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MALKEVICH, M.S.; GLAZOVA, K.S.

Variability of some parameters used in calculating the flow of scattered radiation. Izv. AN SSSR. Ser. geofiz. no.8:1246-1251 Ag '60. (MIRA 13:8)

1. Akademiya nauk SSSR, Institut fiziki atmosfery.
(Solar radiation)

ATROSHENKO, V.S.; GLAZOVA, K.S.; MALKEVICH, M.S.; FEYGEL'SON, Ye.M.;
Prinimali uchastiye: KIM, E., studentka; TOMASHOVA, L., studentka;
ROZENBERG, G.G., prof., doktor fiz.-matem.nauk, otv.red.;
PENKINA, N.V., red.izd-va; SUSHKOVA, L.A., tekhn.red.

[Calculation of light intensity in the atmosphere during anisotropic scattering. Part 2] Raschet iarkosti sveta v atmosfere pri anizotropnom rasseianii. Chast' 2. Moskva, Izd-vo Akad.nauk SSSR, 1962. 222 p. (Akademiia nauk SSSR. Institut fiziki atmosfery. Trudy, no.3). [MICROFILM] (MIRA 15:8)

1. Moskovskiy gosudarstvennyy universitet (for Kim, Tomashova).
(Light—Scattering) (Atmosphere)

USSR / Cultivated Plants. [illegible] . [illegible]. [illegible]. [illegible]

Abs Jour: Ref Zhur-Biol., [illegible], N [illegible], [illegible].

Author : P[illegible]lyanskiy, [illegible]. A.; Gla[illegible], [illegible].
Inst : Not given.
Title : Effectiveness of Bacterial Fertilizers.

Orig Pub: Kartofel', 195[illegible], N [illegible], [illegible]-7[illegible].

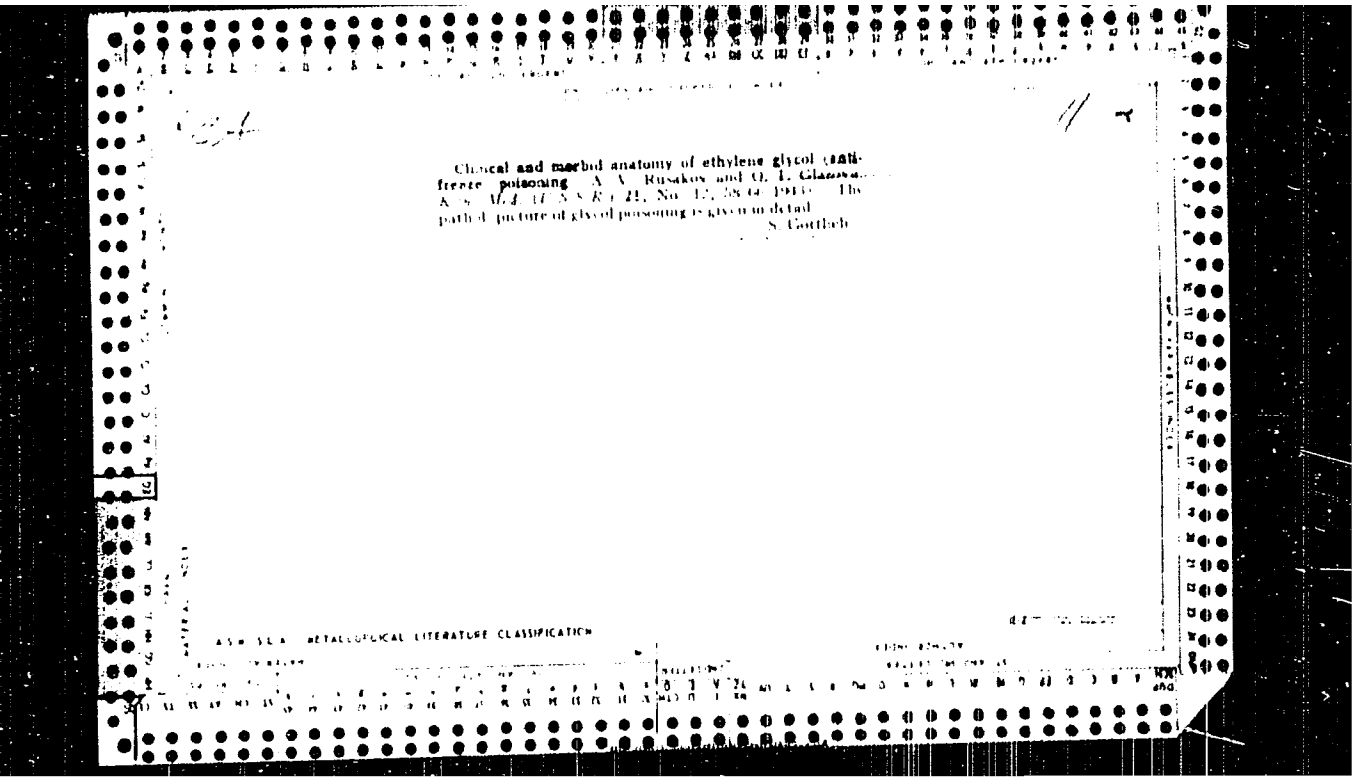
Abstract: At the "Bolshevik" [illegible], Moscow Oblast, phosphor-bacterin and nitrogen-bacterin were applied on a base of 2 centners [illegible], and, at the "Red [illegible]" [illegible], on a base of [illegible] t of manure. The addition [illegible] respectively: from nitrogen-bacterin [illegible] and [illegible], from the phosphor-bacterin [illegible] and [illegible], from a combined application of nitrogen-bacterin and phosphor-bacterin [illegible] and [illegible]. It is recommended that bacterial fertilizers be used under [illegible] on a base of mineral and organic fertilizers. -- V. K. [illegible].

Card 1/1

SOLOVYEV, V. I.; VOLKOVA, A. G.; KUZNETSOVA, G. N.; GLAZOVA, N. S.

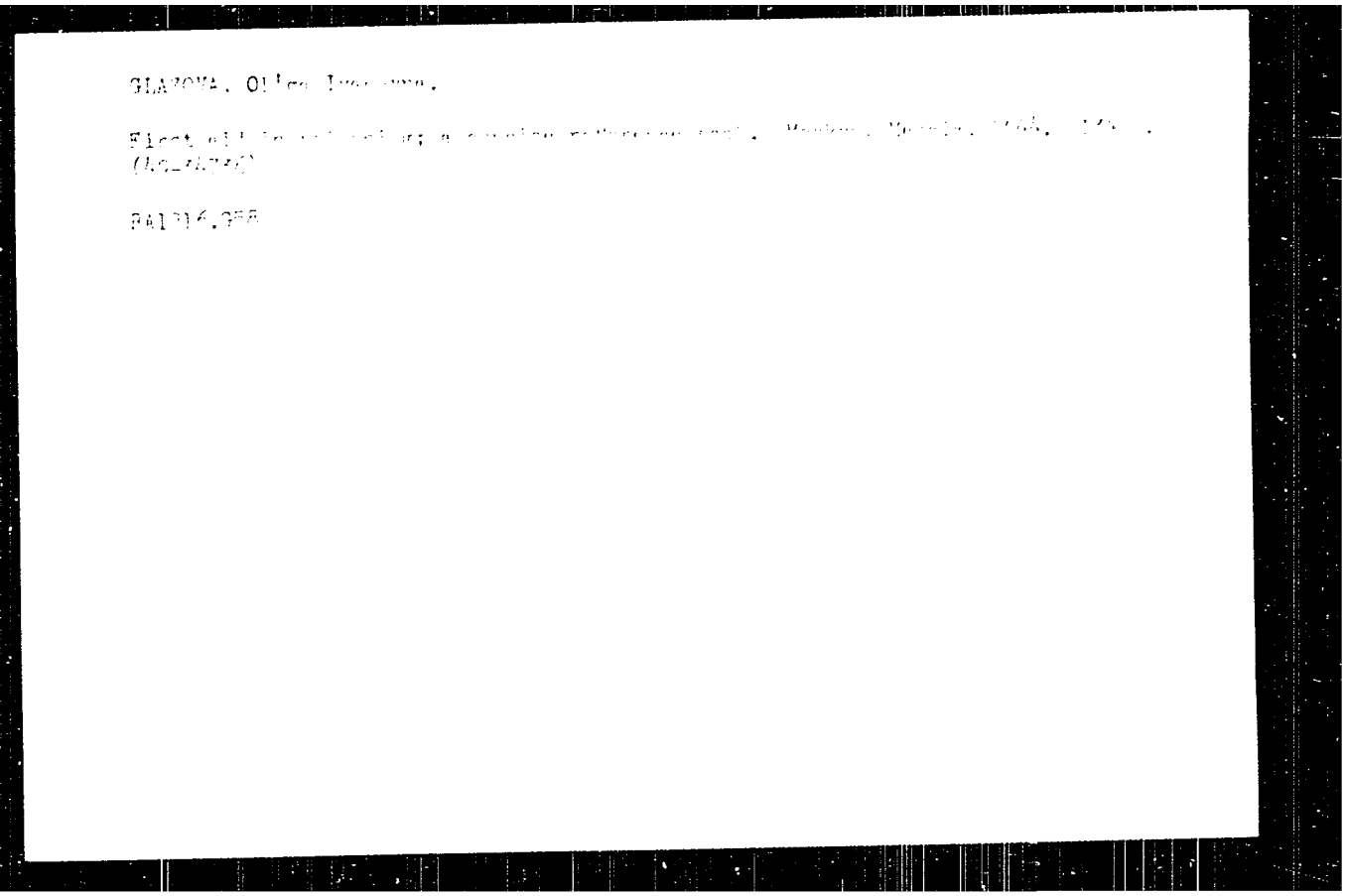
"Biochemical changes observed during storage of quick-frozen pre-cooled beef meat."

report submitted for 14th European Mtg, Meat Res Workers, Roskilde, Denmark, 7-11 Aug 1968.



Clinical and morbid anatomy of ethylene glycol (anti-freeze) poisoning. A. V. Rusakov and O. L. Glazova. [illegible] This pathol. picture of glycol poisoning is given in detail.
S. Gotlieb

A S M S L A METALLURGICAL LITERATURE CLASSIFICATION



30950. GLAZOVA, O. I.

Oslozhneniya infarkta sepdiechnoy Myshtsy. [Doklad na nauch. sessii In-ta im. sklifosovs kogo. Dek. 1946 r.] V sb: Voprosy ostroy vnutrennoy kliniki. M., 1949, s. 45-66.

30952. GLAZOVA, O. I.

Revmatizm Legkikh. V cb: Voprosy ostroy vnutrenney kliniki. M., 1949, s. 135-56

30951. GLAZOVA, O. I.

Prizhiznennyy diagnoz razryva mezhzheludochkovoy peregorodki serdtsa. V sb: Voprosy ostroy vnutrenney kliniki. M., 1949, s. 259-64

GLAZOVA, O.I.

Erroneous diagnosis of infarct of the myocardium. Klin.med., Moskva 28 no.5:90-91 May 50. (CLML 19:4)

1. Of the Therapeutic Clinic (Director -- Honored Worker in Science Prof. A.N.Kryukov, Active Member of the Academy of Medical Sciences USSR) of the Institute of First Aid imeni Sklifosovskiy and of the Third Therapeutic Department of the Central Institute for the Advanced Training of Physicians.

GLAZOVA, [illegible]. I.

Otravleniia [illegible] [illegible]/ [illegible] [illegible]/2-e izd. [illegible], [illegible], [illegible].

SO: Monthly List of Russian Accessions. Vol. [illegible] October [illegible]

GLAZOVA, O. I.

GLAZOVA, O. I. - "The etiology, pathogenesis, clinical aspects, and treatment of stenocardia". Moscow, 1955. State Publishing House for Medical Literature. Min Health USSR. Acad Med Sci. (Dissertation for the degree of candidate of Medical Sciences).

SO: Knizhnaya Letopis' No. 46, 12 November 1955. Moscow

GLAZOVA, O.I. (Moskva)

Myocardial infarct according to the experience of the N.V.Sklifosovskii Institute. Klin.med. 34 no.9:17-23 S '56. (MLRA 9:11)

1. Iz terapevticheskoy kliniki (rukovoditel' - prof. P.L.Shukhinin) Instituta imeni N.V.Sklifosovskogo (dir. - zasluzhennyy vrach USSR M.M.Tarasov)

(MYOCARDIAL INFARCT
statist. & clin. aspects)

GLAZOVA, O.I.; STRAKHOVA, O.G. (Moskva)

Late results in acute coronary insufficiency. Klin. med. 37 no.5: 126-129 My '59. (MIRA 12:8)

1. Iz Instituta imeni Sklifosovskogo (dir. - zasluzhennyy vrach M.M. Tarnsov, rukovoditel' kliniki - deystvitel'nyy chlen AMN SSSR prof. A.N. Kryukov [deceased]).

(CORONARY DISEASES, ther.
remote results (Rus))

GLAZOVA, O. I., doktor med. nauk; IZRAELIT, S. S.; SHCHEGOLEVA, T. G.; LEIN, B. N.

Diagnosis of the active phase of the cardiac form of rheumatic fever. Terap. arkh. no.12:30-35 '61. (MIRA 15:2)

1. Iz terapevticheskoy kliniki (zav. - prof. P. L. Sukhinin) i laboratorii (zav. - kandidat meditsinskikh nauk V. Y. Novosel'skaya) Moskovskogo nauchno-issledovatel'skogo instituta skoroy pomoshchi imeni Sklifosovskogo.

(RHEUMATIC HEART DISEASE)

GLAZOVA, O.P.

Determining the maximum daytime temperature by using data from vertical sounding of the atmosphere. Trudy TSIP no.61:120-130 '57.
(Atmospheric temperature) (MIRA 11:4)

GLAZOVA, [illegible]., Cand [illegible] Sci -- ([illegible]) "Concerning the [illegible] movement of air temperature." [illegible].

