MASHKOVA, Ye.S.; MOLCHANOV, V.A.

Anisotropy of the coefficient of ion-electron emission from copper single crystals. Zhur. tekh. fiz. 35 no.3:575-576 Mr '65. (MIRA 18:6)

L 60358-65 EWT(1)/EWT(m)/EPA(sp)-2/EPF(c)/EPF(n)-2/EPA(w)-2/EWP(t)/EWP(b)
Pr-4/Pa-4/Pab/Pu-4 IJP(c) JD/AT

ACCESSION NR: AP5018316 UR/0057/65/035/007/1321/1323

38
36
8

AUTHOR: Mashkova, Ye. S.; Molchanov, V. A.

TITLE: Concerning angular regularities in the small angle scattering of inert gas ions

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 7, 1965, 1321-1323

TOPIC TAGS: ion scattering, small angle scattering, argon, neon, copper

ABSTRACT: The authors have investigated the scattering of 30 keV A^+ and Ne^+ ions from a polycrystalline copper surface at scattering angles from 5 to 28°, employing as a detector an electrostatic analyzer that has been described elsewhere (V.A.Molchanov and V.Soshka, DAN SSSR, 155, 70, 1964). The investigation was undertaken to obviate possible criticism of their earlier work (DAN SSSR, 146, 558, 1962; Vestn. MGU, ser. fiz.-astr., No.6, 13, 1963) in which ions that were neutralized in the scattering were detected with a secondary electron emission instrument, although they have previously shown (FTT, 7, 619, 1965) that the energy dependence of the secondary emission coefficient and fast sputtered target atoms could not have given rise to significant errors. The scattered ion spectra consisted of narrow peaks corresponding to singly, doubly, and triply

Card 1/2

L 60598-65

ACCESSION NR: AP5018316

2

charged ions. The angular dependence of the intensity of the singly charged ion peak agreed with that obtained in the previous work for ions that were neutralized in the collision. The energies of the scattered ions were close to the energy expected for an ion that had undergone a single collision with a target atom. The number of ions that increased their charge in the scattering was an order of magnitude less than the number of those that were scattered without change of charge, and the number of sputtered target atoms that became ionized was small compared with the number of ions that were scattered with loss of charge. "The authors thank N.V.Fedorenko for a discussion at the Third Conference on Atomic Collisions of scattering of ions by solids". Orig. art. has: 2 figures.

ASSOCIATION: none

SUBMITTED: 11Oct64 ENCL: 00 SUB CODE: NP, SS

NO REF SOV: 005 OTHER: 001

L 65060-65 EWT(1)/T IJP(c) GG

ACCESSION NR: AP5010829 UR/0020/65/161/004/0813/0816

AUTHOR: Mashkova, Ye. S.; Molchanov, V. A.; Soshka, V.

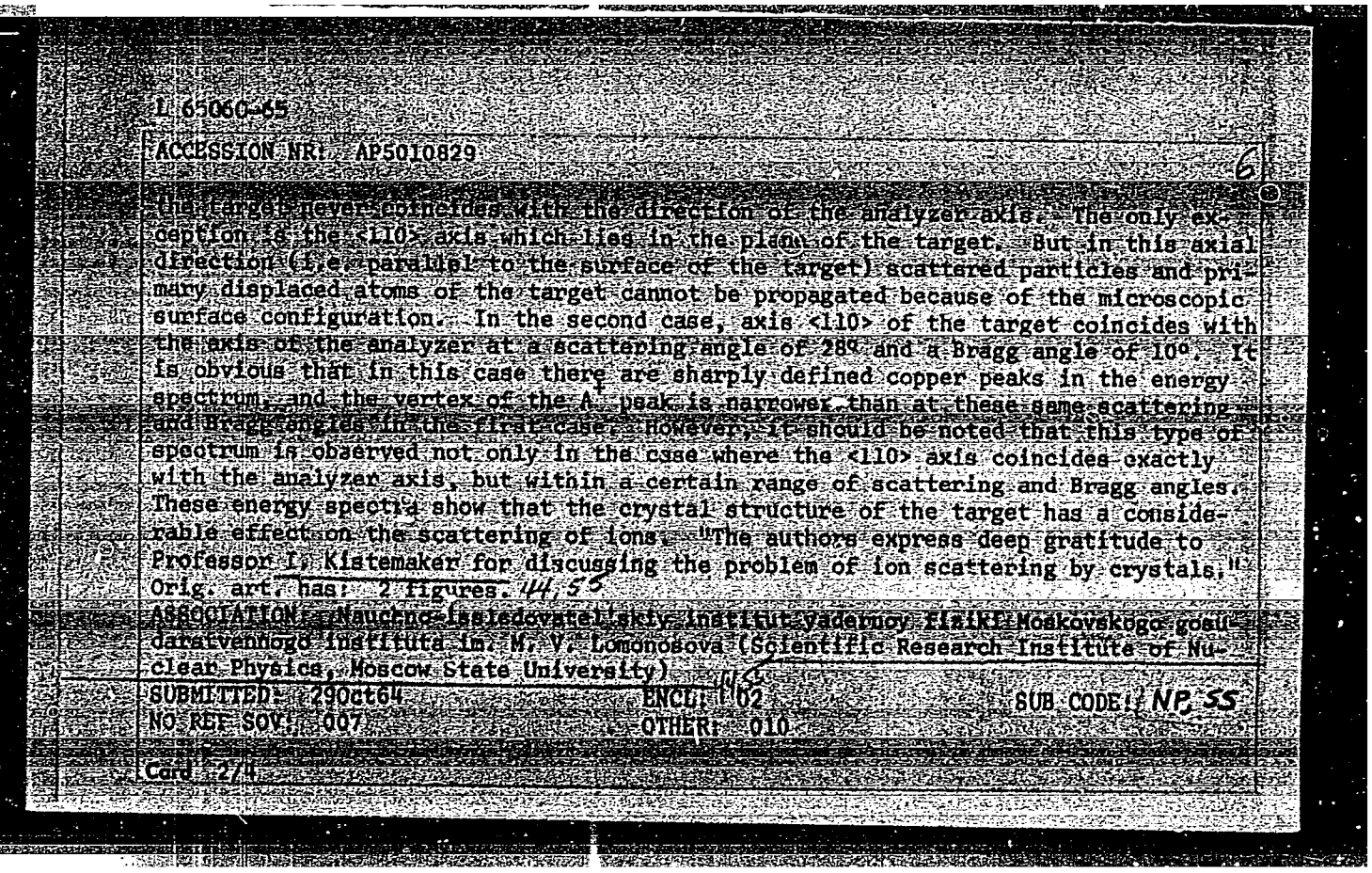
TITLE: The effect which the crystal structure of the target has on the energy spectra of scattered ions

SOURCE: AN SSSR. Doklady, v. 161, no. 4, 1965, 813-816

TOPIC TAGS: particle scattering, copper, irradiation, ion beam, particle spectrum

ABSTRACT: The ordering of atoms in the target has a considerable effect on many processes which take place when the surfaces of solids are irradiated by ion beams. For this reason the authors studied the effect which the crystal structure of the target has on the energy spectra of scattered ions. Copper crystal targets with various orientations were irradiated with singly charged 30 kev argon ions. The targets and analyzer were rotated around axis <110> lying in the plane of the target. The energy spectra of ions scattered by the (100) face of the crystal are shown in fig. 1 of the Enclosure. Fig. 2 of the Enclosure shows the energy spectra of the ions when the shear plane of the target was at an angle of 18° with crystallographic plane (100). The difference between these spectra is explained. In the first case (irradiation of face (100)), the main crystallographic axis of

Card 1/4



L 65060-65

ACCESSION NR: AP5010829

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The target never coincides with the direction of the analyzer axis. The only exception is the <110> axis which lies in the plane of the target. But in this axial direction (i.e. parallel to the surface of the target) scattered particles and primary displaced atoms of the target cannot be propagated because of the microscopic surface configuration. In the second case, axis <110> of the target coincides with the axis of the analyzer at a scattering angle of 28° and a Bragg angle of 10°. It is obvious that in this case there are sharply defined copper peaks in the energy spectrum, and the vertex of the A peak is narrower than at these same scattering and Bragg angles in the first case. However, it should be noted that this type of spectrum is observed not only in the case where the <110> axis coincides exactly with the analyzer axis, but within a certain range of scattering and Bragg angles. These energy spectra show that the crystal structure of the target has a considerable effect on the scattering of ions. "The authors express deep gratitude to Professor I. Kistemaker for discussing the problem of ion scattering by crystals." Orig. art. has: 2 figures. 4,55

ASSOCIATION: Nauchno-issledovatel'skiy institut yadernoy fiziki Moskovskogo gosudarstvennogo instituta im. M. V. Lomonosova (Scientific Research Institute of Nuclear Physics, Moscow State University) 44,55

SUBMITTED: 29Oct64 ENCL: 02 SUB CODE: NP, SS

NO REF SOV: 007 OTHER: 010

Card 2/4

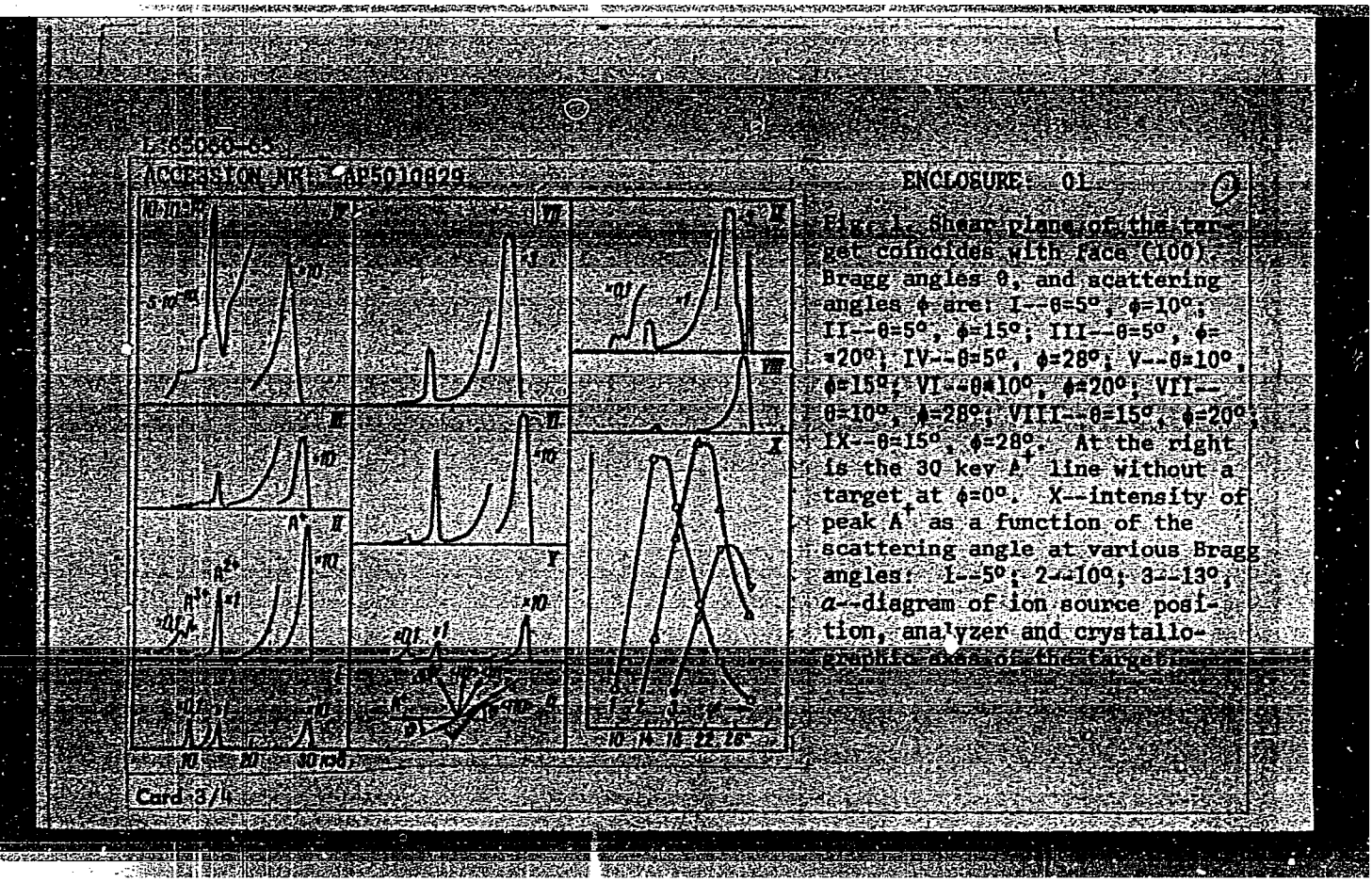

Fig. 1. Shear plane of the target coincides with face (100). Bragg angles θ, and scattering angles ϕ are: I--θ=5°, ϕ=10°; II--θ=5°, ϕ=15°; III--θ=5°, ϕ=20°; IV--θ=5°, ϕ=28°; V--θ=10°, ϕ=15°; VI--θ=10°, ϕ=20°; VII--θ=10°, ϕ=28°; VIII--θ=15°, ϕ=20°; IX--θ=15°, ϕ=28°. At the right is the 30 kev A^+ line without a target at ϕ=0°. X--intensity of peak A^+ as a function of the scattering angle at various Bragg angles: 1--5°; 2--10°; 3--13°; a--diagram of ion source position, analyzer and crystallographic axes of the target.

