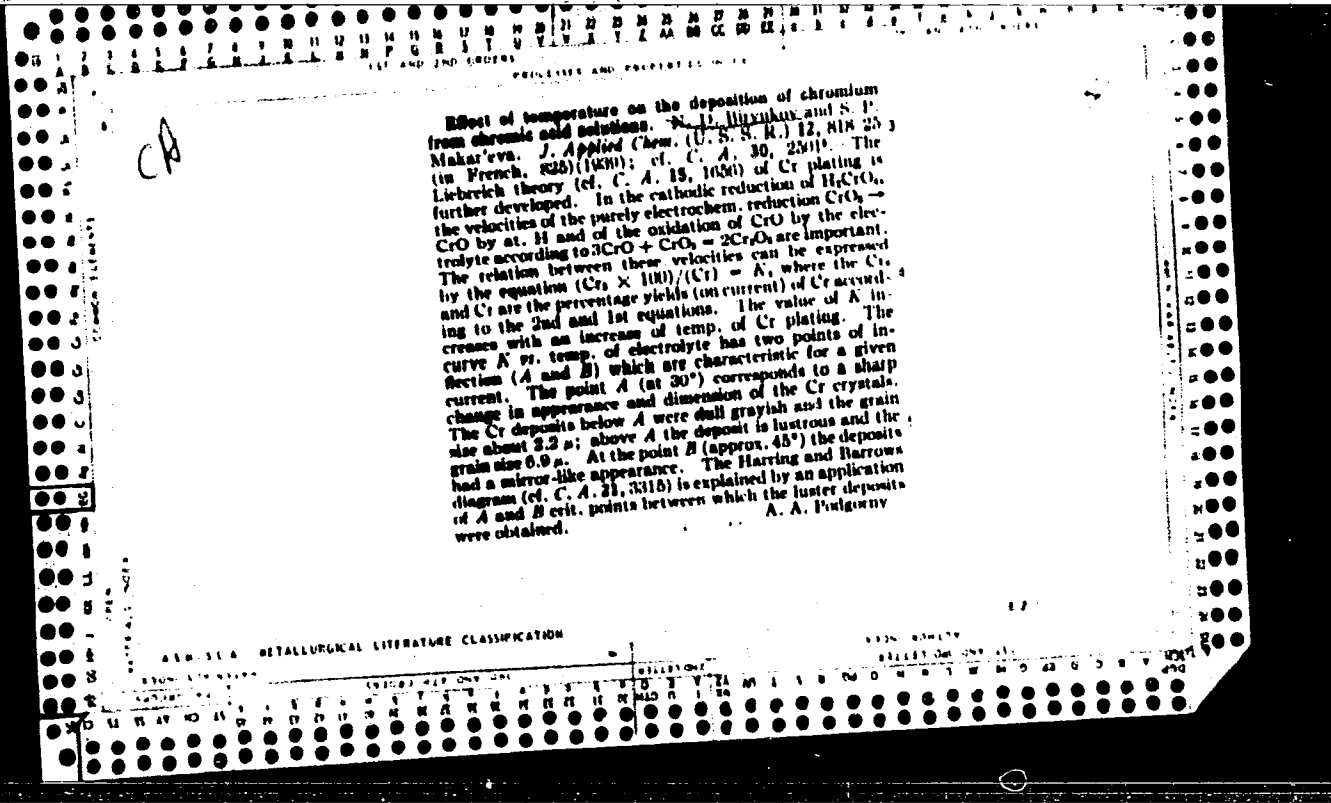
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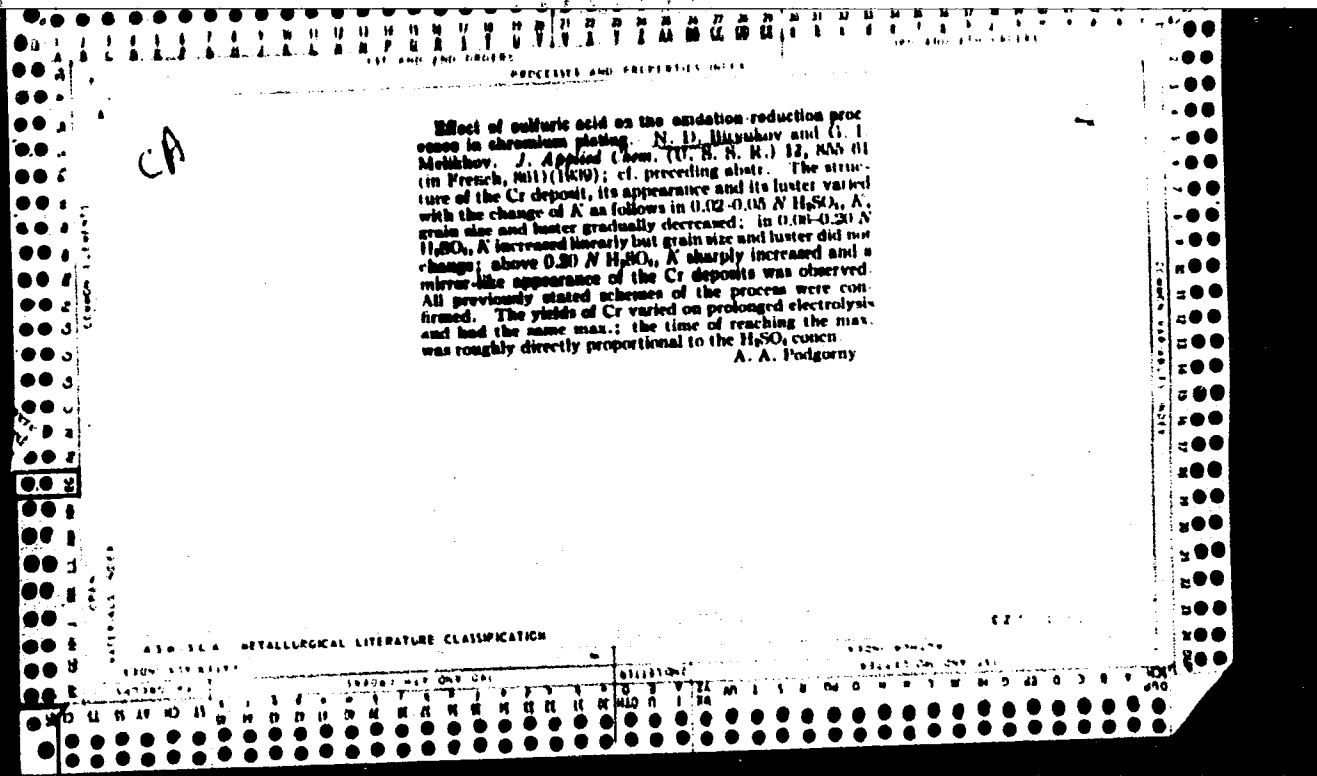
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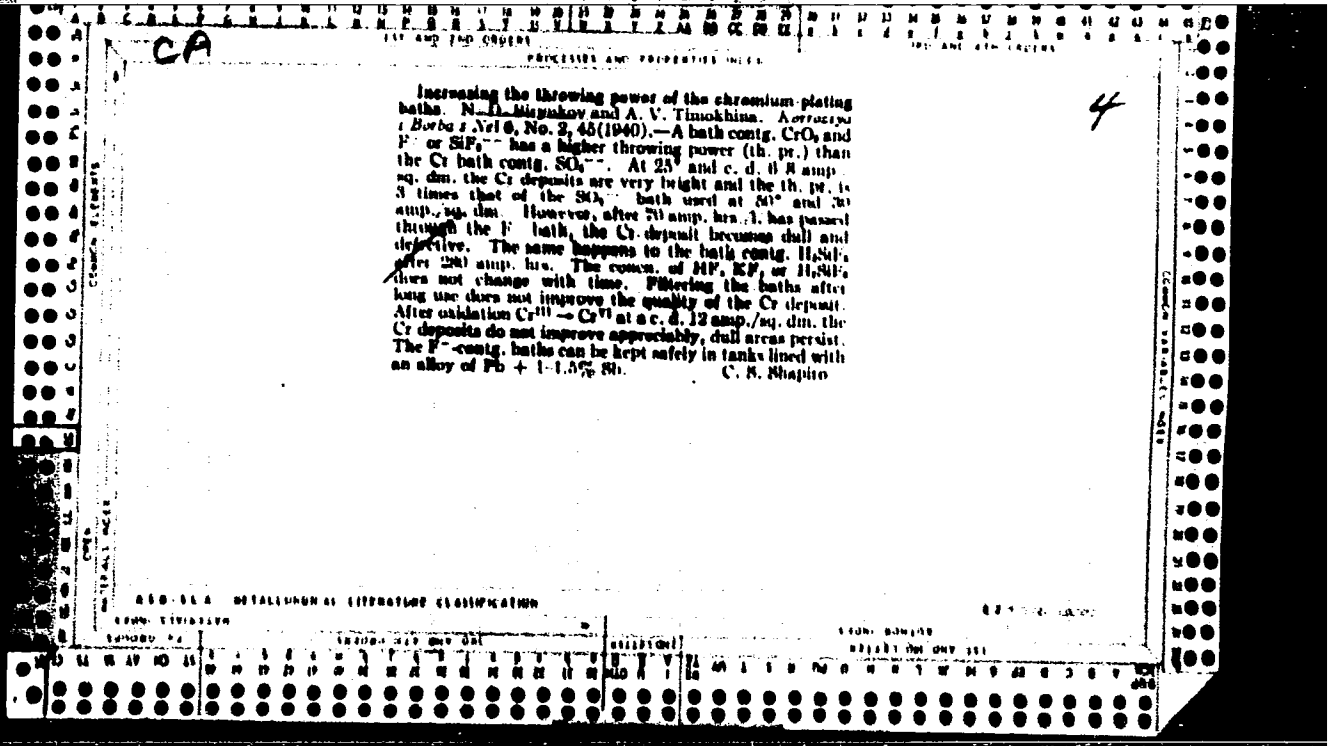
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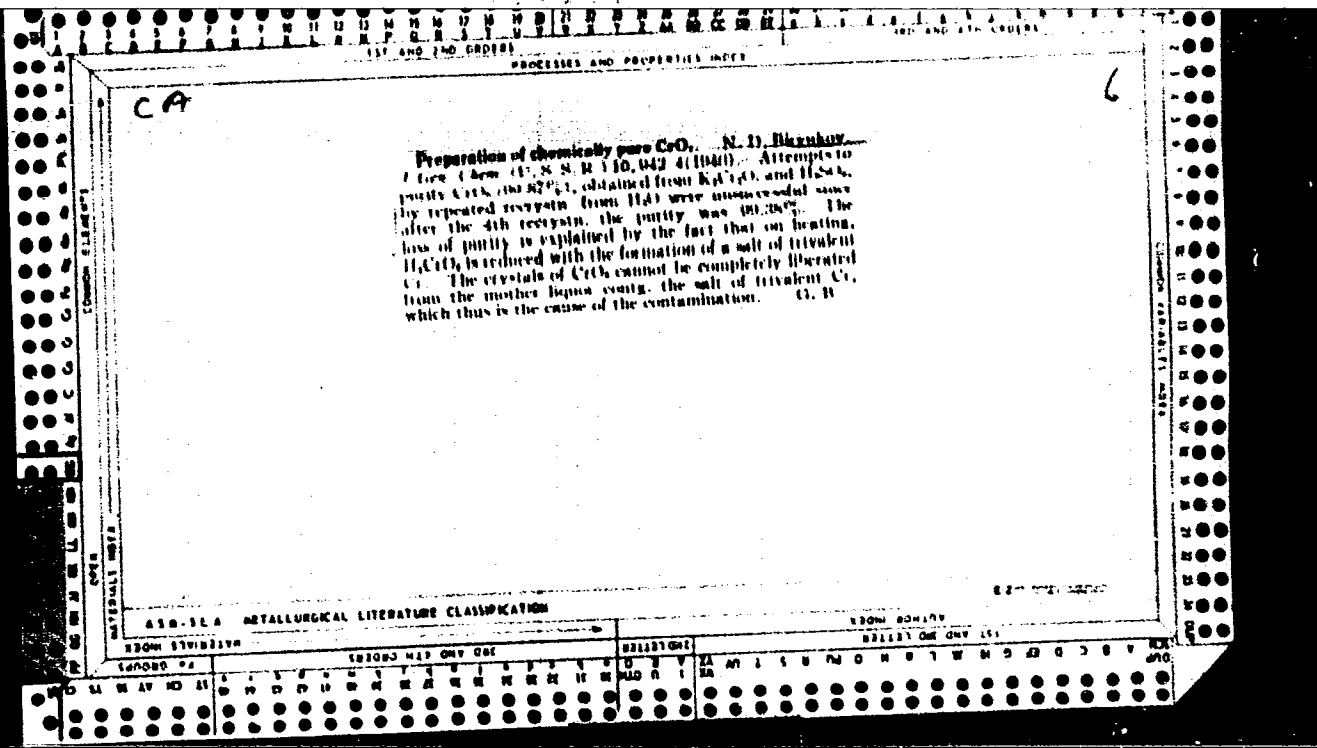
Effect of trivalent chromium on the kinetics of chromium plating. N. D. Moryshov, S. P. Makar'eva and N. D. Podobed. *Korrosiya i Borba s Nei* 6, No. 2, 10-14 (1940); cf. *C. A.* 33, 9151^h.—Two types of trivalent Cr compds. were studied (1) by introducing $Cr(OH)_3$ into the electrolyte, and (2) by cathodic reduction of CrO_3 . Results were quite different. Addn. of $Cr(OH)_3$ reduces the evolution of H_2 and decreases the current yield of Cr. The cathodic reduction of CrO_3 to Cr^{III} increases the evolution of H_2 , and decreases the rate of reaction at the anode. As the concn. of Cr^{III} increases, the current yield of Cr increases up to a certain max., and then decreases. For Cr^{III} from $Cr(OH)_3$, the rate of anodic oxidation is 4 to 6 times that of the Cr^{III} obtained by cathodic reduction of Cr^{VI} .
C. S. Shapiro

