L 53679-65   EWT(m)/EPF(n)-2/T/EWP(t)/EWP(b)/EWA(c)   Pu-4   IJP(c)   JD/WH/JG

ACCESSION NR: AP5012770   UR/0020/65/161/006/1378/1381

AUTHOR: Kornilov, I. I.; Budberg, P. B.; Shakhova, K. I.; Alisova, S. P.

TITLE: Phase diagram of the $TiCr_2$-$ZrCr_2$ system

SOURCE: AN SSSR. Doklady, v. 161, no. 6, 1965, 1378-1381

TOPIC TAGS: titanium chromium alloy, zirconium chromium alloy, alloy phase diagram, alloy composition, alloy structure, alloy crystal lattice

ABSTRACT: The phase composition and microstructure of pure $TiCr_2$ and $ZrCr_2$ compounds and nine $TiCr_2$-$ZrCr_2$ alloys containing from 10 to 90% $TiCr_2$, arc and levitation melted and homogenized at 1250—1300C for 50 hr, have been determined by thermal and x-ray phase analysis. Thermal analysis showed that the alloy liquidus temperatures increased with increasing $ZrCr_2$ content, e.g., from 1480 to 1675C for pure $TiCr_2$ and $ZrCr_2$, respectively. An analogous increase occurred in the lattice constants. The phase diagram of the $TiCr_2$-$ZrCr_2$ system (see Fig. 1 of the Enclosure) based on the obtained data is characterized by the formation of a continuous series of solid solutions between both the low-temperature and the high-temperature modifications of $TiCr_2$ and $ZrCr_2$ compounds. The appearance of the two-phase ($\beta + \delta$) and three-phase

Card 1/3

L 53679-65

ACCESSION NR: AP5012770

($L + \beta + \delta$) regions in the $TiCr_2$-rich alloys is explained by the fact that the $TiCr_2$ compound is formed in the binary Ti-Cr system in the solid state. Orig. art. has: 4 figures and 2 tables.   [MS]

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

SUBMITTED: 09Jul64   ENCL: 01   SUB CODE: MM, SS

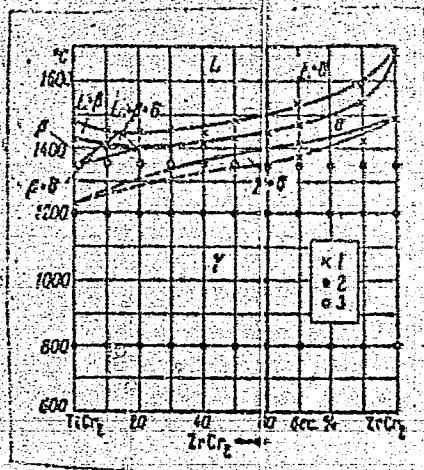NO REF SOV: 006   OTHER: 006   ATD PRESS: 4011

Card. 2/3

Fig. 1. Phase diagram of the $TiCr_2$-$ZrCr_2$ system

1 - Thermal analysis data; 2 - $(TiZr)Cr_2$ solid solution
with a cubic lattice; 3 - $(TiZr)Cr_2$ solid solution with
a hexagonal lattice.

Card 3/3

L 55850-65   EWT(m)/EWP(w)/EWA(d)/EWP(t)/T/EWP(b)/EWP(z)/EWA(c)   Pad   IJP(c)
JD/HW/JG

ACCESSION NR: AP5013122   UR/0370/65/000/002/0175/0179
                                            669.017.12

AUTHOR: Kornilov, I. I.; Myasnikova, K. P.

TITLE: The phase diagram and some properties of nickel-rhodium alloys

SOURCE: AN SSSR. Izvestiya. Metally, no. 2, 1965, 175-179

TOPIC TAGS: nickel alloy, rhodium alloy, metal physical property, metal mechanical
property, binary phase diagram

ABSTRACT: The phase diagram was determined using thermal, microstructural and x-
ray analysis. Electrical resistance, microhardness and hardness at room and ele-
vated temperatures (up to 1273°K) were investigated. The phase diagram shows a
series of solid solutions extending from ...

Card 1/2

L 34356-66   EWT(m)/EWP(t)/ETI   IJP(c)   WVH/JD/WB

ACC NR: AP5027845   SOURCE CODE: UR/0020/65/165/001/0136/0139

AUTHOR: Glazova, V. V.; Kornilov, I. I.; Modestova, V. N.; Tomashov, N. D.

ORG: Institute of Metallurgy im. A. A. Baykov (Institut metallurgii); Institute of Physical Chemistry, AN SSSR (Institut fizicheskoy khimii AN SSSR)

TITLE: Corrosion behavior in sulfuric acid solution of alloys of the titanium-oxygen system

SOURCE: AN SSSR. Doklady, v. 165, no. 1, 1965, 136-139

TOPIC TAGS: titanium compound, titanium base alloy, corrosion resistance, electrode potential, sulfuric acid

ABSTRACT: Titanium has a large affinity to oxygen and the presence of a Ti compound with oxygen decelerates corrosion considerably. It was of interest, therefore, to study the behavior of Ti alloys with oxygen. The Ti-O alloys were prepared in an arc furnace with a noncombustible W electrode in an Ar atmosphere. The initial materials were: Ti iodide (99.9% Ti) and Ti oxide (99.93% TiO_2). The oxygen was added in the form of an alloy containing 15.8% oxygen and prepared by melting in the arc furnace tablets compressed from Ti and TiO_2. The Ti-O alloys, containing 1, 5, 9, 10, 11, 12, 13, 15, 16, 17, 20, 25, and 36 at% oxygen, were thus prepared. The study of corrosion resistance and stationary electrode potential of the Ti-O alloys was made in 40% and 70% H_2SO_4, i.e. under conditions of the strongest possible corrosion of Ti. The curves

Card 1/2   UDC: 620.197.3

L 36924-66   EWT(m)/T/EWP(t)/ETI   IJP(c)   JD/JG
ACC NR: AP6008497   SOURCE CODE: UR/0062/66/000/001/0008/0016

AUTHOR: Kornilov, I. I., Matveyeva, N. M.

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

TITLE: Investigation in metal chemistry. Communication 5. Interaction between intermetallic compounds

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 1, 1966, 8-16

TOPIC TAGS: intermetallic compound, metal chemical analysis, solid solution

ABSTRACT: In this work the authors discuss the basic physicochemical factors determining the interactions between intermetallic compounds and cite their latest experimental data. Intermetallic compounds in equilibrium systems are treated as individual components. During their interaction continuous solid solutions, limited solid solutions, peritectic and eutectic mixtures, and ternary compounds or phases of a complex composition can form. In contrast to solid solutions of metals, the authors termed solid solutions on a base of metallic compounds intermetallic (metallide) solid solutions. Continuous or limited solid solutions of intermetallic compounds under certain conditions are formed between Kurnakov compounds, berthollide-type compounds, daltonide-type compounds, and compounds of the berthollide and daltonide types. The authors examined certain examples of the

Card 1/3   UDC: 547.559+549.2

L 36924-66

ACC NR: AP6008497

interaction between compounds from the data of their investigations, one of the first systems with a continuous solid solution of intermetallic compounds being the system consisting of the CrFe and VFe Kurnakov compounds. These compounds are formed in binary systems from continuous α-solid solutions of components upon a drop of temperature. Both compounds with respect both to chemical and to structural features satisfy the basic conditions for the formation of continuous solid solutions expressed by the author, i.e., that the compounds should have an identical type of crystal structure with similar values of the lattice parameters, similar type of chemical bond in the compounds, the presence in the compositions of these compounds of the atoms of elements (analogs) capable of being continuously replaced in the crystal lattice of the compounds, the presence in the compositions of two interacting compounds of atoms of the same element, and that the compound should have an identical stoichiometric composition. The intermetallic compounds have special, individual properties and play a most important role in the physicochemical and mechanical properties of metal alloys. They have an independent importance as the base for new inorganic materials with special physical properties. The properties of intermetallic compounds can be appreciably modified by their interaction with one another and by the formation of intermetallic solid solutions, eutectic mixtures, and complex multielement compounds. The level of the physicochemical and mechanical properties in intermetallic compound systems is appreciably higher than in simple metallic systems.

Card 2/3

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

Studies in metal chemistry. Report No.6: Suboxides of transition metals. Izv.AN SSSR. Ser.khim. no.1:16-23 '66.   (MIRA 19:1)

1. Institut metallurgii im. A.A.Baykova. Submitted August 22, 1963.

KORNILOV, I.I.; VINOGRADOV, Yu.M.

Using titanium in chemical machinery manufacture and principles of its alloying. Zashch. met. 2 no.1:25-31 Ja-F '66.

(MIRA 19:1)

1. Institut metallurgii imeni A.A. Baykova, Moskva. Submitted March 11, 1965.

L 58971-66   RM(m)/EWP(w)/T/EWP(t)/ETI   IJP(c)   JD/JG

ACC NR: AP6013367   SOURCE CODE: UR/0370/66/000/002/0137/0143

AUTHOR: Kornilov, I. I. (Moscow); Pylayeva, Ye. N. (Moscow); Volkova, M. A. (Moscow)

ORG: none

TITLE: Evaluation of the creep of alloys of the Ti-Al-V system by the bending method at elevated temperatures

SOURCE: AN SSSR. Izvestiya. Metally, no. 2, 1966, 137-143

TOPIC TAGS: creep, titanium alloy, vanadium alloy, aluminum alloy

ABSTRACT: Continuing their study of the high-temperature strength of titanium alloys, the authors investigated it in the ternary system Ti-Al-V as a function of alloy composition and structure. An isothermal section of the system at 550°C was plotted on the basis of microstructural and x-ray analyses and a determination of the properties; the regions of the α and β solid solutions of titanium and of the intermetallic compound Ti$_3$Al (α_2 phase) are indicated (see Fig. 1). Alloys of the Ti-Al-V system along sections with constant aluminum contents of 5, 7.5, and 20% were found to have a maximum creep resistance near the boundary of the limiting solutions based on α Ti, β Ti, and Ti$_3$Al; the lowest high-temperature strength is displayed by alloys from the regions ($\alpha + \beta$) and ($\alpha_2 + \beta$) with a coarse two-phase structure. Alloys from the region of the γ phase have a high creep resistance at

Card 1/2   UDC: 669.017.13

L 20630-66   EWT(m)/T/EWA(d)/EWP(w)/EWP(t)   IJP(c)   JD
SOURCE CODE: UR/0129/66/000/003/0036/0038

ACC NR: AP6010093

AUTHOR: Andreyev, O. N.; Kornilov, I. I.; Nartova, T. T.