L 65060-65

ACCESSION NR: AP5010829 ENCLOSURE: 02

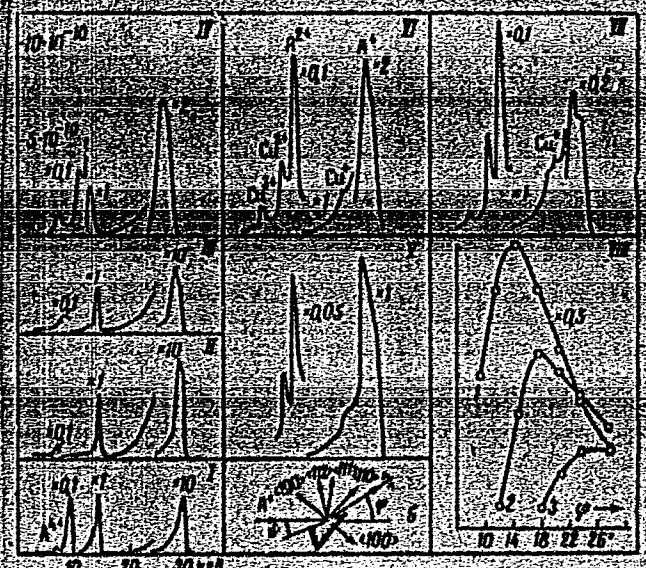

Fig. 2. Shear plane of the target at an angle of 18° to face (100): I--θ=5°, ϕ=10°; II--θ=5°, ϕ=15°; III--θ=5°, ϕ=20°; IV--θ=5°, ϕ=28°; V--θ=20°, ϕ=28°; VI--θ=10°, ϕ=28°; VII--θ=15°, ϕ=28°; VIII--intensity of A⁺ peak as a function of scattering angle at various Bragg angles: 1--5°; 2--10°; 3--15°; b--positions of the ion beam, analyzer and crystallographic axes of the target.

Card 2/2

L 42306-66 EWT(m)/T/EWP(t)/ETI IJP(c) JD

ACC NR: AP6018472 SOURCE CODE: UR/0181/66/008/005/1517/1521

AUTHOR: Mashkova, Ye. S.; Molchanov, V. A.

ORG: Moscow State University im. M. V. Lomonosov (Moskovskiy gosudarstvennyy universitet)

TITLE: Ion-crystal scattering

SOURCE: Fizika tverdogo tela, v. 8, no. 5, 1966, 1517-1521

TOPIC TAGS: particle scatter, coulomb scatter, crystal optic property

ABSTRACT: In earlier articles, the authors showed that many mechanisms of ion-solid interface interactions allow a simple quantitative interpretation if the Coulomb-dependent predominant small-angle particle scattering interaction is taken into consideration. In this paper, the authors show that the application of the earlier derived concepts to the scattering of ions by single crystals makes it possible to explain some other mechanisms being observed. The authors present results of an investigation of the power spectra during the scattering of inert gas ions with energies of 25 — 30 kev by facets (100) and (114) of a copper crystal. The results obtained show that during the scattering of ions by crystals, under certain conditions in the

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L 42306-66
ACC NR: AP6015472

scattered beam, ions which have undergone two-fold scattering predominate. It is also noted that the extremely idealized model of the mechanism presents a quantitatively correct representation of the mechanisms observed. Yu. V. Martynenko performed some of the evaluations. Orig. art. has: 5 figures.

SUB CODE: 20/ SUBM DATE: 21Oct65/ ORIG REF: 010/ OTH REF: 007

Card 2/2

L 36318-66

ACC NR: AP6015783 (A,N) SOURCE CODE: UR/0048/66/030/005/0854/0856

AUTHOR: Mashkova, Ye.S; Molchanov, V.A.

ORG: Scientific Research Institute of Nuclear Physics, Moscow State University im. M.V.Lomonosov (Nauchno-issledovatel'skiy institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta)

TITLE: Ion scattering by crystals /Report, Twelfth All-Union Conference on the Physical Bases of Cathode Electronics held in Leningrad 22-26 October 1965/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 30, no. 5, 1966, 854-856

TOPIC TAGS: ion scattering, multiple scattering, copper, neon argon, krypton, ion energy

ABSTRACT: The energy spectra of initially monoenergetic Ne^+, Ar^+, and Kr^+ ions scattered in the (110) plane of a copper crystal from (100 and (114) faces have been recorded in an investigation of multiple scattering of ions from crystals. The monoenergetic ion beams were produced with the mass monochromator described elsewhere by V.A. Molchanov and V.G.Tel'kovskiy (Vestn. Mosk. un-ta. Ser. fiz.-astron., No. 1, 22 (1961)); data are presented for scattering of 25 keV Kr^+ and 30 keV Ar^+ and Ne^+ ions. The ions scattered through a predetermined angle from the converging monoenergetic beam (convergence angle, 2°) by the crystal face entered the 1 x 4 mm slit (located 16.5 cm from the scattering crystal) of a 10 cm radius 180° electrostatic energy analyzer (energy

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L 36318-66

ACC NR: AP6015783

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resolution, 1 %) and were recorded in a Faraday cup. The presented spectra, recorded at grazing angles from 10 to 17° and scattering angles from 27.5 to 50°, showed that the contribution of doubly scattered ions to the scattered beam increased with decreasing distance between the scattering atoms (i.e., in passing from the (114) to the (100) scattering faces) and with increasing atomic number of the scattered ion. Under some conditions doubly scattered ions predominated in the scattered beam. Calculations of Yu.V.Martynenko (Fiz. tverdogo tela, 6, 2003 (1964)) indicated that the probability of of double scattering should increase with increasing atomic number of the scattered ion and the scattering atom, and with decreasing energy, distance between scattering atoms, and scattering angle. The present measurements are in good agreement with these conclusions. The authors thank L.A.Artsimovich for discussing the organization of the work and for assistance, and Yu.V.Martynenko and E.C.Parilis for discussions. Orig. art. has: 1 formula and 2 figures.

SUB CODE: 20/ SUBM DATE: 00/ ORIG REF: 003/ OTH REF: 002

Card 2/2

KOGAN, Natan L'vovich; MASHKOVETS, Boris Mikhaylovich; TSIBIZOV, Konstantin Nikolayevich; KISUN'KO, G.V., retsenzent; YEMELIN, B.F., kand. tekhn. nauk, nauchnyy red.; ODOYEVTSEVA, I.G., red.; KONTOROVICH, A.I., tekhn. red.

[Complex wave guide systems]Slozhnye volnovodnye sistemy. Leningrad, Sudpromgiz, 1963. 355 p. (MIRA 16:4)

1. Chlen-korrespondent Akademii nauk SSSR (for Kisun'ko).
(Wave guides)

FEYGIN, M.M.; MASHKOVICH, A.M.; LOSKUTOV, V.A.; OSINEYKH, V.Ya.

Four-position device for removing burrs from plastic parts. (MIRA 16:2)
Mashinostroitel' no.1:25 Ja '63.
(Grinding machines)

MASHKOVICH, M.I.

Apparatus for determining the heat capacity of liquid products.
Gidrolis. i lesokhim. prom. 16 no.2:[illegible] '63.
(MIRA 16:6)

1. Tsentral'nyy nauchno-issledovatel'skiy i proyektnyy institut lesokhimicheskoy promyshlennosti.
(Liquids—Thermal properties)
(Calorimetry)

MASHKOVICH, A. F.

MASHKOVICH, A. F. -- "SOME QUESTIONS OF DETERMINING TOLERANCES OF HIGH-PRECISION OPTICO-MECHANICAL INSTRUMENTS, INTENDED FOR THE ACCOMPLISHMENT OF CENTRAL DESIGNING." SUB 16 MY 52, MOSCOW INST OF ENGINEERS OF GEODESY, ARIAL PHOTOGRAPHY, AND CARTOGRAPHY, MINISTRY OF HIGHER EDUCATION USSR (DISSERTATION FOR THE DEGREE OF DOCTOR IN TECHNICAL SCIENCES)

SO: VECHERNAYA MOSKVA, JANUARY-DECEMBER 1952

MASHKOVICH, A. P.

AUTHOR: Poklistov, Ye. M., Engineer SOV/154-58-2-18/22

TITLE: Scientific and Technical Conference of the MIIGA i K (Moskovskiy Institut Inzhenerov Geodezii, Aerofotos"yemki i Kartografii) (Moscow Institute of Engineers of Geodesy, Aerial Photography and Cartography)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Geodeziya i aerofotos"yemka, 1958, Nr 2, pp 115-116 (USSR)

ABSTRACT: In the section for aerophoto-geodetical and photogrammetrical instruments the following persons gave lectures: Professor M. M. Maslov on "New Tendencies in the Production of Objectives in Instruments Used for Cartographical Aerial Photography." Professor A. N. Lebedev: "On Three-Dimensional Phototriangulation and the Use of Electronic Computers." Professor A. P. Mashkovich: "On Some Theoretical Statements With Regard to Questions of Photogrammetry in Connection With the Production of Precision Instruments for These Purposes." Engineer N. V. Znamenskiy: "The Radio-Synchronizer for Simultaneous Photos From Two Airplanes." Professor K. S. Ignatiev: "Apparatus and Laboratories for Aerial Methods of the AN USSR for the Study of Spectral Intensity." Docent B. P. Salmanov: "Making the Transformation of Aerial Photographs Automatic." Engineer L. P. Gnevyshev: "Automatic Control of the [illegible] Exposure." Engineer I. G.

Card 1/2

Indicheshe: "Stereophotogrammetrical Coupled Cameras." In a joint session of the sections for geodetical and photogramme- trical instruments Engineer L. Ye Kindin read a paper on "The Method of Stereodyne Planes in Geophysical Photos." Docent B. M. Rodionov reported on "The Problem of Making Aerial Photography Automatic."

Altogether, there were 32 lectures and reports given. 50 delegates participated in the discussions.

3(4) SOV/154-59-2-11/22

AUTHOR: Mashkovich, A. P., Professor, Doctor of Technical Sciences

TITLE: On Some Photogrammetric Formulas Which Are Connected With the Construction of Instruments (O nekotorykh formulakh fotogrammetrii, svyazannykh s konstruktsiyey priborov)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Geodeziya i aerofotos"yemka, 1959, Nr 2, pp 71-76 (USSR)

ABSTRACT: It is a pressing task for Soviet photogrammetry to produce highly accurate large-scale maps by way of stereoscopic evaluation of aerial photographs. Some suggestions concerning the accuracy of the instruments, as well as of the materials used, are given in this connection. Concerning the deformation of photographic films, the only remedy is the use of ground photographic plates with a high degree of resolving power. The pictures rectified to a high degree of accuracy, must be evaluated by stereoscopic means. The scheme of a stereoscopic rectifying instrument was given by Professor A. N. Lobanov.- Some formulas are further investigated, which are widely used in photogrammetry and are connected wi'h the construction of instruments. By transforming the Gauss formulas, general formulas (a)

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On Some Photogrammetric Formulas Which Are Connected With the Construction of Instruments

and (b) are obtained, which were already earlier introduced by Möbius (Mebius). It is then investigated how the geometrical model described in projection geometry could be utilized. The conditions for the optical conjunction of two planes are written down. These conditions are fulfilled when an optical conjunction occurs along any axis and when the conditions by Sheympflug-Chapskiy are fulfilled. The latter consists in the fact that the plane of the negative and that of the screen intersect along straight lines, one of which is the mirror image of the other. Mechanical devices are used to fulfil these conditions: Scale inverters and perspective inverters. The scale inverter corresponds to the formula (a) along the optical main axis, the perspective inverter to the formula (b) along a secondary axis. There are many designs of inverters, but none of them takes into consideration the distance between the nodal points of the objective. In order to obtain rectified pictures of high accuracy which are suitable for further stereoscopic evaluation, the conditions for a proper rectification must be fulfilled with extreme accuracy. There are 3 figures.

SOV/154-59-2-11/22

On Some Photogrammetric Formulas Which Are Connected With the Construction of Instruments

ASSOCIATION: Moskovskiy institut inzhenerov geodezii, aerofotos"yemki i kartografii (Moscow Institute of Geodetic, Aerial Survey and Cartographic Engineers)

Card 3/3

MASHKOVICH, A.

