

G. Gavril'yuk, F. Ya.

USSR/Soil Science. General questions.

I-1

Abs Jour: Referat.Zh.Biol., No. 16, 25 Aug, 1957, 68984

Author : Gavril'yuk, F. Ya.

Inst :

Title : The Principal Scheme of Districting Rostov Province into Agricultural Soil Districts.

Orig Pub: Pochvovedenie, 1956, No. 7, 92-101

Abstract: In the boundaries of the province the following agricultural soil districts are distinguished: Southern (Alexandrovsk-Mechetinsk-Tselinsky) district of carbonaceous black soils; Primanichsky (Veselovsk-Salskiy) district of carbonaceous medium-vigorous black soils; Terrasov (Azov-Veselovskiy) irrigated district with black soil and meadow soils; Northwest Priasovskiy (Taganrog-Novocherkassky) district of weakly carbonaceous black soils; Western (Don-Salo-Manichsky, irrigated) district of carbonaceous and southern black soils; Central (Don-Salo-Manichsky)

Card 1/2

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APPROVED FOR RELEASE: 07/19/2001

CIA-RDP86-00513R000514510015-9

USSR/Soil Science, General questions.

I-1

Abs Jour: Referat.Zh.Biol., No. 16, 25 Aug, 1957, 68984

Abstract: district of dark chestnut and chestnut soils; Eastern (Verkhne-Salsky) district of light chestnut highly saline soils; Nizhne-Donsky district of soil complex of underwater soils of river Don. A schematic map of the districts, brief information on soil formation conditions and soils, and some measure for improving their fertility are furnished.

Card 2/2

- 4 -

GAVRILYUK, F.Ya.

GAVRILYUK, F.Ya., professor-doktor

Mikhail Petrovich Voskresenskii and his scientific and pedagogic
work. Pochvovedenie no.7:103-104 J1 '57. (MIRA 10:11)
(Voskresenskii, Mikhail Petrovich, 1886-)

USSR/Soil Science - Soil Genesis and Geography.

J

Abs Jour : Ref Zhur Biol., No 1, 1959, 1320

Author : Gavrilyuk, F.Ye.

Inst : -

Title : Soil Classification of Rostovskaya Oblast

Orig Pub : Pochvovedeniye, 1958, No 5, 71-77

Abstract : No abstract.

Card 1/1

APPROVED FOR RELEASE: 07/19/2001, F.CIA-RDP86-00513R000514510015-9"

PANOV, D.G., prof., osv.red.; GAVRILYUK, F.Ye., S.A., dotsent, red.; ZARKHINA, I.Ya., red.; PAVLICHENKO, M.I., tekhn.red.

[Division of the Northern Caucasus and the lower Don Valley into natural regions; reports of an intercollegiate conference] Prirodnoe raionirovanie Severnogo Kavkaza i Nizhnego Dona; doklady. Rostov-na-Donu, Izd-vo Rostovskogo univ., 1959. 110 p.

(MIRA 13:12)

1. Meshvuzovskoye soveshchaniye po prirodnomu rayonirovaniyu Severnogo Kavkaza i Nizhnego Dona. 1959.

(Caucasus, Northern--Physical geography)
(Don Valley--Physical geography)

GAVRILYUK, F.Ya.

Evaluation of Rostov Province soils. Pochvovedenie no.11:
1-7 N '59. (MIRA 13:4)

1. Rostovskiy-na-Donu gosuniversitet.
(Rostov Province--Soils)

GAVRILYUK, F.Ya.

"History of soil science in Russia". Nauch. dokl. vys. shkoly; biol.
nauki no.1:210 '60. (MIRA 13:2)
(Soil research)

GAVRILYUK, Fedor Yakovlevich; SHAGIROVA, I.M., red.izd-va;
~~GRIGORCHUK, L.A., tabl. red.~~

[Field study and the mapping of soils] Polevoe issledovanie
i kartirovanie pochv. Moskva, Vysshaia shkola, 1963. 234 p.
(MIRA 16:10)

(Soils--Maps)

L 46165-66 EWT(m)/EWP(j)/T IJP(c) GG/RM
ACC NR: AP6021932 SOURCE CODE: UR/0143/66/000/003/0020/0026

AUTHOR: Il'chenko, N. S. (Candidate of technical sciences, Docent);
Gavrilyuk, G. I. (Engineer); Kovalev, A. V. (Engineer)

ORG: Lenin Polytechnic Institute, Kiev (Kiyevskiy ordena Lenina
politekhnicheskiy institut

TITLE: Effect of ionization intensity on the service life of
polyethylene (film)

SOURCE: IVUZ. Enegetika, no. 3, 1966, 20-26

TOPIC TAGS: ionization phenomenon, polyethylene plastic, dielectric

ABSTRACT: The article investigates the stability of a dielectric to the
action of ionization of different intensities with an almost identical
intensity of the electric field applied to the dielectric. The
experiments were carried out over the same aging period for all samples.
The sample consisted of three layers of polyethylene with artificial
internal inclusions of air. For the upper and lower layer of the sample,
the polyethylene used had a thickness of 45 microns, and for the middle
layer a thickness of 65, 170, 500, 750, and 1000 microns. A cylindrical
opening with a diameter of 10 or 20 mm was made in the middle layer.

Card 1/2

UDC: 621.315.616.9:537.572

L 46165-66

ACC NR: AP6021932

Then, the upper and lower polyethylene films of the sample were subjected to an ionization process taking place in the inner opening, on the same area for all samples, determined by the diameter of the cylindrical opening in the middle layer. The volume of the artificial air inclusion was varied by changing the height of the cylinder. Detailed experimental results are shown in graphic and tabular form. Analysis of the results shows that ionization processes taking place in inner gas inclusions in a solid dielectric are one of the main factors determining its service life. The service life of polyethylene films decreases with an increase in the intensity of the ionization in the gas inclusions, but no direct proportionality was observed. Orig. art. has: 5 figures and 1 table.

SUB CODE: 11/ SUBM DATE: 02Nov64/ ORIG REF: 010/ OTH REF: 005

Card 2/2 *def*

NOVOZHILOV, M.G., prof., doktor tekhn. nauk; SEL'YANIN, V.G.; TARTAKOVSKIY, B.N.; Primali uchastiye: PCHELKIN, G.D., inzh.; ESKIN, V.S., inzh.; SHARKOV, A.M., kand. tekhn. nauk; BORISYUK, R.F., inzh.; ABDUFATTAKHOV, A.A., inzh.; ANDRIYENKO, A.F., inzh.; KTITOROV, P.M., inzh.; GLUSKIN, L.I., inzh.; LEVCHENKO, N.K., inzh.; GAVRILYUK, I.I., inzh.; SHPEKTOROV, Yu.Z., inzh.; KOCHERGA, N.T., red.; GORKAVENKO, L.I., tekhn. red.

[New technical methods and equipment in open-pit mining of mineral deposits] Novaya tekhnologiya otkrytoi razrabotki mestorozhdenii poleznykh iskopaemykh. Pod obshchei red. M.G.Novozhilova. Kiev, Gos.izd-vo tekhn. lit-ry USSR, 1961. 205 p.

(MIRA 15:5)

(Strip mining)

S/262/62/000/010/020/024
1007/1207

AUTHOR: Gavrilyuk, I. I.

TITLE: Joint operation of a two-stroke engine and supercharging unit

PERIODICAL: Referativnyy zhurnal, otdel'nyy vypusk. 42. Silovyye ustanovki, no. 10, 1962, 74-75, abstract 42.10.456. In collection "Gazoturbin. nadduv. dvigateley vnutr. sgoraniya". Moscow, Mashgiz, 1961, 56-66

TEXT: A method for the tentative calculation of characteristics of a supercharged two-stroke internal combustion engine, is described. As shown by tests, the method suggested may be used in practice and its basic principles permit application to engines of various systems of combined supercharging. There are 2 figures and 5 references.

[Abstracter's note: Complete translation.]

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Card 1/1

NOVOZHILOV, M.G., prof.; TARTAKOVSKIY, B.N., inzh.; GAVRILYUK, I.I., inzh.

New technique for the open working of deposits of flux limestones
of the Karakubskoye Ore Administration. Sbor.trud.VNIINegrud
no.1:24-33 '62. (MIRA 15:7)

1. Dnepropetrovskiy gornyy institut.
(Limestone) (Ukraine--Strip mining)

NOVOZHILOV, M.G., doktor tekhn. nauk; TARTAKOVSKIY, B.N., kand. tekhn. nauk; GAVRILYUK, I.I., inzh.

Ways of increasing labor productivity in flux limestone quarries of the Ukraine. Met. i gornorud. prom. no.4:46-49 (MIRA 16:11)
Jl-Ag '63.