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

TITLE: Determination of the characteristics of heat resistance of titanium alloys

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 3, 1966, 36-38

TOPIC TAGS: titanium alloy, heat resistant alloy, alloy property, centrifuge test, tensile test/VT1 alloy, OT4 alloy, VT5 1 alloy, AT3 alloy, AT4 alloy, ST1 alloy

ABSTRACT: Titanium VT1 (0.3% Fe, 0.25% Si) and titanium alloys OT4 (3.5% Al, 1.78% Mn, 0.2% Fe, 0.1% Si), VT5-1 (4.9% Al, 2.75% Sn), AT3 (3.2% Al, 0.8% Cr, 0.3% Fe, 0.4% Si, 0.01% B) and AT4 (4.8% Al, 0.9% Cr, 0.4% Fe, 0.3% Si, 0.01% B) have been tested for creep behavior by centrifugal (Kornilov) and by conventional methods. Both tests were performed at 450 or 500C for 100 hr under a stress 20 kg/mm². At both temperatures tested and in both test methods VT1 titanium had the highest creep rate and AT4 alloy the lowest creep rate (see Fig. 1). In stress-rupture tests at 500C under a stress of 30 kg/mm² the rupture lives were 12 hr for OT4 alloy, 30 hr for VT5-1 alloy, 210 hr for AT3 alloy, and 260 hr for AT4 alloy. Creep tests by both of the above methods were performed with ST1 titanium alloy of the Ti-Al-Zr-Sn system at 600C under a stress of 15 kg/mm² (alloy was annealed at 800C for 1 hr and air cooled). After 100 hr, the total deflection in the centifugal test amounted

UDC: 620.172.224.226:669.295

Card 1/3

L 20630-66

to 5.6 mm, and the total elongation in the conventional test amounted to 0.56%.
A linear dependence between the elongation (in conventional method) and deflection
(in centrifugal method) was found to exist for all the alloys tested. This makes

Detection, мм
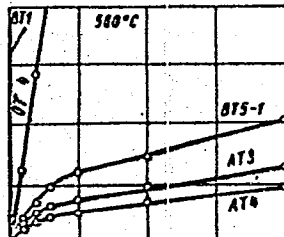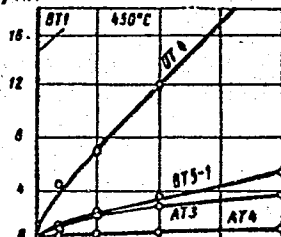
Fig. 1. Creep curves of
titanium alloys in centrif-
ugal (a) and in convention-
al (b) tests
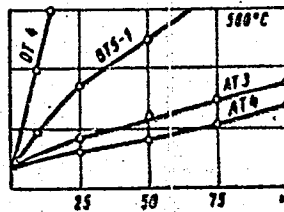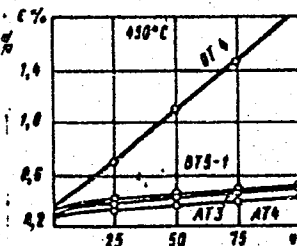
Card 2/3

L 20630-66

ACC NR: AP6010093

it possible to determine. the elongation from the magnitude of deflection. Orig.
art. has: 3 figures and 2 tables.   [AZ]

SUB CODE: 11, 14/ SUBM DATE: none/ ORIG REF: 006/ ATD PRESS: 4124

Card 3/3

L 39961-66   EWT(m)/T/EWP(w)/EWP(t)/ETI   IJP(c)   JG/JD

ACC NR: AP6019775

SOURCE CODE: UR/0370/66/000/003/0172/0178

AUTHOR: Kornilov, I. I. (Moscow); Shakhova, K. I. (Moscow); Budberg, P. B. (Moscow)

ORG: none

TITLE: Electrical resistance and thermal expansion of alloys of the Ti-Nb-Cr system

SOURCE: AN SSSR. Izvestiya. Metally, no. 3, 1966, 172-178

TOPIC TAGS: electric resistance, thermal expansion, titanium alloy, niobium alloy, chromium alloy, alloy phase diagram

ABSTRACT: The electrical resistance of alloys of the Ti-Nb-Cr system was investigated as a function of their chemical and phase composition at room temperature and during heating to 1100°C. The thermal expansion in the 20-1100°C range was also studied. The alloys were first quenched from 1000°C and subjected to prolonged annealing. Data on the variation of the electrical resistance with the composition were found to be in good agreement with the results of microstructural and x-ray phase analyses. The electrical resistance data for the 20-1100°C range permitted the determination of the temperature boundaries of existence of the phase regions. Transition from one phase region to another was indicated by the presence of breaks in the curves of electrical resistance vs. temperature. A study of the thermal expansion of alloys during heating made it possible to establish the temperatures of

Card   1/2

UDC: 669.295.5:293.26

L 39961-66

ACC NR: AP6019775

transitions in the solid state. It is shown that eutectoid-type phase transitions take place very slowly in the alloys studied. Orig. art. has: 4 figures and 2 tables.

SUB CODE: 11,20/SUBM DATE: 04Mar64/ ORIG REF: 007

Card 2/2

ACC NR: AP6032954   SOURCE CODE: UR/0363/66/002/010/1878/1881

AUTHOR: Samsonova, N. N.; Budberg, P. B.; Kornilov, I. I.; Asanov, U. A.

ORG: Institute of Metallurgy im. A. A. Baykov, Academy of Sciences, SSSR (Institut metallurgii Akademii nauk SSSR)

TITLE: Interaction between $TiCr_2$ compound and molybdenum

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 10, 1966, 1878 to 1881

TOPIC TAGS: titanium chromium molybdenum system, titanium chromium compound, titanium chromium compound, titanium compound, molybdenum, system, titanium compound molybdenum interaction metal physical analysis, metal chemical analysis, hardness

ABSTRACT: A series of chromium-titanium molybdenum alloys with compositions located on the $TiCr_2$-Mo section of the ternary chromium-titanium-molybdenum system were scull melted from 99.99%-pure components and studied by various methods of physico-chemical analysis. Molybdenum was found to stabilize the β-phase ternary-molybdenum-chromium-titanium solution, to raise the solidus temperature and to lower the temperature of the $\beta \to \delta + \beta \to \delta$ transformation (see Fig. 1). The microhardness of the alloys at 1300, 1200 and 600C increases with increasing molybdenum content, reaches a maximum of about 820 kg/mm^2 at 6.5% (1300C) or about 825 and 870 kg/mm^2 at 8% (1200 and 600C) molybdenum and then drops rather sharply with further increase in

Card 1/3   UDC: 546.281'76+546.77

ACC NR: AP6032954
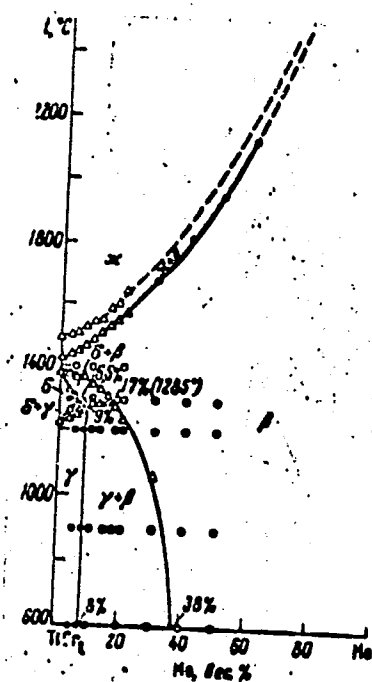
Fig. 1. Polythermal TiCr$_2$—Mo section of the ternary Ti-Cr-Mo diagram.

Card 2/3

ACC NR: AP6032954

molybdenum content. Orig. art. has: 5 figures and 1 table.

SUB CODE: 11/ SUBM DATE: 25Dec65/ ORIG REF: 003/ OTH REF: 003/

Card   3/3

ACC NR: AP6032955

AUTHOR: Samsonova, N. N.; Budberg, P. B.; Kornilov, I. I.; Asanov, U. A.

SOURCE CODE: UR/0363/66/002/010/1882/1886

ORG: Institute of Metallurgy im. A. A. Baykov, Academy of Sciences, SSSR (Institut metallurgii Akademii nauk SSSR)

TITLE: Interaction between $TiCr_2$ compound and vanadium

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 10, 1966, 1882-1886

TOPIC TAGS: titanium chromium vanadium system, titanium chromium compound, titanium compound, vanadium alloy, titanium compound vanadium, system chromium compound, metal physical analysis, metal chemical analysis, hardness

ABSTRACT: A series of chromium-titanium-vanadium alloys with compositions located on the $TiCr_2$-V section of the ternary chromium-titanium-vanadium diagram were levitation melted in helium atmosphere from iodide titanium, 99.99%-pure chromium and 99.75%-pure vanadium and studied by various methods of physicochemical analysis. It was found that vanadium stabilizes β-phase $TiCr_2$-base solid solution, raises the solidus temperature, and lowers the temperature of β → β + δ → δ transformation (see Fig. 1). The microhardness of the alloys at 1200, 900 and 600C generally decreases with increasing vanadium content, first (in the γ region) slowly, then

Card 1/2

UDC: 546.281'76+546.881

AT6034431

(A)

AUTHOR: Kornilov, I. I.