Simplified method of integrating the vortex equation for prognostic purposes. Trudy TSIP no.86:42-48 '59. (MIRA 12:9)
(Atmospheric pressure)

NOVIKOV, L.P., starshiy inzh. (Cheremkhovo); MASHKOVICH, A.Ya. (Cheremkhovo)

Advantages of a cooperative use of equipment. Zhel.dor.transp. 44 no.1:80-81 Ja '62. (MIRA 14:12)

1. U--vleniye Vostochno-Sibirskoy dorogi (for Novikov). 2. Nachal'nik pogruzochno-transportnogo upravleniya tresta "Cheremkhovugol'" (for Mashkovich).

(Railroads--Joint use of facilities)

MASHKOVICH, I.

MASHKOVICH, I.

New method of clarifying glue liquors. Mias. Ind. SSSR. 25 no.3:56 '54. (MLRA 7:7)

1. Orenburgskiy myasokombinat.
(Glue)

MASHKOVICH, K.A.

AID P - 541

Subject : USSR/Engineering

Card 1/1 Pub. 78 - 7/29

Authors : Mashkovich, K. A. and Malevanskiy, V. D.

Title : One method of repair of plugging of the wells under exploitation

Periodical : Neft. Khoz., v. 32, #7, 28-31, Jl 1954

Abstract : A method of cementing of leaking wells is described in detail. Liquid cement is lowered to the leakage zone either with the sludge pump equipped with the special valve or through the set of special piping, depending upon the geological conditions. Plugging by liquid cement is done under pressures varrying from 40 to 100 atm. 6 Russian references (1950-1953).

Institution: None

Submitted : No date

MASHKOVICH, K.A.

Probable conditions in the formation of certain gas-oil pools. Neft. khoz. 33 no.2:55-61 F '55. (MLRA 8:4)
(Petroleum geology) (Oil fields)

MASHKOVICH, K.A.

Discovery of oil pools based on convergence maps. Neft.khoz. 34 no.1:44-49 Ja '56. (MLRA 9:5)
(Petroleum geology)

KASHKOVICH, [illegible]

Method for a comparative evaluation of the industrial prospects of local domes discovered by seismic prospecting (for the Saratov area of the Volga Valley). Sov. geol. no.57:82-93 '57.(MIRA 10:8)
(Volga Valley--Petroleum geology)

MASHKOVICH, K.A.

Factors effecting formation and destruction of Devonian petroleum and gas deposits along the Volga in Saratov Province. Gaz. prom. no.9:7-15 S '58. (MIRA 11:10)
(Saratov Province--Gas, Natural--Geology)

MASHKOVICH, K.A.

3(5) PHASE I BOOK EXPLOITATION SOV/2302

Akademiya nauk Ukrainskoy SSR. Institut geologii poleznykh iskopayemykh

Problemy migratsii nefti i formirovaniya neftyanykh i gazovykh skopleniy; materialy L'vovskoy diskussii 8-12 maya 1957 g. (Problem of Oil Migration and the Formation of Oil and Gas Accumulations; Materials of the Discussion Held in L'vov, May 8-12, 1957) Moscow, Gostoptekhizdat, 1959. 422 p. 1,100 copies printed.

Eds.: V. B. Porfir'yev, Academician of the Ukrainian SSR Academy of Sciences, and I. O. Brod, Professor; Exec. Ed.: P. N. Yershov; Tech. Ed.: A.S. Polosina; Editorial Board: I.O. Brod, Professor, N.B. Ladyzhenskiy, and V.B. Porfir'yev, Academician of the Ukrainian Academy of Sciences.

PURPOSE: This collection of articles is intended for a wide range of geologists and research workers interested in oil problems.

COVERAGE: Articles contained in this book deal with the problems of migration and accumulation of oil and gas. These problems were discussed in May 1957 at L'vov State University im. I. Franko at a meeting organized jointly by the Institute of Geology and Mineral Resources, Academy of Sciences of the USSR, the Department of Geology and Oil Exploration of the L'vov Polytechnic Institute, and the L'vov Geological Society. Theories on the origin of petroleum deposits and the conditions surrounding their occurrence are treated. There are 327 references: 232 Soviet, 86 English, 5 French, and 4 German.

TABLE OF CONTENTS:

Card 5/10

MASHKOVICH, K.A.

Trends and methods of prospecting for new oil and gas fields in the trans-Volga portion of Saratov Province. Geol.nefti i gaza 3 no.5:1-11 My '59. (MIRA 12:7)

1. Upravleniye nefti i gaza Saratovskogo sovnarkhoza.
(Saratov Province--Petroleum geology)
(Saratov Province--Gas, Natural--Geology)

MASHKOVICH, K.A.

Nature of noses and their importance for gas and oil explorations in the Saratov region of the Volga Valley. Gaz. prom. 4 no.3:1-5 Mr '59. (MIRA 12:5)
(Saratov Province--Petroleum geology)

MASHKOVICH, K. A., CAND GEOL-MIN SCI, "PETROLEUM- AND gas-bearing potential OF TECTONIC STRUCTURES OF THE SARATOV VOLGA AREA IN THE LIGHT OF PALEO TECTONICS." MOSCOW, 1960. (INST OF GEOLOGY AND Working OF COMBUSTIBLE MINERALS OF ACAD SCI USSR). (KL, 3-61, 208).

MASHKOVICH, K.A.

Problems and methods of oil and gas prospecting in the Volga Valley portion of Saratov Province in 1959-1965. Trudy VNIGNI no.28:7-23 '60. (MIRA 14:4)

1. Upravleniye neftyanoy i gazovoy promyshlennosti Saratovskogo sovnarkhoza.
(Saratov Province--Petroleum gology)
(Saratov Province--Gas, Natural--Geology)

MASHKOVICH, K.A.; MIRCHINK, M.F., red.; BEKMAN, Yu.K., ved. red.; VORONOVA, V.V., tekhn. red.

[Methods of prospecting for oil and gas in the Volga Valley portion of Saratov Province] Metodika poiskov i razvedki nefti i gaza v Saratovskom Povolzh'e. Pod red. M.F.Mirchinka. Moskva, Gos.nauchno-tekhn.izd-vo neft. i gorno-toplivnoi lit-ry, 1961. 243 p. (MIRA 15:2)

1. Chlen-korrespondent AN SSSR (for Mirchink).
(Saratov Province—Petroleum geology)
(Saratov Province—Gas, Natural—Geology)

MASHKOVICH, K.A.; VAVAYEVA, L.A.

Middle Devonian Riphean massifs in the Volga Valley protion of Saratov Province. Geol.neft i gaza 6 no.10:47-50 O '62. (MIRA 15:12)

1. NVNIIGG.

(Saratov Province—Oil snads)

KOZLENKO, S.P.; MASHKOVICH, K.A.; KHRAMOV, A.I.; EZDRIN, M.B.

Shore area of the Caspian Lowland; future prospects for increasing oil and gas production in the lower Volga Valley. Geol. nefti i gaza 6 no.12:24-32 D '62. (MIRA 15:12)

1. Nizhnevolzhskiy nauchno-issledovatel'skiy institut geologii i geofiziki.
(Caspian Lowland—Petroleum geology)
(Caspian Lowland—Gas, Natural—Geology)

MASHKOVICH, K.A.; ZINGER, A.S.; PLOTNIKOV, Yu.N.

Interpretation of the natural thermal field in the lower Volga Valley. Geol. nefti i gaza 9 no.9:41-45 S '65. (MIRA 18:9)

1. Nizhne-Volzhskiy nauchno-issledovatel'skiy institut geologii i geofiziki.

MASHKOVICH, K.A.; SHEBALDINA, M.G.; ZOLOTOVA, T.N.

Buried tectonic faults in Devonian sediments in the Volga Valley portion of Saratov Province. Gaz.prom. 10 no.11: 6-13 '65. (MIRA 19:1)

MASHKOVICH, L. A.

Vyzgo, M. S. and Mashkovich, L. A. - "On the hydraulic jump," Trudy Sredneaziat. nauch.-issled. in-ta irrigatsii, Issue 73, 1948, p. 62-68

SO: U-4355, 14 August 53, (Letopis 'Zhurnal 'nykh Statey, No. 15, 1949)

MASHKOVICH, L. A.

26371 Novyy sposob regulirovaniya rezhima sopryazheniya potokov pri vnezapnom rasshirenii rusla. Gidrotekhnika i melioratsiya, 1949, No. 2, s. 48-50

SO: LETOPIS' NO. 35, 1949

MASHKOVICH, L. A.

USSR/Hydrology - Flow Lines Sep 51

"New Method of Recording of the Shape of Free Surface in Laboratory Conditions," L. A. Mashkovich, Engr

"Gidrotekh i Meliorat" Vol III, No 9, pp 65, 66

Detn of contour of free surface of model flows is often required. Author suggests new self-recording simplified model. He covers a thin polished plate with coat of diluted printing ink. This plate is immersed vertically parallel to flow lines. The flow lines of free surface are clearly drawn on the plate.

19150

191T55

MASHKOVICH, L. A.

USSR/Hydraulics - Engineering, Historical Sep 51
Literature

"The History of Soviet Hydraulic Engineering and Soil Improvements," L. A. Mashkovich, Engr

"Gidrotekh i Meliorat" Vol III, No 9, pp 67-79

Briefly covers historical development of Russian [Slavic] hydraulic engineering construction starting with wooden water conduits built in 11th century. Concludes with short survey of Soviet developments, emphasizing increased opportunities for great engineering works under Soviet regime.

191T55

MASHKOVICH, L.A., inzhener.

Trapezoidal rapid-flow drop with a rhomboidal spillway. Gid.i mel. 6 no.1:46-55 Ja '54. (MLRA 7:1)
(Hydraulics) (Irrigation canals and flumes)

SOV/112-57-9-18434

Translation from: Referativnyy zhurnal, Elektrotekhnika, 1957, Nr 9, p 47 (USSR)

AUTHOR: Mashkovich, L. A.

TITLE: Hydraulic Jump in a Trapezoidal Channel
(O gidravlicheskom pryzhke v trapetsoidal'nom rusle)

PERIODICAL: Tr. Tashkentsk. in-ta inzh. irrigatsii i mekhaniz. s. kh., 1956, Nr 2, pp 137-143

ABSTRACT: Hydraulic jump was studied in a trapezoidal channel with a horizontal bottom and with side walls having a slope coefficient of m=1.50; a number of experiments were staged in the SANIIRI hydroengineering laboratory. The results revealed a good agreement between experimental jump parameters and those calculated from the well-known formulae. Formation of side eddies and erratic irregular streams associated with the turbulent-to-steady-state transition of the flow is noted. It was discovered that the horizontal expansion of the transit stream and smoothing of speeds occupy a longer length of the channel than that usually assigned for flooring of the lower pool. Methods of experimentation and curves constructed on the experimental results are presented.