ASME-ISA METALLURGICAL LITERATURE CLASSIFICATION

ASME-ISA METALLURGICAL LITERATURE CLASSIFICATION

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PROCESS AND PROPERTIES INDEX

120 AND 4TH CROSS

B-1-4

Effect of current density on the composition of chromium.
 M. J. ... and E. ... U.S. Chem. Abst., 1960.
 In 1910-1920 Cr was deposited in various c.d. on Fe and on
 Ni from a solution of CrO₃ and H₂SO₄. From the c.d. range from 4
 to 7 amp./dm.² for Fe, and from 1 to 10 amp./dm.² for Ni, the ratio
 of Cr to Fe in the deposit varied from 0.1 to 0.3. CrO₃ was the rate of
 electroreduction of Cr and the deposit varied from 10⁻³ to 10⁻² cm.
 of Cr deposited at higher c.d. and the particles also depended
 on c.d. Higher c.d. gave smaller particles. The cathode potential was given,
 and at higher c.d. and. Cathodic potential varied with c.d. similarly
 to Fe.
 J. J. B.

ASS-SLA METALLURGICAL LITERATURE CLASSIFICATION

VISION ROMING

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PA 61T28

USSR/Electronics

Jan 1948

Batteries

Chemistry - Hydrogen - Ion Concentration

"A Graphic Method of Rapid pH Computation of a Solution in a Battery of Any Voltage," N. D. Biryukov, Sci Res Inst, Commercial Air Fleet, 2½ pp

"Zavod Labor" Vol XIV, No 1

Describes method for rapid computation of pH of battery solution based on a simple instrument, which records by means of a needle or else registers automatically and graphically. Barring any type of inertia in instrument, pH values are registered with a margin of error of ± 0.04 .