SOURCE CODE: UR/0000/66/000/000/0003/0015

ORG: none

TITLE: Development of a physico-chemical theory of heat resistance applicable to refractory metals and alloys

SOURCE: AN SSSR. Institut metallurgii. Svoystva i primeneniye zharoprochnykh splavov (Properties and application of heat resistant alloys). Moscow, Izd-vo Nauka, 1966, 3-15

TOPIC TAGS: refractory metal, refractory alloy, heat resistance

ABSTRACT: On the basis of the physico-chemical theory, the basic factors in the strengthening of metals are: 1) formation of solid solutions; 2) reactions leading to the formation of dispersed phases; 3) formation of high melting metals as Kurnakov compounds and as compounds which crystallize out of the melt; 4) formation of solid solutions based on the refractory metals, strengthened by dispersed phases. The present article considers the solubility and dispersion mechanisms for strengthening refractory metals. The main aim of the article is a consideration of the possibility of creating new heat resistant alloys based on the refractory metals, in particular the "big four", columbium, tantalum, molybdenum, and tungsten. A table presents

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ACC NR: AT6034431

calculated temperatures for the above metals. On the basis of the experimental data presented, the following factors must be considered in the application of solution and dispersion effects in the strengthening of alloys: 1) Use should be made of the great tendency of the transition metals, including the "big four", toward the formation of a wide range of solid solutions. For alloys of this kind, the basic systems are tungsten-tantalum-molybdenum-columbium and tungsten-molybdenum-columbium-vanadium. 2) Using the ability of these metals to combine with light metals and metalloids (aluminum, beryllium, boron, carbon, silicon, nitrogen) to form limited solid solutions and high melting compounds (aluminides, beryllides, borides, carbides, silicides, nitrides), these metals should be used for alloying in the creation of optimum compositions for multicomponent alloys; this must be combined with solution and dispersion strengthening at high temperatures. Orig. art. has: 11 figures and 1 table.

SUB CODE: 11/ SUBM DATE: 10Jun66/ ORIG REF: 017/ OTH REF: 012

Card 2/2

L 05004-67   EWT(m)/T/EWP(e)/EWP(t)/ETI   IJP(c)   AT/WH/WW/JD/JG

ACC NR: AP6024395   SOURCE CODE: UR/0020/66/169/002/0343/0346

AUTHOR: Kornilov, I. I.; Glazova, V. V.; Kenina, Ye. M.

40

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

B

TITLE: Formation of the compounds Zr_6O and Zr_3O in the zirconium-oxygen system

SOURCE: AN SSSR. Doklady, v. 169, no. 2, 1966, 343-346

TOPIC TAGS: zirconium alloy , alloy phase diagram , annealing

ABSTRACT: Zirconium-oxygen alloys containing from 1 to 28 at. % oxygen were studied by physicochemical analysis, microscopic analysis, and measurements of microhardness, electrical resistance and thermal emf.. Alloys quenched after annealing for 400 hr at 600°C and containing up to 8% O_2 correspond to homogeneous a solid solutions. Above 8% O_2, glide lines typical of decomposition of solid solutions appear. Alloys containing 15-16% O_2 consist of a single phase, and those with 25-26% O_2 show a fine-grained single-phase structure characteristic of a compound. Alloys with 28% O_2 have a two-phase structure. Resistivity-composition curves for alloys quenched from 600 and 800° show two singular resistivity maxima at 14.5 and 25% O_2, corresponding to the stoichiometric composition of the compounds Zr_6O and Zr_3O respectively. A study of the temperature dependence of the electrical conductivity of these compounds (which increases with temperature) confirmed their semiconducting nature. The bonding in Zr_6O is primarily covalent (with a certain fraction of ionic character). The paper

Card 1/2

UDC: 546.8

L 05664-67

ACC NR: AP6024395

was presented by Academician Sazhin, N. P., 27 Oct 65. Orig. art. has: 4 figures and 1 table.

O

SUB CODE: 11/ SUBM DATE: 06Jul65/ ORIG REF: 005/ OTH REF: 008

Card 2/2

L 01307-67

L 01307-67   EWT(d)/EWT(m)/EWP(w)/EWP(c)/EWP(v)/T/EWP(t)/ETI/EWP(k)/EWP(h)/EWP(1)
ACC NR: AP6003317 IJP(c)   JD/WW/JG/WB SOURCE CODE: UR/0365/66/002/001/0025/0031

AUTHOR: Kornilov, I. I.; Vinogradov, Yu. M.

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

TITLE: Use of titanium in the chemical machine building industry and its principles of alloying

SOURCE: Zashchita metallov, v. 2, no. 1, 1966, 25-31

TOPIC TAGS: titanium, titanium alloy, chemical plant equipment, corrosion resistant alloy, creep, solid solution

ABSTRACT: Titanium has a high resistance to corrosion and relatively high strength properties. This makes it an excellent structural material for producing chemical machine parts and apparatuses. At the present time only technically pure titanium (BT-1) is widely used in the industry for the production of pipes, heat-exchange apparatuses for heating electrolytes, condensers for condensation of ammonium pyrodine bases, heaters, tanks, filters, blades for centrifugal pumps for organic salts containing HCl, valve pumps, sprayers, atomizers, etc. However, titanium alloys will be more widely used in the future because BT-1 has a relatively low strength, it shows creep at room temperature, and stresses of ~80% of the yielding point, as well as a low corrosion resistance in hot solutions of some acids. Some known titanium alloys

Card 1/2

UDC: 669.295 : 620.193.4

L 01307-67
ACC NR: AP6003317

have a higher corrosion resistance than pure titanium. Titanium alloyed with 0.2-0.3% palladium has high stability in mineral acids. The selection of alloying elements for metals, including titanium, is controlled by their reaction with the metal. A study of the metal chemistry of titanium resulted in the separation of four groups of elements in the periodic system. The elements of the first group form continuous solid solutions with titanium; the elements of the second group form limited solid solutions; the elements of the third group form ionic compounds; and the elements of the fourth group do not react with titanium. Only the first two groups are of interest for efficient alloying. The main alloying elements for the formation of corrosion- and heat-resistant titanium alloys in the form of α-solid solution are zirconium and hafnium in unlimited concentration, and Al, Sn, Pd, Si, Cu, Ag, Mn, Cr, Fe, Mo and Nb within the limits of solubility. Oxygen, nitrogen, and hydrogen cause brittleness and can be used only for special purposes. Alloys in the form of β-solid solution can be made by using Mo, Nb, and V as alloying elements in large concentrations (>20-30%) and Zr, Al, Cr, and Fe in small concentrations to preserve a stable β-structure of the alloy. Since there is a shortage of tantalum, it can be recommended only for special cases. The titanium compounds TiAl, Ti$_3$Al, TiB$_2$, TiC, TiN, and their solid solutions have high melting points and heat resistance and can be sued as heat-resistant coatings. The ternary and more complex systems are also of interest: Ti-Mo-Nb, Ti-Mo-Zr, Ti-Cr-Cu, Ti-Zr-Sn, Ti-Pd-Cu, Ti-Mo-Pd, Ti-Mo-Cr, Ti-Cr-Pd, and others. With respect to corrosion resistance interesting results can be obtained in the region of β-solid solutions with a high concentration of molybdenum and niobium. Orig. art. has: 5 fig. and 1 table.

SUB CODE: 11,07/3/ SUBM DATE: 11Mar65/ ORIG REF: 024/ OTH REF: 002

Card 2/2

L 46959-66

L 46959-66

ACC NR: AP6031722
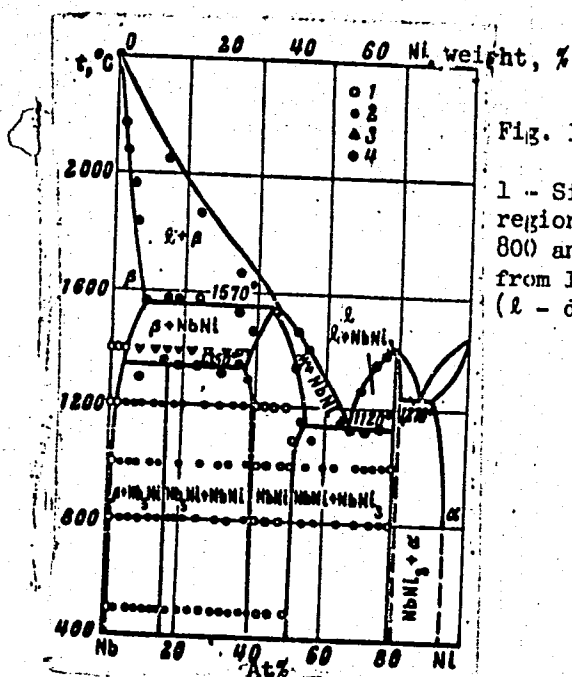
Fig. 1. Phase diagram of Nb-Ni system

1 - Single-phase region; 2 - two-phase
region after quenching from 1200, 1000,
800 and 500C; 3 - same after quenching
from 1400C; 4 - thermal analysis data
(ℓ - denotes liquid).

Card 2/3

Card 3/3   JS

ACC NR: AP7002429

SOURCE CODE: UR/0129/66/000/012/0005/0014

AUTHOR: Kornilov, I. I.

ORG: Institute of Metallurgy, AN SSSR (Institut metallurgii AN SSSR)

TITLE: Physicochemical theory of high temperature strengthening of refractory metals and alloys

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 12, 1966, 5-14

TOPIC TAGS: high temperature metal, high temperature alloy, high temperature strength, melting point, oxidation resistance, metal physics, dispersion strengthening, REFRACTORY METAL, REFRACTORY ALLOY

ABSTRACT: A literature survey was made of the high temperature properties of refractory metals and alloys. Included were the metals Nb, Ta, Mo, and W and the alloying elements Hf, Rh, Ru, Os, Ir, Si, C, B, O, and N. The pure refractory metals have low strength above $0.4 \, T_m$ (T_m is the melting point) and are highly oxidizable; consequently, they are alloyed in order to produce solution or dispersion strengthening. The physicochemical theories of both strengthening methods were studied. Solid solubility and local ordering were examined from the viewpoint of electronic and atomic similiarity. Data are given on the melting point, hardness, and creep strength as a function of alloying. The melting points of the refractory metals are raised substantially by selective alloying. For example, the systems Ta-W, Mo-W, Nb-Ta, Nb-Mo, Cr-Nb

Card 1/2

UDC: 669.27'28'293'294:539.434

ACC NR: AP7002429

and V-Rh all raise their melting point as a function of alloying. The hot hardnesses of Ta-W and Nb-W, however, go through a maximum at 50% W. Besides binary and ternary systems, W-Ta-Mo-Nb and W-Ta-Mo-Nb-V are also possible as solid solution systems. The use of lighter elements (Al, B, Be, C, Si, N) in refractory metals or alloys results in intermetallic compound formation as well as solid solubility. In these cases optimum compositions must be determined to provide for solution and dispersion strengthening. The mechanism of dispersion strengthening was related to the effects of the disperse phase. For example, creep strengthening results from the distribution of the disperse phase at grain boundaries. The equilibrium solubility of carbon in tungsten is given as a function of temperature. Different refractory systems were analyzed for regions of solid solubility in order to develop rules for combining the strengthening effects of both dispersion and solution hardening. The short time tensile strength of various refractory metals and alloys was given as a function of temperature. In all cases alloying increased the strength at critical temperatures of 0.4, 0.6, and 0.8 T_m. Alloy compositions were selected near the solid solubility limits for these temperatures, thereby combining dispersion with solid solution strengthening. Orig. art. has: 6 figures, 1 table.