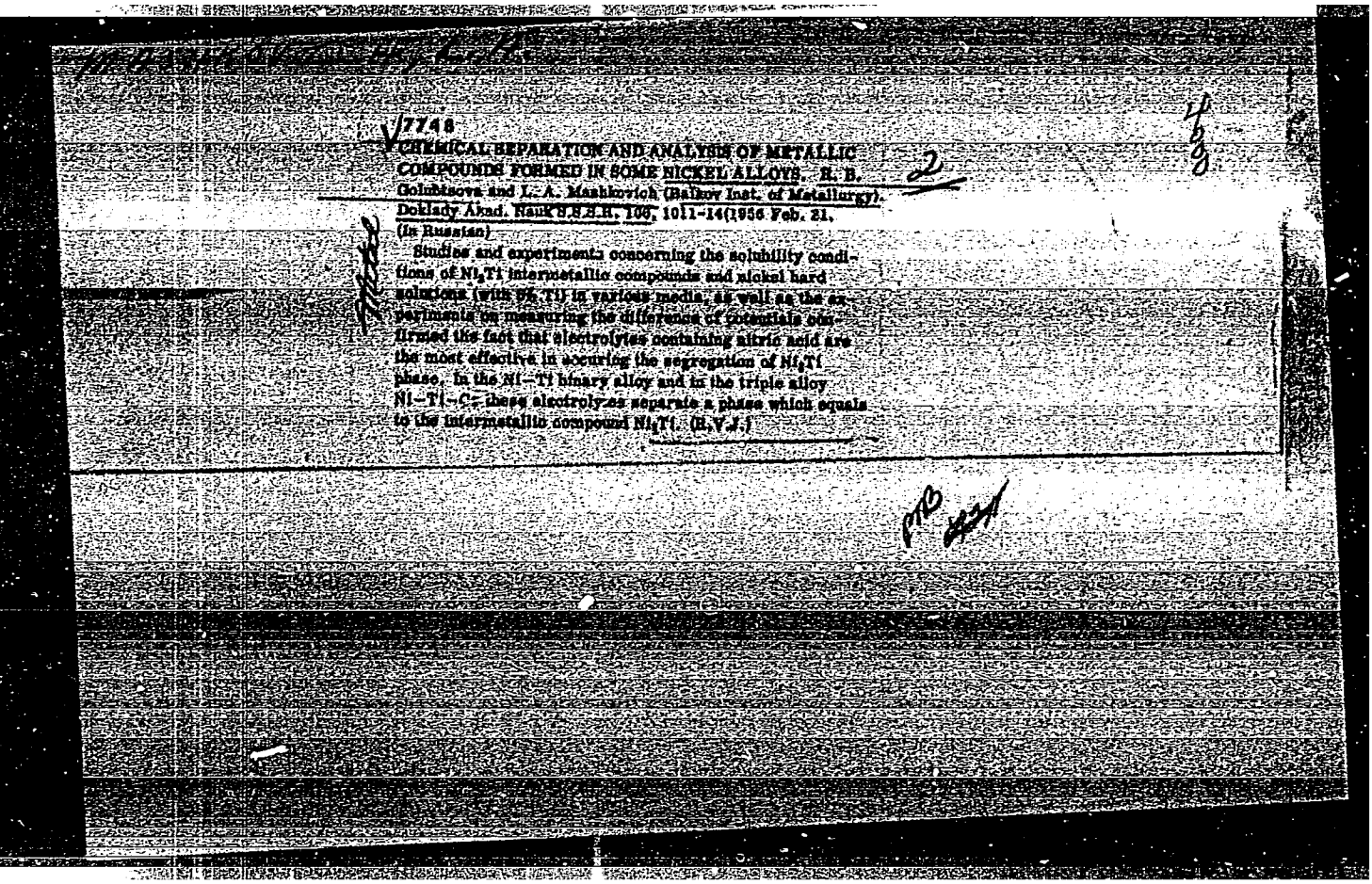
V.I.S.

Card 1/1

MASHKOVICH, L.A.

The chemical separation and analysis of chemical compounds formed in certain nickel alloys. R. H. Golubtsova and L. A. Mashkovich. *Proc. Acad. Sci. U.S.S.R., Sect. Chem.* 106, 113-16 (1956) (Engl. translation).—See *C.A.* 50, 14486*f* B. M. R.

2



V7748
CHEMICAL SEPARATION AND ANALYSIS OF METALLIC COMPOUNDS FORMED IN SOME NICKEL ALLOYS. N. B. Golubtsova and L. A. Mashkovich (Baikov Inst. of Metallurgy). Doklady Akad. Nauk S.S.S.R. 106, 1011-14(1956 Feb. 21. (In Russian)

Studies and experiments concerning the solubility conditions of Ni_3Ti intermetallic compounds and nickel hard solutions (with 9% Ti) in various media, as well as the experiments on measuring the difference of potentials confirmed the fact that electrolytes containing nitric acid are the most effective in securing the segregation of Ni_3Ti phase. In the Ni–Ti binary alloy and in the triple alloy Ni–Ti–C, these electrolytes separate a phase which equals to the intermetallic compound Ni_3Ti. (B.V.J.)

MASHKOVICH, L.A.

3859 2

INVESTIGATIONS OF METALLIC COMPOUNDS IN NICKEL ALLOYS CONTAINING ALUMINUM. R. B. Golubtsova and L. A. Mashkovich (Baikov Inst. of Metallurgy). Doklady Akad. Nauk S.S.S.R. 111, 624-6(1956)

... intermetallic analysis was made to determine the metallic compounds forming in Ni—Al, Ni—Al—Cr, and Ni—Al—Cr—Ti in thermal treatment up to 1200°. The values of potentials of Ni_3Al phase and solid solutions in various electrolytes have been studied. The results of chemical analysis of the anode dust of the binary, triple, and quadruple alloys are presented in a tabulated form showing that Cr and Ti in the investigated quantities do not effect the melting properties of the alloys. The ratio of Ni to Al in wt. and at. % agree with the theoretical Ni_3Al formula where Ni : Al = 6.52(wt. %) and Ni : Al = [illegible]

SOV/124-58-4-4148D

Translation from: Referativnyy zhurnal Mekhanika 1958, Nr 4, p 66 (USSR)

AUTHOR: Mashkovich, L. A.

TITLE: Energy Dissipation and Stream-flow Control by Means of a Hydraulic Jump in the Spillway Flow (Gasheniye energii i regulirovaniye form potoka pri sopryazhenii b'yefov gidravlicheskim pryzhkom)

ABSTRACT: Bibliographic entry on the author's dissertation for the degree of Candidate of Technical Sciences, presented to the Tashkentsk. in-t inzh. irrigatsii i mekhaniz. s. kh. (Tashkent Institute of Irrigation Engineering and Mechanization of Agriculture). Tashkent, 1957

ASSOCIATION: Tashkentsk. in-t inzh. irrigatsii i mekhaniz. s. kh. (Tashkent Institute of Irrigation Engineering and Mechanization of Agriculture). Tashkent

[illegible] waterways--Control systems

Card 1/1

MASHKOVICH, L. A., Cand Tech Sci -- (diss) "Extinction of Energy and Regulation of the Form of Flow in the Interlinking of Waters via an Hydraulic Jump." Tashkent, 1957. 15 pp with one sheet of diagrams. (Min of Agriculture USSR, Tashkent Inst of Engineers of Irrigation and Mechanization of Agriculture TIIIMSKh), 100 copies (KL, 47-57, 88)

MASHKOVICH, L. A.

99-5-5/11

AUTHOR: Mashkovich, L.A., Engineer

TITLE: Water Discharge Thru Curved Gates (Vodovypusk s krivolineynym zatvorom)

PERIODICAL: Gidrotekhnika i Melioratsiya, 1957, # 5, p 33-38 (USSR)

ABSTRACT: Irrigation gates generally in use in the USSR consist of vertical partitions with rectangular openings. Many years of experience have shown that washouts of newly constructed gates occured frequently due to erosion caused by whirls. In order to eliminate whirls which form at the sides and to slow down the flow of water gushing from the gates, trapezoidal ducts are attached to the gates. Research conducted by the Central Asian Scientific Research Institute showed that no turbulent discharge of water intc the lower level occured after the initial hydraulic jump when the new gates were used. Curved gates installed in 1954 in the Uzbek irrigation systems proved satisfactory after being in operation for 2 years, at a water discharge of 4.5 cu m/sec.

This article contains 4 figures, 2 diagrams, 1 photograph, and 2 references, both Slavic.

Card 1/2

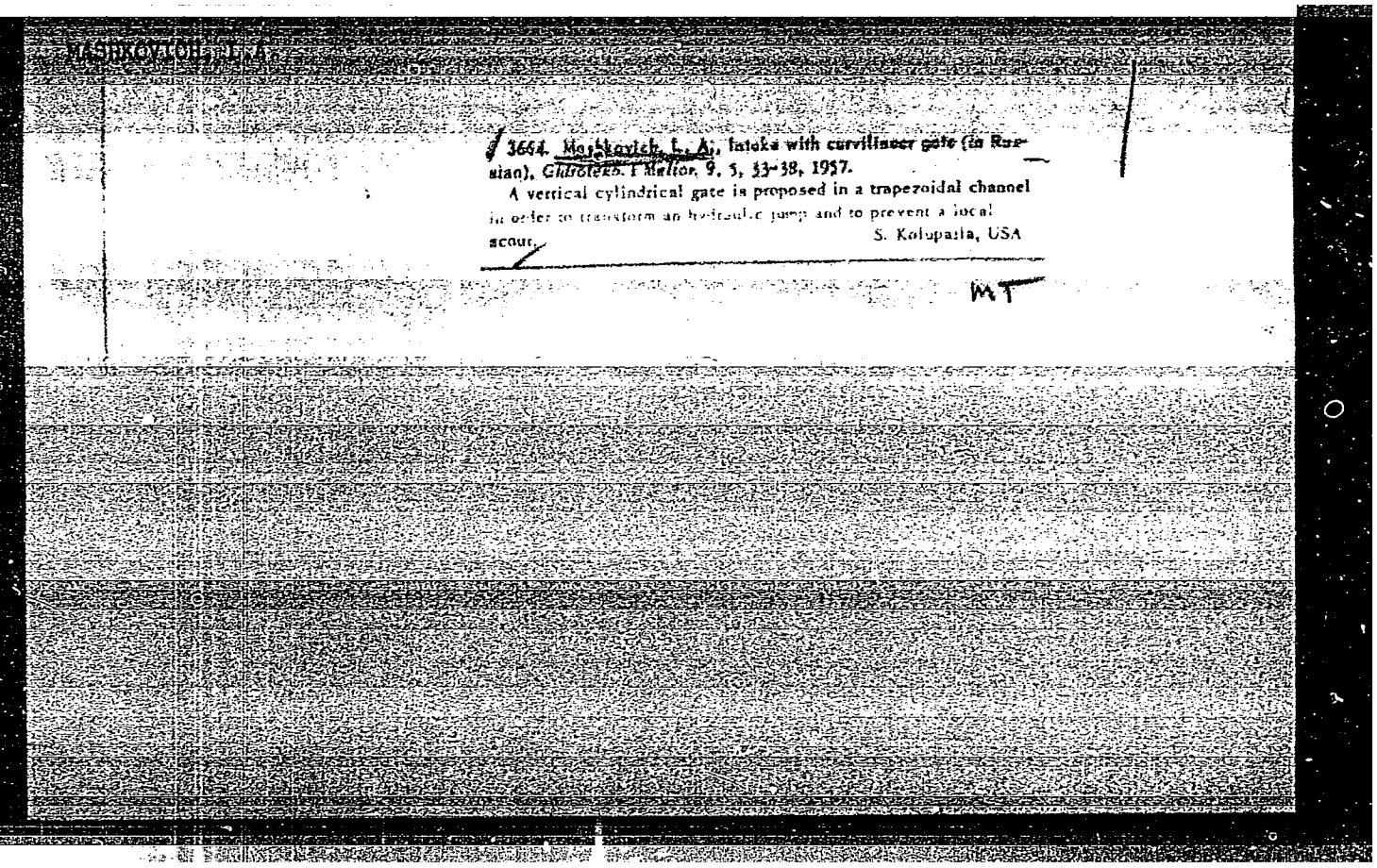
99-5-5/11

Water Discharge Thru Curved Gates

ASSOCIATION: Central Asian Scientific Research Institute for Irrigation (Sredneaziatskiy nauchno-issledovatel'skiy institut irrigatsii)

AVAILABLE: Library of Congress

Card 2/2



MASHKOVTSEV, I. A.

3664. Mashkovich, I. A., Intake with curvilinear gate (in Russian), *Gidrotekh. i Melior.* 9, 5, 33-38, 1957.

A vertical cylindrical gate is proposed in a trapezoidal channel in order to transform an hydraulic jump and to prevent a local scour.

S. Kolupaila, USA

MT

78-3-3-30/47

AUTHORS: Golubtsova, R. B., Mashkovich, L. A.

TITLE: The Investigation of Metallic Compounds in Polycomponent Alloys on the Basis of Nickel (Issledovaniye metallicheskikh soyedineniy v mnogokomponentnom splave na nikelevoy osnove)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol.3, Nr 3, pp.717-721 (USSR)

ABSTRACT: The metallic compounds in polycomponent alloys on the basis of nickel were investigated. The number of components in these alloys is nine. The investigations of the microstructure of these alloys are characterized by three phases:
1) the γ-phase of the solid nickel solutions
2) a metalloid phase
3) a carbide phase

The phases were isolated by the use of new electrolytes by an electrochemical process. The following electrolytes were used: 10 % H_2SO_4 and 50 ml HNO_3 + 20 $HClO_4$. In spite of the use of electrolytes with complex-formers such as succinic acid or citric acid no quantitative isolation by electrochemical

Card 1/2

78-3 3-30/47

The Investigation of Metallic Compounds in Polycomponent Alloys on the Basis of Nickel

processes takes place. Beside the carbides of titanium and niobium in the form of solid solutions elements such as tungsten, molybdenum, nickel, chromium and aluminum occur. The carbide phase has face-centered cubic lattices. The investigations showed that a quantitative separation of the carbide phase from metalloid inclusions by the flotation method is possible. There are 6 tables and 7 references, 6 of which are Soviet.