61T28

Biryukov, N. D.
BIRYUKOV, N.D.

Regularities in the quantities of electrode potentials of
metals. Zhur.neorg.khim. 2 no.9:2240-2258 S '57. (MIRA 10:12)

1. TSentral'nyy nauchno-issledovatel'skiy institut AN SSSR.
(Metals--Electric properties) (Potential, Theory of)

BIRYUKOV NI

LISVIN, N.I., inzh.-polkovnik, red.; BIRYUKOV, N.I. [translator]; ZAYTSOV,
N.F., red.; KLIMENKO, S.B., tekhn. red.

[Supersonic airplanes; a collection of translations and abstracts
from foreign periodical literature] Sverkhzvukovye samolety; sbornik
perevodov i referatov iz inostrannoi periodicheskoi literatury.
Moskva, Izd-vo inostr. lit-ry, 1958. 233 p. (MIRA 11:7)
(Airplanes)

~~5(2), 5(4)~~ 5.4600, 5.2200 (C)
AUTHOR: Biryukov, N. D.

66296

SOV/78-4-12-4/35

TITLE: On the Dependence of the Normal Electrode Potentials of Metals Upon the Dimensions of the Atoms and Molecules of Metallic Oxides

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 12, pp 2670-2681 (USSR)

ABSTRACT: In an earlier paper (Ref 1) the author has already noted that in calculating the free energy ΔF of the reduction of metallic oxides by atomic hydrogen the normal electrode potentials E_0 are almost linearly dependent upon ΔF . With the E_0 -values of alkali- and alkaline-earth metals, however, deviations are observed which were shown to depend on the dimension $\sqrt[3]{V}$ of the atom and ion of the metal. In this article the author reports that he detected similar relationships also in the other groups of the periodic system. He explains these results with the help of a hypothesis. The normal electrode potential E_{calc}

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SOV/78-4-12-4/35

On the Dependence of the Normal Electrode Potentials of Metals Upon the Dimensions of the Atoms and Molecules of Metallic Oxides

of the metals of the electromotive series was calculated as a function of the reduction of metallic oxides and hydroxides by atomic hydrogen. Moreover, the author determined the deviations of the empirical values E_0 from E_{calc} (Table 1). It was proven that each group of the periodic system has a special, approximately linear dependence of this deviation on the dimension of the atom. Empirical equations were developed for the dependence of E_0 upon ΔF and \sqrt{v} , where v denotes the atomic volume. The calculated values of the normal electrode potential agree with E_0 for the greater part of metals of the electromotive series as well as for the lanthanides and rare earths (the potentials of which were calculated by V. Latimer)(Table 2). The author proves the dependence of the deviations of E_0 from E_{calc} upon the structure of the electron sheath of the atoms and upon the molecule dimensions of metallic oxides and

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On the Dependence of the Normal Electrode Potentials of Metals Upon the Dimensions of the Atoms and Molecules of Metallic Oxides

hydroxides. It is assumed that the additional energy consumption for the escape of the electron from the electrode, which effects the deviation, is dependent on the diameter of the oxide molecules inhibiting the escape (Figs 2, 6). On the basis of a hypothesis concerning the oxide reduction by atomic hydrogen at the interface between metal and solution the author calculated the electromotive force of five galvanic cells by utilizing S. Glesston (Ref 5) and V. A. Kireyev (Ref 3) data. With the help of the Gibbs-Helmholtz equation the working heat Q of the element ($Q = -\Delta H$) was shown to be the difference ΔH_0 of the salts developing and vanishing during the process. The deviations from the empirical values of Q and E were only insignificant (Table 3). There are 6 figures, 3 tables, and 5 Soviet references.

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66296

SOV/78-4-12-4/35

On the Dependence of the Normal Electrode Potentials of Metals Upon the
Dimensions of the Atoms and Molecules of Metallic Oxides

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii
nauk SSSR
(Institute of Inorganic Chemistry of the Siberian Branch of the
Academy of Sciences, USSR)

SUBMITTED: May 26, 1958

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Card 4/4

BIRYUKOV, N.D.