1. Dnepropetrovskiy gornyy institut (for Novozhilov).
2. Otdeleniye gornorudnykh problem Instituta elektrotekhniki AN UkrSSR (for Tartakovskiy, Gavrilyuk).

NOVOZHILOV, M.G., prof.; TARTAKOVSKIY, B.N., kand. tekhn. nauk; GAVRILYUK,
I.I., inzh.; LASHKO, V.T., inzh.

Parameters of pile-forming conveyors equipped with a swivel-
component dumping device. Izv. vys. ucheb. zav.; gor zhur. 6
no.9:27-34 '63. (MIRA 17:1)

1. Dnepropetrovskiy ordena Trudovogo Krasnogo Znameni gornyy
institut imeni Artema. Rekomendovana kafedroy otkrytykh rabot.

TARTAKOVSKIY, B.N.; GAVRILYUK, I.I.; LASHKO, V.T.

Efficient operations diagram of a revolving, link-type dump piler.
Ogneupory 29 no.4:172-176 '64. (MIRA 17:4)

1. Otdeleniye gornorudnykh problem AN UkrSSR.

NOVOZHILOV, M.G., prof.; TARTAKOVSKIY, B.N., kand. tekhn. nauk; GAVRILYUK,
I.I., inzh.

Basis for the optimum height of the bench flux limestone quarries
with the use of electronic computers. Izv. vys. ucheb. zav.; gor.
zhur. 8 no.2:100-105 '65. (MIRA 18:5)

1. Dnepropetrovskiy ordena Trudovogo Krasnogo Znameni gornyy institut
Imeni Artema.

TARTAKOVSKIY, B.N., kand. tekhn. nauk; GLUSKIN, L.I., kand. tekhn. nauk;
GAVRILYUK, I.I., inzh.; CHETVERIK, M.S., inzh.

Graphoanalytical method of investigating the regime stripping
operations. Sbor. trud. VNIIMerud no.4:33-41 '65.
(MIRA 18:11)

NOVOZHILOV, M.G., doktor tekhn. nauk; DRUKOVANYI, M.F., kand. tekhn. nauk;
TARTAKOVSKIY, B.N., kand. tekhn. nauk; YEFREMOV, E.I., kand.
tekhn. nauk; IL'IN, V.I., inzh.; GAVRILYUK, I.I., inzh.

Use of high benches in flux quarries. Varyv. delo no.57/14:
167-173 '65. (MIRA 18:11)

Filial Institute ~~mekhaniki~~ AN UkrSSR.

SPIRICHEV, S.V.; GAVRILYUK, I.N.; KRASHENNIKOV, V.F.; CHIBISOV, I.I.

Accelerated techniques for drying components. Prom.energ. 18
no.1:10-11 Ja '63. (MIRA 16:4)

(Electric heating)

GAVRILYUK, L., inzh.po novoy tekhnike; DAVIDOVICH, M., mladshiy
nauchnyy sotrudnik

Manufacture of "Double T" type slabs. Prom.stroi.i inzh.soor.
4 no.1: 34-36 Ja-F '62. (MIRA 15:8)

1. Trest "Makstroy" (for Gavrilyuk). 2. "Orgstroy" (for
Davidovich).

(Roofing, Concrete)

GAVRILYUK, L.A. (stantsiya Zavodoukovskaya, Tyumenskoy oblasti)

Uniform orthographic system in geography classes. Geog. v
shkole 25 no.1:39-41 Ja-F '62. (MIRA 15:1)
(Geography--Study and teaching)
(Russian language--Orthography)

U. V. L. N. N.

"Investigation of a Receiver With Electrical Feedback for a Frequency Telemetering System." D. I. L. N. N., Kiev Polytechnic Inst, Kiev, 1953. Dissertation (Doklady i Zhurnal--Fizika, Moscow, Feb 54)

SI: 1954, 12 Aug 1954

GAVRILYUK, Lena Nikiforovna, kand.tekhn.nauk, dotsent

: Theory and design of a phase discriminator using diodes.

Izv. vys. ucheb. zav.; elektromekh. 4 no.9:95-100 '61.

(MIRA 14:9)

1. Taganrogskiy radiotekhnicheskiy institut.

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GAVRILYUK, L.N.

Increasing the distance of reading transmissions of the UDU remote level gauge. Izv. vys. ucheb. zav.; neft' i gaz 3 no.7: 111-114 '60.

1. Taganrogskiy radiotekhnicheskiy institut.

(Liquid level indicators)

(Remote control)

GAVRILYUK, L.N.

Teledynamometer. Izv.vys.ucheb. zav.;neft' i gaz 5 no.5:107-111
'62. (MIRA 16:5)

1. Taganrogskiy radiotekhnicheskiy institut.
(Telemetering) (Dynamometer)

GAVRILYUK, L.N.

Telemechanical apparatus for deep pumping wells and oil-gathering stations. Izv. vys. ucheb. zav.; neft' i gaz 5 no.1:83-86 '62. (MIRA 16:11)

1. Teganrogskiy radiotekhnicheskiy institut.

SPIVAKOVSKIY, V.B.; ZIMINA, V.A.; GAVRILYUK, L.S.

Determination of uranium traces in rocks and natural waters. Zav.
lab. 27 no. 4:390-391 '61. (MIRA 14:4)

1. Kiyevskiy gosudarstvennyy universitet imeni T.G. Shevchenko.
(Uranium--Analysis) (Rocks--Analysis)
(Mineral waters)

FROLOV, V.V.; LAZAREV, B.L.; GAVRILYUK, L.Ya.; FOFANOV, A.A.

Operation of blast furnaces with fluxed sinter made of Tagil-Kushva region ores. Stal' 21 no. 4:296-299 Ap '61. (MIRA 14:4)

1. Nizhne-Tagil'skiy metallurgicheskiy kombinat i Ural'skiy institut chernykh metallov.

(Ural Mountains--Iron ores) (Blast furnaces)

POFANOV, A.A., kand.tekhn.nauk; GAVRILYUK, L.Ya., inzh.; DUBROV, N.F.;
GORLACH, I.A.; PRIVALOV, S.S.

New developments in research. Stal' 21 no.5; 402-403, 414 My '61.
(MIRA 14:5)

(Ural Mountains—Metallurgical furnaces)
(Zhdanov—Blast furnaces)

KHOLZAKOV, V.I.; BRATCHENKO, V.P.; OSTROUKHOV, M.Ya.; LUKIN, P.G.;
GAVRILYUK, L.Ya.

Effect of the shape of a blast furnace working area on the distribution
of the gas flow. Metallurg 8 no.8:6-9 Ag '63. (MIRA 16:10)

KHOLZAKOV, V.I.; BRATCHENKO, V.P.; OSTROUKHOV, M.Ya.; LUKIN, P.G.; NEKIPELOV, S.P.;
POPOV, Yu.A.; GAVRILYUK, L.Ya.

Investigating the processes in the stack and hearth of a blast furnace
during smelting with sinter of Bakal and Sokolovka-Sarbay ores. *Stal'*
23 no.4:297-300 Ap '63. (MIRA 16:4)

1. Chelyabinskiy nauchno-issledovatel'skiy institut metallurgii i
Chelyabinskiy metallurgicheskiy zavod.
(Blast furnaces)

GAVRILYUK, L. Ya.; OSTROUKHOV, M. Ya.

Effect of the configuration of the contact surface of a large
bell on the distribution of gas flow. Metallurg 9 no.1: 11-12
Ja '64 (MIRA 18:1)

GAVRILYUK, L.Ya.; PROKHOROV, V.N.

Reducing the sulfur content in cast iron by increasing the
number of tappings. Stal' 24 no.8:678-680 Ag '64.

(MIRA 17:9)

VYATKIN, M.P.; NEKIPELOV, S.P.; POPOV, Yu.A.; GAVRILYUK, L.Ya.; FONTALIN, V.N.;
VYATKIN, G.P.; OSTROUKHOV, M.Ya.

Experience of five years of operating a 1,719m³ capacity furnace.
Stal' 24 no.11:964-968 N '64. (MIRA 18:1)

LUBENETS, I.A.; LUKIN, P.G.; GAVRILYUK, L.Ya.; PROKHOROV, V.N.

Results of the use of natural gas in blast furnaces. Metallurg 10
no.9:5-7 S '65. (MIRA 18:9)

1. Chelyabinskiy metallurgicheskiy zavod.

L 63670-65

ACCESSION NR: AR5003339

S/0271/64/000/011/A020/A020
621.398.694.3:538.652

SOURCE: Ref. zh. Avtomatika, telemekhanika i vychislitel'naya tekhnika.
Svodnyy tom, Abs. 11A126

17
B

AUTHOR: Gavrilyuk, M. A.