ASSOCIATION: Institut metallurgii im. A. A. Baykova Akademii nauk SSSR (Metallurgical Institute imeni A. A. Baykov, AS USSR)

SUBMITTED: June 25, 1957

Card 2/2

MASHKOVICH, L.A., kand.tekhn.nauk

Determining losses of head due to the "passage" in calculating the discharge capacity of a tubular water outlet.
Trudy SANIIRI no.97:17-22 '59. (MIRA 13:6)
(Hydraulics)

MASHKOVICH, L.A., kand.tekhn.nauk

Table for determining the specific energy of the cross section of a trapezoidal channel. Trudy SANIIRI no.97: 23-25 '59. (MIRA 13:6)
(Hydraulics—Tables, calculations, etc.)

5 (2)

AUTHORS: Golubtsova, R. B., Mashkovich, L. A. SOV/62-59-6-3/36

TITLE: Investigation of Metallic Compounds in Multicomponent Nickel Alloys With Variable Content of Titanium Carbide (Issledovaniye metallicheskikh soyedineniy v mnogokomponentnykh nikelevykh splavakh s peremennym soderzhaniyem karbida titana)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 6, pp 971-974 (USSR)

ABSTRACT: The investigation of side reactions in multicomponent systems is of special importance for the discovery of new metallic alloys with given physical properties. In this connection the excess phases which form in the system mentioned were investigated in the course of the investigation reported here by physico-chemical analysis (as in reference 3 Kornilov, Pryakhina, Ozhimkova). As initial material the sixcomponent alloy Ni-(basic metal)- Cr - Mo - W - Nb - Al was used. These alloys contained 0.1, 1.0, 4.0, 7.5 % TiC. Table 1 gives the data of the chemical analysis of the melt. In the intermetallide analysis, which was worked out by the authors in reference 7, the excess phase of Ti(Nb, W, Mo, Cr)C was electrolytically separated at the anode as powder (Data of the analysis of the powder in

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Investigation of Metallic Compounds in Multi-component Nickel Alloys With Variable Content of Titanium Carbide SOV/62-59-6-3/36

table 2). Thus it proves that the alloy consisted of only two phases: a solid γ-nickel solution, and the carbide phase of the above indicated composition. Radiographic investigations showed that the carbide phase has a cubic, face-centered lattice which corresponds to the lattice of the TiC, the parameter of which only varies in dependence on the NbC and TiC content (Different carbide content of the separated carbide phase in table 3). Tables 1-4 show the microstructure of the alloys with different TiC content. A. Ya. Snetkov carried out the X-ray analysis. There are 4 figures, 3 tables, and 10 references, 9 of which are Soviet.

ASSOCIATION: Institut metallurgii Akademii nauk SSSR (Institute of Metallurgy of the Academy of Sciences, USSR)

SUBMITTED: October 12, 1957

Card 2/2

18.9200

67948
SOV/20-130-1-21/69

~~5(2),10(6)~~

AUTHORS: Golubtsova, R. B., Meshkevich, L. A.

TITLE: Investigation of Metallic Compounds Formed in the Interaction of a Five-component Solid Nickel Solution With Titanium Carbide

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 130, Nr 1, pp 79-81 (USSR)

ABSTRACT: In the system mentioned in the title, the formation of titanium carbide or a phase on the basis of this carbide is most probable. Other metallic carbides may form part of the solid solutions of titanium carbide. If the difference in the lattice periods is not very great, the carbides with equal (isomorphic) crystal structure always form an uninterrupted series of solid solutions. Carbides of the metals of groups IV and V may be soluble with the metallic carbides of group VI to a limited extent only. The authors dissolved samples of alloys (melted by L. I. Pryakhina and O. V. Ozhimkova), after thermal treatment, electrochemically in an electrolyte (method described in Ref 7). The experiments showed that none of the alloys contained an intermetallic phase. The carbide phase was isolated in another electrolyte: 100 ml of HCl (1.19), 100 g of citric acid, 5 g of succinic acid, 1000 ml of water, current density 0.5 a/cm^2, cooling with ice (Ref 7). In an alloy with 0.1% of TiC, no separation of excess phases occurred

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since the composition of this alloy corresponds to a homogeneous solid solution on nickel basis. The phase analysis of the alloys with a TiC content of 1.00; 4.00; 8.00% showed the presence of a carbide phase of complex composition in the alloys. Table 1 shows the chemical analysis of the carbide powders isolated. Only traces of nickel, and small quantities of aluminum were found. This proves that Ni and Al form less stable carbides than Ti, W and other metals, and are not part of the titanium-carbide phase. Table 1 shows that titanium prevails in the carbide phase (39 - 40%). Consequently, the titanium carbide is the basis of the carbide phase. The total content of the carbide-forming elements Ti, W, Mo and Cr is 52 - 54% expressed in gram-atomic percentage, the content of C being 44 - 46%. Thus, the ratio between the sum of carbide-forming elements and carbon is very close to 1 : 1. The authors assert that a formula of the carbide MeC may be assigned to the carbide precipitate, and this formula may be expressed as Ti(W,Mo,Cr)C. On the basis of the X-ray structural analysis (made by A. Ya. Snetkov), the carbide phase has a cubical, face-centered lattice of the TiC type. Parameter a = 4.30 - 4.32 kX.

Card 2/3 If the formula of the complex carbide is interpreted to denote

Investigation of Metallic Compounds Formed in the Interaction of a Five-component Solid Nickel Solution With Titanium Carbide

SOV/20-130-1-21/69

the individual carbides TiC, WC, MoC and Cr_4C forming solid solutions with each other, the (theoretically) required carbon amount (Table 2), as well as the content of single carbides in the anodic powders, can be computed. Thus, the authors proved that only 2 phases participate in the equilibrium of the multiple-component system of the alloys investigated: the solid 5-component nickel solution, and the solid solution of titanium carbide. The name of I. I. Kornilov was mentioned in the text. There are 3 tables and 7 Soviet references.

ASSOCIATION: Institut metallurgii im. A. A. Baykova Akademii nauk SSSR (Institute of Metallurgy imeni A. A. Baykov of the Academy of Sciences, USSR)

PRESENTED: August 14, 1959, by I. P. Bardin, Academician

SUBMITTED: July 20, 1959

Card 3/3

S/020/60/134/006/016/031
B016/B067

AUTHORS: Golubtsova, R. B. and Mashkovich, L. A.

TITLE: Study of the Influence Exerted by the Aging Time on the Formation and the Composition of the γ'-Phase in Alloys of the System Ni-Cr-W-Al-Ti

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 6, pp. 1353-1355

TEXT: According to microstructural analysis (L. I. Pryakhina and O. V. Ozhimkova, Ref. 1) it was found that the Ni-Cr-W-Al-Ti alloys consist of two phases, i.e., of a γ-solid solution and the γ'-phase. To study the composition and the structure of the phases the authors carried out a special investigation which was based on an electrolytical isolation of the excess phases. To isolate the γ'-phase from the alloys, the authors used an electrolyte consisting of 50 ml HNO_3, 20 ml $HClO_4$ per 1000 ml water (Ref. 4). The anodic powders separated were dissolved in aqua regia with subsequent hydrolytic isolation of tungsten. Al, Ni,

and Cr were determined in the filtrate. It was found necessary to prove the possibility of chemically determining gamma amounts of chromium with diphenyl carbazide on the background of obviously predominating elements. On the basis of the investigations rational conditions of determining chromium were developed. Since the high amount of tungsten which is contained in the anodic powders (~20%) partly carries along titanium in the precipitation, titanium was determined in a special weighed-in portion (0.01 g). To fix tungsten 1.70 H_3PO_4 were added to the solution.

The results of the chemical analysis are shown in Table 1. To study the electrochemical dissolution of the alloys the authors isolated the excess phase in the electrolyte which they had proposed earlier (Refs. 5,6): 35 g citric acid, 5 g $(NH_4)_2SO_4$, 15 ml HNO_3 per 1000 ml water. Table 1 shows the chemical composition of the phase isolated in this connection. As may be seen therefrom the composition of the γ'-phase remains unchanged if the aging duration is extended from 0 to 10,000 h. The ratio of Ni to Σ Al, Ti, Cr, expressed in atom%, amounts to approximately 3.

Study of the Influence Exerted by the Aging Time on the Formation and the Composition of the γ'-Phase in Alloys of the System Ni-Cr-W-Al-Ti

S/020/60/134/006/016/031
B016/B067

This ratio for the phase which was separated in the electrolyte: 50 ml HNO_3, 20 ml $HClO_4$ per 1000 ml water was closer to 3 than that of the phase which was separated from the electrolyte: 35 g citric acid, 5 g $(NH_4)_2SO_4$, 15 ml HNO_3 per 1000 ml water. This shows that the former electrolyte is better suited for separating the γ'-phase. On the basis of an X-ray structural analysis (by A. Ya. Snetkov) the γ'-phase was observed in all anodic powders with a lattice parameter a = 3.573 kX which forms a solid solution on the basis of Ni_3Al. However, no superstructural lines which are characteristic of pure Ni_3Al, were observed. In all powders obtained from hardened alloys as well as from the 10,000 h old alloys, weak lines of a phase were proven, whose nature has not yet been explained. For the purpose of determining the distribution of the elements over the phases, the authors set up a balance of electrolysis products for a 1000 h old alloy. Furthermore, they calculated the content of elements in wt% in the solid γ-nickel solution in the γ'-phase. The method used here made it possible to determine the metalloid γ'-phase in the

Card 3/4

Study of the Influence Exerted by the Aging Time on the Formation and the Composition of the γ'-Phase in Alloys of the System Ni-Cr-W-Al-Ti

S/020/60/134/006/016/031
B016/B067

5-component Ni alloys investigated. Also the influence exercised by a long aging time on the composition and the structure of this phase could be studied. The authors mention a paper by N. I. Blok et al (Ref. 3). There are 1 table and 6 Soviet references.

ASSOCIATION: Institut metallurgii im. A. A. Baykova Akademii nauk SSSR (Institute of Metallurgy imeni A. A. Baykov of the Academy of Sciences, USSR)

PRESENTED: May 30, 1960, by I. I. Chernyayev, Academician

SUBMITTED: May 17, 1960

Card 4/4

MASHKOVICH, L.A.

14

PHASE I BOOK EXPLOITATION SOV/5994

Akademiya nauk Ukrainskoy SSR. Institut metallokeramiki i spetsial'nykh splavov. Seminar po zharostoykim materialam. Kiyev, 1960.

Trudy Seminara po zharostoykim materialam, 19-21 aprelya 1960 g. Byulleten' no. 6: Khimicheskiye svoystva i metody analiza tugoplavkikh soyedineniy (Transactions of the Seminar on Heat-Resistant Materials of the Institute of Powder Metallurgy and Special Alloys of the Academy of Sciences of the Ukrainian SSR. Held 19-21 April, 1960. Bulletin no. 6: Chemical Properties and Methods of Refractory Compound Analysis). Kiyev, Izd-vo AN UkrSSR, 1961. 124 p. 1500 copies printed.

Sponsoring Agency: Akademiya nauk Ukrainskoy SSR. Institut metallokeramiki i spetsial'nykh splavov.

Editorial Board: I. N. Frantsevich; G. V. Samsonov, Resp. Ed.; I. M. Fedorchenko, V. N. Yeremenko, V. V. Grigor'yeva, and T. N. Nazarchuk; Tech. Ed.: A. A. Matveychuk.

Card 1/5

PURPOSE: This collection of articles is intended for chemists, engineers, workers at scientific research institutes and plant laboratories, senior students, and aspirants at chemical and metallurgical schools of higher education.

COVERAGE: Articles of the collection present the results of studies of the chemical properties of refractory compounds (carbides, borides, nitrides, phosphorides, silicides), refractory and rare metals, and their alloys, and some original methods of analyzing these materials, which are now being utilized in the new fields of engineering. No personalities are mentioned. Each article is accompanied by references, mostly Soviet.

TABLE OF CONTENTS:

AVAILABLE: Library of Congress

SUBJECT: Metals and Metallurgy

Card 5/5

DV/wrc/ldc
7/20/62

S/137/62/000/008/014/065
A006/A101

AUTHORS: Golubtsova, R. B., Mashkovich, L. A.

TITLE: Investigation of metallic compounds forming during the interaction of multi-component nickel solutions with titanium carbide

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 8, 1962, 44, abstract 8G298 ("Byul. metallokeram. i spets. splavov AN UkrSSR", 1961, no. 6, 109 - 113)

TEXT: Electrochemical separation was performed, and carbide phases forming in multi-component Ni-alloys were investigated. In anodic dissolving of an alloy containing 0.1% TiC, excessive phases are not singled out. In alloys containing 1.4 and 8% TiC, the presence of complex-composed carbide phase of the MeC type is shown. X-ray analysis shows that the singled-out carbide phases have a face-centered cubic lattice of the TiC type with parameters a = 4.30 - 4.32 kX (for a phase which does not contain NbC) and a = 4.33 - 4.38 kX for a phase with variable NbC content.