SUB CODE: 11/   SUBM DATE: none/   ORIG REF: 024/   OTH REF: 017

Card 2/2

SOURCE CODE: UR/0020/67/172/002/0390/0393

AUTHOR: Kornilov, I. I.; Nartova, T. T.

ORG: Metallurgy Institute im. A. A. Baykov, Academy of Sciences, SSSR (Institut metallurgii Akademii nauk SSSR)

TITLE: Some regularities in the high-temperature strength of titanium alloys and types of composition vs. high-temperature strength diagrams

SOURCE: AN SSSR. Doklady, v. 172, no. 2, 1967, 390-393

TOPIC TAGS: titanium alloy, high strength alloy, solid solution

ABSTRACT: In an attempt to establish the regularities of the high-temperature strength (HTS) of titanium alloys, the following characteristics are considered on the basis of reported and experimental data: nature of the chemical reaction of Ti with other elements; formation of solid solutions and metallic compounds of Ti; solid-state phase transformations; and degree and final state of the phase equilibrium in systems based on Ti. The following conclusions were reached: (1) The change in HTS in Ti systems is determined by the nature of the chemical reaction of Ti with other elements, polymorphic transformations, and types of equilibrium diagrams of Ti systems. (2) In accordance with the four basic types of equilibrium diagrams, 4 types of composition-HTS diagrams of Ti systems were established, in contrast to the three types of similar diagrams of metal systems without polymorphic transformations. Many

Card 1/2

KORNILOV, K.A., kand. tekhn. nauk

Reconditioning gear wheels in repairing industrial equipment.
Mashinostroitel' no.5:11-12 My '65.   (MIRA 18:5)

ARNOLD, Z.; KORNILOV, M.

Reactivity of 1,1-dialkoxytrimethylamines. Coll Cz Chem 29 no. 3:645-651 Mr '64.

1. Institute of Organic Chemistry and Biochemistry, Czechoslovak Academy of Scien~~ ~~~~~e (for Arnold). 2. Kiev State University, Institute of Organic Chemistry, SSR (for Kornilov).

CA

/5

Comparative evaluation of several methods of determining the lime requirement of soils. M. E. Keyurhov, Doklady Vsesoyuz. Akad. Sel'skokhoz Nauk im. I. Lenina 12, No. 7, 3 0(1947). The Lazarev method gives results nearest to those of field expts. In this method the lime requirement is $N_1 - [2(N - N_1)/3]0.123$, in which N is the total N and N_1 humic N of the alkali ext.; 0.123 accounts for the quantity of lime needed to neutralize the humic acids that retain N. The methods next in accuracy of detg. lime requirement are those of Kappen and of Galkovskii.

I. S. Joffe.

A S M - S L A   METALLURGICAL LITERATURE CLASSIFICATION
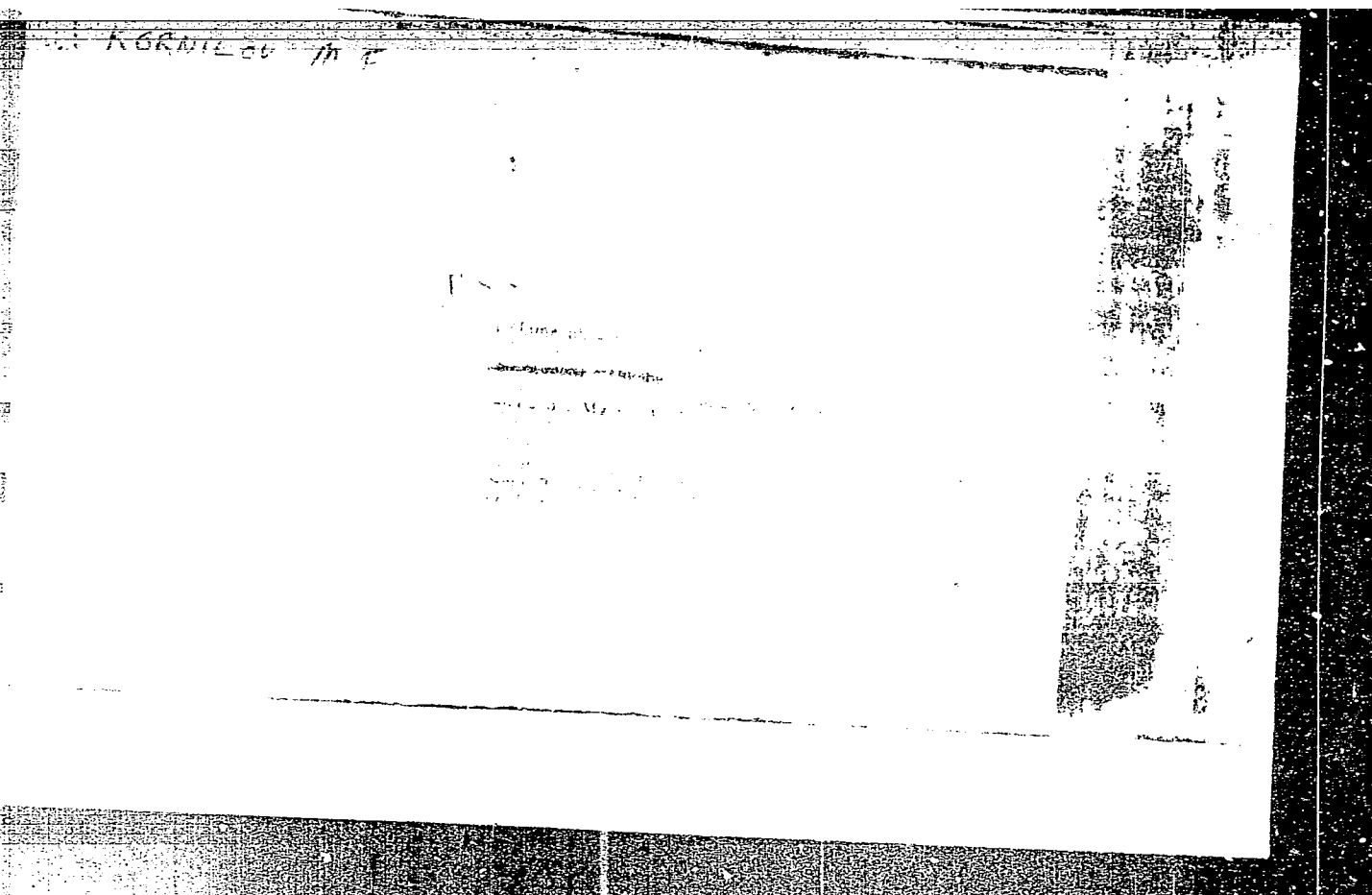
Kornilov, M.F.

USSR/Soil Science. Mineral Fertilizers.

Abs Jour: Referat Zh-Biol., No 6, 25 March, 1957, 22475   I-5

Author : Kornilov, M.F., Borisova, E.M., Trunina, Z.V.
Inst   :
Title   : Soil Liming and Varieties.

Orig Pub: Tr. Vses. n.-i. in-ta udobr., agrotekhn. i agropochvoved., 1955,
          No 31, 202-250

Abstract: Based on vegetative and field-laboratory experiments with diffe-
          rent varieties of a number of agricultural plants conducted in
          the Leningrad division of the All-Union institute of fertilizers,
          agrotechnique and agrosoil science, it was established that var-
          ieties grown on neutral soils, rich in calcium, are more respon-
          sive to liming when grown on acid soils than varieties grown in
          districts further north on acid soils. These differences in be-
          havior of varieties were mostly observed in summer wheat, barley,
          flax, peas, clover, and were less clearly expressed in summer

Card   : 1/2

-1-

Abs Jour: Referat Zh-Biol., No 6, 25 March, 1957, 22475   I-5

          rye, vetch, buckwheat. Sensitivity to soil acidity of different
          oat varieties had no connection with their origin.

Card   : 2/2

-2-

MASALOV, A., tekhnik-mekhanik (Ufa); KORNILOV, M., inzh.; SHIGANOV, A., (Chernigov); DUMIN, A., inzh. (Leningrad); AYUPOV, S., slesar'-instrumental'shchik (g.Kirovsk, Leningradskoy oblasti); DROBYSHEVSKIY, V., inzh.; VENEDIKTOV, V. (Sverdlovsk)

Suggested, developed, introduced. Izobr.i rats. no.1:40-42 Ja '60.   (MIRA 13:4)
          (Technological innovations)

SAVCHENKOV, A.F., kand.ekonomicheskikh nauk, dotsent; KORNILOV, M.F., doktor
sel'skokhozyaystvennykh nauk; CHUBAROV, A.P., kand.sel'skokhozyay-
stvennykh nauk; TSITOVICH, O.B., inzhener-tekhnolog, khimik

Need in nitrogen fertilizers and their varieties in the northwestern
part of the U.S.S.R. Trudy LIEI no.36:13-22 '61.   (MIRA 15:1)
(Fertilizers and manures) (Nitrogen)

KORNILOV, M.F., doktor sel'skokhoz, nauk (Leningrad)

Needs of the agriculture of the northwestern areas of the U.S.S.R. in nitrogen fertilizers. Trudy LIEI no.37:7-13 '61.