TITLE: Errors of a-c automatic bridges

CITED SOURCE: Sb. nauchn. rabot aspirantov L'vovsk. politekhn. in-ta, no. 2, '1963,
142-149

TOPIC TAGS: ac bridge, automatic ac bridge, automatic ac bridge error

TRANSLATION: The operation of automatic bridges as automatic-control systems is analyzed. The errors introduced by the bridge control are considered. The error transfer functions are determined which serve to evaluate the bridge-balancing performance. Curves of the error transfer function are presented. Five illustrations. Bibliography: 3 titles.

SUB CODE: DP, EE

ENCL: 00

Card 1/1 *llc*

GAVRILYUK, M.A.

Simulation of automatic a.c. bridges with quadrature detection. Izv.vys.
ucheb.zav.;prib. 7 no.5:7-13 '64. (MIRA 17:12)

1. L'vovskiy politekhnicheskoy institut. Rekomendovano kafedroy
avtomatiki i telemekhaniki.

GAVRILYUK, M.A.

An a.c. bridge with automatic balancing of two parameters. Nauch.
zap. LPI no.1:262-268 '61. (MIRA 16:6)
(Bridge circuits) (Electric measurements)

GAVRILYUK, M.F., inzh.; ZHELTCNOZHKO, Yu.V., inzh.

Prevention of dust formation in mines of the Kirovugol' Trust.
Bezop.truda v prom. 5 no.6:29-31 Je '61. (MIRA 14:6)
(Lugansk Province--Coal mines and mining--Safety measures)

18.7500

29817
S/020/61/140/006/014/030
B104/B102

AUTHORS: Savitskiy, Ye. M., Tylkina, M. A., Pekarev, A. I., Gavrilyuk, M. I., and Zabavnova, A. P.

TITLE: Recrystallization diagram of cast tungsten

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 6, 1961, 1301 - 1303

TEXT: By x-ray diffraction studies, microscopic examinations, and hardness measurements (Vickers hardness, 10 kg load) the authors constructed a complete recrystallization diagram of cast tungsten (99.6 %). After casting the specimens were compressed (70 %) and annealed (1600°C). The material had a grain size of 40 - 50 μ. The specimens were compressed from 6 to 90 % with a hammer in a hydrogen atmosphere at 700 - 1100°C. These temperatures are just below the recrystallization temperature of tungsten. After this treatment specimens of each deformation degree were annealed in the range from 1000 to 2500°C at every 100°C for one hour (between 1400 and 1600°C at every 50°C). The specimens were electrolytically polished (10 % NaOH in water, 1.7 a/cm²). The recrystallization Card 1/4/3

29817

S/O20/61/140/006/014/030

B104/B102

Recrystallization diagram of cast ...

diagram of deformed tungsten is shown in Fig. 1. At deformations between 30 and 90 %, recrystallization sets in at 1450°C. The recrystallization takes place between 1450 and 1600°C. At a temperature of 1700°C, the grains start growing. At 9 % deformation, recrystallization sets in at 1600°C. The critical degree of deformation shifts from 12 % deformation at an annealing temperature of 1600°C to 6 % deformation at an annealing temperature of 2100°C. The coarsest grains were obtained by annealing at 2500°C. With an increase of the degree of deformation from 30 to 90 % hardness increased from 380 kg/mm² to 440 kg/mm². When recrystallized grains appear, hardness drops to 360 kg/mm². The optimum annealing temperature of tungsten deformed by 50 - 90% was assumed to be between 1500 and 1600°C. A comparison with data on high-purity single crystals showed the strong influence of impurities on the recrystallization temperature. There are 1 figure and 4 references: 2 Soviet and 2 non-Soviet. The 2 references to English-language publications read as follows: E. L. Hamon, J. Metals, 12, no. 9 (1960); S. J. Noesen, I. R. Hughes, Trans. Met. Soc., AIME, 218 (1960). X

ASSOCIATION: Institut metallurgii im. A. A. Baykova Akademii nauk SSSR
(Institute of Metallurgy imeni A. A. Baykov of the Academy
of Sciences USSR)
Card 2/4 3

Recrystallization diagram of cast ...

29817
S/020/61/140/006/014/030
B104/B102

PRESENTED: June 2, 1961, by I. V. Tananayev, Academician

SUBMITTED: May 31, 1961

Fig. 1. Recrystallization diagram of commercial cast tungsten. Legend:
(1) degree of deformation; (2) annealing temperature; (3) mean diameter
of grains.

Card 3/4 3

X

S/126/62/015/005/008/031
E195/E383

AUTHORS: Gavrilyuk, M.I., Chaporova, I.N., Vasil'yeva, N.P.
and Sultanyan, T.A.

TITLE: Investigation of the effect of recrystallization-
annealing on the structure and properties of cast
tungsten

PERIODICAL: Fizika metallov i metallovedeniye, v. 13, no. 5,
1962, 693 - 700

TEXT: Although the problem of recrystallization-induced
embrittlement of tungsten has been extensively studied, specimens
prepared by powder-metallurgy technique have been mostly used
as the experimental material - hence the present investigation,
conducted on vacuum-arc melted 99.95% tungsten. The cast ingots
were hot-worked to 70 - 85% reduction in two stages, the second
stage being carried out below the recrystallization temperature.
Rods obtained in this manner were used to prepare tensile-test
pieces (5 mm in diameter, 25 mm gauge length) and specimens for
hardness measurements and for examination of the fracture
surfaces. The mechanical-test and hardness measurements were
Card 1/4

S/126/62/013/005/008/031

Investigation of the effect E195/E583

carried out at 400 °C on specimens vacuum-annealed for 1 hour at temperatures varying from 1 000 - 2 300 °C. The structure of the fracture surfaces of specimens broken under impact at room temperature was examined with the aid of an electron microscope, both optical and electron microscopes being used for the examination of microstructure. The results can be summarized as follows:

1) the mechanical properties of cast and cold-worked tungsten were not affected by annealing at temperatures below 1 200 °C, the average numerical values obtained being:

UTS = 62 kg/mm²; Brinell hardness number HB = 430; elongation δ = 17%; reduction in area ψ = 50%.

2) After annealing at temperatures equal to or higher than 1 600 °C, the UTS of the metal studied decreased to ~ 20 kg/mm² and its HB to ~ 300. In contrast to the general rule, the decrease in hardness was not accompanied by a corresponding increase in plasticity. On the contrary, both δ and ψ decreased after this treatment, the former to about 3% and the latter to about 18%.

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Investigation of the effect

S/126/62/013/005/008/031
E193/E383

- 3) Irrespective of annealing temperature, no evidence was found of the precipitation of a second-phase at the grain boundaries of recrystallized specimens.
- 4) Recrystallization of tungsten was accompanied by broadening of the grain boundaries and by a gradual increase in the degree of order of the structure in the interior of the grains (this latter effect was revealed by the fact that small etching pits which were randomly oriented on deformed material formed a regular pattern on recrystallized specimens).
- 5) The width of grain boundaries depended on the degree of misalignment between the adjacent grains and increased with increasing annealing temperature, reaching a value of 3.5 - 4.5 μ in cast material, which can be regarded as material annealed at a temperature just below the melting point of the metal.
- 6) Plastic deformation caused considerable changes in the structure of the interior of the grains and promoted the formation of a specific microstructure, characterized by very narrow (0.5 - 1 μ) grain boundaries.
- 7) The decrease in plasticity of recrystallized tungsten was

Card 3/4

Investigation of the effect S/126/62/013/005/008/031
E193/E383

found to be directly related to the broadening of grain boundaries. This was taken to indicate that the brittleness of recrystallized tungsten and other similar metals was caused by intergranular internal adsorption of impurities. In view of the results obtained it would appear that there are four possible ways of minimizing the embrittling action of recrystallization of tungsten and other metals prone to this effect: a) reducing the impurity content of the metal; b) grain refinement; c) heat-treatment; d) alloying with elements inhibiting intergranular internal adsorption and harmful impurities. That the last of these methods may be no less effective than the first is indicated by the results of many investigations carried out by V.I. Arkharov and his co-workers and by the fact that the plasticity of W and Mo can be increased considerably by the addition of 20 - 35% rhenium in the former and 40 - 50% rhenium in the latter case. There are 4 figures.

SUBMITTED: August 15, 1961

Card 4/4

GAVRILYUK, M.I.; GERMAN, Ye.N.

Properties of cast tungsten.
'62.