I. Brokhin

[Abstracter's note: Complete translation]

Card 1/1

MASHKOVICH, L.A.; MASLOVA, T.I.; KUTEYNIKOV, A.F.

Phase analysis of tungsten-base materials. Konstr. uglegraf. mat. no.1:308-313 '64.

(MIRA 17:11)

L 23084-65 EWG(j)/EWP(e)/EWT(m)/EPF(c)/EPF(n)-2/EWG(m)/EPR/T/EWP(t)/EWP(b)/
EWA(c) Pr-4/Pu-4 IJP(c) JD/WW/JG/GS/AT/WR
ACCESSION NR: AT5003520 S/0000/64/000/001/0308/0313 51

AUTHOR: Mashkovich, L. A.; Maslova, T. P.; Kuteynikov, A. F. 50

B+1

TITLE: Phase analysis of materials based on tungsten

SOURCE: Konstruktsionnyye uglegrafitovyye materialy (Carbon and graphite construction materials); sbornik trudov, no. 1. Moscow, Izd-vo Metallurgiya, 1964, 308-313

TOPIC TAGS: titanium carbide, tungsten steel, carbon steel, metallurgical research, electrolysis, chemical analysis

ABSTRACT: The authors use the phase analysis method for studying materials which contain tungsten, carbon and various quantities of titanium carbide (5, 50 and 90%). The phase composition of the material was established and the state of the carbide phase was determined (quantity, chemical composition, structure). In order to solve these problems, it was necessary to isolate the titanium carbide from the material. The authors verified the possibility of isolating the TiC by chemical dissolution in media which did not dissociate carbides of titanium but dissolved metallic tungsten. The experiments which were conducted and the data of other authors showed that separation of metallic tungsten and titanium carbide is difficult to accomplish by chemical methods. Therefore a method was developed for

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L 38084-65
ACCESSION NR: AT5003520

isolating these components by electrolysis. The phase composition of W-C-TiC and Mo-C-TiC materials was established. The data of the chemical analysis were confirmed by x-ray analysis. Orig. art. has: 3 tables.

ASSOCIATION: none

SUBMITTED: 20Dec63 ENCL: 00 SUB CODE: MM, IE

NO REF SOV: 000 OTHER: 003

Card 2/2

L 29525-65 EWT(m)/EWP(e)/EPF(n)-2/EPR/T/EWP(t)/EWP(k)/EWP(b) Pf-4/Pa-4/Pu-4
LJP(c) AT/WH/JD/JG

ACCESSION NR: AP4035081 S/0032/64/000/005/0522/0524

AUTHORS: Mashkovich, L. A.; Kuteynikov, A. F.; Maslova, T. P.

TITLE: Phase analysis of materials made of tungsten and tungsten carbide

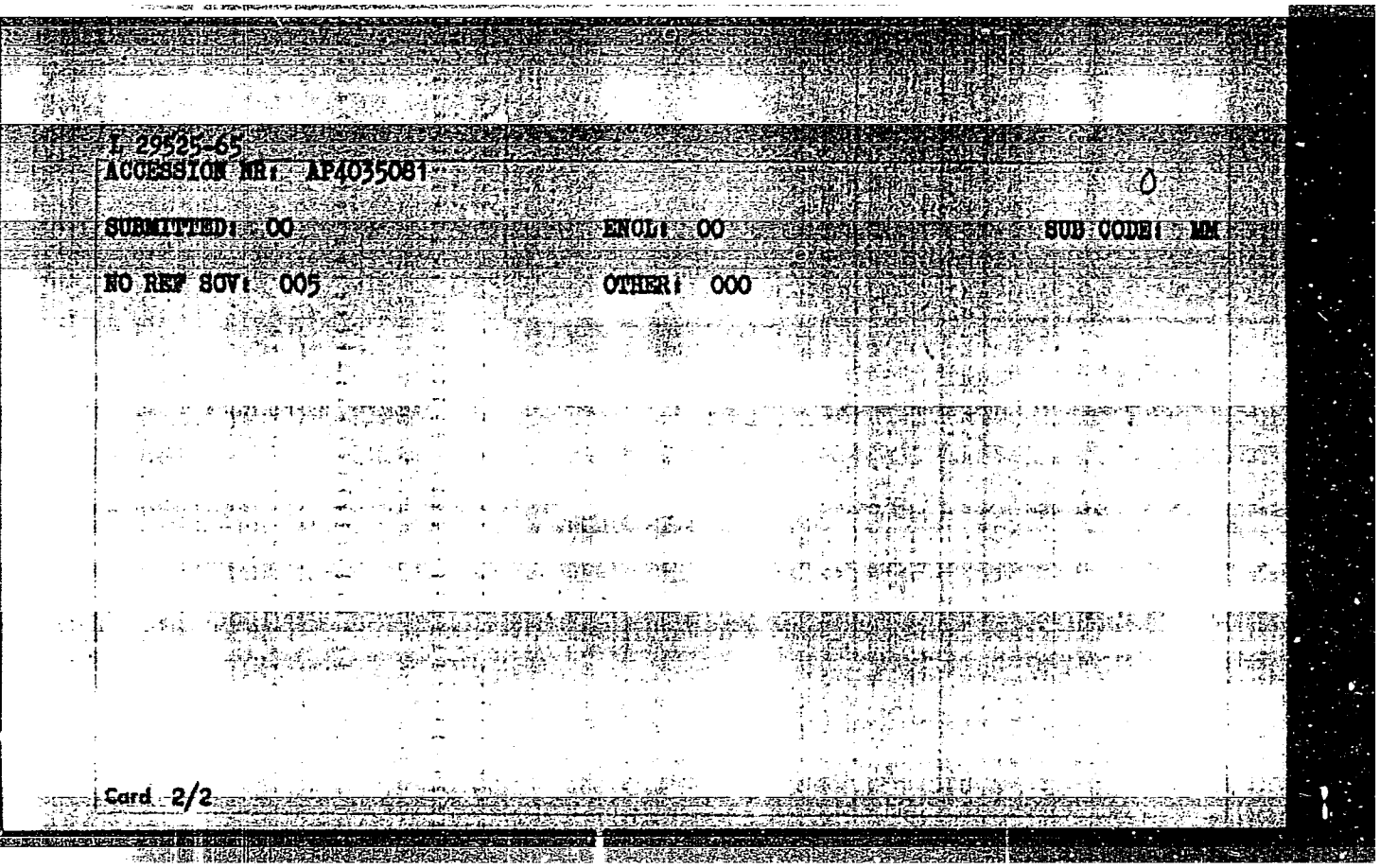
SOURCE: Zavodskaya laboratoriya, no. 5, 1964, 522-524

TOPIC TAGS: tungsten, carbide, phase composition, electrochemical process, electrolyte/ LP 58 potentiometer

ABSTRACT: An electrochemical method was used to determine the phase composition of tungsten base powder materials. It was found that an electrochemical method utilizing citric acid in the electrolyte is best for quantitatively determining tungsten in the presence of its carbide. The largest potential difference between metallic tungsten and its carbide was observed with citric anions of pH = 3. This difference was as large as 600 mv. Furthermore, the smallest amount of carbide loss (5-7%) was obtained in the citric acid electrolyte. N. A. Tsepkova took part in these experiments. Orig. art. has: 3 figures and 2 tables.

ASSOCIATION: none

Card 1/2



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ACCESSION NR: AP4035081 0

SUBMITTED: 00 ENCL: 00 SUB CODE: MM

NO REF SOV: 005 OTHER: 000

Card 2/2

MASHKOVICH, L.A.; KUTEYNIKOV, A.F.; MASLOVA, T.P.

Electrochemical separation of tungsten and titanium carbide.
Zav. lab. 30 no.7:788-791 '64. (MIRA 18:3)

MASHKOVICH, M. D.

"Investigation of the Nature of the Conductivity of Certain Types of Electroceramic Materials." Cand Tech Sci, Min Radio Engineering Industry USSR, Moscow, 1955. (KL, No 10, Mar 55)

So: Sum. No 670, 29 Sept 55 - Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (13)

MASHKOVICH, M. D.

USSR / Electricity G

Abs Jour : Ref Zhur - Fizika, No 4, 1957, No 9609

Author : Skanovi, G.I., Mashkovich, M.D.
Inst : Not given
Title : Nature of Electric Conductivity of High Voltage Porcelain

Orig Pub : Tr. Gos. Issled. Elerktrokeram., in-ta, 1956, vyp. 1, 63-78

Abstract : Using the Tuband method, the author determines the nature of the current carriers and the corresponding numbers of transports in felspar insulator porcelain M-23 and porcelain B-44, containing as a flux ascharite ore and calcium carbonate, in the temperature range from 200 to 400° at voltage of approximately 10^4 -- 10^3 v/cm.

Card : 1/1

VALEYEV, Kh.S., kand.tekhn.nauk; MASHKOVICH, M.D., kand.tekhn.nauk

Semiconductor oxide ceramics. Trudy GIKI no.2:20-39 '57. (MIRA 11:7)

(Ceramics) (Semiconductors)

MASHKOVICH, M.D., kand.tekhn.nauk

Nature of electric conductivity of titanium-containing ceramic materials. Trudy GIKI no.2:92-100 '57. (MIRA 11:7)
(Electric conductivity) (Ceramic materials) (Titanium)

МАШКОВИЧ М.Д.

AUTHORS Valeyev Kh.S., Mashkovich M.D.

TITLE Nonlinear ZnO-TiO_2-Semiconductors. 57-8-2/36
(Nelineynyye poluprovodniki na osnove ZnO-TiO_2 - Russian)

PERIODICAL Zhurnal Tekhn.Fiz., 1957, Vol 27, Nr 8, pp 1649-1651 (U.S.S.R.)

ABSTRACT Some electric properties of polycrystalline oxide-semiconductors in a consecutive composition series, starting with little additions of TiO_2 to ZnO and ending with additions of up to from 30-40% mole TiO_2-which are already dielectrics-were investigated. With little quantities of TiO_2(1 - 3 % Mole) the resistance decreased compared with pure ZnO.However,beginning with 10% TiO_2 the resistance increases strongly. The authors stated that with a content of up to 30% TiO_2 electronic conduction,and with higher TiO_2 concentrations hole conduction develops. Based on the investigations can be said that the semiconductor mixtures on ZnO-TiO_2 basis are a mixture of crystalline phases with different kinds of conduction.We can assume that the reason for the remarkable nonlinearity of the polycrystalline materials investigated is to be found in the contact phenomeny at the limit of the zinc-oxide grains and of the zinc-orthititanate grains which depend on the electron-hole transitions.
(1 illustration. 1 table and 7 Slavic references).

ASSOCIATION GIEKI,Moscow.

SUBMITTED March 21, 1957

AVAILABLE Library of Congress.

Card 1/1

MASHKOVICH, M.D.

Mashkovich, M.D. [Moscow, Gosudarstvennyy issledovatel'skiy electrokeramicheskiy institut (State Research Institute of Electroceramics)] The Nature of Electroconductivity of Several Types of Ceramic Materials

(The Physics of Dielectrics; Transactions of the All-Union Conference on the Physics of Dielectrics) Moscow, Izd-vo AN SSSR, 1958. 245 p. 3,000 copies printed

This volume publishes reports presented at the All-Union Conference on the Physics of Dielectrics, held in Dnepropetrovsk in August 1956 sponsored by the "Physics of Dielectrics" Laboratory of the Fizicheskiy institut imeni Lebedeva AN SSSR (Physics Institute imeni Lebedev of the AS USSR), and the Electrophysics Department of the Dnepropetrovskiy gosudarstvennyy universitet (Dnepropetrovsk State University).

84145

S/112/59/000/013/006/067
A002/A001

24.7700
26.2532

Translation from: Referativnyy zhurnal, Elektrotekhnika, 1959, No. 13, pp. 11-12
26241

AUTHOR: Mashkovich, M. D.