(MIRA 18:4)

KORNILOV, M.F., doktor sel'skokhozyaystvennykh nauk; KHODASEVICH, B.G.;
CHURKIN, K.G.

Using town construction and industrial waste for the
fertilization of fields. Zemledelie 24 no.10:62-68
O '62.
(MIRA 15:11)

1. Severo-Zapadnyy nauchno-issledovatel'skiy institut
sel'skogo khozyaystva (for Kornikov). 2. Leningradskiy
sel'skokhozyaystvennyy institut (for Khodasevich).
3. Ural'skiy nauchno-issledovatel'skiy institut
sel'skogo khozyaystve (for Churkin).
(Fertilizers and manures)
(Waste products)

ASTAKHOV, I.I., glav. red.; ANSIN, A.N., red.; IVANOV, D.A., red.;
    KORNILOV, M.F., doktor sel'khoz. nauk, red.; KONYUKHOV, V.N.,
    kand. sel'khoz. nauk, red.; MARKITANTOVA, A.V., uchenyy sekre-
    tar', red.; SAPOZHNIKOV, N.A., red.; DMITRIYEV, N.N., red.

[Science in the service of agricultural production; collection
of scientific and technical information] Nauka - sel'skokhoziai-
stvennomu proizvodstvu; sbornik nauchno-tekhnicheskoi informatsii.
Leningrad, Lenizdat, 1964. 143 p.   (MIRA 17:3)

1. Leningrad. Severo-zapadnyy nauchno-issledovatel'skiy institut
sel'skogo khozyaystva.

YERMOLAYEVA, Antonina Nikitichna; KORNILOV, M.F., doktor sel'-
    khoz. nauk, nauchn. red.; TOLOCHINSKAYA, B.M., red.;
    KRYUCHKOVSKIY, S.A., red.

[Chemistry in agriculture; index of recommended literature
for compulsory education in agrochemistry] Khimiia v sel'-
skom khoziaistve; rekomendatel'nyi ukazatel' literatury v
pomoshch' agrokhimicheskomu vseobuchu. Leningrad, 1964.
51 p.   (MIRA 17:11)
1. Leningrad. Publichnaya biblioteka.

KOBYL'SKAYA, M.V.; KORNILOV, M.F.; SEMENOV, S.S.; PYSHKINA, N.I.;
    PUSTOVALOVA, Ye.K.; KUZNETSOVA, O.A.; Prinimali uchastiye:
KSENOFONTOVA, tekhnik; AYZENBERG, Z.M., tekhnik; LOBANOVA, E.M.,
tekhnik

Using acid asphalt for the preparation of superphosphate
phosphorous fertilizer. Trudy VNIIT no.12:119-129 '63.
                                        (MIRA 18:11)

YURK, Yu.Yu., doktor geol.-miner. nauk, prof., otv. red.;
    GOROSHNIKOV, B.I.[Horoshnykov, B.I.], kand. geol.-
    miner. nauk, red.; KARASIK, M.A.[Karasyk, M.A.], kand.
    geol.-miner. nauk, red.; KORNILOV, M.O.[Kornylov, M.O.],
    kand. geol.-miner. nauk, red.; LEBEDINSKIY, V.I.
    [Lebedyns'kyi, V.I.], kand. geol.-miner. nauk, red.;
    SHTUL'MAN, I.F., red.; DAKHNO, Yu.B., tekhn. red.

    [Mineralogy and geochemistry of the southeastern part of
    the Ukrainian S.S.R.] Mineralogiia i geokhimiia pivdenno-
    skhidnoi chastyny URSR. Kyiv, Vyd-vo AN Ukr.RSR, 1963. 148 p.
                                              (MIRA 17:1)
    1. Akademiya nauk URSR, Kiev.

KORNILOV, N.A. [Kornilov, M.O.]

Psilomelane from the crust of weathering of ferruginous quartsites
of the Korsak Mogila deposit. Dop, AN URSR no.8:1111-1114 '63.
                                        (MIRA 16:10)
1. Institut mineral'nykh resursov AN UkrSSR. Predstavleno
akademikom AN UkrSSR N.P. Semenenko [Semenenko, M.P.].
          (Korsak Mogila mountain—Psilomelane)

KIPRIANOV, A.I.; KORNILOV. M.Yu.

Ionogenic addition of halogens to bis-methylene bases of nitrogen-
containing heterocycles. Zhur.ob.khim. 31 no.5:1699-1705 My '61.
(MIRA 14:5)

1. Kiyevskiy gosudarstvennyy universitet.
(Polymethylene compounds)

KORNILOV, M.Yu.; ARNOL'D, Z.

Activity of dimethylformamide acetals. Zhur.ob.khim. 34 no.2:700-701
F '64.
(MIRA 17:3)

1. Institut organicheskoy khimii i biolkhimii Akademiii nauk Chekho-
slovatskoy Sotsialisticheskoy Respubliki, Praga, i Kiyevskiy gosu-
darstvennyy universitet.

KIPRIANOV, A.I.; KORNILOV, M.Yu.

Ionogenic addition of halogens to bis-methylene bases of nitrogen heterocycles. Part 2. Zhur.ob.khim. 34 no.1:77-82 Ja '64.

(MIRA 17:3)

1. Kiyevskiy gosudarstvennyy universitet.

TSVIK, G.; KORNILOV, N.

Promotion of the motor-vehicle reliability is an objective
of national importance. Avt. transp. 43 no.10:18-19 O '65.
(MIRA 18:10)

1. Minskiy avtomobil'nyy zavod.

KORNILOV, N.

[Geopolitical mutation] Geopoliticheskaia mutatsiia.
Sao Paulo, Brazillia, Knizhnyi magazin S.Rozov. Pt.1.
1958.   (MIRA 16:9)
        (Social psychology)

KORNILOV, N.A.

Joint growth of two minerals. Zap.Vses.min.ob-va 83 no.3:260-262. '54.

(Mineralogy)

(MLRA 7:11)

New occurrence of tivaite in copper-nickel ...

G. I. Gorbunov and N. A. ...

KORNILOV, N.A.

Ore metasomatosis in the Pechenga copper and nickel sulfide deposits. Izv.Kar. i Kol'.fil.AN SSSR no.4:20-31 '58.
(MIRA 12:5)

1. Laboratoriya mineralogii i geokhimii Kol'skogo filiala AN SSSR.

(Pechenga District--Ore deposits)
(Metasomatism)

AUTHORS: Ivanova, V. P., Kornilov, N. A.   2o-119-1-42/52

TITLE: Asbestiform (Transverse Fibrous) Chlorite From a Copper-
                Nickel Deposit (Asbestovidnyy (poperechnovoloknistyy)
                khlorit iz medno-nikelevogo mestorozhdeniya)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 119, Nr 1,
                pp. 154-157 (USSR)

ABSTRACT: Scaly aggregate-forms are characteristic of the minerals
                of the chlorite-group; asbestiform ones are unknown. In
                similar layered chrysolite and endellionitz asbestiform
                aggregates form a union of individual tubes the walls of which
                consist of several atomic layers (Reference 1). Therefore
                the investigation of individual fibers in this chlorite is
                of interest. It was found in the form of black, small
                veins in a hydrothermally changed schist at the contact
                with epigenetic copper-nickel grains of ore which are ge-
                netically connected with ultrabasic rocks. The mineral
                can easily be separated in individual small columns or
                needles which glimmer through dark-green at the edges.
Card 1/4   Its hardness is 2-2,5 (figure 1). The microscopic struc-

Asbestiform (Transverse Fibrous) Chlorite From a   2o-119-1-42/52
Copper-Nickel Deposit

                ture is described in detail. The chemical composition
                (table 1) permits to classify the chlorite with the mag-
                nesic group; it is placed near the boundary with ferri-
                ferous-magnesic chlorites (Reference 2). A crystallo-
                chemical formula after recalculation to 18 oxygen atoms
                is given. Beside the elements mentioned in table 1 Ni, Co,
                V, Cu, Zn and traces of Be, Ca, Zr and Sr were determined
                by spectral analysis. The debye crystallogram is very
                similar to those of scaly chlorites. The comparison of
                the lattice-parameters, calculated from the interplanar
                spacings (table 2) was performed. The calculated parame-
                ters as compared to the theoretical ones show a considerab-
                ly higher quantity of the parameter c. The differential
                curves of heating were obtained according to the method
                described in reference 4. For the asbestiform chlorite,
                ground to a different degree of comminution, they are
                given in figure 3. These curves are dependent on the
                degree of comminution (References 5, 6). The causes of
Card 2/4   the stronger projection of the exothermic peak following

Asbestiform (Transverse Fibrous) Chlorite From a   2o-119-1-42/52
Copper-Nickel Deposit

the two endothermic effects in the case of a finer commi=
nution of the chlorite deserve a special investigation and
discussion, which the authors intend to perform. In order
to be able finally to judge on the shape of the elementary
particles which form the finest fibers of chlorite they were
investigated in the electron-microscope. The particles pro=
ved to be scaly. The assumption on the tubular structure of
the asbestiform are thus confirmed. At the same time the op=
tical properties of the asbestiform chlorite essentially
differ from those of scaly chlorite. According to the type
of pleochroism and the position of the axes of the indica=
trix the asbestiform chlorite is close to the usual nega=
tive chlorites. It differs from the latter by the extreme=
ly large angle 2V (-13o$^\circ$). A similar distortion of the op=
tical properties is characteristic of the minerals of the
serpentine-group. There are 3 figures, 2 tables and 6 refe=
rences, 4 of which are Soviet.

Card 3/4

KORNILOV, N.A.

Some observations on the contact of effusive diabases of the Pechenga series. Izv. Kar. i Kol'. fil. AN SSSR no.1:33-39 '59.
(MIRA 12:9)

1.Geologicheskiy institut Kol'skogo filiala AN SSSR.
(Kola Peninsula—Diabase)

KORNILOV, N.A.; DENISOV, A.P.

Composition and conditions governing the formation of pyrrhotite
and troilite in the Pechenga copper-nickel deposits. Isv.Kar.
i Kol'.fil.AN SSSR no.4:24-33 '59.   (MIRA 13:5)

1. Geologicheskiy institut Kol'skogo filiala AN SSSR.
          (Pechenga region--Pyrrhotite)

KORNILOV, N.A.