Mendeleev's periodic law and normal standard potentials of metals.
Izv.Sib.otd.AN SSSR no.6:4-56 '61. (MIRA 14:6)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR,
Novosibirsk.

(Metals—Electric properties)

BIRYUKOV, N.D.

Recovery of antimony by electrolysis from antimony thio salt solutions. Zhur.prikl.khim. 35 no.5:1048-1057 My '62.
(MIRA 15:5)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.

(Antimony--Electrometallurgy)

SAPIR, A.D.; BIRYUKOV, N.D.; KATAL'NIKOV, S.G.; FROLOVA, Z.M.;
NEGINA, V.R.; SHUVANOVA, N.V.; KRASHENINNIKOVA, Ye.P.;
BLINOVA, H.V.

Exchange of experience. Zav.lab. 28 no.6:670-671 '62.

(SIRA 15:5)

1. Chelyabinskiy metallurgicheskiy zavod (for Sapir).
2. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR (for Biryukov).
3. Moskovskiy khimiko-tekhnologicheskiy institut imeni Mendeleeva (for Katal'nikov, Frolova).

(Chemistry, Analytical)

BIRYUKOV, N.D.

Reducing properties of $(\text{NH}_4)_2 \text{S}_2\text{O}_8$. Zhur.neorg.khim. 7 no.7:1748-1750
Jl '62. (MIRA 16;3)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
(Ammonium peroxydisulfate) (Reducing agents)

BIRYUKOV, N.D.

Mechanism of cathodic and anodic processes in the electrolytic deposition of antimony from solutions of salts. Zhur. prikl. khim. 36 no.10:2167-2179 0 '63. (MIRA 17:1)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.

BIRYUKOV, N.D.

Mechanism of the hydration and structure of aquo ions. Izv.
Sib. otd. AN SSSR no. 840-52 '62. (MIRA 17:8)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya
AN SSSR, Novosibirsk.

BIRYUKOV, N.F.

From our practices of machinery maintenance. Put' 1 puk.
khoz. 5 no.7:25 J1 '61. (MIRA 14:8)

1. Glavnyy mekhanik putevoy mashinnoy stantsii No.63,
st. Znamenka-Passazhirskaya, Odesskoy dorogi.
(Railroads--Maintenance and repair)

BUNIN, B.B.; BIRYUKOV, N.G.; GRECHISHCHEV, Ye.S.

Testing for strength of the main frame and body of 2TE10L diesel
locomotives. Trudy VNITi no.19:28-43 '64. (MIRA 18:3)

BARON, L.I., BIRYUKOV, N.I. (Moskva)

Incidence of pneumoconiosis and coal dust control in Ruhr mines.
Gig.truda i prof. zab. 2 no.5:59-60 S-0 '58 (MIRA 11:11)

1. Komissiya pri Akademii nauk SSSR po bor'be s silikozom:
(RUHR VALLEY--MINE DUSTS)
(RUHR VALLEY--LUNG--DUST DISEASES)

L 13346-63

ENP(q)/ENT(m)/BDS AFFTC/ASD JD

ACCESSION NR: AF3002898

S/0148/63/000/006/0043/0048

AUTHOR: Biryukov, N. I.

TITLE: Treatment of a metal in a ladle with a synthetic titanium-containing slag

SOURCE: IVUZ. Chernaya metallurgiya, no. 6, 1963, 43-48

TOPIC TAGS: synthetic titanium-containing slag, synthetic lime - alumina slag, titanium dioxide, aluminum oxide, freshly roasted lime, titanium-containing slag, aluminum, titanium