TITLE: The Nature of the Electric Conductivity of Some Types of Ceramic Materials

PERIODICAL: Fiz. dielektrikov, Moscow, AN SSSR, 1958, pp. 54-62, Discussion p.83

TEXT: The author presents the results of an investigation of the following materials: M-23 (M-23) feldspar insulator percelain, whose glass phase contains ~10% alkali metal oxides; B-44 (B-44) insulator porcelain, in which the calcium-magnesium boron silicate glass phase of the material contains ≤ 1% alkali oxides; capacitor materials, which are close by their composition to Ca, Sr, Ba, Zn titanates, Ba tetratitanate and Mg orthotitanate. The investigation was performed in the direction of establishing the nature of electric conductivity, the type of charge carriers and the corresponding transfer numbers in dependence on the temperature. For this purpose the electrolysis of specimens was investi-

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A002/A001

The Nature of the Electric Conductivity of Some Types of Ceramic Materials

gated in a wide temperature range. The electrolysis of M-23 porcelain was studied in the temperature range of 200 - 850°C at an electric field strength of 10^4 - 10^5 v/cm. The qualitative and quantitative analyses of electrolysis products deposited at the cathode showed that only ions of Na (96%) and K (4%) participate in the current transmission up to 650°C. At temperatures higher than 700°C, a noticeable part of the conductivity is caused by Al and Fe ions. It was established during the investigation of porcelain specimens containing Na and K alkali ions in different ratios that the transfer numbers for them change according to a nonlinear law in dependence on the concentration. The part of the potassium conductivity becomes noticeable (29%) only at a concentration of K_2O/R_2O of the order of 90%. The curve $\lg \gamma = f(1/T)$, obtained during the cooling of the specimen with Pt electrodes, has a break at a temperature of ~600°C, which can be connected with a change in the nature of the electric conductivity. Asharite porcelain (asharitovyy farfor) shows a practically pure ionic conductivity in the temperature range of 400 - 900°C, up to 400°C because of Na^+, then because of Fe^{++} and Fe^{+++}, and because of Al^{+++} and Ca^{++} at temperatures higher than 800°C. Titanates of Ca, Sr, Ba, and Ba tetratitanates

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show a practically pure electron conductivity. $ZnTiO_3$ and Mg_2TiO_4 have a mixed electric conductivity; accordingly, a current component takes place on account of Zn and Mg ions. $ZnTiO_3$ and Mg_2TiO_3 differ from the other titanates investigated and have the structure of a disorderly spinel, in which bivalent cations have an equal probability of occurrence in different interstices of the lattice. This can be the cause of a higher mobility of Zn^{++} ions in $ZnTiO_3$ and Mg^{++} in Mg_2TiO_4 in the temperature range, in which titanates of the perovskite type do not yet show their own ionic conductivity. There are 19 references.

ASSOCIATION: Gos. issled. elektrokeramich. in-t (State Research Institute for Electroceramics), Moscow

M. D. M.

Translator's note: This is the full translation of the original Russian abstract.

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MASHKOVICH, M. D.

24.7100

66561

SOV/81-59-15-54103

Translation from: Referativnyy zhurnal. Khimiya, 1959, Nr 15, p 310 (USSR)

AUTHORS: Valeyev, Kh.S., Mashkovich, M.D.

TITLE: Non-Linear Ceramic Semiconductors on the $ZnO-TiO_2$ Base

PERIODICAL: V sb.: Primeneniye poluprovodnikov v elektrotekhn. Leningrad, 1958, pp 119 - 123

ABSTRACT: A new type of non-linear resistors on oxide base (ZnO and TiO_2) has been proposed. It has been established that the cause of the non-linearity of the obtained ceramic semiconductors are electron-hole transitions on the grain boundaries of zinc and spinel $2ZnO-TiO_2$. It is noted that the semiconductors of various configuration can be prepared by the usual methods of ceramic technology on the base of cheap raw materials. In this case the necessary semiconductor properties are ensured as a result of the burning in a weakly oxidizing medium (Silit furnace). It is indicated that the presence of semiconducting properties in combination with the non-linearity at various TiO_2 concentrations

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Non-Linear Ceramic Semiconductors on the ZnO-TiO_2 Base SOV/41-59-15-5/103

(1 - 25%) makes it possible to obtain semiconductors with ρ varying approximately from 10^2 to 10^6 ohm cm. It is noted that this permits to produce high-ohm as well as low-ohm non-linear elements which can operate at increased temperatures and can correspondingly dissipate high powers.

C. Maslennikova

Card 2/2

5.4600

68187
SOV/58-59-5-10859

Translation from: Referativnyy Zhurnal Fizika, 1959, Nr 5, pp 136 - 137 (USSR)

AUTHOR: Mashkovich, M.D.

TITLE: The Nature of Electric Conductivity in Some Forms of Ceramic Materials

PERIODICAL: V sb.: Fiz. dielektrikov. Moscow, AS USSR, 1958, pp 54 - 62. Diskus., p 83

ABSTRACT: The author investigated the nature of conductivity in M-23 and B-44 insulator porcelains, as well as in materials similar in comparison to the titanates of the alkali earth metals and zinc, barium tetratitanate, and magnesium orthotitanate. The results of measuring transfer numbers in the temperature range 200° - 850°C at a field intensity of 10^3 - 10^4 V/cm showed that in porcelain M-23 up to 650°C the transfer of electricity is effected only by Na and K ions (in which case the fraction of Na in the transfer is significantly higher than that of K). Beyond 700°C the transfer numbers of the alkali ions fall off with a simultaneous increase of the transfer numbers of Al and Fe ions, whose participation in the transfer of electricity becomes preponderant at 800°C. Measurements of transfer

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numbers in porcelain B-44, carried out in the 400 - 900°C region, showed the presence of 100% ionic conductivity. The fraction of Na ions in the transfer of electricity falls off from 100% at 450°C to 4% at 890°C. Starting with 450°C Fe^{2+} and Fe^{3+} ions begin to participate in the transfer of electricity, the fraction of Fe^{3+} being 4 times as great as that of Fe^{2+}. At 800°C Al and Ca ions begin to transfer electricity, more than half of the transferred electricity falling to their share at 850°C. On the curve representing the temperature dependence of the electric conductivity breaks can be observed which correspond to the start of the transfer of electricity by Fe and Al ions in the case of porcelain M-23 and Al and Ca ions in the case of porcelain B-44. The experiments showed that samples of the titanates of Ca, Sr, and Ba, as well as barium tetratitanate, possess 100% electronic conductivity. $ZnTiO_3$ and Mg_2TiO_4 display a cationic component of conductivity (about 8% at 750°C), due to the migration of Mg and Zn ions. This is explained by the fact that the structure of Mg_2TiO_4 and $ZnTiO_3$ is characterized by a disorderly arrangement of atoms, which has for its result that the bivalent cations are located in both tetrahedral and octohedral coordination; this causes their enhanced mobility. (Gos. issledovat. elektro-keramich. in-t, Moscow).

V.I. Malkin

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S/181/60/002/010/025/051
B019/B056

24,2400 (1144,1162,1385)

AUTHORS: Avetikov, V. G., Zlatkis, A. S., Mashkovich, M. D., and Rozenberg, N. Yu.

TITLE: An Investigation of the Dielectric Losses and the Dielectric Constants of Several Forms of Ceramics in the Super-high Frequency Range

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 10, pp. 2497-2504

TEXT: The authors give the results of measurement of ε and $\tan\delta$ in the frequency range of $7 \cdot 10^4$ - $3.75 \cdot 10^{10}$ c and for temperatures between 20 - 500°C, for two steatite ceramics of the types CK-1 (SK-1) and TK-21 (TK-21), mullite-corundum ceramics of the type M-2 (M-2) and insulation porcelain of the type M-23 (M-23). Measurements at radio-frequencies were carried out with Q-meters of the types KB-1 (KV-1) and YK (UK). For measurements up to 10^{10} c, a resonator device (Fig. 1) having a cylindrical volume resonator developed at the VNIIFTRI, was

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84602

An Investigation of the Dielectric Losses and the Dielectric Constants of Several Forms of Ceramics in the Super-high Frequency Range

S/181/60/002/010/025/051
B019/B056

used. For measurements carried out at high temperatures, the wave guide shown in Fig. 2 was used. In Fig. 3, ε and $\tan\delta$ are graphically represented as functions of the frequency for the materials investigated here. In Figs. 4-7, ε and $\tan\delta$ of the above mentioned materials are shown as functions of temperature for the frequencies $7 \cdot 10^4$, 10^7, 10^6, and 10^{10} c. It is found that in all materials ε decreases on transition from radiofrequencies to super-high frequencies and $\tan\delta$ increases. The increase of ε and $\tan\delta$ with an increase of temperature is considerably lower at 10^{10} c than at other frequencies. The degree of this change depends on the composition, and the kind of structure. There are 7 figures, 1 table, and 8 references: 7 Soviet and 1 US.

SUBMITTED: October 3, 1959 (initially), March 7, 1960 (after revision)

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S/081/63/000/004/024/051
B187/B208

AUTHORS: Drozdov, N. G., Valeyev, Kh. S., Mashkovich, M. D.

TITLE: Nonlinear semiconductors on the basis of zinc and titanium oxides with glass admixture

PERIODICAL: Referativnyy zhurnal, Khimiya, no. 4, 1963, 431, abstract 4M61 (Tr. Gos. insiad. elektrokeram. in-ta, no. 4, 1960, 64 - 69)

TEXT: The authors studied a possible improvement in the nonlinear properties of semiconductors on the basis of $ZnO-TiO_2$ by adding easily fusible glass. Small additions of glass were assumed to cause an additional artificial blocking layer by forming a thin glass film on the grain surface. Low-resistant compositions of $ZnO-TiO_2$ were first synthesized at a temperature of 1300°C and then comminuted to maximum grain diameters of 10 - 15 μ, after which 2 - 6 % by weight of easily fusible glass were added. Burning was effected at temperatures of 1050 - 1320°C, the final temperature being maintained for about 1 hr. With rising temperature of

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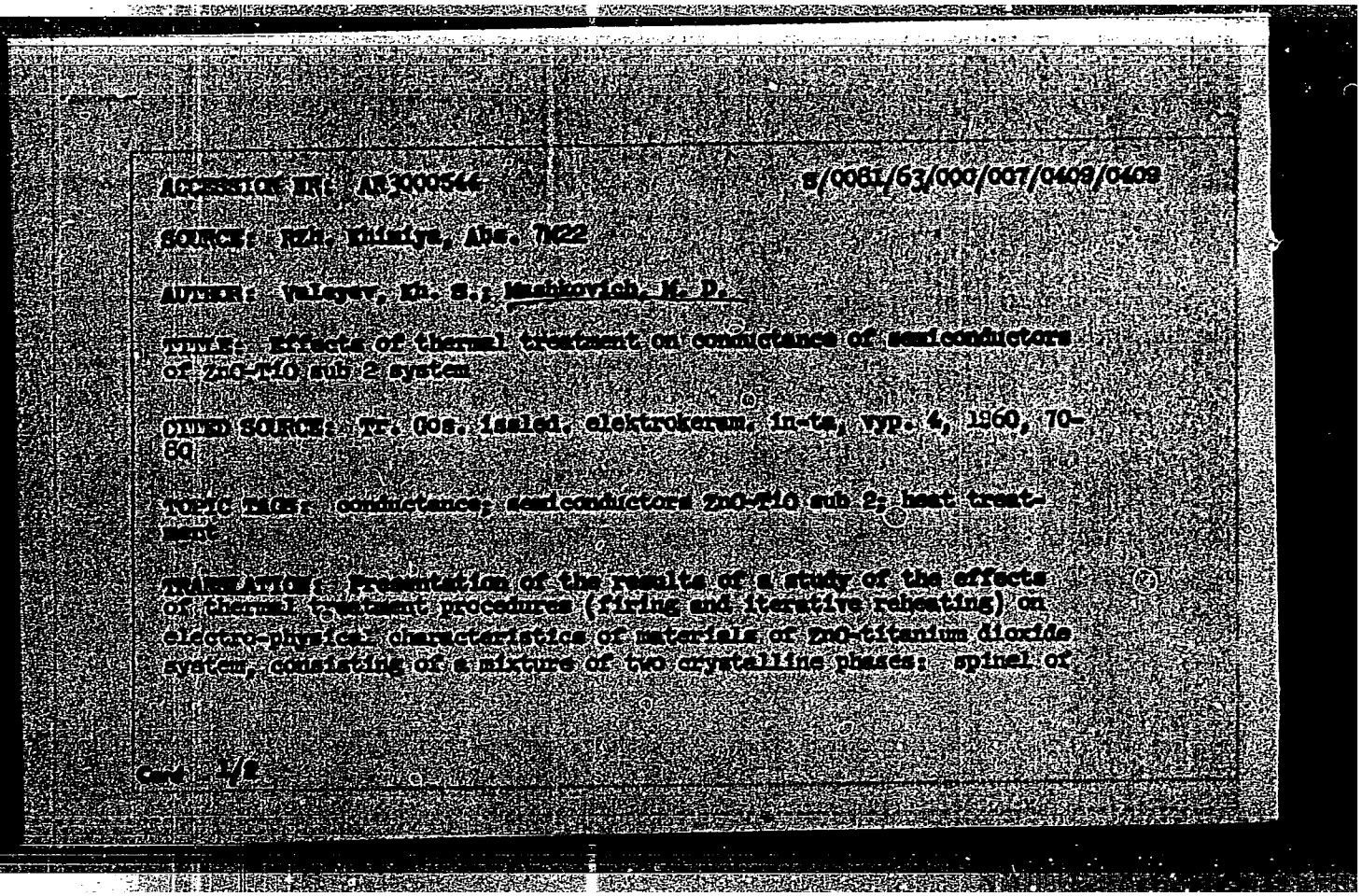
burning resistivity dropped abruptly owing to a reduction of the contact resistances caused both by diminution of the spacings between the grains and by a reduction in the number of contact places in the process of recrystallization. Under otherwise equal conditions resistivity considerably increases with an increasing proportion of easily fusible glass and with increasing TiO_2-content. The nonlinearity coefficient was found to be increased considerably by adding small amounts of easily fusible glass to a semiconductor composition of the Tn_2TiO_4 - ZnO type, both at high and low voltages. [Abstractor's note: Complete translation.]