Large meteor over the Kola Peninsula. Priroda 48 no.6:113 Je
'59.   (MIRA 12:5)

1.Kol'skiy filial AN SSSR, Kirovsk.
             (Meteors)

KORNILOV, N.A.

Anomal optical properties of certain asbestos-type hydrosilicates. Zap.Vses.min.ob-va. 88 no.2:115-125 '59.

(MIRA 12:8)

1. Kol'skiy filial AN SSSR, Geologicheskiy institut.
(Silicates--Optical properties)

KORNILOV, N. A., Cand Geol-Min Sci -- (diss) "Characteristics of hydro-
thermal wall rocks and ore metasomatosis in the Pechengskiye Copper-
Nickel Deposits. (Kol'skiy Peninsula)." Leningrad, 1960. 26 pp; (Min-
istry of Higher and Secondary Specialist Education RSFSR, Leningrad
Orders of Lenin and of Labor Red Banner Mining Inst im G. V. Plekha-
nov); 200 copies; price not given; printed on duplicating machine;
list of author's work on pp 25-26; (KL, 24-60, 129)

KORNILOV, N.A.

X-ray determination of ferro-magnesian chlorites. Zap.Vses.min.ob-va 89 no.2:160-165 '60.

(MIRA 13:7)

1. Kol'skiy filial AN SSSR, Geologicheskiy institut. Deystvitel'nyy chlen Vsesoyuznogo mineralogicheskogo Obshchestva.
    (Chlorites)   (X rays--Diffraction)

KORNILOV, N.A.

Mineralogy of serpentines. Zap.Vses.min.ob-va 90 no.5:535-548
'61.
(MIRA 14:10)

1. Kol'skiy filial AN SSSR, Geologicheskiy institut.
(Serpentine)

KORNILOV, N.A.

Quartz from sulfide copper-nickel ores of Pechenga. Geol.rud.
mestorozh. no.4:123-126 Jl-Ag '62.   (MIRA 15:8)

1. Institut mineral'nykh resursov AN UkrSSR, Simferopol'.
        (Pechenga District--Quartz)

KORNILOV, N.A.

Sulfide olivinites and harzburgites of the Allarechensk nickel-bearing intrusive (Kola Peninsula). Dokl. AN SSSR 146 no.1:199-202 S ' 2.
(MIRA 15:9)

1. Institut mineral'nykh resursov AN USSR. Predstavleno akademikom V.S. Sobolevym.
        (Kola Peninsula—Olivinites)
        (Kola Peninsula—Harzburgite)

KORNILOV, N.A.

Some foreign works on mineralogy and geochemistry of recent and
fossil shells. Zap.Vses.min.ob-va 91 no.6:736-738 '62.

(MIRA 16:2)

1. Institut mineral'nykh resursov AN SSSR, Simferopol'.
(Shells—Analysis)

KORNILOV, N.A.

New kind of mineralogical levels in copper-nickel sulfide
deposits. Mat. po min. Kol'. poluost. 2:152-148 '62.
(MIRA 16:4)

(Sulfides)

KORNILOV, N.A.

Redoposition of impregnated sulfides in the process of forming
sulfide cuprous nickel deposits. Dokl. AN SSSR 152 no.2:396-
399 S '63.   (MIRA 16:11)

1. Institut mineral'nykh resursov AN UkrSSR. Predstavleno
akademikom D.S.Korzhinskim.

KORNILOV, N.A.,

Natural sulfide-silicate liquation. Mat. po min. Kol'.
poluost. 3:100-106 '62.   (MIRA 17:3)

IVANOVA, V.P.; KORNILOV, N.A.

Effect of the degree of the dispersion of minerals of tho
serpentinite and chlorite group on their thermal character-
istics. Trudy VSEGEI 96:187-201 '63.   (MIRA 17:9)

YURK, Yu.Yu.; KORNILOV, N.A.; KIRICHENKO, O.N.; LEBEDEV, Yu.S.

Outlines of the Cimmerian iron ore basin in the southern
part the U.S.S.R. Dokl. AN SSSR. 154 no.2:355-358 Ja'64.

(MIRA 17:2)

1. Institut mineral'nykh resursov AN UkrSSR. Predstavleno
akademikom D.I. Shcherbakovym.

KORNILOV, N.A.; KAL'YAN, G.A.

Strontium in the Kimmeridge iron-ore deposits of the Azov and
Black Sea Basin. Geokhimiia no.2.241-245 F '65.

(MIRA 18:6)

1. Institut mineral'nykh resursov Gosudarstvennogo geologicheskogo
komiteta SSSR, Simferopol'.

TAVROVSKIY, V.A.; IVANOV, D.U.; KORNILOV, N.A.

First results of reacclimatizing sables in the southern and
eastern regions of Yakutia. Trudy Inst.biol.IAFAN SSSR no.4:
3-49 '58.   (MIRA 11:11)
                    (Yakutia—Sables)

ACC NR: AM6015327   Monograph   UR/

Onoshko, YUriy Anatol'yevich; Gittsigrat, Ernest Ernestovich; Kornilov, Nikita
   Ivanovich; Kokovkin, Viktor Sergeyevich

Drilling holes with diamond bits (Bureniye skvazhin almaznymi dolotami) Leningrad,
   Izd-vo "Nedra", 1965. 307 p. illus., biblio. 2000 copies printed.

TOPIC TAGS: drilling, diamond bit drilling, drilling tool, drilling equipment,
   geologic survey, geologic prospecting, diamond specification

PURPOSE AND COVERAGE: This book is intended for geological engineering personnel and
   for students of geological survey tekhnikuns. It may also serve as textbook for
   improving the qualifications of drilling teams. The book reviews the most impor-
   tant properties of diamonds used for drilling geological survey holes in rocks of
   various hardness. Designs of equipment and tools used in drilling   with dia-
   mond bits and methods and procedures applied to drill test holes are discussed in
   detail.

TABLE OF CONTENTS [abridged]:

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ACC NR: AM6015327

SUB CODE: 08/ SUBM DATE: 06Dec65/ ORIG REF: 032/ OTH REF: 018

Card 2/2

ISAYEV, M.I.; KORNILOV, N.I.

Diamond drilling is a most important potential for increasing drilling output. Razved. i okh. nedr 31 no.2:21-24 F '65.
(MIRA 18:3)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut metodiki i tekhniki razvedki Gosudarstvennogo geologicheskogo komiteta SSSR (for Isayev). 2. Gosudarstvennyy geologicheskiy komitet SSSR (for Kornilov).

KORNILOV, N.I.; KUROCHKIN, P.N.

Using low-quality diamonds in drill bits. Razved. i okh. nedr
30 no.9:23-25 S '64.   (MIRA 17:12)

1. Gosudarstvennyy geologicheskiy komitet SSSR (for Kornilov).
2. Vsesoyuznyy nauchno-issledovatel'skiy institut metodiki i
tekhniki razvedki Gosudarstvennogo geologicheskogo komiteta
SSSR (for Kurochkin).

Solubility of chemical elements in titanium. N. N. Kornilov (Izvest. Akad. Nauk. SSSR, Otdel. khim. Nauk, 1954, No. 3, 392—408).—An analysis of published information about the solubility of elements in Ti shows that these vary in the same way with position in the Periodic Table as for solubility in Fe, Ni, Cr, etc. Elements are classified into those yielding continuous and limited series of solid solutions. (38 references.)   R. C. MURRAY.

KORNILOV, N.N.

Continuous assembly line for front axles of cars and equip-
ment for attaching springs. Obm.tekh.opyt.na avt.transp.
no.3:43-48 '60.   (MIRA 13:7)
        (Automobiles--Maintenance and repair)

BAGUZOV, N. P.; KORNILOV, N. V.

Unified standard sections and standard spans for industrial
construction. Prom stroi 41 no. 12:6-12 D '63.   (MIRA 17:5)

KORNILOV, P.

The image of V.I. Lenin in photography. Sov. foto 17 no.4:1-4 Ap '57.
(Photography)   (Lenin, Vladimir Il'ich, 1870-1924) (MIRA 10:6)

VYDRIN, Vladimir Nikolayevich, doktor tekhn. nauk; SITNIKOV,
Leonid Leonidovich, inzh.; KORNILOV, Petr Vasil'yevich,
inzh.; SVET, Ye.B., red.

[Strength of rolling-mill rolls] Stoikost' prokatnykh
valkov. Cheliabinsk, Cheliabinskoe knizhnoe izd-vo, 1964.
70 p.   (MIRA 17:8)

TETEL'BAUM, S.I., prof.; KORNILOV, R.A., nauchnyy sotrudnik (Kiyev)

Portable ergometer-ergograph. Vrach.delo no.11:1211-1212 N '57.
(MIRA 11:2)

1. Chlen-korrespondent AN USSR
(DYNAMOMETER) (ERGOGRAPH)

KORNILOV, R. A.: Master Med Sci (diss) -- "Investigation of the static-dynamics

of the body under normal conditions and in certain pathological states of the

support-motor apparatus". Kiev, 1959. 19 pp (Kiev Order of Labor Red Banner Med

Inst im Acad A. A. Bogomolets), 200 copies (KL, No 8, 1959, 138)

L 46026-66   EWP(k)/EWT(d)/EWP(h)/EWP(l)/EWP(v)   BC/GD

ACC NR: AT6017617   (N)   SOURCE CODE: UR/0000/65/000/000/0251/0264

AUTHOR: Kornilov, R. V.

ORG: none

TITLE: A method for designing optimal relay systems

SOURCE: Vsesoyuznaya konferentsiya po teorii i praktike samonastraivayushchikhsya sistem. 1st, 1963. Samonastraivayushchiyesya sistemy (Adaptive control systems); trudy konferentsii. Moscow, Izd-vo Nauka, 1965, 251-264

TOPIC TAGS: optimal automatic control, nonlinear automatic control, automatic control design, automatic control R and D, nonlinear automatic control system

ABSTRACT: The author describes a method for parameter selection, to insure the quality of regulation by an optimal inertial relay system [see fig. 1]. The problem is

Fig. 1. 1--actuator; 2--nonlinear part of the controlled object; 3--linear part of the controlled object; 4--optimizer; 5--the contact closure output of the optimizer.