10 pp. (Main administration of Hydrome[illegible] service under the Council of [illegible] USSR. Central Inst of Forecasting) [illegible] (KL, [illegible])

– [illegible] –

GLAGOVA, O.P.

Diurnal air-temperature variation. Trudy TSIP no.[illegible]:96-115 '[illegible]. (MIRA 11:6)

(Atmospheric temperature)

GLAZOVA, O.P.; PONOMARENKO, S.I.

Causes of errors in weather forecasts for Moscow in 1958-1959.
Trudy TSIP no.112:3-17 '61. (MIRA 14:5)
(Moscow--Weather forecasting)

CLAZOVA, O.P., kand. geograficheskikh nauk

Forecast of maximum air temperature in heavy cloudiness according to data of morning sounding of the atmosphere. Meteor. i gidrol. no.7:37-40 Jl '65.

(MIRA 18:6)

1. TSentral'nyy institut prognozov.

IL'INSKIY, [illegible]; GLAZOVA, G.F., nauchn. red.; KOLIKOVSKAYA, A.B., red.

[Manual on short-range weather forecasting] Rukovodstvo po kratkosrochnym prognozam pogody. Leningrad, Gidrometeoizdat. Pt.3. No.4. 1965. 211 p. (MIRA 18:10)

1. Moskva. Tsentral'nyy institut prognozov. 2. Leningradskiy gidrometeorologicheskiy nauchno-issledovatel'skiy gidrometeorologicheskiy institut (for Il'inskiy). 3. Tsentral'nyy institut prognozov, Moskva (for Glazova).

CHISTYAKOV, A. [illegible] KOVA, N.V.; [illegible]LOVA, Ye.M., GLAZOVA, O.F.; PED[illegible] A., [illegible] N.Ye.; ABRAMOVICH, K.G.; POPOVA, T.P.; MATVEYEV, L.T.; BACHURINA, A.A.; LEBEDEVA, N.V.; PESKOV, B.Ye.; ROMANOV, N.N.; VOLEVAKHA, N.M.; PCHELKO, I.G.; [illegible] [illegible], I.V.; PINUS, N.Z.; SHMETER, S.M.; [illegible]YEVA, [illegible]; [illegible]NINA, L.S.; BEL'SKAYA, N.N., nauchn. red.; ZVEREVA, N.I., nauchn. red.; [illegible], nauchn. red.; [illegible]SALOVA, A.N., nauchn. red.; [illegible], L.V., nauchn. red.; [illegible], N.V., otv. red.; [illegible]VSKAYA, A.[illegible]

[Man[illegible] ... rukovodstv. po k[illegible] ...nym prognozam [illegible], Gidrometeo[illegible], Pt.2, 19[illegible]
(MIRA 18:8)

1. Moscow. TSentral'nyy [illegible]

L 3073-66 EWT(1)/FCC GW

ACCESSION NR: AP5016519 UR/0050/65/000/007/0037/0040
551.509.323

AUTHOR: Glazova, O. P. (Candidate of geographical sciences)

TITLE: Predicting maximal air temperature during extensive cloudiness from morning sounding of the atmosphere

SOURCE: Meteorologiya i gidrologiya, no. 7, 1965, 37-40

TOPIC TAGS: weather forecasting, cloud, atmospheric temperature

ABSTRACT: This paper presents the development of a method of using the maximum on a stratification curve for predicting the temperature maximum on cloudy days. Data were obtained for the period from the second half of March to the first half of October 1964, in Moscow, Vologda, Kazan, Kharkov, and Minsk. A dry adiabatic gradient was established from temperature soundings for the investigated period. This held whether the weather was very cloudy, only slightly cloudy, or variably cloudy. It was assumed that the upper limit of the gradient was lower for extreme cloudiness than for light or variable cloudiness. Since the air temperature amplitude in very cloudy weather averages but 0.4 the value during cloudless or nearly cloudless weather, this factor was used to reduce data (on height of the

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ACCESSION NR: AP5016519

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dry adiabatic gradient) for cloudless and slightly cloudy days. Thus reduced, the upper limit of dry adiabatic stratification ranged from 0.4 to 1.0 km during the investigated period, and these values are in agreement with actual sounding data. The temperature maximum for cloudy days may thus be predicted by: 1) determining the maximum warming for the given month from the table of corrected gradient limits as indicated above, and to note this value on the aerological chart; 2) using the surface map and the AT_{850} map to determine the temperature for this height by considering advection to 1:00-3:00 p.m.; 3) drawing the dry adiabatic curve from the newly obtained point and noting the intersection with the isobar of surface temperature. The temperature at the point of intersection is the maximum. The technique was verified by several comparisons of predicted and actual values. Orig. art. has: 1 figure and 3 tables.

ASSOCIATION: Tsentral'nyy institut prognozov (Central Forecasting Institute)

SUBMITTED: 12Jan65 ENCL: 00 SUB CODE: ES 55

NO REF SOV: 003 OTHER: 000

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L 27320-66 EWT(1)/FCC GW

ACC NR: AM6002137 Monograph UR/

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B+1

Moscow. Tsentral'nyy institut prognozov.

Handbook on short-range weather forecasting. pt. 3, no. 4: Synoptic processes and weather forecasting in the eastern regions of the USSR (Rukovodstvo po kratkosrochnym prognozam pogody. ch. III, vyp. 4: Sinopticheskiye protsessy i prognoz pogody v vostochnykh rayonakh SSSR) Ed. by O. P. Glazova. Leningrad, Gidrometeoizdat, 1965. 211 p. illus., biblio. (At head of title: Glavnoye upravleniye gidrometeorologicheskoy sluzhby pri Sovete Ministrov SSSR. Dal'nevostochnyy nauchno-issledovatel'skiy gidrometeorologicheskiy institut) 1650 copies printed.

TOPIC TAGS: synoptic process, weather forecasting, climatology

PURPOSE AND COVERAGE: This handbook describes basic patterns and particular features of the development of synoptic processes over eastern Asia and the Far Eastern seas. It also gives information needed by the forecaster regarding the regime, the synoptic conditions, and the local characteristics of the origin of most important weather phenomena in the eastern USSR. The book is intended for geographers and meteorologists, particularly for the short-range weather forecasters. There are 60 references, all Soviet.

UDC: 551.509.31(571.6)(022)

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L 27320-66

ACC NR: AM6002137

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L 27320-66
ACC NR: AM6002137

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SUB CODE: 04/ SUBM DATE: 08Jul65/ ORIG REF: 060

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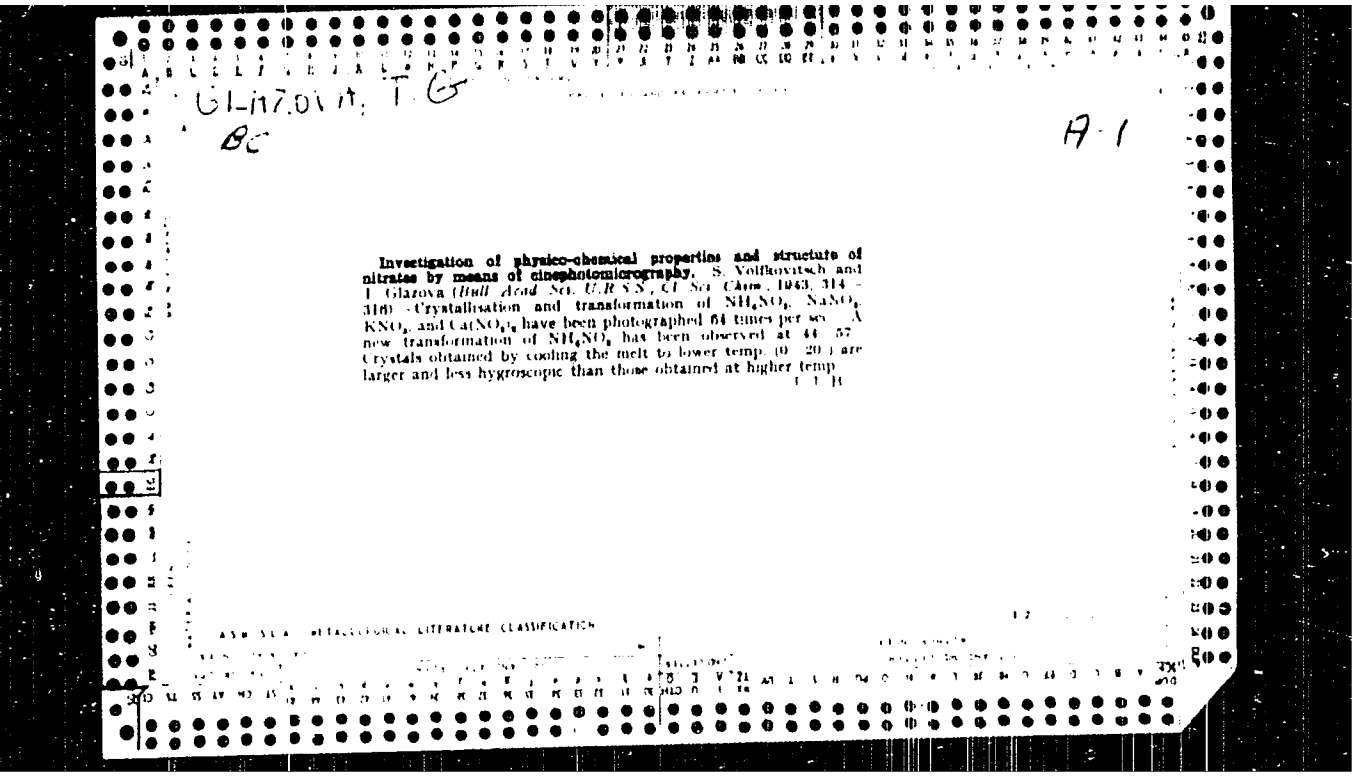
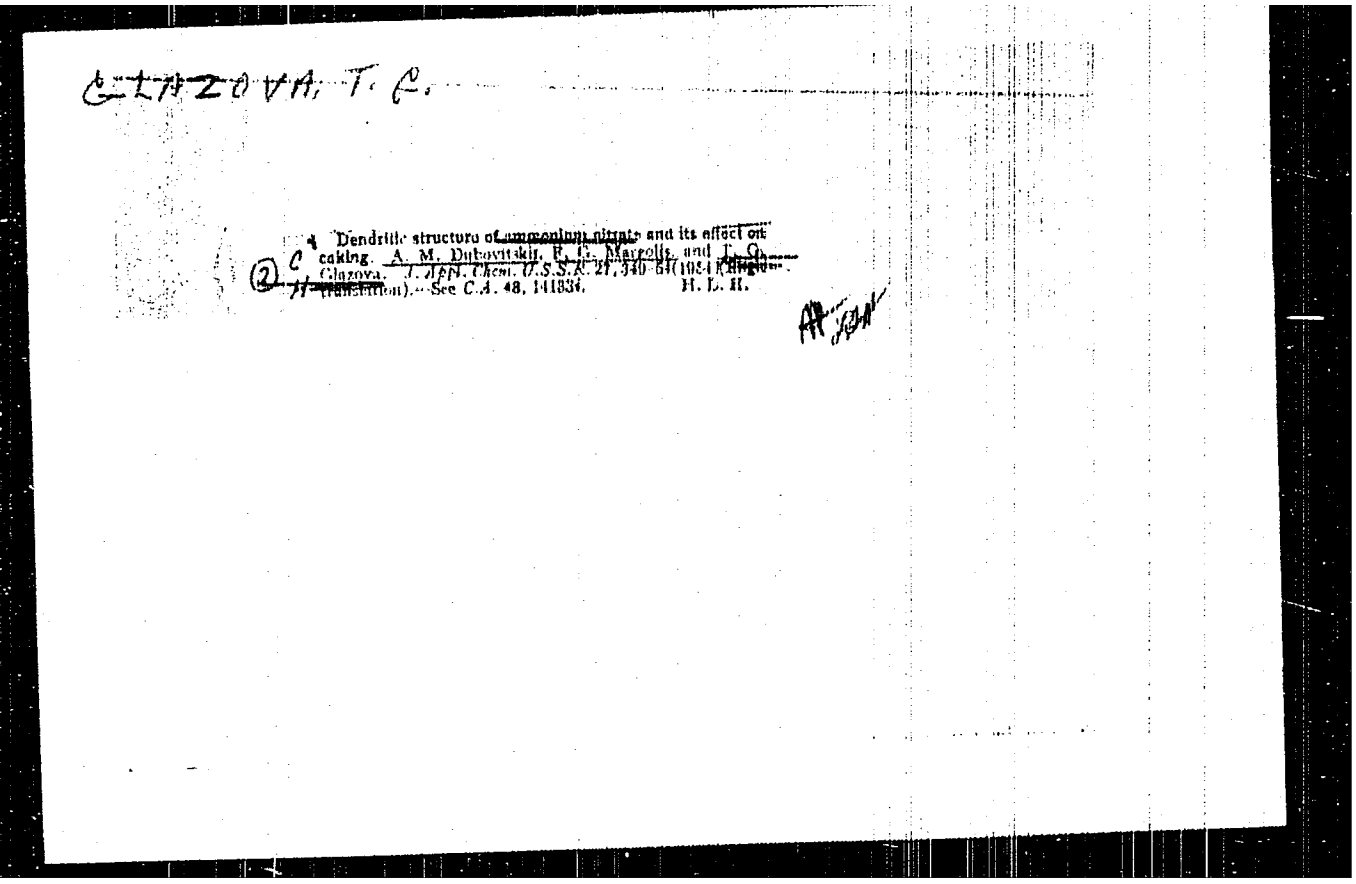
MONINA, P.V., kand.tekhn.nauk; GLAZOVA, R.A., starshiy nauchnyy sotrudnik; LATYSHEVA, N.P.; POLUMIYENKO, Ye.A., inzh.