ACCESSION NR: AR3000544 S/0081/63/000/007/0408/0408

SOURCE: Ref. zhurn, Abs. 7M22

AUTHOR: Valeyev, Kh. S.; Mashkovich, M. D.

TITLE: Effects of thermal treatment on conductance of semiconductors of ZnO-TiO sub 2 system

CITED SOURCE: Tr. Gos. issled. elektrokeram. in-ta, vyp. 4, 1960, 70-80

TOPIC TAGS: conductance; semiconductors ZnO-TiO sub 2; heat treatment

TRANSLATION: Presentation of the results of a study of the effects of thermal treatment procedures (firing and iterative reheating) on electro-physical characteristics of materials of ZnO-titanium dioxide system, consisting of a mixture of two crystalline phases: spinel of

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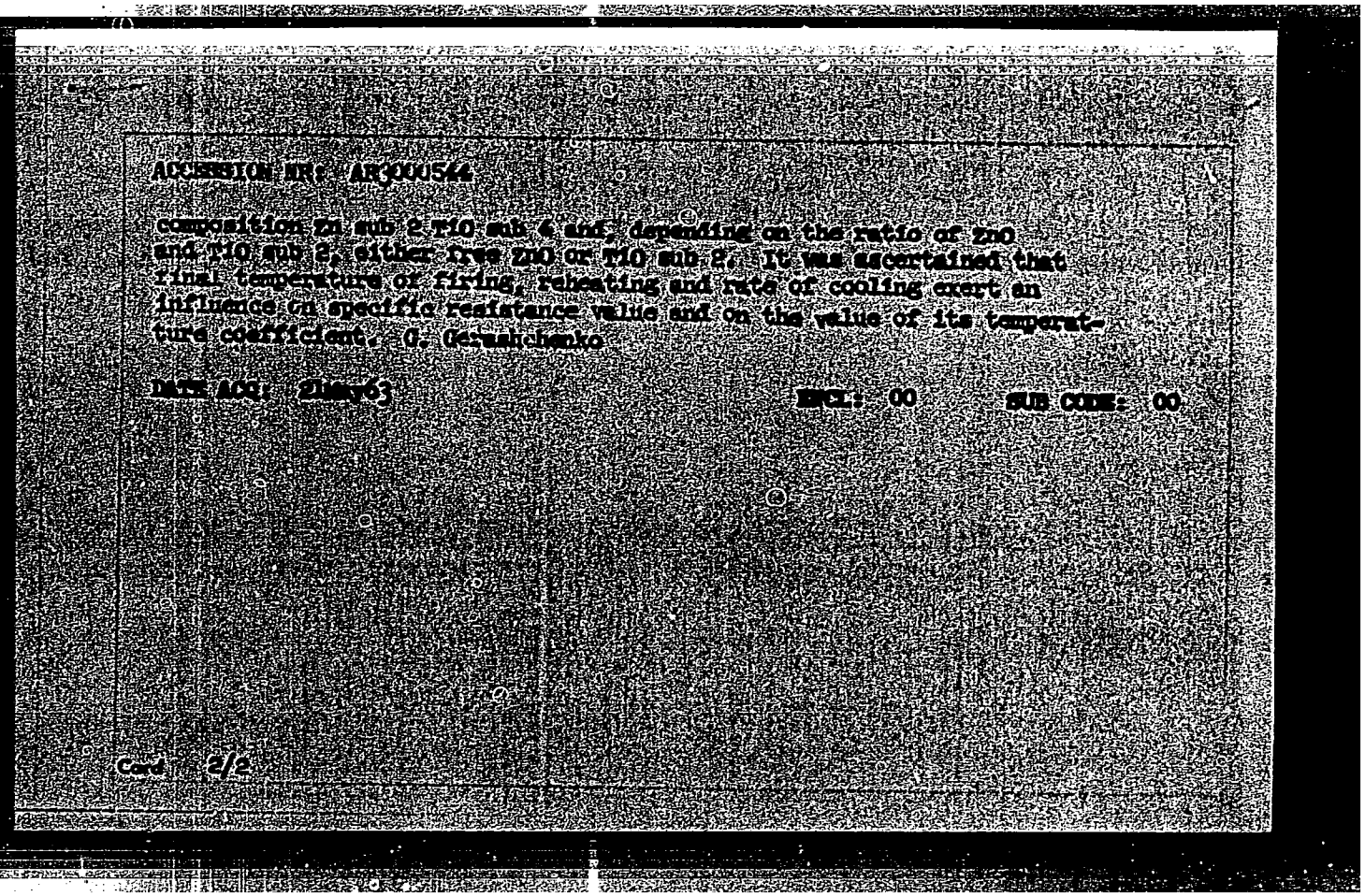

ACCESSION NR: AR3000544

composition Zn sub 2 TiO sub 4 and, depending on the ratio of ZnO and TiO sub 2, either free ZnO or TiO sub 2. It was ascertained that final temperature of firing, reheating and rate of cooling exert an influence on specific resistance value and on the value of its temperature coefficient. G. Gerasimchenko

DATE ACQ: 21May63 ENCL: 00 SUB CODE: 00

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S/181/61/003/004/011/030
B102/B214

24.7600 (1136, 1145, 1155)

AUTHOR: Mashkovich, M. D.

TITLE: The problem of the dielectric losses and dielectric constant of glasses at superhigh frequencies

PERIODICAL: Fizika tverdogo tela, v. 3, no. 4, 1961, 1105-1109

TEXT: The present paper gives results of investigations of the dielectric characteristics (ε and tan δ) of different glasses in the frequency range 10^2 - $3.75 \cdot 10^{10}$ cps and at temperatures of 20-400°C. The composition of the glasses (in wt%) is given in the table. The experimental method is described by Mashkovich et al. in Ref. 4 (FTT, v. 2, no. 10, 1960). Fig. 1 shows the frequency dependence of ε and tan δ for glasses nos. 1, 5, 6, and 7 and for steatite ceramic CK -1 (SK-1). Further results are given in Figs. 2 and 3. The experimental results may be summarized as follows: 1) tan δ is higher in the superhigh-frequency range than in the range 10^6 - 10^7 cps. 2) The more pronounced the relaxation effects at low frequencies, the more strongly do the temperature functions of ε and

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tan δ slope on transition from the radio-frequency range to the superhigh-frequency range. In the given case, the relaxation processes are essentially due to the destruction of the cross links of the glass by alkali ions. 3) In spite of the low increase of ε and tan δ with increasing temperature at $f = 10^{10}$ cps, the character of the temperature functions remains qualitatively the same, i.e., the order of materials inside a group remains the same with regard to the intensity of temperature-dependent changes. 4) The substitution of light alkali ions by heavy ones leads to an increase of tan δ in the superhigh-frequency range. This fact is very important when considering that the frequency of characteristic oscillations of heavy ions is smaller than that of light ones. The following conclusions can be drawn from these experimental results:

1) At frequencies of the order of 10^9-10^{10} cps, a new mechanism of dielectric losses begins to predominate. It manifests itself by an increase of tan δ and depends in some manner on the composition. One can assume a resonance loss or some new kind of relaxation effect. A definite answer to this question is not yet possible for lack of experimental material. In the cm-wave range, the temperature dependences of the dielectric

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Properties show "traces" of such relaxation processes; the frequency range between 10^9-10^{10} cps can be considered to be the transitional range where low-frequency relaxation processes also play a role. Superhigh-frequency effects act at the same time - vibration and deformation effects in the terminology of Stevels (Phil. Techn. Rev. 13, 360, 1952). The samples studied were prepared at the Institut stekla (Glass Institute), in the laboratory of I. D. Tykachinskiy to whom the author offers his thanks. There are 3 figures, 1 table, and 5 references: 1 Soviet-bloc and 4 non-Soviet-bloc.

ASSOCIATION: Institut elektrotekhnicheskogo stekla Moskva (Institute for Electrotechnical Glass, Moscow)

SUBMITTED: October 20, 1960

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The problem of the dielectric ...

Fig. 1: Frequency dependence of ε and tan δ at 20°C.
Legend: 1) steatite SK-1; 2) glass 1; 3) glass 5; 4) glass 6; 5) glass 7.

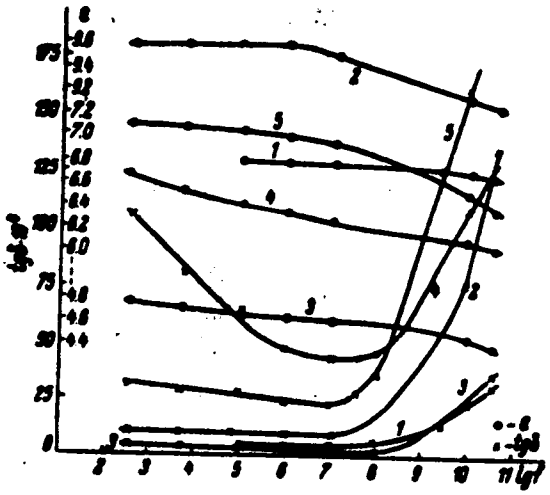

Fig. 1

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The problem of the dielectric ...

Fig. 2: Temperature dependence of ε and $\tan\delta$. Legend:
1) glass 1, f = 10^6 cps;
2) glass 1, f = 10^{10} cps;
3), 4), 5) f = 10^{10} cps;
3) glass 2; 4) glass 3;
5) glass 4.

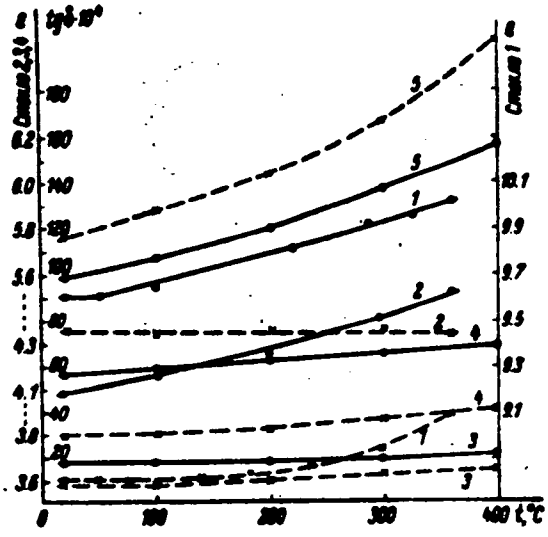

Fig. 2

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The problem of the dielectric ...

Fig. 3: Temperature dependence of ε and tan δ. Legend: 1) $f = 10^6$ cps; 2) $f = 10^{10}$ cps; I - glass 7; II - glass 6; III - glass 5.

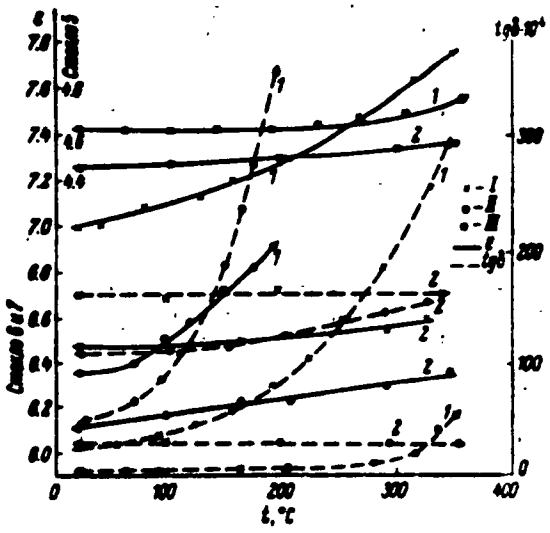

Fig. 3

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The problem of the dielectric ...

Номер стекла	SiO_2	B_2O_3	Al_2O_3	CaO	BaO	Na_2O	Zr_2O	K_2O
1	38.0	—	3.6	1.1	57.3	—	—	—
2	55.0	45.0	—	—	—	—	—	—
3	52.2	42.8	—	—	—	5.0	—	—
4	44.0	36.0	—	—	—	20.0	—	—
5	45.0	35.0	10.0	—	10.0	—	—	—
6	42.9	33.3	9.5	—	9.5	—	4.8	—
7	36.2	29.6	8.5	—	8.5	—	—	15.3

X

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