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ACC NR: AT6017617

to find for given transfer functions of blocks 1, 2 and 3 a set of parameters for the optimizer which would insure the desired performance. Two performance aspects are chosen as the design criteria: the minimum search time (to generate an output) during which given search losses are not to be exceeded, and minimum search losses. The author selected two approaches to the solution of this problem, both of which are thoroughly explained and analyzed. The first method is a point transformation, resulting in a set of design formulas, graphs and rules; the second, following from the first, is a method for numerical solution using an analog computer. The analysis is based on the assumption that the nonlinear static response characteristic of the block (3) can be made linear on a piecewise basis to any desired degree of approximation. This approach is particularly suitable when the response of the controlled object cannot be described by a parabolic function. Orig. art. has: 36 formulas, 9 figures.

SUB CODE: 13/   SUBM DATE: 22Nov65/   ORIG REF: 007

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L 46030-66   EWT(d)/EWT(v)/EWP(k)/EWP(h)/EWP(1)   GD/BC

ACC NR: AT6017618   (N)   SOURCE CODE: UR/0000/65/000/000/0265/0277

37

B+1

AUTHOR: Putsillo, V. P.; Bobrov, Yu. I.; Kornilov, R. V.

ORG: none

TITLE: Methods of constructing single channel automatic optimizers for inertial pro-
cesses

SOURCE: Vsesoyuznaya konferentsiya po teorii i praktike samonastraivayushchikhsya
sistem. 1st, 1963. Samonastraivayushchiyesya sistemy (Adaptive control systems); trudy
konferentsii. Moscow, Izd-vo Nauka, 1965, 265-277

TOPIC TAGS: optimization, optimal control, extremal control , NONLINEAR CONTROL
SYSTEM

ABSTRACT: Two methods of synthesizing a controller for a nonlinear, inertial, ex-
tremal control system are presented. The synthesis is performed by analyzing the out-
put of the system by a phase plane diagram. The first method establishes the control
law by evaluating the first order derivative of the output, while the second method
utilizes the second order derivative as well. The second method is supposed to im-
prove the stability of the system. The control law is expressed as a logical binary
algorithm and schemes composed of logical elements to perform the control functions
are proposed. The second method proposed by the authors is criticized by V. V. Kaza-
kevich, whose work is referred to in this paper. His conclusion is that the perform-

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ance of the second method is dubious due to several oversights of the authors. Orig.
art. has: 12 formulas, 7 figures, 2 tables.

SUB CODE: 13/   SUBM DATE: 22Nov65/   ORIG REF: 003

Card 2/2

KORNILOV, R.V.

PHASE I BOOK EXPLOITATION

SOV/4411

Konferentsiya po voprosam teorii i primeneniye diskretnykh avtomaticheskikh sistem, Moscow, 1958

Teoriya i primeneniye diskretnykh avtomaticheskikh sistem; trudy konferentsii (Theory and Application of Discrete Automatic Systems; Transactions of the Conference) Moscow, AN SSSR, 1960. 572 p. 5,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Natsional'nyy komitet SSSR po avtomaticheskomu upravleniyu. Institut avtomatiki i telemekhaniki.

Editorial Board: M.A. Gavrilov, Doctor of Technical Sciences; Yu.I. Topcheyev, Doctor of Technical Sciences; V.A. Kotel'nikov, Candidate of Technical Sciences; A.Ya. Lerner, Doctor of Technical Sciences; I.S. Morozanov (Scientific Secretary), G.S. Pospelov, Doctor of Technical Sciences, A.A. Fel'dbaum, Doctor of Technical Sciences; A.Y. Kharasy, Candidate of Technical Sciences, and Ya.Z. Tsypkin, Doctor of Technical Sciences; Resp. Ed.: Ya.Z. Tsypkin, Doctor of Technical Sciences; Ed. of Publishing House: M.L. Podgoyetskiy; Tech. Ed.: S.G. Markvich.

PURPOSE: These transactions are intended for the members of the conference and other specialists in automatic control.

COVERAGE: The Conference on the Problems of Theory and Application of Discrete Automatic Systems took place in Moscow from September 22 to 26, 1958. It was the first conference devoted to discussion of the present status of the theory and techniques of discrete automatic systems and to planning for future development. The papers discussed at the conference have been divided into four groups. In the first group optimization switching circuits are discussed as well as methods of relay control systems, in particular plant leg control systems in which are realized optimal processes as to quick response. The second group of papers is devoted to the analysis and synthesis of pulse systems with variable parameters, of pulse systems with several rules components, to the study of self-oscillating phenomena in nonlinear pulse systems, and to the method of calculating linear pulse systems. Problems of simulating pulse systems and descriptions of some pulse regulators have also been included. The third group of papers deals with digital systems. Problems of using elements of digital technique and initial complexity for the automation of various fields of engineering, i.e., power engineering, making radio communication, metallurgy, etc., are discussed. Problems of analog-digital conversion and vice versa as well as problems of developing specialized functional converters have been included in this group. The fourth group of papers includes theoretical aspects and certain practical applications of the simplest type of self-adjusting system optimizing control systems, which are developed as relay, pulse and digital devices. Here are also found papers describing various methods of investigating steady-state conditions in optimizing systems, results of studying the effects of random factors on the process of automatic scanning, and examples of existing optimizing control systems. Some of the more interesting communication and operations made during the discussion of the various conference papers have also been included in the transactions. Personalities and references accompany most of the papers.

Ketkin, M.G. (Moscow). Automatic Single-Action Minimizer in Discrete Systems of Automatic Optimization   534
The author derives the problem of automatic optimization as the process of reaching a minimum value for a certain input quantity f through automatic scanning. This process is a single-action one and the methods used are the same as those discussed in the paper delivered by R.L. Stakhovskiy (p.505). The author considers the method of the quickest triggering as the most economical. He describes the practicable equipment for developing this type of automatic minimizer.

Kiriltier, O.K. (Moscow). Optimizing System of Turbine Drilling with Discrete Devices   544
The problem consists of establishing a maximum drilling speed for a given load on the chisel, its technological conditions, and a given stratum. The author describes a structural scheme of the optimizing control system for a turbine drilling installation. There are no references.

Karkevich, V.I., R.V. Kornilov, and M.G. Khristoforov.   Electronic Optimizing Controller   558
The authors examine and give a detailed description of the peak-holding device method of optimizing control. There are 7 references; 5 Soviet (including 1 translation) and 2 English.

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S/194/61/000/002/028/039
D216/D302

/6. 8000(/0/3, /068, 300I)

AUTHORS: Kazakevich, V.V, Kornilov, R.V. and Khristoforov,
                  N.G.

TITLE: Electronic extremum controller

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika,
                  no. 2, 1961, 39, abstract 2 V316 (V sb. Teoriya i
                  primeneniye diskretn. avtomat. sistem, M., AN SSSR,
                  1960, 558-569)

TEXT: In an extremum controller operating with storage of the
extremum, the fundamental disturbance is the fast monotonically
disappearing extremum characteristic. For the stabilization of the
position of the controlling device it becomes then advantageous to
use a commutator which periodically reverses the speed of the
machine. The presence of inertia or delay in the load influences
the steady-state of a system with such a controller. If in a load
without inertia in its steady-state positive and negative increments

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Electronic extremum controller   D216/D302

alternate, then in the load with inertia after a few positive in-
crements, the same number of negative increments will follow (the
characteristic is said to be symmetrical). The bloc-diagram of
extremum controller consists of a signum-relay determining the sign
of the increment, a commutator and output device. The operation
of the signum-relay and of the commutator are synchronized. The
extremum controller has been tried on a model of the load. 7 ref-
erences.

Card 2/2

KORNILOV, R.V.

Electronic optimalizing control. Priborostroenie no.4:11-13
Ap '60.   (MIRA 13:6)
              (Electronic control)

S/569/61/006/000/003/008
D201/D303

AUTHORS: Putsillo, V. P., Petrov, V. V., Kornilov, R. V. and
             Volodin, Ye. Ye. (USSR)

TITLE: Principles of design of one class of extremum control
             systems for the automation of production processes

SOURCE: International Federation of Automatic Control. 1st Con-
             gress, Moscow, 1960. Trudy. v. 6. Avtomatizatsiya
             proisvodstvennykh protsessov; khimiya, neftepererabotka,
             teploenergetika, yadernaya energetika, metallurgiya.
             Moscow, 1961, 356-366

TEXT: The authors describe an extremum control system designed for
controlling processes with large time constants in the linear sec-
tions. This extremum control system is the easiest to design and
is based on the method of forced reversals or hunting with "memori-
zing" the extremum. When the controller is switched in, the con-
trolling element starts to move in any direction, thus producing
changes in the controlled quantity y. The controlling signal is ac-

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D201/D303

Principles of design ...

tually the sign of a finite increment: $\Delta = \text{sign}\ (y_i - y_{i-1})$. If the
maximum is sought, then at $\Delta > 0$ the motion is allowed for, but at
$\Delta < 0$ the drive of the controlling element is reversed. The bloc-
diagram of an extremum controller is given. It has the following
main units: 1) Input unit (IU), which determines the sign of the
increment of controlled quantity by comparing its current magni-
tudes with those previously stored; 2) commutator unit, providing
the forced reversal of the system, excluding the consecutive sig-
nals of one sign and controlling the IU; 3) output unit (OU) for
producing a signal with enough power for controlling the drive of
the controller; 4) the switching-off unit (SO) which disconnects
the controller when extremum is reached and makes a reversed con-
nection, if no disturbance changing the position of extremum is
acting upon the system; 5) control velocity regulator (CVR) pro-
viding a wide range of regulation of the motor (output stage) ve-
locity. The circuit diagram of the arrangement is given. The con-
troller has been experimentally tried with a high-temperature tun-
nel furnace. The controller made it possible to control the fur-

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Principles of design ...