Results of tests on Kovo hydraulic looms. Tekst.prom. 20 no.2:36-39 F '60. (MIRA 13:6)

1. TSentral'nyy nauchno-issledovatel'skiy institut shelkovoy promyshlennosti (for Glazova). 2. Glavnyy inzhener shelkotkatskoy fabriki imeni Sverdlova (for Latysheva).
(Looms) (Synthetic fabrics)



Investigation of physico-chemical properties and structure of nitrates by means of cinephotomicrography. S. Volfkovitsch and I. Glazova (*Bull. Acad. Sci. U.R.S.S., Cl. Sci. Chim.*, 1943, 314–318).—Crystallisation and transformation of NH_4NO_3, $NaNO_3$, KNO_3, and $Ca(NO_3)_2$ have been photographed 64 times per sec. A new transformation of NH_4NO_3 has been observed at 44—57°. Crystals obtained by cooling the melt to lower temp. (0—20°) are larger and less hygroscopic than those obtained at higher temp.



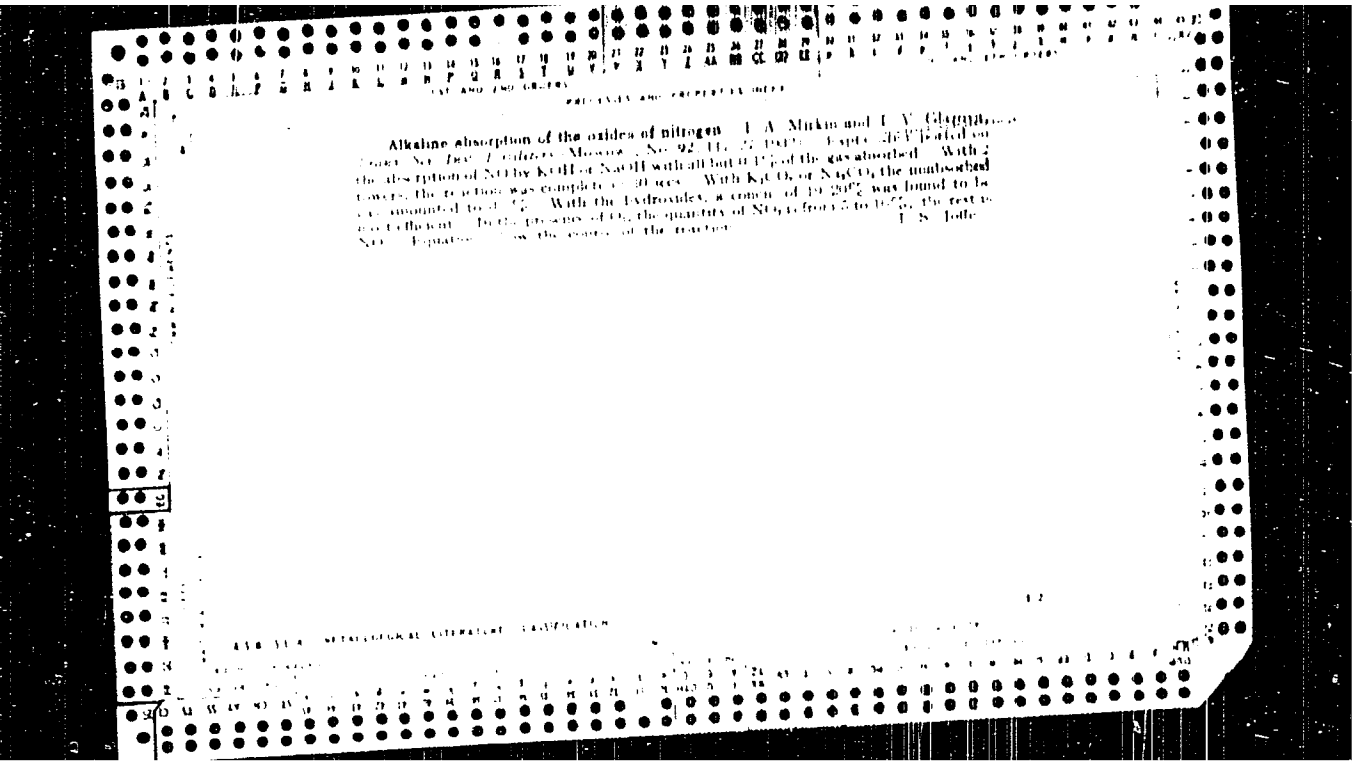
GLAZOVA, T. P.

(2) C Dendritic structure of ammonium nitrate and its effect on caking. A. M. Butovitskii, E. G. Marcolis, and L. G. Glazova. *J. Appl. Chem. U.S.S.R.* 21, 340-54(1948). (English translation).—See *C.A.* 48, 141834. H. L. H.

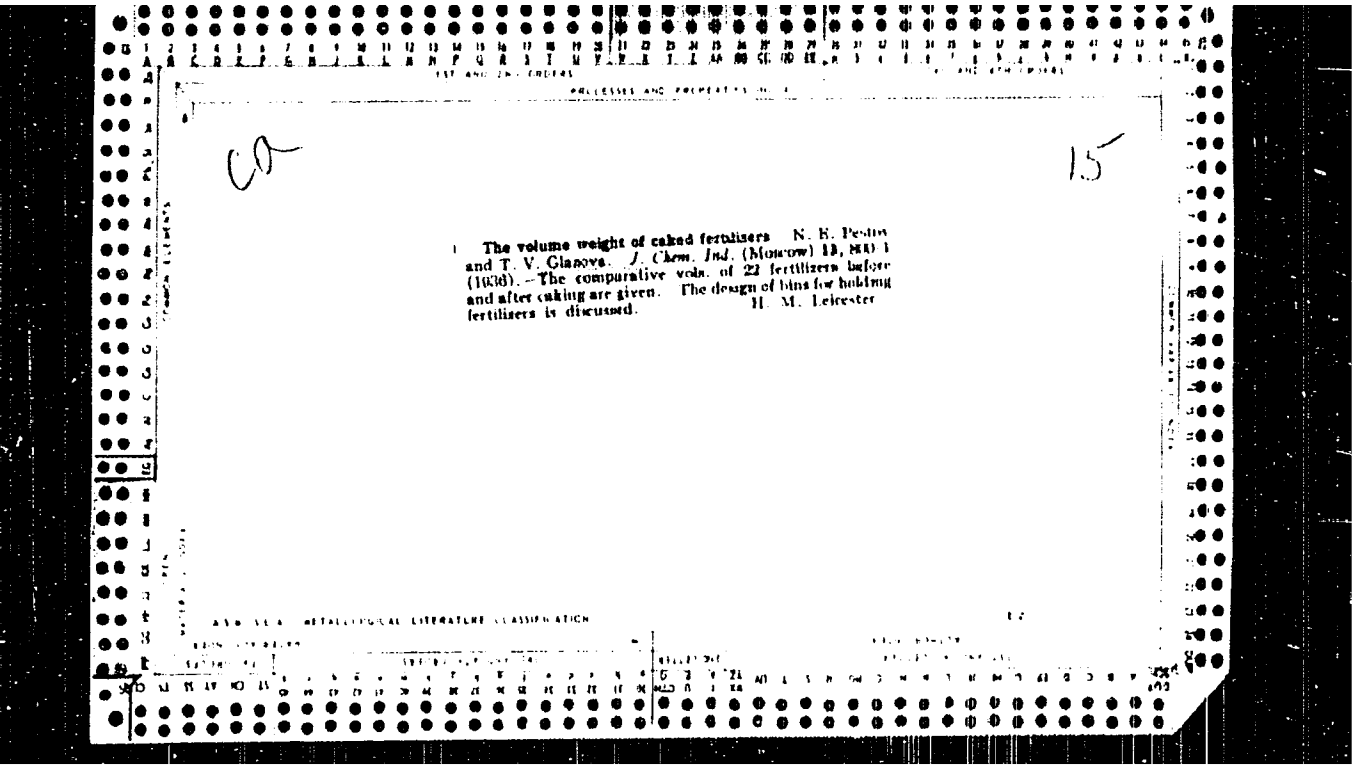
FAL'KOVSKIY, V.B.; MURAKHAMEDOVA, R.A.; GLAZOVA, T.I.; YELEPINA, L.T.; L'VOV, S.V.

Preparation of carboxylic acids by one-stage oxidation of polymethylbenzenes in bubble columns. Izv.vys.uchob.zav.; khim. i khim. tekh. 7 no. 1:122-126 '64. (MIRA 17:5)

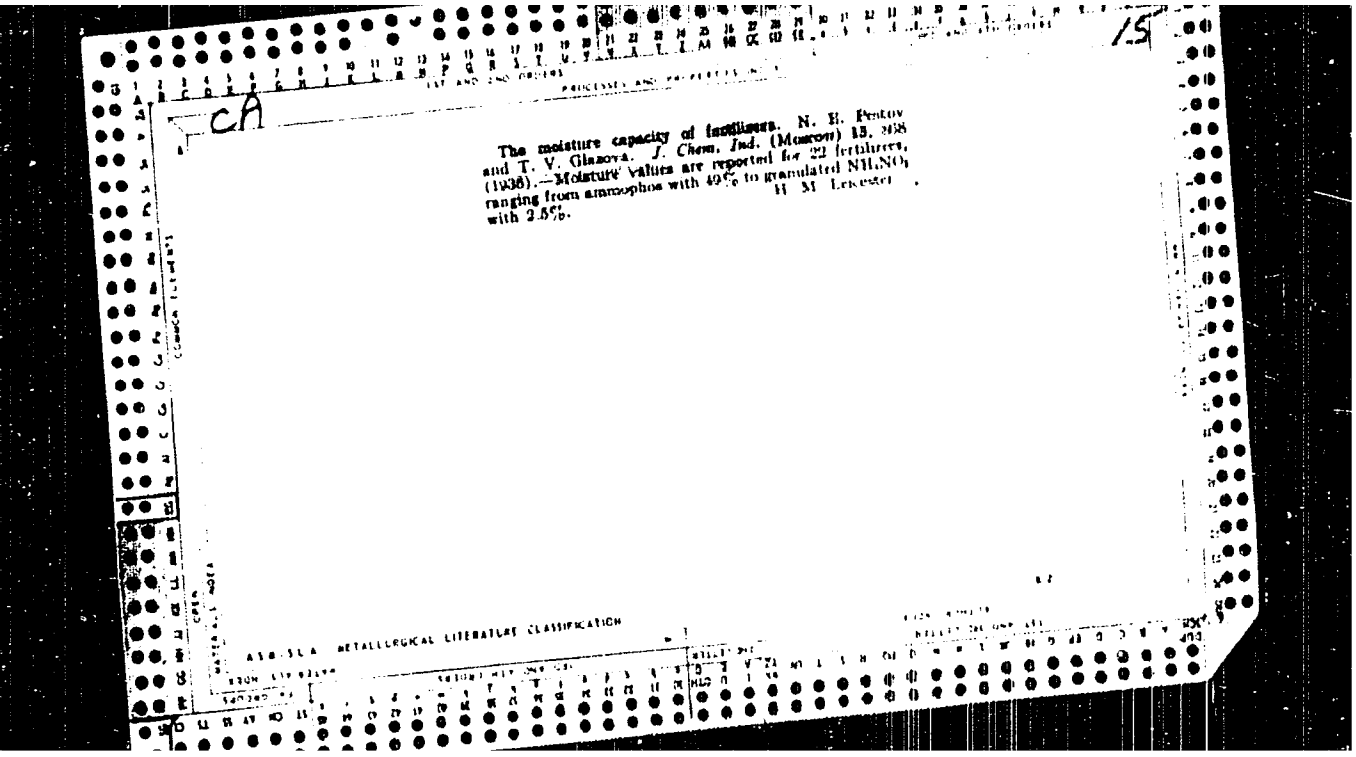
1. Moskovskiy institut tonkoy khimicheskoy tekhnologii im. M.V.Lomonosova, kafedra tekhnologii osnovnogo organicheskogo sinteza.