Issl. po zharopr. splav. 9:190-192
(MIRA 16:6)
(Tungsten)

L 13778-65 EWI(m)/EPF(n)-2/T/EWP(t)/EPA(bb)-2/EWP(b) Pu-4 ASD(m)-3/ASD(r)-2
ACCESSION NR: AP4046091 JD/JG S/0126/64/018/003/0389/0395

AUTHOR: Gavrilyuk, M. I.; Milova, V. B.; Konstantinov, V. A. 8

TITLE: Investigation of the effect of recrystallization annealing
on the structure and properties of tantalum and its alloys

SOURCE: Fizika metallov i metallovedeniye, v. 18, no. 3, 1964,
389-395

TOPIC TAGS: tantalum, ⁷tantalum ²⁷tungsten alloy, tantalum recrystalliza-
tion, tantalum tungsten alloy recrystallization, tantalum tungsten
alloy property, tantalum property

ABSTRACT: Study of the effect of annealing temperature on the hard-
ness, microstructure, impurity content, and lattice parameters of
arc-cast and electron-beam-melted tantalum and of tantalum alloys
with 10% W has shown that in both cases the dependence of hardness
upon the annealing temperature follows the same pattern (see Fig. 1
of the Enclosure). In the 1200—2300C range, both tantalum and its
alloy have a single-phase structure. The recrystallization tempera-

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L 13778-65

ACCESSION NR: AP4046091

tures of arc-cast tantalum and tantalum alloy were found to be 1200—1300C and 1500C, respectively, and those of electron-beam-melted tantalum and tantalum alloy (higher purity), 1000—1100C and 1300C, respectively. These results indicate that the recrystallization temperature depends to a great extent on the impurity content. During the recrystallization of tantalum and its alloys, and of other refractory metals, intercrystalline adsorption of impurities occurs. The minimum content of impurities within the grains is observed with annealing at temperatures exceeding the recrystallization temperature of the metal by 100—200C. A further increase in temperature leads to a reversed migration of impurities into the grains. The increase in hardness, and the accompanying decrease in ductility and increase in the tantalum lattice parameter after annealing at 1800C, are explained by the reverse migration of impurities and the contamination occurring during heat treatment. The fact that different refractory metals show different behavior during recrystallization can be explained by the different solubilities on interstitial elements in those metals. Orig. art. has: 3 figures and 3 tables.

Card 2/4

L 13778-65

ACCESSION NR: AP4046091

ASSOCIATION: none

SUBMITTED: 14Aug63

ENCL: 01

SUB CODE: MM

NO REF SOV: 006

OTHER: 005

ATD PRESS: 3131

Card 3/4

L 13778-65

ACCESSION NR: AP4046091

ENCLOSURE: 01 -

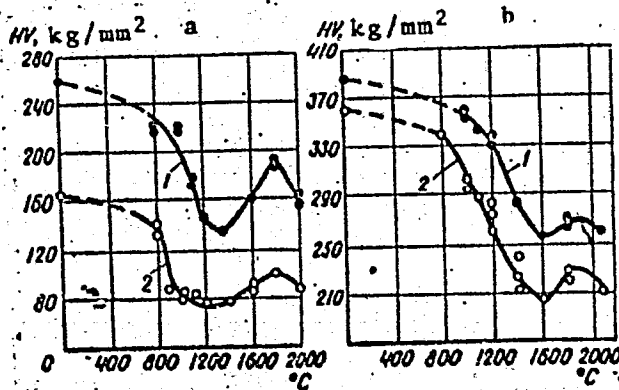


Fig. 1. Dependence of hardness of arc-cast (1) and electron-beam-melted (2) tantalum (a) and tantalum-tungsten alloy (b) upon annealing temperature

Card 4/4

ACC NR: AP6032619

SOURCE CODE: UR/0126/66/022/003/0410/0414

AUTHOR: Gavrilyuk, M. I.; Konstantinov, V. A.

ORG: none

TITLE: Effect of oxygen on recrystallization of tantalum

SOURCE: Fizika metallov i metallovedeniye, v. 22, no. 3, 1966, 410-414

TOPIC TAGS: tantalum, tantalum recrystallization temperature, oxygen contamination, tantalum hardness, metal recrystallization, oxygen impurity, hardness

ABSTRACT: To investigate the effect of oxygen on recrystallization temperature of high-purity tantalum electron-beam melted ingots of 99.362%-pure tantalum containing 0.0007% oxygen were cold forged and rolled into 1.0 mm sheets after which the oxygen content increased to 0.1%. Annealing in air at 500C for 5 or 10 hr followed by homogenizing annealing at 1200C in a vacuum, increased the oxygen content to 0.4 or 0.7% respectively, which was below the limit of oxygen solubility of tantalum at 20C. The sheets were then cold rolled with a reduction of 50% and vacuum annealed at 800 to 2000C for 1 hr. The recrystallization temperature of oxygen-poor and oxygen-rich tantalum as determined by x-ray diffraction pattern examination and by hardness measurements was 1200C regardless of the oxygen content. Annealing at temperatures above 1200C and below 1600C brought about no noticeable changes in hardness. However, annealing at 1800C lowered the hardness in direct proportion to the initial oxygen

Card 1/2

UDC: 669.294:548.53

ACC NR: AP6032619*

content to roughly the same value. Thus, after annealing at 1800C, the oxygen-rich and oxygen-poor tantalum have the same microhardness and also the same lattice parameters. This appears to indicate that the embrittlement of recrystallized tantalum molybdenum, tungsten and chromium is brought about not by interstitial, but by substitutional elements. Orig. art. has: 2 figures.

SUB CODE: 11/ SUBM DATE: 200ct65/ ORIG REF: 008/ OTH REF: 006

Card 2/2

ACC NR: AP7002436 (A) SOURCE CODE: UR/0219/66/000/012/0037/0040

AUTHOR: Gavriilyuk, M.I.; Yershova, V.T.; Konstantinov, V.A/

ORG: none

TITLE: Reaction of tantalum with nitrogen and air

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 12, 1966, 37-40

TOPIC TAGS: metal surface impregnation, tantalum , air, nitrogen

ABSTRACT Vacuum arc-melted ingots of 99.51% pure tantalum were homogenized and rolled into 1 mm thick sheets which were annealed in a vacuum of $1 \cdot 10^{-4}$ mm Hg and then held in a nitrogen atmosphere at 800—1200C for 1.5 or 10 hr or in air at 300—600C for 1—15 hr. The depth of nitrogen penetration into tantalum was found to increase with increasing temperature and duration of the contact of tantalum with nitrogen (see Fig. 1). A

Card 1/3

UDC: 669.294:786'87

ACC NR: AP7002436

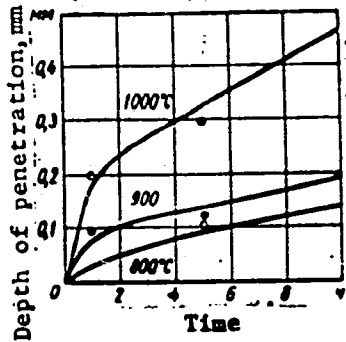


Fig. 1. Temperature and time dependence of the depth of nitrogen penetration into tantalum

particularly sharp increase in the penetration rate was observed at temperatures above 900C. In the reaction of tantalum with air, the increase in metal microhardness and in the depth of air penetration followed a similar pattern. However, the reaction of tantalum with air began at 300C, and the increase in the microhardness of tantalum, in this case, is attributed to the air oxygen. The nitrogen-contaminated surface layer

ACC NR: AP7002436

consisted of four zones: a very thin outer zone of TaN followed by a zone consisting of TaN₂, a zone with a tetragonal lattice (a = 3.314 kX, c = 3.3715 kX, c/a = 1.0175), and a zone with a bcc structure. Vacuum annealing of contaminated tantalum at temperatures up to 1600C brought about a diffusion of nitrogen and oxygen from the surface deep into the metal and metal contamination in the entire volume. The removal of nitrogen and oxygen from tantalum in vacuum began at 1800—2000C. Nitrogen and oxygen in the solid solution strongly inhibited the grain growth of tantalum.

UDC: 669.294:786'87

[MS]

SUB CODE: 11/ SUBM DATE: none/ OTH REF: 001/ ATD PRESS: 5113

Card 3/3

GAVRILYUK, T.V., kand.med.nauk

Administration of strophanthin by electrophoresis and intravenous
drip in diseases of the cardiovascular system. Vop. pt. krovi i
krovoobr. no.5:126-130 '59. (MIRA 15:4)
(CARDIOVASCULAR SYSTEM--DISEASES) (PAPER ELECTROPHORESIS)
(INJECTIONS, INTRAVENOUS) (STROPHANTHIN)

GAVRILYUK, T.V.

Therapeutic action of dionine electrophoresis in suppurative skin diseases. Vop. kur. fizioter. i lech. fiz. kul't. 25 no. 5:408-412 S-0 '60. (MIRA 13:10)

1. Iz kafedry fizioterapii (zav. - prof. N.N. Mishchuk [deceased]) Gosudarstvennogo instituta usovershenstvovaniya vrachey i kafedry fakul'tetskoy terapii (zav. - zaslužhennyi deyatel' nauki prof. V.A. Val'dman) Leningradskogo pediatričeskogo instituta.