ABSTRACT: Authors studied the use of a synthetic lime - alumina slag (with an admixture of titanium dioxide up to 5%) from scrap slags containing up to 70 - 80% aluminum oxide and freshly-roasted lime in order to determine the effect of the oxides contained in it on the quality of a steel and its chemical composition. Authors found that a content of titanium dioxide of up to 5.0% in a synthetic lime - alumina slag does not produce any negative effect on the process of desulfurizing the steel by the slag. As a result of the reaction of the metal with the liquid, synthetic, titanium-containing slag, a partial reduction of the aluminum and titanium takes place, and they transform into steel. The mechanism of this reduction of aluminum and titanium was not established. The fining of a metal in a ladle with

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L 13346-63

ACCESSION NR: AP3002898

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liquid, synthetic, lime-alumina slag causes the origination of nitride inclusions in the steel (titanium nitride and carbonitride). It is recommended that only steels which are not required to have an especial purity with respect to nitrides inclusions be treated with these slags. Orig. art. has: 4 figures and 3 tables.

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

SUBMITTED: 05Jul62

DATE ACQ: 24Jul63

ENCL: 00

SUB CODE: 00

NO REF SOV: 005

OTHER: 003

Card 2/2

BIRYUKOV, N.I.; MOROZOV, A.N.

Modeling processes of in-the-ladle treatment of metal
by slag. Izv. vys. ucheb. zav.; Chern. met. 6 no.2:39-44
'69. (MIRA 16:3)

1. Chelyabinskiy politekhnicheskiy institut.
(Metallurgy)
(Dimensional analysis)

BIRYUKOV, N. M.

BIRYUKOV, N. M.

Afforestation-Rostov Province

Raise the quality of afforestation work in
Rostov Province. N. M. Biryukov. Les i step'
4, No. 6, 1952

Monthly List of Russian Accessions, Library of Congress, September 1952. UNCLASSIFIED.

BIRYUKOV, N. M.

BIRYUKOV, N. M.

Cultivators

Implement for cultivating sprout seedlings
of oak. Les i step' 4 no. 6, 1952.

Monthly List of Russian Accessions, Library of Congress, September 1952. UNCLASSIFIED.

BIRYUKOV, N.M.

Afforestation - Ukraine

Afforestation of sands in the Chernassy District
Les i step' no. 4, 1952

(See also: BIRYUKOVA, N. M.)

BIRYUKOV, N. M. Cand Tech Sci -- (diss) "Establishment of the relationship
between of the specific pressure of ^{an} ~~the~~ elastic ~~ity~~ matrix and the depth of ^{stretching} ~~exhaustion~~."
Mos, 1958. 12 pp (Min of Higher Education USSR. Mos Order of Lenin Aviation
Inst im Sergo Ordzhonikidze), 110 copies (KL, 14-58, 112)

AUTHOR: Biryukov, N.K.

SOV/147-58-1-22/22

TITLE: Impact Extrusion by an Elastic Die (Shtampovka-vytyazhka elastichnoy matritsey)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Aviatsionnaya Tekhnika, 1958, Nr 1, pp 179-189 (USSR).

ABSTRACT: Papers devoted to studying the process of stamping by an elastic die, including the careful investigations of Isa-chenkov (Ref 1), do not contain recommendations for determining the relation between the specific pressure and the depth of the extrusion without an additional experimental investigation in each case. This paper discusses that relation theoretically. The compressive tangential stresses in the transition zone of the blank as a result of plastic deformation vary with the depth of the extrusion. The specific pressure of the elastic die necessary to prevent folding also varies. Hence, it follows that its dependence on the depth of the extrusion can be found by an investigation of the stressed state of the transition zone of the blank and the conditions of its stability. The fundamental parameter influencing the quality of the component in impact extrusion by an elastic die is just the specific pressure. The equilibrium equation for a component Card1/3 formed by the rotation of the surfaces is established under the

Impact Extrusion by an Elastic Die

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following assumptions: the loading and the deformation are symmetrical; the thickness of the blank is constant and the line of the overflow of the side surface of the component towards the flange in the meridional section is an arc of a circle. If, for the preparation of a given component, there is required a specific pressure less than a critical value (which is determined), then the impact extrusion process can follow one of the laws illustrated, whereas if the specific pressure is greater than the critical value, the process must follow the other illustrated law. These illustrations enable various conclusions to be made about the process. As the experimental curve approaches that illustrated in the text for the variation of the specific pressure, as a function of the depth of the extrusion, the maximum stress during the stamping diminishes and the permissible gap between the die and the clamping ring at the beginning of the extrusion grows.