Alkaline absorption of the oxides of nitrogen. I. A. Mukin and I. V. Glagol[illegible]. Zhur. Fiz. Khimii, Moscow, No. 92 [illegible] Engl. abstr. published on the absorption of NO by KOH or NaOH with all but 0.1% of the gas absorbed. With a lower [illegible] was complete in 30 secs. With K_2CO_3 or Na_2CO_3 the unabsorbed amounted to [illegible]. With the hydroxides, a concn. of 10-20% was found to be [illegible] In the presence of O_2, the quantity of NO is from 5 to 10%, the rest is [illegible] U.S. Dofe



The volume weight of caked fertilizers N. E. Pestin and T. V. Glasove. *J. Chem. Ind.* (Moscow) 13, 883-4 (1936).—The comparative vols. of 22 fertilizers before and after caking are given. The design of bins for holding fertilizers is discussed. H. M. Leicester



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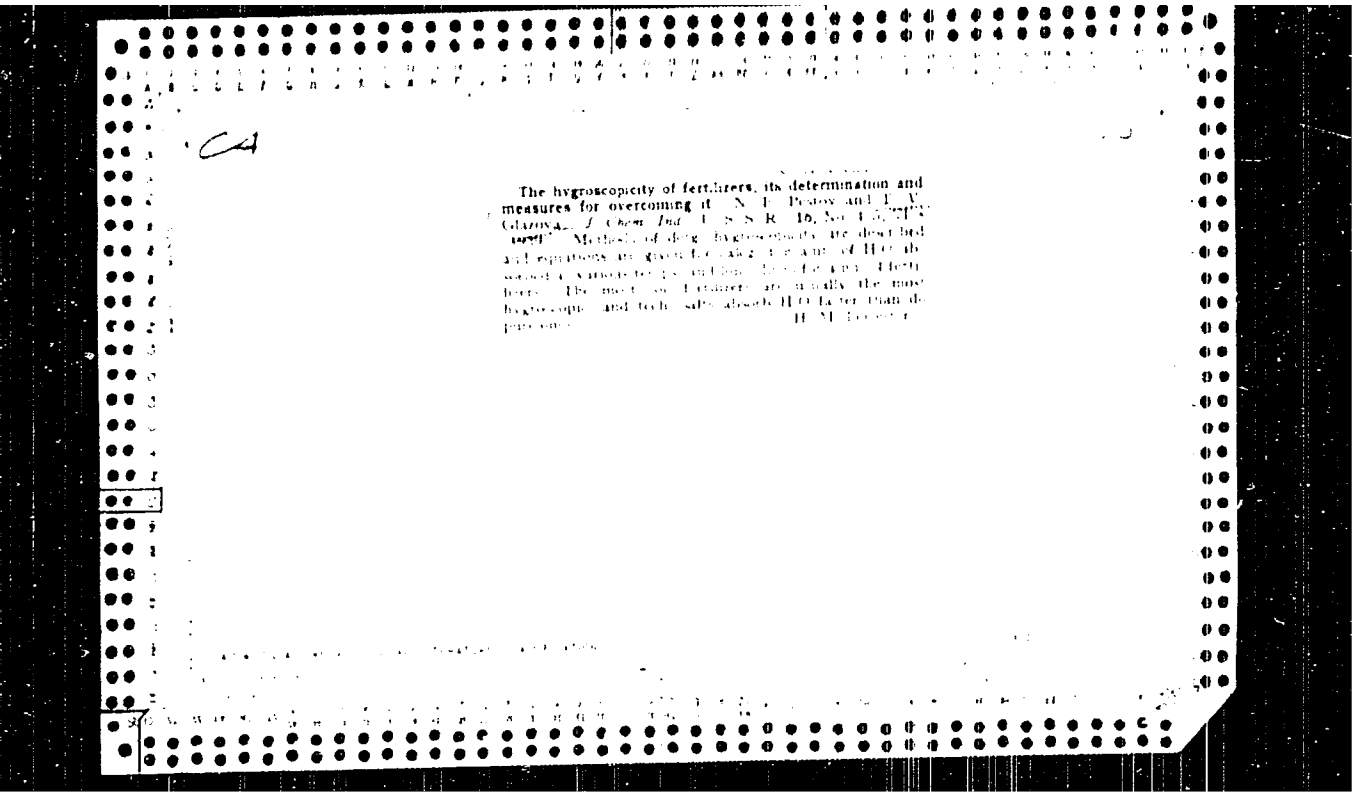
The moisture capacity of fertilizers. N. E. Pentov and T. V. Glazova. *J. Chem. Ind.* (Moscow) 15, 958 (1938).—Moisture values are reported for 22 fertilizers, ranging from ammophos with 49% to granulated NH_4NO_3 with 2.6%. H. M. Leicester

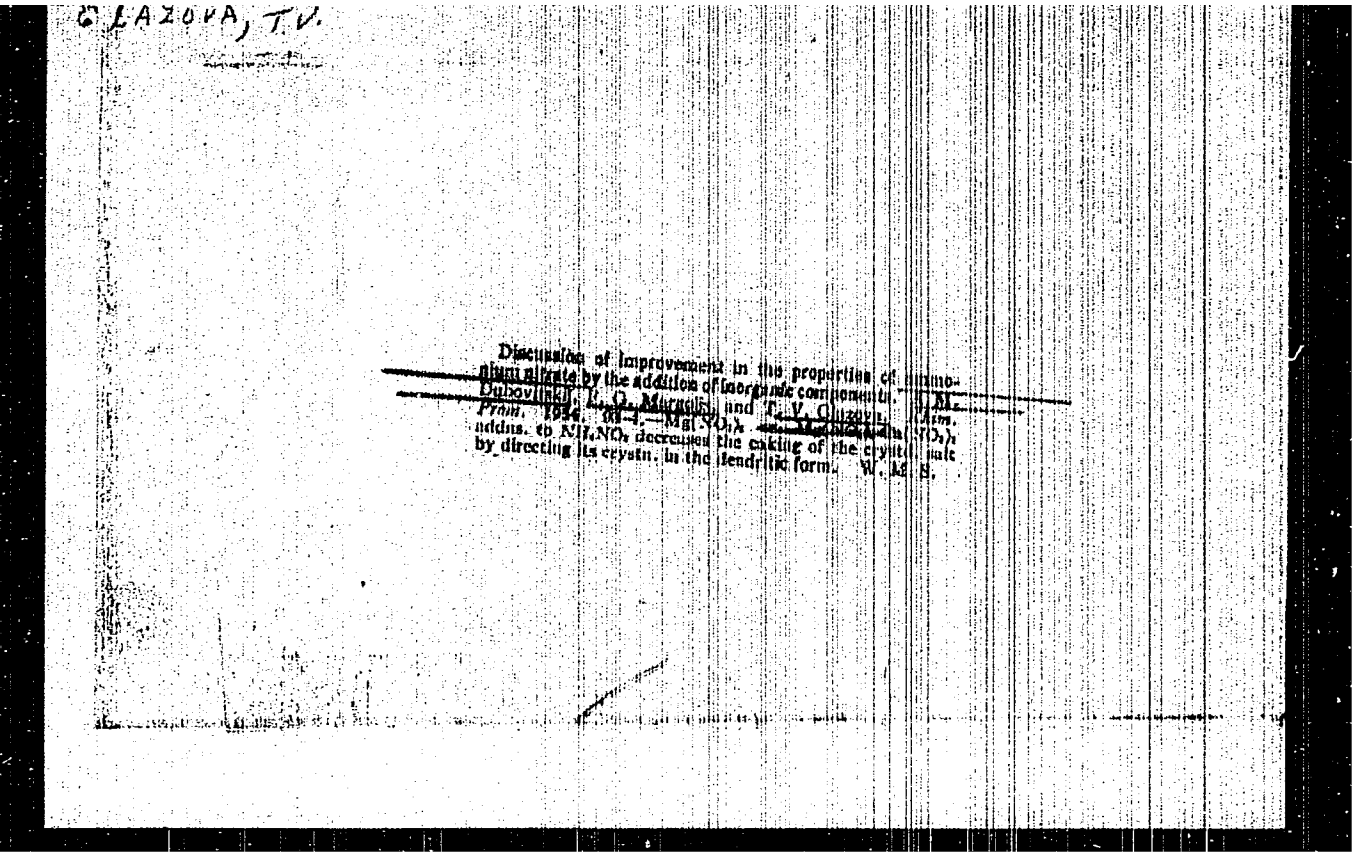
ASBSLA METALLURGICAL LITERATURE CLASSIFICATION



The hygroscopicity of fertilizers, its determination and measures for overcoming it. N. F. Postov and I. V. Glazova. *J. Chem. Ind.* U.S.S.R. 16, No. 1, [illegible]. Methods of determining hygroscopicity are described and explanations are given for using a series of [illegible] solutions to [illegible]. The most hygroscopic fertilizers are usually the most hygroscopic and tech. salts absorb H$_2$O faster than do pure ones. H. M. [illegible]

Microcinematographic investigation of the processes of crystallization of nitrates. S. I. Vol'fkovich and L. V. Glazova. *Bull. acad. sci. U. R. S. S., Classe sci. chim.* 1943, [illegible]; *Doklady Akad. Nauk S.S.S.R.* 41, [illegible] (*Compt. rend. acad. sci. U.R.S.S.* 41, [illegible] (1943) (in English)). A description is given of details of changes in crystal structure, to be observed under the microscope, on cooling molten NH_4NO_3, molten $Ca(NO_3)_2$, and on crystn. of KNO_3 from satd. aq. soln. J. W. Perry

METALLURGICAL LITERATURE CLASSIFICATION



GLAZOVA, T.V.

Discussion of improvements in the properties of ammonium nitrate by the addition of inorganic components. [With discussion] Dubovitskii, L. O. Margulis, and T. V. Glazova. Zhur. prikl. khim. Prom. 1954, 27, 1.—$MgSO_4$, $Mg(NO_3)_2$, $Mn(NO_3)_2$, TiO_2, and Fe_2O_3 additions to NH_4NO_3 decreased the caking of the crystalline salt by directing its crystn. in the dendritic form. W. A. S.

GLAZOVA, T. V.

AID - P-83

Subject : USSR/Chemistry

Card : 1/1

Authors : Dubovitskiy, A. M., Margolis, F. G., and Glazova, T. V.

Title : Dendrite structure of ammonium nitrate and its effect on caking of the salt

Periodical : Zhur. Prikl. Khim. 27, no. 4, 368-375, 1954

Abstract : Under certain conditions, formation of dendritic crystals of ammonium nitrate takes place from both solutions and fusions. Dendritization of ammonium nitrate eliminates caking of the salt. Ten references (six U.S.S.R.): 1891-1952. One table; four photos.

Institution : Scientific Institute for Fertilizers, Insecticides and Fungicides.

Submitted : August 17, 1953

MARGOLIS, E.G.; LUBOVITSKIY, A.M.; GLAZOVA, T.V.

Obtaining dicalcium phosphate dihydrate and ammonium nitrate by nitric acid decomposition of phosphates. Khim.prom.no.1: 26-31 Ja-F '56. (MIRA 9:7)

1.Nauchnyy institut po udobreniyam i insektofungitsidam imeni Ya.V.Samoylova.

(Phosphates)

MARGOLIS, F.G.; GLAZOVA, T.V.; SIMONOVA, O.N.

Ammoniation of nitrate solutions in the production of carbonate nitrophoska. Khim. prom. no.2:85-89 F '61. (MIRA 14:4)
(Fertilizers and manures) (Phosphates) (Ammonium nitrate)

MARGOLIS, F. G., kand. tekhn. nauk; GLAZOVA, T. V.; SVERDLOVA, A. I.

Recent developments in the technology of complex fertilizers using the nitric acid treatment of phosphates. Zhur. VKHO 7 no.5:507-512 '62. (MIRA 15:10)

(Phosphates) (Nitric acid)
(Fertilizers and manures)

GLAZOVA, V. V., Cand Chem Sci -- Study of the equilibrium phase and certain physico-chemical properties of solid solutions in the system, titanium-zirconium-tin." Mos, 1961. (Mos State U im M. V. Lomonosov. Chem Fac, Chair of Gen Chem) (KL, 8-61, 230)

GLAZOVA, V.V.; KURNAKOV, N.N.

Phase equilibrium in the quasiternary system Ti - Ti_3Sn - Zr. Dokl. AN SSSR 138 no.4:835-838 Je '61. (MIRA 14:5)

1. Institut metallurgii imeni A.A.Baykova AN SSSR. Predstavleno akademikom I.I.Chernyayevym.

(Titanium-tin-zirconium alloys)
(Phase rule and equilibrium)

8262

S/180/60/000/004/014/027
E111/E452

18.1200
18.1285

AUTHORS: Glazova V.V. and Kurnakov N.N. (Moscow)

TITLE: Methods of Preparing Alloys Based on Titanium and Zirconium for Phase-Diagram Investigation

PERIODICAL: Izvestiya Akademii nauk SSSR Otdeleniye tekhnicheskikh nauk Metallurgiya i toplivo 1960, No.4, pp.81-84

TEXT: The authors discuss methods used for preparing high-melting alloys, particularly those based on titanium and zirconium. They note the advantages of levitation melting: this gives sound ingots (Fig.1). The authors have used this method for preparing phase-diagram study specimens for Ti-Sn, Ti-Zr, Zr-Sn and Ti-Zr-Sn. Parallel specimens were made with arc melting. Starting materials were grade TG-00, 99.5% pure titanium (magnesium thermic), 99.8% pure iodide zirconium and grade ChDA (99.95% pure) tin. Alloys produced by both methods were subjected to microscopic analysis in the as-cast state and

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E111/E452

Methods of Preparing Alloys Based on Titanium and Zirconium for Phase-Diagram Investigation

after stabilization for 650 hours at 800°C. Microstructures of Ti + 30% Sn are shown in Fig.2 illustrating the differences between alloys produced by arc and levitation melting (left-hand and top and bottom photomicrographs, respectively), which are reduced by stabilization (right-hand photo-micrographs). Hardness was also measured and is tabulated for various alloys arc and levitation melted, the hardness values are plotted in Fig.3 as a function of tin-content for arc- and levitation-melted alloys (curves 1 and 2 respectively). The authors conclude from their own and published work that levitation melting is the better method for preparing specimens for phase-diagram investigations. A.A.Fogel, T.A.Sidorova and N.A.Pavlov assisted in preparation of alloys. There are 3 figures.

Card 2/3

82620
S/180/60/000/004/014/027
E111/E452

Methods of Preparing Alloys Based on Titanium and Zirconium for Phase-Diagram Investigation

1 table and 11 references: 5 Soviet and 6 English.

SUBMITTED: March 2, 1960

Card 1/3

S/020/60/134/003/013/024
B016/B064

AUTHORS: Glazova, V. V., and Kurnakov, N. N.