(MORPHINE) (ELECTROPHORESIS) (FURUNCLE) (CARBUNCLE)

GAVRILYUK, T.V., kand.med.nauk

Dynamics of blood serum protein fractions in liver, kidney, and
lung diathermy. Vop.pat.krovi i krovoobr. no.6:166-173 '61.
(MIRA 16:3)

(BLOOD PROTEINS) (DIATHERMY)

ACC NR: AP6006420

(A)

SOURCE CODE: UR/0317/65/000/011/0055/0059

AUTHOR: Bazanov, A. (Colonel Reserve, Candidate of Pedagogical Sciences, Docent);
Gavrilyuk, V. (Lieutenant Colonel, Candidate of Pedagogical Sciences, Docent)

22

ORG: None

TITLE: Psychological aspects of driver training

SOURCE: Tekhnika i vooruzheniye, no. 11, 1965, 55-59

TOPIC TAGS: army psychology, psychologic stress, military training, specialized training, training procedure, motor vehicle, reaction rate

ABSTRACT: Military drivers must be trained under simulated conditions in order to meet combat condition requirements since many drivers lose their sense of orientation when driving armored vehicles which are "buttoned up." Special studies of driver reactions show a correlation between attentiveness during training and reliability as a driver. Tests of drivers' ability to quickly orient themselves over strange terrain revealed that over half (17 of 24) could not do so successfully. Special experiments showed that in 68% of the cases, drivers capable of rapid thinking were more effective drivers because of their fast reaction times, but over-reaction is dangerous in drivers. Speed, maneuverability, and driver dependability are determined not only by level of technical training, but by native ability and psychic endurance as well.

SUB CODE: 15, 05/SUBM DATE: None
Card 1/1/10

GAVRILYUK, Y.A.

New electric drive control system with steep characteristics
obtained by dynamic capacitance. Izv. KPI 26:291-304 '57.

(MIRA 11:6)

1. Kafedra elektrifikatsii promyshlennykh predpriyatii Kiyevskego poli-
tehnicheskogo instituta.

(Electric machinery) (Automatic control)

GAV. ILMUK, V.A.

Flower formation in some plants of the southeastern part of the
Chukchi Peninsula. Doct. AN SSSR 137 no.2:448-450 Nr '61.
(MIRA 14:2)

1. Botanicheskiy institut im.V.L.Komarova AN S SR. Predstavleno
akademikom V.K.Sukachevym.
(Chukchi Peninsula—Plants, Flowering of)

GAVRILYUK, V.A.

Duration of the period of fruiting and seed productivity in plants of the southeastern part of the Chukchi Peninsula. Bot. zhur. 46 no.1:90-97 Ja '61. (MIRA 14:3)

1. Botanicheskiy institut im. V.L.Komarova Akademii nauk SSSR, Leningrad.

(Chukchi Peninsula--Seed production)

VIKHIREVA-VASIL'KOVA, V.V.; GAVRILYUK, V.A.; SHAMURIN, V.F.

Aboveground and underground plant mass of some scrub communities
of the Koryak National Area. Probl. Sev. no.8:130-147 '64.

(MIRA 17:11)

1. Botanicheskiy institut imeni Komarova AN SSSR i Laboratoriya
rastitel'nosti Kraynego Severa, Leningrad.

GAVRILYUK, V.A.

Biology of the parasite *Boschniakia rossica* (Cham. et Schlecht.)
B. Fedtsch. Bot. zhur. 50 no.4:523-528 Ap '65.

(MIRA 18:5)

1. Sel'skokhozyaystvennyy institut, Sofiyevka, Cherkasskoy oblasti.

GAVRILYUK, V.I., inzh.

Universal unit for testing vibratory feeders. Mashinostroenie
no.6:92-93 N-D '63. (MIRA 16:12)

Handwritten:
A large arrow points from the word "Hand" on the left towards the words "File" and "Foster" on the right.

RABINOVICH, Avram Nakhimovich, doktor tekhn. nauk; YAKHIMOVICH,
Vladimir Aleksandrovich, inzh.; BOYECHKO, Bogdan
Yulianovich, kand. tekhn. nauk. Primalni uchastiye:
KOBLYUKH, B.F.; GAVRILYUK, V.I.; KAMYSHNYI, N.I., doktor
tekhn. nauk, retsenzent; CHERNIS, N.Kh., inzh., retsenzent

[Automatic vibratory feed mechanisms] Avtomaticheskie zag-
ruzochnye ustroistva vibratsionnogo tipa. Kiev, Tekhnika,
1965. 379 p. (MIRA 18:3)

GAVRILYUK, V.K.

Interaction between the signal systems during simultaneous muscular and mental activity. Vop.psikhol.3 no.1:149-152 Ja-F '57.

(MIRA 10:3)

1. Krasnoznamenny voyenny institut fizicheskoy kul'tury i sporta imeni V.I. Lenina, Leningrad.

(Work) (Movement, Psychology of) (Thought and thinking)

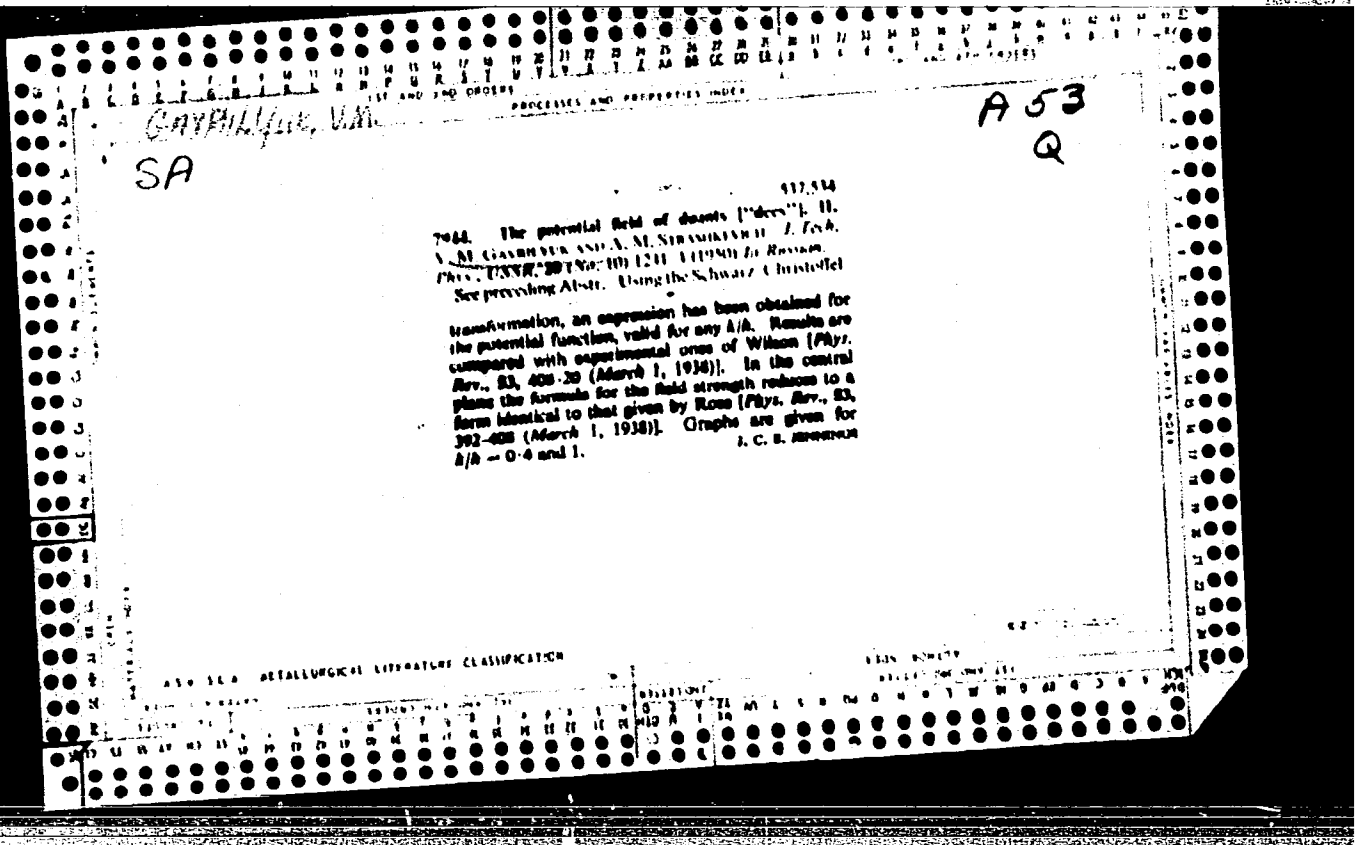
GAVRILYUK, V.K. (Leningrad)

New aid on psychology for military personnel. Vop. psikhol.
no.5:145-147 S-0 '64 (MIRA 18:1)

VAREKHA, Zh.P., inzh.; GAVRILYUK, V.M., inzh.