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Impact Extrusion by an Elastic Die

SOV/147-58-1-22/22

There are seven figures and nine references, 8 of which are Soviet and 1 English.

ASSOCIATION: Kafedra proizvodstva samoletov, Moskovskiy aviatsionnyy institut (Chair of Aircraft Production, Moscow Aviation Institute)

SUBMITTED: October 28, 1957

Card 3/3 1. Dies--Performance 2. Materials--Extrusion 3. Mathematics
 --Applications

SOV/147-58-3-16/18

AUTHOR: Biryukov, N.M.

TITLE: On the Selection of Pressure of an Elastic Die for Stamping of Components from Sheets (Vybor udel'nogo davleniya elastichnoy matritsy pri shtampovke detaley iz lista)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Aviatsionnaya Tekhnika, 1958, Nr 3, pp 126-134 (USSR)

ABSTRACT: The best conditions obtain if the intensity of pressure on the elastic die surface (Fig.1) varies in direct proportion to the depth of drawing of the sheet-metal (Ref.1). A proper pressure distribution may substantially decrease the number of operations needed to produce a given shape. For the case of drawing a cup from a flat blank of circular shape, as shown by the author (Ref.1) the relations of Eq.1 to 4 decide about the equilibrium of the transition ring (between the "cup" and the flange), where R_h - the inner radius of this ring (mean); r - radius of the conical portion (mean)(die shoulder); a - the width of the flange; σ_c, σ_ϕ ($\sigma_{CKP}, \sigma_{\phi KP}$) - hoop stresses in the conical portion and in the flange respectively (and their critical values).

Card 1/6 Assuming that $r = 0$, so that the cup and the flange have

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On the Selection of Pressure of an Elastic Die for Stamping of
Components from Sheets

a sharp joint, and consider an element of the flange as shown in Fig.2. It is acted on by its hoop stress σ_0 and the pressure from the blank holder, q , c. The effect of the junction with the inner portion is replaced by a hinge and the elastic forces which tend to bulge the flange. When the magnitude of these stresses exceeds a certain critical value (dependent on the the current flange dimensions) lateral collapse into waves or wrinkles occurs. Using the energy method to determine the critical value of σ_0 we get Eq.5 where:

$$E_r = \frac{4\pi E}{(\sqrt{E} + \sqrt{\pi})^2} \quad \text{- reduced modulus of elasticity;}$$

$$\Pi = \frac{\sigma_B}{(1 - \epsilon_p)^2} \quad \text{- modulus of strain hardening;}$$

σ_B - elastic limit;

ϵ_p - relative reduction of cross-sectional area at the instant necking is forming during tension;

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E - modulus of elasticity;

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On the Selection of Pressure of an Elastic Die for Stamping of Components from Sheets

- l - the length of the projection on x-axis of the buckled mean line of the flange;
 v, γ - vertical and angular displacement of the cross-section of the flange;
 μ - Poisson's ratio;
 $I_K = 1/3 a \delta^3$ - second moment of the plate area (in torsion);
 δ - thickness of the flange;
 $K_v = \frac{8E\delta^3}{12 \times 1.07 \times a^3}$ - coefficient of the elastic resistance of the flange against bending (Ref.2).

To solve Eq.5 a substitution is made for γ as given in Eq.6 where: A_n - angle of rotation of the cross section through the crest of the wave; n - number of wrinkles. Applying all these values and using the substitution of Eq.7, finally we obtain Eq.11 giving the number of wrinkles and Eq.12 giving the critical hoop stress $\sigma_{\phi KP}$. Solving Eq.12 for $q_{\phi p}$ we get Eq.13 and relations 14 - 16 where R_0 is the initial radius of the blank. In the case of lubrication being used between the blank and its

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