TITLE: Equilibrium in the System Titanium - Tin

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 3, pp. 1087-1090

TEXT: The authors wanted to clarify the question as to whether a continuous series of solid solutions is formed in the Ti - Sn system, and to determine the equilibrium between the α-Ti and γ phases. The equilibrium diagram was plotted for the concentration range between 0 and 25 atom% of Sn. Induction melting in a suspended state was found to be the most favorable method of producing alloys on the basis of Ti (Refs. 14, 15). To study the phase diagram, alloys with an Sn content of 0.83, 2.12, 4.35, 5.28, 6.52, 7.78, 10.[illegible], 9, 18, 22.0, and 25 atom% were prepared. Microscopic analysis showed that the cast samples of alloys having an Sn content of up to [illegible]4.9 atom% inclusive have only one phase. The structure of the alloys with 18 and 22.0 atom% Sn contains small intermediate layers of the second phase. After a deformation of

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10-20% and annealing in vacuum (10^{-4} torr) at 850°C for 1 500 h, these intermediate layers became much thinner. Alloys with 4.35, 5.28, 6.52 and 7.78 atom% Sn had an α-structure. The remaining alloys had a polyhedral structure. The authors subjected all alloys to another deformation of 10-20%, and annealed them at 800°C for 1 500 h. Then all alloys were single phase and had a polyhedral structure. This suggests the existence of a continuous series of solid solutions between the α-Ti and β phases. Fig. 1 gives data on the uppermost limit of the existence of the $\alpha(\beta)$-phase as measured by the methods described in Refs. 1 and 12. The temperature dependence α_t of resistivity ρ (Ref. 13) first rises linearly with a temperature increase (Table 2); later on, the rate of increase in ρ is slowed down. At the moment of phase transformation ρ decreases rapidly (Table 1). Fig. 2 shows ρ as a function of t between 800° and 1,050°C. The temperatures of phase transformations of the alloys investigated (Table 2) were determined from the sharp breaks of the curves. Fig. 2 shows that the transition of the alloys with 5.28 and 7.78 atom% Sn from the α range to the β range takes place between certain temperatures, whereas the intermediate alloy with 6.52 atom% Sn undergoes an isothermal transformation at 842°C. Fig. 3 shows ρ and α_t as a function

Equilibrium in the System Titanium - Tin S/020/60/[illegible]/005/[illegible]/023
B019/E054

of the concentration at 20°, 400° and 500°C. This function is characterized by curves reaching a maximum [illegible] atom% Sn. The authors constructed the equilibrium variant of the Ti - Sn diagram (Fig. 4) on the basis of their experimental results. Hence, it follows that there is a continuous series of solid solutions between the α-Ti and β phases. An addition of Sn reduces the temperature of the allotropic transformation of Ti to a minimum at 542°C and 6.5% atom%, and then increases it again. The authors mention a method by G. A. Meyerson (Ref. 20) and a paper by I. I. Kornilov (Ref. 12). There are 4 figures, 2 tables, and 20 references: 12 Soviet and 8 US.

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 9, 1960, by I. I. Chernyayev, Academician

SUBMITTED: May 5, 1960

Card 3/3

22979

18.8200 1045, 1418, 2807

S/180/61/000/003/007/012
E193/E183

AUTHORS: Glazova, V.V., and Kurnakov, N.N. (Moscow)

TITLE: Resistance to plastic deformation of the titanium—zirconium solid solutions at various temperatures

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1961, No.3, pp. 67-72

TEXT: In spite of the relatively high melting points of titanium and zirconium, the strength of both these metals decreases rapidly at about 400-500 °C. It has, however, been postulated by A.D. Schwoppe that Ti-Zr alloys might have better high-temperature properties, and the object of the present investigation was to study the resistance to deformation of these alloys at elevated temperatures with a view to evaluating their possible use as a basis of creep-resistant materials. To this end hardness tests and centrifugal bending tests were conducted on 10 experimental alloys containing 5.5-82.5% Zr. The diamond pyramid indentor was used in the hardness measurements which were carried out in vacuum at 300, 400, 500, 600 and 700 °C under the load of 1 kg, applied for 0.5, 5, and 50 minutes; each measurement was taken on a test piece that

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had been held at the test temperature for 100 hours. The centrifugal bending tests were carried out in air at 500 °C on a testing machine described elsewhere (Ref.10: V.F. Prokhanov. Zavodskaya laboratoriya, 1957, No.8, p 1030). When the results of hardness measurements (which are tabulated in the paper) were represented graphically it was found that the time-dependence of the diagonal d of the indentation at any given temperature is given by $d = a\tau^b$, where τ is the loading time (minutes) and a and b are parameters which depend on the nature of the alloy, test temperature and the magnitude of the applied load. Values of a and b, relating to the alloys and experimental conditions used in the present investigation, are also tabulated. At the same time, it is known that the rate of creep can be calculated from data on hardness at high temperatures. Thus the rate of creep V_d (1/min) at the moment at which the diagonal of the indentation attains the magnitude d is given by:

$$\log V_d = \log b - \frac{\log a - \log d}{b} \qquad (2)$$

Resistance to plastic deformation....

This formula was used in presenting the results of hardness measurements obtained by the present authors who related them to the solid state transformation part of the constitution diagram of the Ti-Zr system, shown in Fig.1a. Fig.1б shows the concentration (at.% Zr) dependence of log V_d, corresponding to d = 0.18 mm at 600 °C (circles) and 700 °C (triangles); Fig.1в showing the same relationship of log V_d corresponding to d = 0.12 mm at 300 (crosses), 400 (squares) and 500 °C (dots). It will be seen that the log V_d isotherm for 300 °C represents a smooth curve with a minimum at a composition corresponding to an alloy characterised (at this temperature) by maximum creep resistance. As the temperature increases the shape of the log V_d isotherm changes, and with increasing concentration of either component log V_d first decreases, passes through a minimum and then through a maximum, situated approximately at the composition which corresponds to the minimum of the 300 °C isotherm. Similar results were yielded by the centrifugal bending tests. These are reproduced in Fig.2, showing the concentration dependence of the deflection (f, mm) of specimens tested at 500 °C under a stress of 15 kg/mm^2, applied for 5, 10, 25 and 50 hours (curves 1-4 respectively). The character of

S/180/61/000/003/007/012
E193/E183

Resistance to plastic deformation....

the concentration dependence of the high temperature strength of the Ti-Zr alloys is, according to the present authors, directly related to the shape of the $\beta \rightarrow \alpha$ transformation curve (Fig.1a) of this system. Their theory, which is extended to any other transformation (including the solidification of alloys) is best explained with reference to Fig.3, whose top part shows a transformation curve with a minimum; the shaded area represents a temperature region within which the alloys retain to a larger or smaller extent the structural characteristics (short-range order) of the inherently weak phase existing above the transformation temperature. Consequently, a log V_d isotherm for a temperature t_1 will show a maximum (i.e. minimum creep resistance) in this composition range where t_1 is within the shaded area (the top curve in the lower part of Fig.3). A log V_d isotherm for a temperature t_2 which is below the shaded area for the whole range of the concentration of the system will have a shape typical of the concentration-dependence of physical properties of solid solutions (the bottom curve in the lower part of Fig.3).
There are 3 figures, 2 tables and 16 Soviet references.

Card 4/6

[illegible]2
S/1[illegible]/[illegible]1/012/005/005/028
E1[illegible]/E583

18.1285 [illegible] 1496 [illegible]

AUTHORS: Gl[illegible]va, V.V., Kurn[illegible] [illegible] A.B.

TITLE: Study of atomic interaction [illegible] solid solutions

PERIODICAL: Fizika metallov i metallovedenie, [illegible] 1961, 656 - [illegible]

TEXT: The object of the present [illegible] an explanation [illegible] earlier-established [illegible] greater effect of Zr and Sn additions [illegible] than the effect of each of these alloying additions [illegible] separately. To this end the concentration-dependence of the [illegible] of elastic modulus E and [illegible] expansion coefficient of binary and ternary alloys in the Ti corner of the Ti-Zr-Sn system was determined. The experimental alloys [illegible] argon-arc furnace, each [illegible] 100 [illegible] remelted 10 to 30 times to ensure homogeneity [illegible] [illegible] The composition of the alloys is given in Table 1. [illegible] E [illegible] 20 - [illegible] °C [illegible] having been determined by dilatometric [illegible]

Card 1/[illegible]

S/126/[illegible]/[illegible]/[illegible]/[illegible]
E[illegible]/E[illegible]

Study [illegible]

characteristic [illegible] Θ of the [illegible] calculated from the formula

$$\Theta = \frac{[illegible] \cdot 10^{[illegible]} \sqrt{E}}{A^{1/[illegible]} d^{1/[illegible]}}$$

where A is the density of the alloy and d the mean atomic weight.
The results are tabulated and reproduced [illegible].
In Fig. 1 E [illegible] (left-hand scale) and Θ °K (right-hand scale) of Ti-Zr alloys are plotted [illegible] Zr content (%). In Fig. 2 E [illegible] Ti-Zr-Sn alloys [illegible] plotted against the Sn content (%). Curves [illegible] alloys with a constant Zr content of [illegible]. The [illegible] dependence of Θ of the ternary alloys is illustrated in the same manner in Fig. 3. It was concluded [illegible] increase in E [illegible]

Card 2/5

32652
S/136/61/000/007/005/008
Study of atomic interaction E193/E383

[illegible] by addition of Sn [illegible] the Ti-8% Zr alloy [illegible] results of [illegible] properties between the alloying additions which [illegible] diffusion mobility and an increase in the [illegible] of the alloy to plastic deformation.
There are 7 figures, 3 tables and 10 references: 3 Soviet-bloc and 7 non-Soviet-bloc.

ASSOCIATIONS: Institut metallurgii AN SSSR im. A.A. Baykova (Institute of Metallurgy of the AS USSR im. A.A. Baykov)
Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR (Institute of Powder Metallurgy and Special Alloys of the AS UkrSSR)

SUBMITTED: March 6, 1961

Card 3/5

88572

S/020/61/135/001/020/057
B016/B055

18 1200

AUTHORS: Glazova, V. V. and Kurnakov, N. N.

TITLE: A Study of the Phase Equilibrium in the System Ti_3Sn - Zr

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 135, No. 1, pp. 100-103

TEXT: The authors studied the phase equilibriums in 16 casting alloys with compositions corresponding to the Ti_3Sn - Zr section of the ternary diagram Ti - Zr - Sn (Table 1). Most of these alloys were subjected to a 20% deformation and homogenizing annealing at 800°C for 1500 h, and subsequently at 1000°C for 150 h and at 1200°C for 200 h and then chilled. Annealing was carried out in double-walled evacuated quartz ampoules. Micro-sections etched with HNO_3 + HF + glycerol at a volume ratio of 1 : 1 : 2 were used for microscopic analysis. All the alloys were single-phase and of polyhedral structure up to Zr concentrations of 22% by weight. At higher Zr concentrations a second phase appears, the quantity of which steadily increases with rising Zr content. Above 55% Zr this second phase exhibits

Card 1/3

A Study of the Phase Equilibrium in the System Ti_3Sn - Zr

S/020/61/136/001/020/C37
B016/B055

an α' structure. Alloys containing 80% Zr and annealed at 1000 and 1200°C posses a single-phase α' structure. From the above data and hardness data of the alloys the authors assume the Ti_3Sn - Zr section to be quasi-binary. The quasi-binary diagram of this section (Fig. 3) was investigated by high-temperature contactless thermal analysis which yielded several hitherto unavailable characteristics, i.e. the solidus curve, transitions in the solid state and the liquidus temperatures corresponding to the formation of primary β and β crystals. The authors conclude from Fig. 3 that the equilibrium between the β modification of Zr and Ti_3Sn may be described by a eutectic-type phase diagram with partial solid-state solubility. The eutectic point lies around 1540°C and the eutectic contains 50% by weight Zr. The authors compare this system with the Ti_3Sn - Ti system and find that in spite of the close chemical relationship of Zr and Ti, equilibrium is much more easily attained and diffusion at the corresponding temperatures is more rapid in the Ti_3Sn - Zr system. The authors thank N. A. Nedumov, who developed the contactless thermographic method, for his collaboration. There are 4 figures, 2 tables, and 11 references: 9 Soviet, 1 French, and

Card 2/3

88572

A Study of the Phase Equilibrium in the System Ti_3Sn - Zr

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B016/B055

1 British.

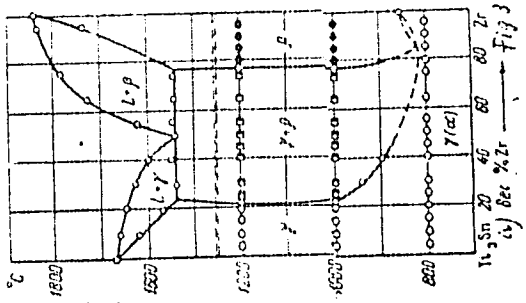
ASSOCIATION: Institut metallurgii im. A. A. Baykova Akademii nauk SSSR (Institute of Metallurgy imeni A.A. Baykov of the Academy of Sciences USSR)

PRESENTED: July 8, 1960, by I. I. Chernyayev, Academician

SUBMITTED: June 23, 1960

Table 1: Legend: 1) No. of alloy; all values in % by weight. Fig. 3: a) % by weight Zr.