Using a VG-3 drilling rig with a V-100 rotary-percussion drill
in sinking a vertical shaft. Shakht. stroi. 5 no.8:26-28 Ag '61.
(MIRA 16:7)

1. Normativno-issledovatel'skaya stantsiya No.6, Karaganda.
(Boring machinery)



GAVRILYU, V. I.

"Investigation of the Escape of an Electron from Solid Bodies Covered with Absorber Films of Atoms and Dipolar Molecules;" Cand Phys-Math Sci, Inst of Mathematics, Acad Sci Ukrainian SSR, 11 Dec 54. (IU, 1 Dec 54)

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

GAVRILYUK, V.M.

Effect of barium atom absorption on tungsten electron yield
conditions. Trudy Inst.fiz. AN URSR no.5:87-93 '54.
(Barium) (Tungsten) (Electrons) (MLRA 7:12)

GAVRILYUK, V. M.

USSR/ Physics - Molecular beam

Card 1/1 Pub. 22 - 22/49

Authors : Morgulis, N. D.; Gavrilyuk, V. M.; and Kulik, A. Ye.

Title : Condensation of a molecular beam on a metal surface

Periodical : Dok. AN SSSR 101/3, 479-482, Mar 21, 1955

Abstract : A quantitative experimental study of condensing molecules on metal surfaces is discussed. Special consideration was given to the condensation of strontium oxide molecules on very well milled tungsten bands. The method of marked molecules was used in the studies (a beam of radioactive molecules of isotope Sr ⁸⁹ was used for the marking strontium oxide molecules). The experiments were conducted with the help of a passive platinum evaporator at a temperature of T 1350° K. The density of the molecule beam was about 10¹⁴-10¹⁵ cm⁻² sec⁻¹. The results are presented in the form of diagrams. Ten references: 4 USSR 4 USA; 1 French and 1 British. Graphs.

Institution : The Acad. of Sc., USSR, The Institute of Physics

Presented by : Academician S. A. Vekshinskiy, December 9, 1954

GAVRILYUK, V.M.

"Adsorption Effect of Barium Oxide Dipole Molecules on the Photoemission of an Antimony-Cesium Cathode," by V. M. Gavril-yuk, Institute of Physics, Academy of Science Ukrainian SSR, Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, Vol 20, No 9, Sep 56, p 1066 (abbreviated report; full text published in ZhTF, 25, 2469, 1955)

An attempt is made to control the output work and the photoemission of a Sb-Cs semiconductor cathode by the adsorption of BaO dipole molecules on its surface. It was established that the adsorption of BaO dipole molecules at their optimal concentration produces a drop in the output work of the cathode of 0.1 eV and a rise of the photocurrent by a factor of 1.5. The comparison of these results with the data of B. I. Dyatlovitskaya [ZhTF, 25, 2264 (1955)] concurs with that of G. A. Morozov' [ZhTF, 9, 2012, 2018 (1939)]; and B. I. Dyatlovitskaya's conclusions that the sensitization mechanism of a Sb-Cs cathode with oxygen consists in the formation of cesium oxide dipole molecules on the cathode surface.

Sum 1255

GAVRILYUK, V.M.

Effect of adsorbed films of barium atoms and barium oxide molecules on the electron emission by the metal. Ukr.fiz.zhur. 1
no.1:73-80 '56. (MLRA 9:11)

1. Institut fiziki Akademii nauk URSR.
(Electron emission) (Barium) (Tungsten)

GAVRILYUK, V.M.

No. 9

Influence of adsorbed atomic barium and polar molecular barium oxide films on the work function of tungsten, gold, and germanium. V. M. Gavrilyuk. *Izvest. Akad. Nauk S.S.S.R., Ser. Fiz.* 20:1071-5 (1958); cf. *C.A.* 50, 13597i. — A wedge-shaped film of Ba (from an Al-Ba getter) and BaO (from BaCO₃) was evapd. in a vacuum of 10⁻⁸ mm. In the system Ba-W the work function goes through a min. ($\phi = 1.8$ e.v.) at a concn. $n = 3.5 \times 10^{14}$ cm.⁻² and then in-

phys. L

creases again. Adsorption of BaO on W decreases the work function to 2 e.v. at $n = 1 \times 10^{14}$ cm.⁻². Heating to ~600° decreases ϕ still further with a min. ~1.0 e.v. at $n \approx 1 \times 10^{14}$ cm.⁻². Ba on Au does not have a min. in ϕ which is equal to that of Ba (2.4 e.v.). It is higher at ~500° due to the formation of a Ba-Au compd., which explains the antiemission properties of Au in grids. BaO on Au has $\phi = 3.7$ e.v. and, after heating to 900°, ϕ drops again to 1.0 e.v. Pure Ge was evapd. on a metallic substrate until ϕ was the same as for bulk metal (4.8-4.9 e.v.). The thickness of the corresponding layer was measured, by using radioactive Ge⁶⁸; as 2.3×10^{-4} cm. Ba on Ge decreases ϕ to 2.4 e.v. without a min. Adsorption of BaO on Ge decreases ϕ to 3.6 e.v. S. Paksver

GAVRILYUK, VM

408

5188. EFFECT OF AN ADSORBED FILM OF DIPOLE MOLECULES ON THE ELECTRON WORK FUNCTION.

N.D. Morgulis and V.M. Gavriilyuk. Zh. eksper. teor. fiz., Vol. 30, No. 1, 140-59 (1956). In Russian.

Changes in the work function of tungsten have been studied under conditions of high vacuum when an accurately dosed film of varying thickness of caesium chloride molecules is precipitated on the metal; a fraction of the caesium atoms consisted of radioactive Cs¹³⁴ which permitted the density of the molecules in the film to be determined with a sufficient degree of accuracy by its activity. It is shown that films of CsCl molecules possessing intrinsic dipole moments decrease the work function of tungsten; this decrease, however, is much smaller than that observed in the caesium atom film. These systems are compared with the data cited in the literature for BaO-W and Ba-W systems. Some possibilities of theoretical interpretation of the results obtained are discussed.

Institut fiziki Akademii nauk Ukrainской SSR.

GAVRILYUK, V. M.

The effect of an adsorbed film of dipole molecules on the
work function of metals. N. D. Morgulis and V. M. Gavril-
yuk. *Soviet Phys., JETP* 3, 159-67 (1956) (English trans-
lation). See *C.A.* 30, 105184. *phys* 2

Gavriluk, V.M.

7
Influence of adsorbed atomic hydrogen and polar molecular
barium oxide films on the work function of tungsten, gold,
and germanium. *V. M. Gavriluk, Bell. Acad. Sci.*
U.S.S.R., Phys. Ser. 20, 801-71 (1966) (English transla-
tion).—See C.A. 51, 3272i. B. M. R.

4
YE4j

6/11

GAVRILYUK, V.M.

H-1

Category : USSR/Electronics - General Problems

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 1631

Author : Gavriilyuk, V.M.

Title : Conference on Cathode Electronics

Orig Pub : Uspekhi fiz. nauk, 1956, 59, No 2, 363-374

Abstract : Contents of the papers delivered at the Conference on Cathode Electronics, held in Kiev on 25-30 November 1955. See also Abstract No 1632.

TRANS - U-3,053,082, 12 Dec 1956

Card : 1/1

GAVRILYUK, V.M.

109-11-8/8

AUTHORS: Morgulis, N.D. and Gavriilyuk, V.M.

TITLE: 40 Years of Soviet Cathode Electronics (Sorok let sovetskoy katodnoy elektroniki)

PERIODICAL: Radiotekhnika i Elektronika, 1957, Vol. II, No.11, pp. 1451 - 1467 (USSR).

ABSTRACT: An attempt is made by the authors to give a brief summary of the most important Soviet works and achievements in this field. The first electron tubes were produced in the Soviet Union in 1918 by M.A. Bonch-Bruyevich, who initiated a small-scale production of receiving tubes. The first investigations of the cathodes were carried out by several workers a few years later. In 1920, P.I. Lukinskiy and N.N. Semenov carried out first investigations of the photo effect. At the beginning of the Thirties, the work on cathode electronics was primarily carried out in a laboratory in Leningrad attached to the factory "Svetlana" and in a laboratory in Moscow. The Moscow laboratory was directed by P.V. Timofeyev and it was primarily interested in the investigation of the photo effect and the secondary emission. At about the same time, I.Ye. Tamm and S.P. Shubin proposed a theory of the photo effect which is valid up to the present day. The photo effect was also investigated quantitatively on Ag-Cs cathodes and on Sb-Cs cathodes.