№№ сплавов	Ti	Zr	Sn	№№ сплавов	Ti	Zr	Sn
1	51,9	4,9	43,2	9	27,6	49,9	22,5
2	49,2	10,0	40,8	10	24,4	55,0	20,6
3	47,2	14,7	38,1	11	19,6	64,3	16,1
4	44,2	19,9	35,9	12	14,6	74,0	11,4
5	40,8	25,0	34,2	13	11,9	79,2	8,9
6	37,4	30,1	32,5	14	8,4	84,6	7,0
7	32,9	39,9	27,2	15	5,5	89,4	5,1
8	30,3	44,8	24,9	16	3,4	94,1	2,5
1	2	3	4	1	2	3	4



Card 3/3

[illegible] 004/0[illegible]/023
[illegible]

AUTHORS: Glazova, V. V. and K[illegible] N. [illegible]

TITLE: Study of the ph[illegible] [illegible] of the [illegible]ternary system $Ti - Ti_3Sn - Zr$

PERIODICAL: [illegible] SSSR [illegible]

TEXT: The authors studied the [illegible] equilibrium of the system $Ti - Ti_3Sn - Zr$ which is considered to be a quasiternary system. They suppose the existence of an uninterrupted series of solid solutions [illegible] low temperatures on the basis of the α-modification of titanium (and the [illegible] phase of zirconium) in a region of the ternary system [illegible] Sn [illegible] the [illegible] angle and limited by the binary system Ti_3Sn - [illegible]. [illegible] the authors produced more than 74 alloys (Table 1) [illegible] melting without a pot in a suspended state in purified helium (A. A. Fogel', Ref. 1: Izv. AN SSSR, OTN, Metallurgiya i toplivo (Metallurgy and Fuels), [illegible] (1959)). Most of the molten specimens were [illegible] ([illegible] %) [illegible] and annealed at [illegible]00 and [illegible] for [illegible]00 hr [illegible]

Card 1/7

Study of the phase equilibrium [illegible] S/[illegible]/[illegible]/004/012/023
B[illegible]

evacuated to 10^{-4} mm Hg were used [illegible]. The [illegible] between the walls was filled with pure titanium [illegible] as a getter to prevent air diffusion [illegible] the parts [illegible]. The phase equilibrium was studied microscopically on specimens quenched from different temperatures. After homogenization at [illegible] all alloys were annealed at [illegible]°C for 1000 hr. This temperature lies below that of the allotropic transformation of Ti and Zr, and below the minimum temperature of the system Ti - Zr. Then, the specimens were quenched in water. The authors find all specimens to be one-phase [illegible] structure α(γ). Figs. 1-4 show isothermal sections at [illegible]. Fig. [illegible] exhibits the existence of an unlimited [illegible] in the whole concentration range of the system Ti - Ti_5Sn_3 - Zr (Fig. 2). The temperature [illegible]°C lies below that of the allotropic transformation of Ti and Zr, but above the minimum temperature of the system Ti - Zr. As expected, a two-phase range α(γ) + β appears which separates the two single-phase ranges α(γ) and β. Alloys quenched from [illegible]°C [illegible] and to the range α(γ) + β consist of a mixture of α(γ) and [illegible]; the β-ranges quenched in a similar way have an α' structure. The above-mentioned specimens were then annealed [illegible] and [illegible]°C for [illegible] and 2 hr.

Card 2/7

Study of the phase [illegible] [illegible]/[illegible]/[illegible]

Fig. 3: The temperature [illegible] lies [illegible] that [illegible] the allotropic transformation of Ti and Zr. As can be seen, the β-range is extended at the expense of the $\alpha(\gamma)$-range. The [illegible] is similar to that of Fig. [illegible]
Fig. 4: The specimens were annealed [illegible] The temperature 1560°C lies above that of the [illegible] transformation of the system $Ti_2Sn - Zr$ (1540°C), but below that [illegible] $Ti - Sn$ [illegible]. Besides the above-mentioned ranges, new phase ranges [illegible] appear [illegible] (1) L, (2) $L + \alpha(\gamma)$, (3) $L + \beta$, and (4) $L + \alpha(\gamma) + \beta$. [illegible] looks like typical fusion in the ranges [illegible] and [illegible]. The [illegible] structural components were similar to those described above. The alloy [illegible] 25 % by weight each of Ti and Sn, and 50 % of Zr melts completely. From a comparison of their results the authors conclude that at low temperatures (below those of the minimum in the Ti − Zr system) the phase equilibrium in the quasi-ternary system $Ti - Ti_2Sn - Zr$ is expressed [illegible] a phase diagram with an uninterrupted series of solid solutions. At higher temperatures, this equilibrium is described [illegible] characteristic [illegible] ternary phase diagram. It consists of three binary [illegible]: two of them (β-Ti) $- Ti_2Sn$ and $Ti_2Sn -$ (β-Zr) are of the eutectic type with restricted [illegible] in the solid state; the

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Study of the phase equilibrium in the [illegible]

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B[illegible]

third one (β-Ti) – (β-Zr) is a diagram with [illegible] series of solid solutions. This type diagram can be [illegible] by means of simple geometrical constructions, the [illegible] basis of the character of the phase [illegible] temperatures on the temperatures. There are [illegible] figures, [illegible] table, and [illegible] references: [illegible] Soviet-bloc and [illegible] non-Soviet-bloc. The reference [illegible] the English-language publication reads as follows: Ref. [illegible]: M. K. M[illegible] J. Inst. Metals, 84, 307 (1956).

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

PRESENTED: January 19, 1961, by I. I. Chernyayev, Academician

SUBMITTED: January 12, 1961

Legend to Table 1: (1) No. of the alloy, asterisk = calculated composition, (a)-remainder.

Card 1/7

S/180/62/000/006/012/022
E021/E151

AUTHORS: Glazova, V.V., and Kurnakov, N.N. (deceased). (Moscow)

TITLE: Creep of titanium-tin and titanium-zirconium-tin alloys

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Metallurgiya i toplivo, no.6, 1962, 131-136

TEXT: The resistance to plastic deformation of Ti-Ti_3Sn and Zr-Ti_3Sn alloys was investigated by hot-hardness measurements. The purity of the initial materials was: zirconium 99.9, titanium 99.89, and tin 99.9%. Alloys were prepared by induction melting in a purified helium atmosphere. The cast alloys were deformed by 10-20% and annealed at 850 and 800 °C for a total of 2700 hours. Hot-hardness tests were carried out in a vacuum of 10^{-3} mm Hg using a diamond pyramid with angle 136° and a 1 kg load. Loading times were 0.5, 5 and 50 minutes at 300, 400, 500, 600 and 700 °C. The alloy was held at the test temperature for 100 hours before testing. The results were plotted with log. (diagonal of indentation) against log. (time). The diagonal (d) - time (τ) relationship was shown to be

$$d = a\tau^b$$

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where a and b are constants. From the results, values of creep rates at any given value of the diagonal or indentation were calculated. The relationship between creep rate and concentration was then examined. For the titanium-tin system, the maximum creep resistance at 300 and 400 °C was shown by alloys containing 25-30 wt.% tin, and at 500 °C by alloys containing 15 wt.% tin. At 600 °C the most stable alloy corresponded to the composition Ti_3Sn and at 700 °C no useful effect was obtained by increasing the tin content above 5%. Results from the quasi-binary system Zr-Ti Sn showed that at 300 and 400 °C an increase in creep resistance was obtained up to 20 wt.% Ti_3Sn. Further additions had little effect. At 600 °C up to 15 wt.% addition of Ti_3Sn gave a marked decrease in creep rate. Between 15 and 35 wt.% Ti_3Sn there was a characteristic inflection in the creep-concentration curve. Alloying zirconium with Ti_3Sn had considerably more effect than alloying titanium with Ti_3Sn.
There are 2 figures and 3 tables.

SUBMITTED: March 15, 1962

S/598/62/000/007/004/040
D267/D307

AUTHORS: Glazova, V. V. and Kurnakov, N. N.

TITLE: Investigating the phase diagram of the ternary system titanium-zirconium-tin

SOURCE: Akademiya nauk SSSR. Institut metallurgii. Titan i yego splavy. no. 7, Moscow, 1962. Metallokhimiya i novvye splavy, 43-50

TEXT: It can be assumed that this system may contain a wide region of solid solutions which can form the basis of alloys endowed with valuable properties. When analyzing the available data of phase equilibria in the Ti-Sn system between α-Ti and the γ-phase based on Ti_3Sn, it appears that the closest to the equilibrium are the data of M. K. McQuillan. Since homogenization of Ti-Sn alloys obtained by arc fusion is very difficult, it is recommended to use levitation melting. The Ti-Sn alloys thus prepared were (with a few exceptions) twice subjected to deformation with subsequent an-

Card 1/2

Investigating the phase ...

nealing. It was found that all alloys had a single-phase structure (polyhedral (γ)). The upper temperature limit of the δ (γ')-phase was determined from the temperature dependence of the conductance. An improved equilibrium phase diagram for the system Ti-Sn is given. To investigate the phase diagram of the ternary system Ti-Zr-Sn alloys along eight sections were prepared; most of them were subjected to deformation with subsequent annealing. It was found that the section Ti_3Sn-Zr is quasi-binary; the corresponding phase diagram of this system was constructed; the nature of phase equilibrium in the quasi-ternary system Ti-Ti_3 Sn-Zr at various temperatures was established.

Card 2/2

L 19454-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD/JG/WB

ACCESSION NR: AP3005829 S/0279/63/000/004/0154/0158

AUTHOR: Glazova, V. V. (Moscow); N. N. Kurnakov (Deceased)

TITLE: Effect of zirconium and tin on oxidation resistance of titanium

SOURCE: AN SSSR. Izvestiya. Metallurgiya i gornoye delo, no. 4, 1963, 154-158

TOPIC TAGS: titanium zirconium alloy, titanium tin alloy, titanium zirconium tin alloy, oxidation resistance, oxidation rate, temperature effect, zirconium addition effect, tin addition effect, zirconium tin effect, titanium zirconium alloy oxidation, titanium tin alloy oxidation, titanium tin zirconium alloy oxidation, titanium tin alloy oxidation resistance, titanium zirconium alloy oxidation resistance, titanium tin zirconium alloy oxidation resistance, titanium tin alloy oxidation rate, titanium zirconium alloy oxidation rate, titanium tin zirconium alloy oxidation rate

ABSTRACT: Oxidation resistance in air of Ti-Zr and Ti-Sn alloys containing 0—9% Zr and 0—20% Sn, respectively, and Ti-Zr-Sn

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L 19454-63
ACCESSION NR: AP3005829

alloys containing 5 or 15% Sn and 0—55% Zr, levitation melted from 99.9% pure Ti, Sn, and iodide Zr in a pure helium atmosphere has been investigated. Cylindrical specimens 5 mm in diameter and 20 mm long were held in calm air for 1—20 hr at 500—1000C for Ti-Zr and Ti-Sn and at 700C for Ti-Zr-Sn. The oxidation resistance of Ti-Zr alloys was found to decrease with increasing Zr content. At 500C, addition of up to 60% Zr only slightly decreased the oxidation resistance, but an alloy with 90% Zr oxidized very rapidly. At 700C, a sharp increase in oxidation rate was observed at 40% Zr, and at 800C, at a Zr content as low as 30%. A thick oxide layer is formed on the alloy with 30% Zr after 1 hr at 800C; the weight gain exceeds 50 mg/cm^2. Oxidation resistance of Ti-Zn alloys also decreased with increasing Sn content. At 700C, the oxidation resistance slightly increased with addition of up to 5% Sn, but decreased again with further additions. At 800C, the alloy containing 12—15% Sn had the lowest oxidation resistance; its weight gain in 20 hr amounted to 100 mg/cm^2. At 1000C, a sharp increase in oxidation rate was observed at an Sn content as low as 5%; the weight gain in 6 hr was about 120 mg/cm^2. The average oxidation

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L 19454-63
ACCESSION NR: AP3005829

rate versus Zr or Sn content is shown in Fig. 1 of the Enclosure. Addition of Zr decreased the oxidation resistance of Ti-Sn alloys at 700C. In the case of Ti-5% Sn alloy, the decrease was slight with addition of up to 10% Zr. However, it rose sharply as the Zr content increased further, so that a Ti-5% Sn-40% Zr alloy oxidized completely during 1-hr exposure. Similar behavior was observed in a Ti-15% Sn alloy. Of the alloys with the same Zr content those containing more Sn are more oxidation resistant. For example, a Ti-15% Sn-40% Zr alloy has an average oxidation rate at 700C of 2.8 mg/cm^2 hr, compared with the 8 mg/cm^2 hr of a Ti-5% Sn-40% Zr alloy. Orig. art. has: 4 figures.

ASSOCIATION: none

SUBMITTED: 27Jul62 DATE ACQ: 11Sep63 ENCL: 01

SUB CODE: ML NO REF SOV: 010 OTHER: 001

Card 3/3

KORNILOV, I.I.; GLAZOVA, V.V.

Nikolai Nikolaevich Kurnakov. Zhur. neorg. khim. 8 no.6:
1297-1301 Je '63. (MIRA 16:6)

(Kurnakov, Nikolai Nikolaevich, 1860-1952)

L 10090-63 EWP(q)/EWT(m)/EDS AFFTC/ASD JD
ACCESSION NR: AP3000518 S/0020/63/150/002/0313/0316

55
54

AUTHOR: Kornilov, I. I.; Glazova, V. V.

TITLE: Formation of Ti sub 6 O and Ti sub 3 O compounds in the titanium-oxygen system

SOURCE: AN SSSR. Doklady, v. 150, no. 2, 1963, 313-316

TOPIC TAGS: titanium oxidation, titanium oxides, titanium-oxygen system

TEXT: An extensive study has been conducted of the Ti-O system, specifically of Ti-rich alloys with an O sub 2 content up to 35 at %. Alloys were melted in an unconsumable-electrode arc furnace in an argon atmosphere from 99.9% pure iodide Ti and a master alloy containing 15.8 wt % O sub 2, homogenized in vacuum at 1000C for 800 hrs, annealed at various temperatures in the 400-1400C range for periods of 600 to 2 hrs, and quenched in ice-cold water. Microscopic and x-ray diffraction analyses, microhardness tests, and measurements of electrical resistance and thermal emf all indicated the existence of two previously unknown oxides, Ti sub 6 O and Ti sub 3 O,

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L 10090-63
ACCESSION NR: AP3000518

both formed from the Alpha solid solution. The Ti sub 6 O oxide is stable at temperatures up to 820-830C and has a narrow homogeneity region extending from 14 to 16 at % O sub 2 at 2000C. The Ti sub 3 O oxide appears to be stable at temperatures up to about 1400C; it does not form solid solutions. The corrected phase diagram of the Ti-O system is shown in the article. Orig. art. has: 4 figures.