Card1/3

40 Years of Soviet Cathode Electronics.

109-11-8/8

In the field of secondary emission, the following problems were investigated: velocity distribution of the secondary electrons, emission of alkali-haloid compounds, emission of thin, transparent films, emission of dielectrics, and Sb-Cs cathodes. A new era in the development of the cathode electronics dates from July, 1944, when a conference on the problem took place in Moscow. During the conference, a number of important papers were read by various workers in this field. A rapid development of the electronics began in 1951, when a conference devoted to cathode electronics took place in Kiev. During the conference, a large number of papers were read on the following problems: electron microscopy, pulse emission, cathode sputtering, secondary emission, Sb-Cs cathodes, Pb-Cs cathodes and secondary ion-electron emission. Since that time, a large number of technical papers have been published in which the following problems have been considered: determination of the vapour pressure of barium, measurement of the semi-conductor layer of the oxide cathodes and their work functions, mono-layer cathode systems, investigation of the natural semi-conductors such as PbS and CdS, special investigation of the physics of secondary electron emission, ion

Card2/3

109-11-8/8

40 Years of Soviet Cathode Electronics.

bombardment of cathodes, investigation of the structure of metals by means of electron microscopy and investigation of gas discharges.
There are 174 Slavic references.

AVAILABLE: Library of Congress
Card 3/3

Gavrilyuk, V.M.

AUTHORS: Vedula, Yu.S. and Gavrilyuk, V.M.

109-12-7/15

TITLE: Thermo-chemical Reduction of Barium Oxide by Various Activators (Termokhimicheskoye vosstanovleniye bariya iz ego okisi razlichnymi aktivatorami)

PERIODICAL: Radiotekhnika i Elektronika, 1957, Vol.II, No.12, pp. 1519 - 1524 (USSR)

ABSTRACT: Understanding of the mechanism of the operation of thermionic cathodes requires the knowledge of the value of the saturated barium vapour pressure in the presence of BaO and the activators. This work aimed at determining the pressure and its temperature dependence. The experiments were carried out on a special tube which is shown in Fig. 1. The tube consisted of: 1) a container; 2) a heater; 3) a tungsten ribbon; 4) an electron gun, and 5) an Alpert-type ionisation vacuum gauge. The investigated reaction was taking place in the container, which consisted of two hollow cylinders. The container had an aperture of about 0.5 mm at its lower end. The stream of barium atoms ejected from the aperture of the container was collected by the tungsten ribbon. The experimental results of an investigation of the reactions of $BaCO_3$ and BaO, where BaO is a product of the decomposition of $BaCO_3$, are

Card1/2

Thermo-chemical Reduction of Barium Oxide by Various Activators. 109-12-7/15

illustrated in Figs. 2, 3, 4, 5 and 6. Fig. 3 shows the barium vapour pressure as a function of temperature for a cathode with tungsten activator (the tungsten was in the form of a very fine powder). A similar curve for the barium vapour pressure of a system with silicon activator is given in Fig. 4, while Figs. 5 and 6 show the pressure for tantalum and titanium activators, respectively. The results are additionally summarised in Table 1, p.1524. From the data obtained, it follows that, at 1 600 °K, molybdenum has the lowest reducing properties and it is followed by silicon, tungsten and tantalum; at operating temperatures of about 1 300 °K, the reducing properties are the lowest in molybdenum and the highest in titanium. The authors thank N.D. Morgulis for his constant attention and help. There are 6 figures, 1 table and 19 references, 8 of which are Slavic.

ASSOCIATION: Physics Institute AS Ukrainian SSR, Kiyev
(Institut fiziki AN USSR, S. Kiyev)
SUBMITTED: May 8, 1957.
AVAILABLE: Library of Congress
Card 2/2

SOV/120-59-2-24/50

AUTHORS: Gavriilyuk, V.M., and Kucherov, Ya.M.

TITLE: An Ionisation Gauge for the Measurement of Pressures in the Range 10^{-4} to 10^{-10} mm Hg (Ionizatsionnyy vakuummeter dlya izmereniya davleniy 10^{-4} - 10^{-10} mm rt. st.)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 2, pp 83-85 (USSR)

ABSTRACT: The manometric valve is shown in Fig 2 and is a modified form of the manometer described by Bayard and Alpert in Ref 1. The cathode of the valve is a tungsten wire 110 mm long and 0.1 mm in diameter. Two such cathodes are available, one of which is a spare. The grid of the valve is 30 mm in diameter and 50 mm long. It consists of a tungsten wire 0.4 mm in diameter. The grid is so constructed that it can be heated by an electrical current. The grid is isolated from the metallic supports by tubular ceramic insulators. The ceramic tubes can be heated up to 900 °C and can thus be reliably outgassed. The ion collector is a tungsten wire 50 mm long and 0.2 mm in diameter. The valve turned out to be more sensitive than the valve described by Bayard and Alpert. The valve constant is 0.15 amp/mm Hg

Card 1/2

SOV/120-59-2-24/50

An Ionisation Gauge for the Measurement of Pressure in the Range
10⁻⁴ - 10⁻¹⁰ mm Hg

at 5 mamp electron current. The valve may be used to measure pressures right down to 10⁻¹⁰ mm. The dependence of the ion current at the collector on the grid voltage is shown in Fig 3. The ion current at the collector, at a grid voltage of 100 volts, is greater than the photo-current from the collector even at a pressure of 5 x 10⁻¹¹ mm Hg. The electronic circuit used with the instrument is shown in Fig 4. The main part of this is a two stage d.c. amplifier using the 2E2P electrometer valve. N.D. Morgulis and G.F. Kobenchuk are thanked for interest and help respectively.

Card 2/2

There are 4 figures and 2 English references.

ASSOCIATION: Institut fiziki AN USSR (Institute of Physics of the Academy of Sciences of the Ukr. SSR)

SUBMITTED: June 9, 1958

GAVRILYUK, V.M. [Havryliuk, V.M.]

Adsorption of barium atoms and barium oxide molecules on tungsten. Part 2. Ukr.fiz.zhur. 4 no.6:734-749 M-D '59. (MIRA 14:10)

1. Institut fiziki AN USSR.
(Barium) (Barium oxide) (Tungsten)

VEDULA, Yu.S.; GAVRILYUK, V.M. [Havryliuk, V.M.]

Adsorption of atoms of barium on tungsten covered with an adsorbed film of oxygen. Ukr. fiz. zhur. 5 no.6:816-833 N-D '60.

(MIRA 14:3)

1. Institut fiziki AN USSR.
(Adsorption)

GAVRILYUK, V.M. [Havryliuk, V.M.]; MEDVEDEV, V.K. [Medvediev, V.K.]

Electron emission from tungsten covered with barium in an
oxygen atmosphere. Ukr. fiz. zhur. 5 no.6:858-860 N-D '60.
(MIRA 14:3)

1. Institut fiziki AN USSR.
(Electrons--Emission) (Tungsten)

GAVRILYUK, V.M. [Havryliuk, V.M.]; MEDVEDEV, V.K. [Medvediev, V.K.]

Adsorption of carbon monoxide on tungsten. Ukr. fiz. zhur. 5
no.6:860-862 N-D '60. (MIRA 14:3)

1. Institut fiziki AN USSR.
(Carbon monoxide) (Tungsten) (Adsorption)

54400

31089
S/195/61/002/004/004/008
E111/E552

AUTHOR: Gavrilyuk, V M.

TITLE: Reaction of electro-negative atoms or molecules adsorbed on the surface of a metal

PERIODICAL: Kinetika i kataliz, v.2, no.4, 1961, 497-506

TEXT: The author has previously proposed (Ref.1: Ukr. fiz. zh. 4, 734, 1959) a theory for the reaction of adsorbed atoms or molecules on a metal surface. This was experimentally verified only for the electro-positive atoms of barium and caesium. In the present work the author proposes a more refined version of part of the theory and compares theory with experiment for the adsorption of oxygen, hydrogen, carbon monoxide and nitrogen on metals. The author's ideas consist essentially of the following. Adsorbed atoms are ionized to an extent γ and carry a positive or negative charge γe . A dipole P_0 is produced with polarizability β . The ion is also polarized by the field of the electrical image and all the other dipoles, giving equal dipoles P_1 and P_2 with polarizability α . The normal component of the effective electrical field E acting at the site of the ion for a monomolecular layer can be found by summing the fields of all the dipoles P_0 , P_1 and P_2 . This
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treatment applies if the length of the dipoles is less than the distance between them, which holds even in a monomolecular layer. Without neglecting, as was done in Ref. 1, the E^2 term the equation obtained is

$$E = \frac{C_0}{a^3} (P_0^0 - BE) - \frac{C_1}{a^3} (P_1^0 + aE) + \frac{\alpha + \beta + 3\beta \frac{P_1^0}{P_0^0}}{4d_0^3} E - \frac{3\alpha + \beta}{4d_0^3 P_0^0} E^2 \quad (3)$$

where $a = (n_1)^{-1/2} \times x$ is the lattice constant of the monolayer. P_0^0 and P_1^0 are the values of P_0 and P_1 when the degree of filling of the layer θ is zero; $d_0 = d_{00}(1 - BE_0/P_{00})$, where d_{00} is approximately equal to the ionic radius in the gas phase and $P_{00} = 2\gamma e d_{00}$. C_0 and C_1 are functions of d_0/a described in Ref. 1.