ASSOCIATION: Institut metallurgii im. A. A. Baykova (Institute of Metallurgy)

SUBMITTED: 09Jan63 DATE ACQ: 12Jun63 ENCL: 00

SUB CODE: 00 NO REF SOV: 008 OTHER: 007

Card 2/2

L 14310-65 EPF(c)/EPR/EWG(j)/EWT(m)/EWP(b)/EWP(t) Pr-4/Ps-4 ASD(a)-5
ACCESSION NR: AT4048046 JD/MLK S/0000/64/000/000/0015/0025

AUTHOR: Kornilov, I. I. (Professor, Doctor of chemical sciences); Glazova, V. V.

TITLE: Phase diagram of the Ti-O_2 system and some properties of the alloys of this system

SOURCE: Soveshchaniye po metallurgii, metallovedeniyu i primeneniyu titana i yego splavov. 5th, Moscow, 1963. Metallovedeniye titana (Metallography of titanium); trudy* soveshchaniya. Moscow, Izd-vo Nauka, 1964, 15-25

TOPIC TAGS: titanium alloy, titanium dioxide, alloy phase composition, alloy hardness, alloy electrical resistance, alloy crystal structure, titanium oxide

ABSTRACT: The interaction of titanium with oxygen and the equilibrium curves of this system have, up to now, been based on the α-solid solution of oxygen in titanium and the compounds TiO, Ti_2O_3, and TiO_2 appearing in it. However, the literature has little to say

which were quenched after being raised to various temperatures at concentration intervals

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of from 0 to 35 at. % O_2. From the results of these experiments and the curves of the graphs showing properties of the alloy as a function of composition, plotted according to N. S. Kurnakov's method, the authors were able to pinpoint anomalies in the Hall effect and postulate the existence of two new compounds, i.e.: Ti_6O and Ti_3O. They thus added new equilibrium curves to the graphs of the Ti-O_2 system. Ti_6O is stable up to about 820-830C, and Ti_3O is probably stable above 1400C. The compositions of these compounds should characterize the maximal degree of ordering of oxygen atoms on a lattice of the α-solid solution. Tests over a wide range of temperatures and concentrations established the dependence of the coefficient of thermal expansion on the composition of the alloys in this system. This led in turn to conclusions as to the stability of the chemical bond between the atoms of titanium and oxygen in the crystal lattice of the alloys and the compounds Ti_3O and Ti_6O. Tests with various periods of heating at temperatures of 300-700C and at oxygen concentrations ranging from 0-18 at. % enabled the authors to calculate the speed of plastic

experimental work." Orig. art. has: 5 graphs, 6 photomicrographs, 2 tables and 3 formulas.

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L 14310-65
ACCESSION NR: AT4048046

ASSOCIATION: None

SUBMITTED: 15Jul64 ENCL: 00 SUB CODE: MM

NO REF SOV: 014 OTHER: 009

ACCESSION NR: AP4040993 S/0279/64/000/003/0169/0172

AUTHOR: Kornilov, I. I.(Moscow); Glazova, V. V. (Moscow)

TITLE: Oxidation resistance of oxygen-containing titanium

SOURCE: AN SSSR. Izvestiya. Metallurgiya i gornoye delo, no. 3, 1964, 169-172

TOPIC TAGS: titanium, titanium oxygen alloy, alloy oxidation resistance, alloy oxidation, titanium oxidation

ABSTRACT: Oxidation resistance of titanium-oxygen alloys with 1—35% oxygen was investigated. The alloys were melted under argon in an unconsumable electrode electric furnace from 99.9%-pure iodide titanium. The oxygen was added as a titanium-oxygen master alloy containing 15.8 wt% oxygen. Alloys were homogenized at 800C for 100 hr in a vacuum of 10^{-3}—10^{-4} mm Hg and quenched in ice water. The specimens were oxidized at 700—900C for 1—100 hr. At all temperatures tested, the pure titanium was found to be less resistant to oxidation than titanium alloys with 1, 3, and 5 wt% oxygen. The alloy with

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ACCESSION NR: AP4040993

5 wt% oxygen had the highest oxidation resistance. With further increase of oxygen content up to 20% the oxidation resistance drops. The Ti_3O compound and alloys close to this compound are oxidation resistant because of the high thermal stability of the compound, but the Ti_6O compound and alloys close to it were shown to be thermally unstable and to have a low oxidation resistance. Orig. art. has: 3 figures.

ASSOCIATION: none

SUBMITTED: 27Jul63 ATD PRESS: 3054 ENCL: 00

SUB CODE: MM, GC NO REF SOV: 008 OTHER: 003

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L 24851-65 EWG(j)/EWT(m)/EPF(c)/EPR/T/EWP(t)/EWP(b) Pr-4/Ps-4 AFWL/ESD(t)/IJP(c) JD

ACCESSION NR: AP4046096 S/0126/64/018/003/0457/0459

AUTHOR: Kornilov, I. I.; Glazova, V. V.

TITLE: Comments on the question of the physical and chemical nature of solid solutions of O_2 in α-Ti

SOURCE: Fizika metallov i metallovedeniye, v. 18, no. 3, 1964, 457-459

TOPIC TAGS: solid solution, alpha titanium, specific resistance, Hall coefficient, hole type conductivity, scale resistance

ABSTRACT: Ti-O_2 alloys were found to have a resistance to scale formation with an O_2 content of approximately 5 atm. %. Specific resistance, thermoelectromotive force and the Hall coefficient were investigated in α-solid solutions of Ti with 6 to 8% O_2. The hole-type conductivity of α-Ti is attributed to the electrons that fill its valent zone to a considerable degree. Apparently, in alloying Ti, the O_2 electrons fill this zone immediately. The hole-type conductivity of Ti has been a controversial subject but the authors propose that the explanation of the mechanism of the effect of various alloying elements in the formation of binary and

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ACCESSION NR: AP4046096

other more complex Ti alloys be based on it. In alloying Ti with O_2 the thermo-electomotive force and the Hall coefficient decrease and change their sign from positive to negative with an O_2 concentration of 4.2 to 5.7 atm.%. It follows that the dissolving O_2 in alpha-Ti contributes a certain part of electrons to the general group of electrons forming a metallic bond with the solvent. Specific resistance appreciably increases upon the addition of up to 1.5 atm.% O_2 although the effect of further additions remains negligible. The authors acknowledge the contribution of L. S. Milevskiy. Orig. art. has: 3 figures

ASSOCIATION: Institut metallurgii im. A. A. Baykova (Institute of Metallurgy)

SUBMITTED: 24Dec63 ENCL: 00

SUB CODE: MM, SS NO REF SOV: 008 OTHER: 002

Card 2/2

ACCESSION NR: AP4013333 S/0020/64/154/003/0638/0641

AUTHORS: Kornilov, I.I.; Glazova, V.V.

TITLE: Investigation of Certain Strength Characteristics of the Chemical Bond at Ti sub 6 O and Ti sub 3 O Compounds Formed from alpha-Solid Solutions of the Titanium-Oxygen System

SOURCE: AN SSSR. Doklady*, v. 154, no. 3, 1964, 638-641

TOPIC TAGS: thermal expansion, titanium oxygen alloy, Ti sub 6 O, Ti sub 3 O titanium alloy

ABSTRACT: The experimental investigation of the thermal expansion of titanium-oxygen alloys at temperatures of up to 800 C showed the empirical relation between Young's modulus and the coefficient of thermal expansion of that system. Specimens were prepared in an electric arc furnace with a permanent electrode in argon. Mg, Si, Al, Fe, Ni, Cr, O_2, N_2 and titanium dioxide with 99.93% TiO_2 were tested. Oxygen introduction occurred through a master alloy prepared from compressed titanium and titanium dioxide. Thermal ex-

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pansion increased within the 14.5 atm% and 23 atm.% ranges and dropped sharply thereafter. Young's modulus, characteristic temperatures and the root mean-square atomic displacement from equilibrium in the crystal lattice of solid solutions were studied. New Ti_6O and Ti_3O compounds were precipitated from α-solid solutions of titanium. The chemical bond between the atoms in the crystal lattice of α-titanium was strengthened by alloying with up to 15 atm% oxygen. The chemical bond of Ti_3O was found to possess maximum strength and the thermal stability of that compound was higher than that of Ti_6O. Orig. art. has: 3 figures, 2 tables, 6 formulae.

ASSOCIATION: Institut metallurgii imeni A.A. Baykov (Metallurgical Institute)

SUBMITTED: 26Apr63 DATE ACQ: 26Feb64 ENCL: 00

SUB CODE: CH NO REF SOV: 009 OTHER: 003

Card 2/2

SOURCE: AN SSSR. Izvestiya. Metally, no. 1, 1965, 189-194

TOPIC TAGS: titanium, aluminum oxide, titanium aluminum oxide alloy, alloy phase diagram, alloy structure, aluminum oxide solubility, alloy microhardness

ABSTRACT: A series of Ti-Al_2O_3 alloys containing from 0 to 30 wt% Al_2O_3 were melted from 99.9%-pure iodide titanium, a Ti-Al master alloy containing 35.8 wt% Al, and a Ti-O master alloy containing 15.9 wt% O_2, in an arc furnace with a nonconsumable electrode in an argon atmosphere. The microscopic analysis of the as-cast alloys showed the Ti-Al_2O_3 system to be a pseudobinary system. The solidus temperature of the alloys increased from 1675C for pure Ti to 1880C at an

containing up to 3 wt% Al_2O_3 and a single phase [illegible]

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ACCESSION NR: AP5009275

forged at 1200C without cracking. In alloys containing 3 wt% Al_2O_3, a second phase of a $Ti_x(Al_2O_3)_y$ composition is present in an amount which increases with increasing Al_2O_3 content. After quenching from 1200C, the structure of alloys containing 1, 3, and 5 wt% Al_2O_3 has two phases; the amount of the second phase increases with increasing Al_2O_3 content. Within the limits of the single-phase region, the microhardness of alloys increased from about 175 kg/mm^2 (for pure Ti) to a maximum of 625, 675, 700, and 725 kg/mm^2 in alloys

L 7930-66 EWT(m)/EPF(c)-2/EWP(t)/EWP(b) IJP(c) JD/WW/JG

ACC NR: AP5027934 SOURCE CODE: UR/0363/65/001/010/1778/1786

AUTHOR: Kornilov, I. I.; Glazova, V. V.

ORG: Institute of metallurgy im. A. A. Baykov (Institut metallurgii)

TITLE: The character of chemical bonding in titanium and zirconium suboxide

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 10, 1965, 1778-1786

TOPIC TAGS: titanium oxide, zirconium compound, chemical bonding, semiconducting material, hafnium oxide

ABSTRACT: Phase equilibria of the titanium-oxygen and zirconium-oxygen systems were studied on alloys containing 32 and 28 at. % oxygen, respectively. After annealing, the samples were subjected to microscopic and qualitative x-ray structural analyses, and measurements of microhardness, electrical resistance, and thermoemf were made. The suboxides Ti_6O and Ti_3O, having a metallic bond type, were found to form in this system. Ti_6O is formed from the α solid solution and is stable up to 820-830C. Ti_3O is formed during crystallization from the melt at 1940C. Both compounds have a singular point on the property-composition (microhardness-composition; electrical resistance-composition; thermoemf-composition) diagrams. In the Zr-O system, two distinct singular maxima were observed on the composition-electrical resistance diagram, corresponding to the compounds Zr_6O and Zr_3O; this indicates the semiconductor nature of these compounds. The temperature dependence of the electrical resistance of all four compounds confirmed the assumption that Ti_6O and

UDC: 546.831'21+546.821'21

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L 7930-66

ACC NR: AP5027934

Ti_3O have a metallic bond type, and that Zr_6O and Zr_3O have a semiconductor bond type. It is suggested that the compounds Hf_6O and Hf_3O may exist in the hafnium-oxygen system, where a broad region of α solid solutions based on the low-temperature modification of hafnium is known to exist. The study of the interaction of zirconium and oxygen was carried out by Ye. M. Kenina. Orig. art. has: 8 figures.

SUB CODE: SS, IC, GC / SUBM DATE: 05Jul65 / ORIG REF: 010 / OTH REF: 014

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L 00999-66 EWT(m)/EPF(n)-2/EWP(t)/EWP(b) IJP(c) JD/JG

ACCESSION NR: AP5018248 UR/0078/65/010/007/1660/1662
546.821-31

AUTHOR: Kornilov, I. I.; Glazova, V. V. 44 45

TITLE: On thermal stability of the Ti_3O compound in the titanium-oxygen system

SOURCE: Zhurnal neorganicheskoy khimii, v. 10, no. 7, 1965, 1660-1662

TOPIC TAGS: titanium, titanium oxide, titanium compound, titanium alloy, titanium oxide physical property

ABSTRACT: A series of alloys of the Ti-O system containing 22--28 at% oxygen were investigated to determine whether the Ti_3O compound remains stable at temperatures above 1400C. All the alloys homogenized at 800C were found to be single-phase alloys with a polyhedral structure. Slip lines were observed in all the alloys, with the maximum number of slip lines in the alloy with 25 at% oxygen, a composition corresponding to that of Ti_3O compound. Microhardness-composition and resistivity-composition curves for alloys annealed at 1000, 1400, and 1600C for 4 hr and quenched have an identical pattern with a minimum for both characteristics at 25 at% oxygen. Thermal analysis showed that alloy with 25 at% oxygen undergoes no changes either on heating up to the melting point (1940C) or on cooling. All this proves that Ti_3O

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compound is stable at temperatures up to the melting point. The Ti_3O crystallizes directly from the liquid phase. The x-ray diffraction patterns revealed a lattice structure similar to the structure of α-titanium. The stability of the compound is one of the factors which explains why oxygen cannot be completely removed from titanium alloys by outgassing in vacuum. On the basis of obtained data the ordinate corresponding to the existence of Ti_3O compound was added to the phase diagram of the Ti-O system (see Fig. 1 of the Enclosure). Orig. art. has: 3 figures. [WW]

ASSOCIATION: none

SUBMITTED: 25Feb64 ENCL: 01 SUB CODE: MM, TD

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Card 2/3

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ACCESSION NR: AP5018248

ENCLOSURE: 01

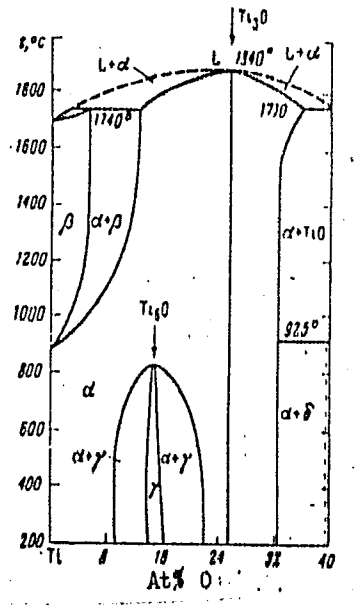

Fig. 1. Titanium-oxygen phase diagram

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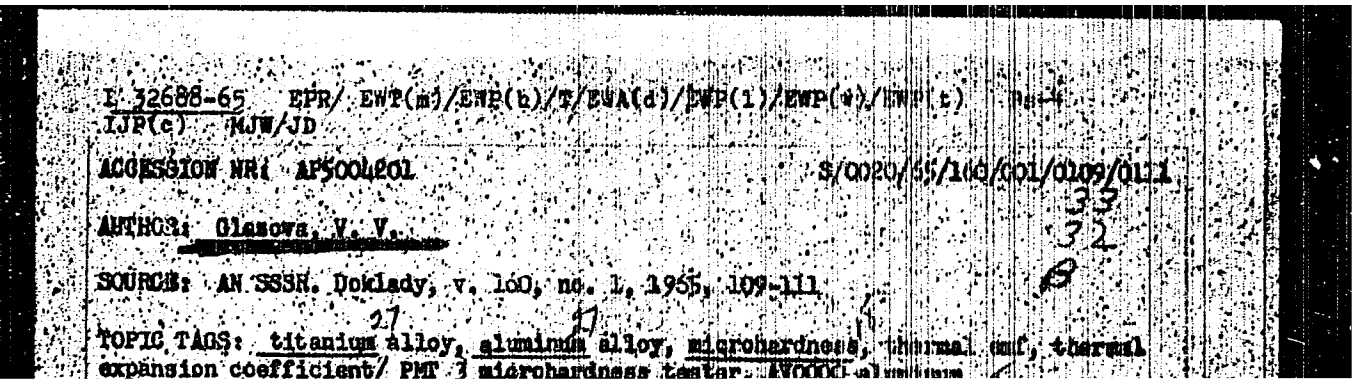


L 32688-65 EPR/ EWT(m)/EWP(b)/T/EWA(d)/EWP(1)/EWP(v)/EWP(t) Pu-4
IJP(c) MJW/JD

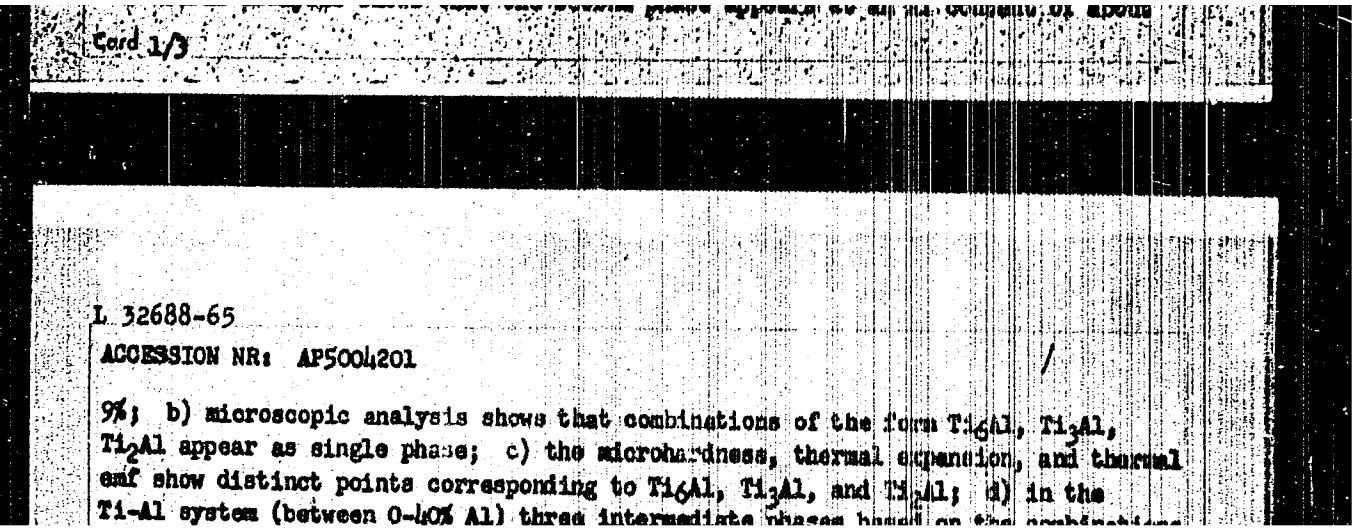
ACCESSION NR: AP5004201 S/0020/65/160/001/0109/0111

AUTHOR: Glazova, V. V.

SOURCE: AN SSSR. Doklady, v. 160, no. 1, 1965, 109-111

TOPIC TAGS: titanium alloy, aluminum alloy, microhardness, thermal emf, thermal expansion coefficient/ PMT 3 microhardness tester, AV0000 aluminum

ABSTRACT: The author extends previous investigations on the titanium-aluminum system summarized by I. I. Kornilov, Ye. M. Pylayeva, and M. A. Volkova (Sborn. Titan i ego splavy, Izd. AN SSSR, v. 10, 1963, 74), by reporting on forty Ti-Al alloy samples (0-40% Al in 1% steps) produced from 99.9% pure Ti and aluminum AV0000 (99.999% pure). After induction smelting, the alloys were heat-treated at 900C (10^{-4} mm mercury vacuum) for 2000 hours and then quenched in water. The microstructure (etching with 20 parts HF, 20 HNO_3, rest glycerin), microhardness (apparatus PMT-3 with 200-g load), coefficient of thermal expansion (with dilatometer from room temperature to 700C) and the thermal and [Cu contact using 5 mm diameter, 30 mm long alloy samples] were measured as a functio[n] of Al content. The results are shown in Fig. 1 on the Enclosure. It was [illegible]



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L 32688-65

ACCESSION NR: AP5004201

9%; b) microscopic analysis shows that combinations of the form Ti_6Al, Ti_3Al, Ti_2Al appear as single phase; c) the microhardness, thermal expansion, and thermal emf show distinct points corresponding to Ti_6Al, Ti_3Al, and Ti_2Al; d) in the Ti-Al system (between 0-40% Al) three intermediate phases based on the combinations

Ti_6Al, Ti_3Al and Ti_2Al are formed. Orig. art. has: 2 figures.

ASSOCIATION: Institut metallurgii im. A. A. Baykova (Metallurgy Institute)

SUBMITTED: 12May64 ENCL: 01 SUB CODE: MM

NO REF SOV: 010 OTHER: 005

Card 2/3

L 32688-65
ACCESSION NR: AP5004201

ENCLOSURE: 01

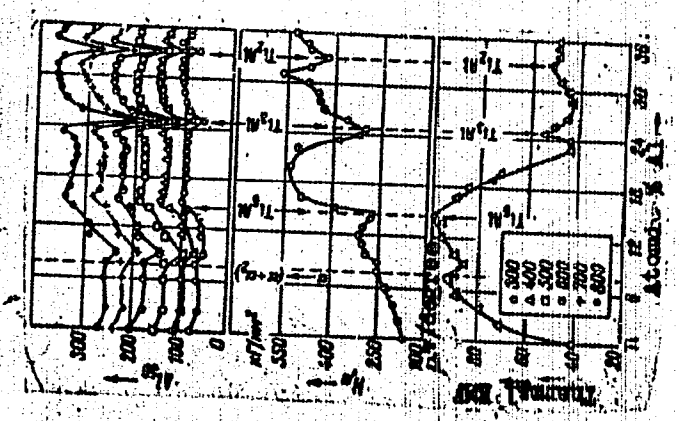

Fig. 1. Microhardness, thermal expansion, and thermal emf of the Fe-Al system

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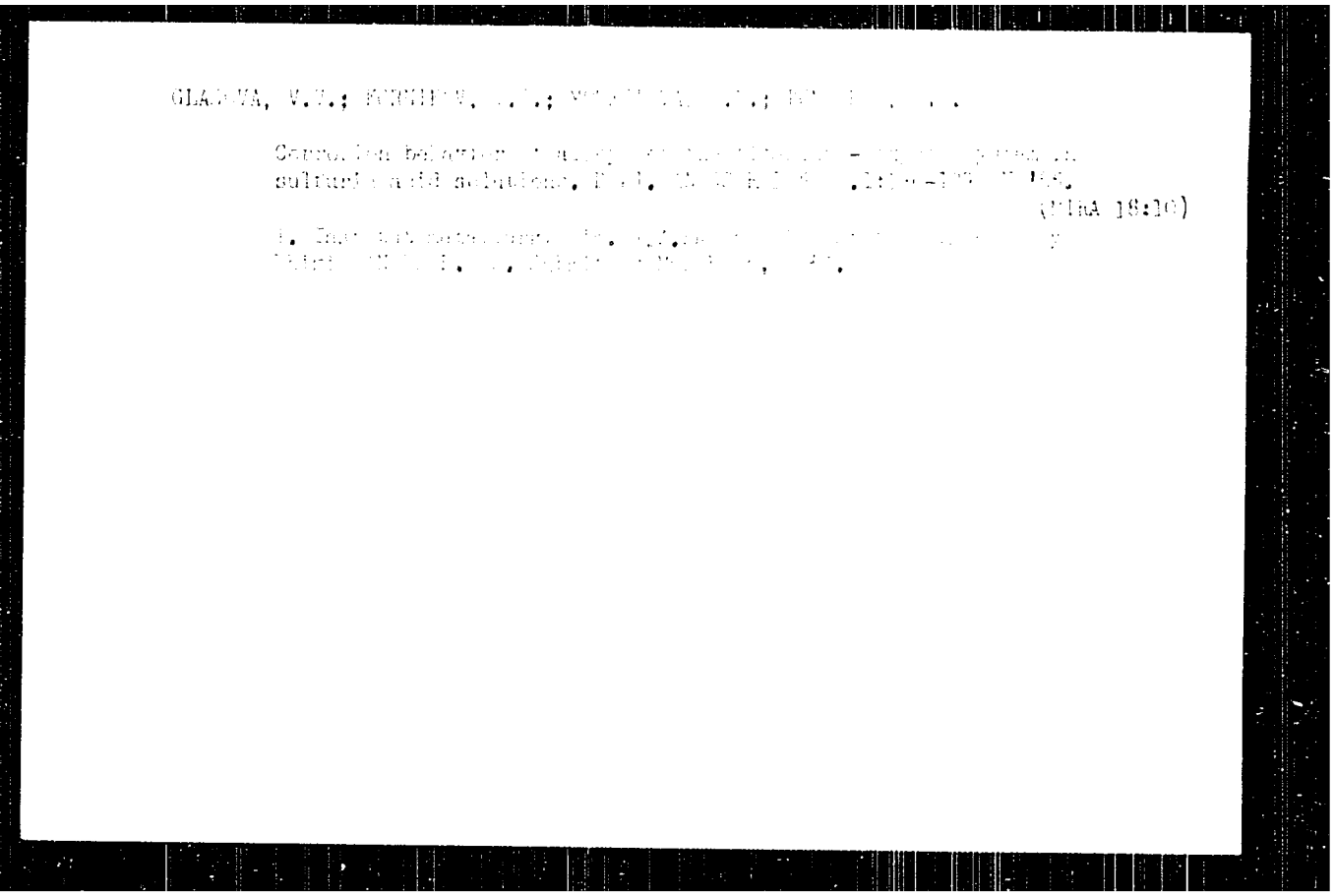
GLAZOVA, V.V.

Phase equilibrium in the ternary system titanium - aluminum - oxygen. Dokl. AN SSSR 164 no.3:567-570 S '65. (MIRA 18:9)

1. Institut metallurgii imeni A.A. Baykova. Submitted March 15, 1965.



L 7925-66 EWT(m)/EPF(n)-2/EWP(t)/EWP(b) IJP(c) JD/WW/JG

ACC NR: AP5027939 SOURCE CODE: UR/0363/65/001/010/1834/1837

AUTHOR: Glazova, V. V.; Kornilov, I. I.

ORG: Institute of Metallurgy im. A. A. Baykov (Institut metallurgii)

TITLE: Temperature dependence of the electrical conductivity of titanium and zirconium suboxide

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 10, 1965, 1834-1837

TOPIC TAGS: zirconium compound, titanium oxide, electric conductivity, forbidden zone width, chemical bonding

ABSTRACT: In order to establish the physicochemical nature of the compounds Ti_6O, Ti_3O, Zr_6O, and Zr_3O, the temperature dependence of their electrical resistance was studied by a contactless method in a rotating magnetic field. The curves obtained for Ti_6O and Ti_3O (see Fig. 1) are typical of compounds with a metallic bond type.

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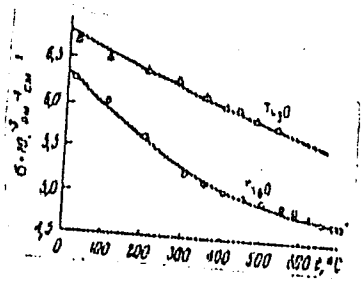
Fig. 1
Temperature dependence of the electrical conductivity of the compounds Ti_6O and Ti_3O.



The curves for Zr_6O and Zr_3O (see Fig. 2) show that these two oxides are semiconductors.

Fig. 2
Temperature dependence of the electrical conductivity of the compounds Zr_6O and Zr_3O.