[Abstractor's note: x in the Russian text the symbol γ here is slightly different from that used previously; $\times x$ - not defined but probably number of molecules per cm^2 .]

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For a given degree of filling θ and localized adsorption the equation

$$E(\theta) = \frac{2\epsilon(\theta)}{1 - \left\{ 1 - \frac{3.03(C_o P_o^o - C P_1^o)\theta}{a^3 f(1 + b\theta) \frac{2}{a} \frac{1}{d_o}} \right\}^{1/2}} \quad (6)$$

is obtained. Here

$$\epsilon(\theta) = \frac{(C_o P_o^o - C P_1^o)\theta}{a^3 f(1 + b\theta)} \quad (5)$$

is the effective field and

$$b = \frac{C\alpha + C_o \beta}{a^3 f} \quad \text{and} \quad f = 1$$



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The author obtains the following expression for the change in the heat of adsorption $\Delta q_1(\theta)$:

$$\Delta q_1(\theta) = \frac{(p_0^n - 2p_1^n)(C_0 - p_0^n) - (C_1^n)\theta(2 - \theta)}{4a_3 f(1 - b\theta)^2} \cdot \theta \cdot \{1 - \chi(\theta)\} [1 - \theta] \cdot \theta$$

Here $\chi(\theta) \ll 1$. The additional change due to short range interaction $\Delta q_2(\theta)$ is given by

$$\Delta q_2(\theta) = \frac{ZV}{2} \left\{ \frac{1 - \theta}{[1 - (1 - \theta)^2]^{1/2}} - \frac{\theta}{[1 - (1 - \theta)^2]^{3/2}} \right\}$$

The total change is the sum of these in the expressions for $\Delta q(\theta)^*$

$$\Delta q(\theta) = 4\pi n_1 \theta \left\{ \frac{p_0^n}{2} - p_1^n - \left(\dots \right) \theta(1 - \theta) \right\}$$

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the function $F(\theta) \approx \text{const}$ and differs little from unity. This expression, too, is affected when the E^2 terms are not neglected. The author compares $\Delta\phi(\theta)$ and $\delta q_1(\theta)$ calculated from his equation with reported values (e.g. his own work with Yu. S. Vedula (Ref 9 Ukr. fiz. zh., 5, 816, 1960)) for adsorption of oxygen and carbon monoxide on tungsten and of hydrogen and nitrogen on a variety of metals including tungsten. His conclusions fall into two sections. Firstly, for the adsorption of oxygen, carbon monoxide and nitrogen on tungsten. Here the main effect is short-range interaction of adsorbed atoms probably due to overlapping of electron shells when they approach to a distance less than the average lattice constant for the mono-layer. The convex nature of curves of $q(\theta)$ is a result of this, while the absence of electrostatic interaction leads to the $\Delta\phi(\theta)$ relation being linear. Secondly, for the adsorption of hydrogen on tungsten, tantalum and nickel. At low degrees of filling ($\theta \leq 0.6$) long-range electrostatic interaction predominates here, and this leads to the $q(\theta)$ curve being concave in the range. When $\theta > 0.6$ short-range interaction predominates and the curve is convex. The total effect is to give an S-shaped

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curve for the relation between heat of adsorption and degree of filling. The existence of electrostatic long-range interaction leads to the $\Delta_{\text{ad}}(\theta)$ relation being non-linear. * N. D. Morgulis and A. G. Naumovets are mentioned for their contributions in this field. There are 5 figures and 22 references. 5 Soviet bloc, 4 Russian translations from non-Soviet-bloc publications and 13 non-Soviet-bloc. The English-language references read as follows: Ref 7. J. Eisinger, J Chem Phys., 50, 412, 1959; Ref 14. J. Eisinger, J Chem Phys., 29, 1154, 1958; Ref 18. J. Eisinger, J Chem Phys., 27, 1206, 1957; Ref 20. J. Eisinger, J Chem Phys., 28, 165, 1958.

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AUTHOR: Gavrilyuk, V. M.

TITLE: Problem of condensation (adhesion) of gas molecules during their chemisorption on a metal surface

PERIODICAL: Akademiya nauk SSSR Doklady, v. 141, no. 5, 1961, p. 24-25

TEXT: Proceeding from the papers Refs. 1 - 3 (see below) the dependence of the condensation coefficient α on the concentration of adsorbed atoms or molecules is explained. Basing on his theoretical study (Ukr. fiz. zhurn. 4, 734 (1959)), the author assumes that formation of an electron bond between gas molecule and metal requires a time which is longer than the time of collision. Chemisorption with the condensation coefficient α_{ch} is preceded by physical adsorption having a condensation coefficient α_{ph} .

In experiments only the apparent condensation coefficient is measured: $\tilde{\alpha}_{ch} = d(n - n_{ev})/dN = dn_{ch}/dN$. Here, n is the concentration of molecules adsorbed, n_{ev} the number of molecules evaporated during the same period, n_{ch} the number of chemisorbed molecules, and N the number of molecules.
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colliding with the metal. If a molecular flux dN/dt impinges on the surface the following holds for the change in concentration of physically adsorbed molecules: $dn_{ph}/dt = \alpha_{ph} dN/dt - n_{ph} a \exp(-q_{ph}/kT) - n_{pr} b \exp(-\epsilon/kT)$

(2). The second and third terms of the right-hand side of Eq (2) correspond to the flux of evaporating, physically adsorbed molecules and to the flux of molecules passing over from the physically adsorbed to the chemisorbed state, respectively. a and b are the ratios of distribution functions of the intermediate complex and of the adsorbed molecule. q_{ph} is

the heat of physical adsorption, ϵ is the activation energy of the transition from the physically adsorbed to the chemisorbed state. The solution of Eq (2) for $T \neq 0$ yields: $n_{ph} = (\alpha_{ph} dN/dt) / [a \exp(-q_{ph}/kT) + b \exp(-\epsilon/kT)]$

(3). For the change in concentration of chemisorbed molecules at hold: $dn_{ch}/dt = n_{ph} b \exp(-\epsilon/kT) - n_{ch} a_{ch} \exp(-q_{ch}/kT) - a_{ch}$. Here a_{ch} is the rate of chemisorption, $a_{ch} = a$ but only for desorption from the chemisorbed

state. The second term of the right-hand side of Eq.(3) equals the flux of evaporating, chemisorbed molecules. Substitution of Eq (3) into Eq (2) yields (without consideration of evaporation)

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$\alpha_{ch} = d(n_{ch} - n_{ev})/dN = \alpha_{ph} / \left\{ (a/b) \exp[-(q_{ph} - \epsilon)/kT] + 1 \right\}$ (5), and for the apparent condensation coefficient $\tilde{\alpha}_{ch}$ (taking evaporation into account):

$$\tilde{\alpha}_x = \frac{dn_x}{dN} = \frac{\alpha_\phi}{\frac{a}{b} e^{-(q_\phi - \epsilon)/kT} + 1} - \frac{n_x a_x e^{-q_x/kT}}{n_x dN/dt} \quad (6).$$

($\tilde{\alpha}_x = \tilde{\alpha}_{ch}$; $\alpha_\phi = \alpha_{ph}$; $n_x = n_{ch}$; $a_x = a_{ch}$; $q_\phi = q_{ph}$; $q_x = q_{ch}$). The second term of the right-hand side of Eq.(6) explains the decrease of α_{ch} owing to evaporation with increasing n_{ch} . The apparent average condensation coefficient \tilde{K}_{ch} equals

$$\tilde{K}_x = \frac{1}{n_x} \int_0^{n_x} \tilde{\alpha}_x dn_x = \frac{\alpha_\phi}{\frac{a}{b} e^{-(q_\phi - \epsilon)/kT} + 1} - \frac{a_x}{n_x dN/dt} \int_0^{n_x} n_x e^{-q_x/kT} \quad (7).$$

($\tilde{K}_x = \tilde{K}_{ch}$). From Eq.(5) it follows that $\alpha_{ch} < \alpha_{ph}$. q_{ch} is a function of n_{ch} and considerably decreases with increasing n_{ch} owing to interaction of
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