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nace temperature within 3 - 4°C (nominal operating temperature was
1600 - 1650°C). The maximum deviation during the transitional un-
stable state did not exceed 9 - 12°C. At the same time the air
consumption was down by 20%. The results obtained were in agree-
ment with the requirements. V. V. Petrov (USSR) took part in the
discussion and acknowledges the help of Professor V. V. Kazakevich
and of Engineer A. L. Malyy in designing the first model of the
extremum control of the tunnel furnace. There are 5 figures and
6 references: 5 Soviet-bloc and 1 non-Soviet-bloc. The reference
to the English-language publication reads as follows: C. S. Draper,
L i J. T. Principles of optimalizing control, ASME, 1951.

Card 3/3

KLIMOVITSKIY, M.D.; KORNILOV, R.V.

Using optimalizing controllers in a continuous furnace.
Priborostroenie no.11:9-) I '61.   . (MIRA 14:10)
          (Furnaces, Heating)
          (Thermostat)

S/103/63/024/002/007/020
D201/D308

AUTHORS: Bobrov, Yu. I., Kornilov, R. V. and Putsillo, V. P.
                  (Moscow)

TITLE: Determination of the control law of an optimizer,
                  taking into account the inertness of the object

PERIODICAL: Avtomatika i telemekhanika, v. 24, no. 2, 1963,
                  183-191

TEXT: The authors analyze the on-off extremum control
systems, in which the controlled object is represented by a first
order factor, a non-linear element with one extremum and has an in-
active zone. From the analysis of the system's motion in the phase
plane the structure of the optimizer controller is derived and it is
shown that, for the above class of systems, a stable search for opti-
mum is achieved by introducing the second derivative: this is done
bearing in mind that, for objects with an inactive zone and low
speed of the output stage, the signal from the second derivative may
be commensurable with the inactive zone. The synthesis of the con-
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Determination of the control law ...   S/103/63/024/002/007/020
                                        D201/D308

trol law was used for selecting the functional diagram of the opti-
mizer. The first derivative signal is differentiated and a signal,
proportional to the second derivative, is applied to the summing
element, to which the compensating constant signal is also applied.
If the output from the summing element is less than - ε, where ε
is the inactive zone of the relay, a signal is applied to a logic
circuit, which then transmits a pulse from the timing generator.
This output is then applied to a trigger circuit, which reverses
the direction of the output stage. A model of the device, with
polarized relays as sensing elements, operated in full agreement
with the theory. There are 7 figures.

SUBMITTED: March 27, 1962

Card 2/2

KORNILOV, S.

The VS-2 machine tool. Stroitel' no.4:18 Ap '58.   (MIRA 11:5)
(Brickmaking machinery)

KORNILOV, S.A.

Complete spectrum of combinational noise in a transit klystron.
Radiotekh. i elektron. 8 no.10:1719-1729 O '63.   (MIRA 16:10)

KORNILOV, S.A.

Letter to the editor. Vest. mash. 36 no.6:81 Je '56.

(MLRA 9:10)

(Brazing)

9(4)

AUTHOR: Kornilov, S. A.

TITLE: SHF Amplification by Means of an Underexcited Reflex Klystron
(Usileniye SVCh-kolebaniy s pomoshch'yu nedovozbuzhdennogo otrazhatel'nogo
klistrona)

ABSTRACT: An underexcited reflex klystron is used as a regenerative amplifier.
Fundamental parameters of the amplifier are determined. Experiments in the
3×10^9- and 10×10^9-cps bands have confirmed the theoretical conclusions.

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SUBMITTED: December 7, 1957

AUTHORS: Golubkov, P.V. and Tsirlin, Sh. Ye.

SOV/109-3-3-22/23

TITLE: The Second All-Union Conference on Radioelectronics of the Ministry of Higher Education of the USSR (Vtoraya vsesoyuznaya konferentsiya MVO SSSR po radioelektronike) - News item

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol 3, Nr 3, pp 440 - 444 (USSR)

ABSTRACT: The conference took place during September 23 - 29, 1957, at Saratovskiy gosudarstvennyy universitet imeni N.G. Chernyshevskogo (Saratov State University imeni N.G. Chernyshevskiy). Apart from the representatives of some universities, the conference was attended by the representatives of the Soviet and Ukrainian Academies of Science, various industrial establishments and the interested ministries. This arrangement stimulated the discussion and evaluation of the papers presented and permitted the determination of plans for the future research to be carried out by the universities in the field of radioelectronics.

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The problems dealing with various fluctuation phenomena in electron and gas-discharge devices and with the physics and applications of gas discharges at

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U.H.F. were discussed in the papers by B.A.Alkhanov, I.F. Trofimenko, G.F. Antonov and N.G. Tikhodeyev, the systems; the problem was also discussed in the papers: "The Electron Velocity Distribution in a Maintaining Plasma" by A.M. Alekovskiy; "Frequency and Amplitude Fluctuations of the Oscillation; 2,3,5-cm Klystron Oscillator" by V.M. Nikonov; "De-electronisation of Gas in a 10-cm Antenna Switch" by U.V. Gorokhov and "Detuning of Cavity Resonators by Means of Gas Discharges" by U.V. Gorokhov and I.F. Bykova. The lecture of B.A. Kornilov entitled "Reflex Klystron as a Regenerative U.H.F. Amplifier" was of great practical interest. The simplicity of the amplifier permits the application of this device in the whole range of equipment where the comparatively high level of noise is not important. The Section of Electrodynamics had six sessions, during which over 30 papers and communications were read. A considerable part of these was devoted to the theoretical and experimental investigations of the propagation of electromagnetic waves in various delay systems. The paper by V.M. Dashenkov entitled "Scattering Properties of Certain Rod-type Delay Systems" gave the results of equation for a structure consisting of a number of arbitrarily-loaded rods (stubs). The author found that the theory was in agreement with the experimental results. The communication by V.I. Bespalov and V.Ya. Dauks entitled "Propagation of Electromagnetic Waves in a Non-uniform Helix" gave the results of a perturbation-method investigation of the effect of random longitudinal and radial displacements of the helix conductor on the characteristics of the delay system. The results obtained by the authors permit the evaluation of the tolerances in the helices employed in backward-wave tubes. The paper "Generalisation of the Circuit Theory including the Helical Delay Systems" was concerned with the possibility of the application of small perturbing objects to the measurement of the coupling impedance in a wide range of delay systems. Apart from the theoretical justification of the above method of measuring the coupling impedance, the paper gave some experimental results.

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AUTHOR: Kornilov, S. A.

TITLE: Frequency Division in Transit-Time Klystrons with Three Grid Systems (Deleniye chastoty v proletnom klistrone s tremya zazorami)

ABSTRACT: The system considered (see Fig.1) consists of a single-resonator oscillator stage and a modulating grid system. For the purpose of analysis, the output resonator system can be represented by an equivalent R, L and C circuit, which can be described by the differential equation:

$$\frac{d^2 U_3}{dt^2} + 2\delta \frac{dU_3}{dt} - 2\delta R \frac{di_H}{dt} + \omega_0^2 U_3 = 0, \qquad (1)$$

where i_H is the current induced at the output grids, U_3 is the voltage at the third grids, U_1 is the modulating voltage, having a frequency $N\omega$, $\delta = 1/2\ RC$ and $\omega_0 = 1/\sqrt{LC}$. Eq.(1) can be written (see Ref.1) in the form of

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Frequency Division in Transit-Time Klystrons with Three Grid Systems

Eq.(2), whose right-hand portion is written as Eq.(2a). If it is assumed that the velocity modulation of the electron beam in the first resonator is small, the convection current i_2, appearing at the second grid system can be represented by Eq.(4), in which I_0 is the beam current, t_2 is the instant of the appearance of the electrons at the second grids, X_0 is the bunching parameter defined by

$$X_0 = \frac{\beta_1 \theta_1 a_1}{2U_0}$$ where β_1 is the coefficient of electron interaction in the first grid system, θ_1 is the transit angle of the electrons in the first transit space, a_1 is the amplitude of the modulating signal and U_0 is the DC potential of the beam. It is shown that for $N = 2$ the induction current at the third grid system can be expressed

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by Eq.(7) in which

$$X = \sqrt{X_a^2 + X_b^2} \quad \text{and} \quad \text{tg } \varphi = \frac{X_b}{X_a}$$

and X_a and X_b are defined by Eqs.(5). On the basis of
Eq.(7), it is possible to describe the transient processes
of the system by Eqs.(8) in which X is the bunching
parameter and φ is the phase. When the transit angle θ_2
for the second grid system is an optimum, Eqs.(8) can be
written as Eqs.(9). In the steady state, Eqs.(9) are
written as Eqs.(10) from which it follows that the bunching
parameter of the system can be expressed by:

$$X^2 = 8\left\{1 - \frac{1 - \sqrt{1 - \left(1 - \frac{m^2}{4}\right)\left(1 + 4Q^2\eta^2\right)}}{\gamma\left(1 - \frac{m^2}{4}\right)}\right\} \tag{11}$$

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where $m = 2J_1(X_0)$, $\eta = (\omega - \omega_0)/2\omega$ and $Q = \omega/2\delta$.

Eq.(11) is used to determine the synchronisation bandwidth of the system and to construct a number of graphs (see Figs.5, 6 and 7). From the above analysis it is concluded that a triple resonator klystron can be used as a reliable frequency divider. The characteristics of such a divider (the presence of an excitation threshold and the shape of the resonant curves) are similar to those of an electron tube frequency divider. In the case of a two-to-one frequency division the klystron gives a synchronisation bandwidth equal to that of the output resonator. There are 7 figures and 3 Soviet and 1 English references.

SUBMITTED: December 10, 1956.

1. Klystrons--Analysis   2. Klystrons--Applications   3. Frequency dividers--Equipment   4. Differential equations--Applications

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9,4220

69267

SOV/112-59-17-37505

Translation from: Referativnyy zhurnal. Elektrotekhnika, 1959, Nr 17, pp 235-236 (USSR)

AUTHORS: Kornilov, S.A., Nelepets, V.V.

TITLE: Experimental Characteristics of the Reflex Clystron as a Regenerative Micro-
             wave Amplifier

PERIODICAL: Nauchno-tekhn. inform. byul. Leningr. politekhn. in-t, 1958, Nr 5, pp 40-47

ABSTRACT: Results of a study of operating characteristics of regenerative VHF-ampli-
             fiers on reflex clystrons of 3 cm and 10 cm band are cited. The measurements
             in the 10 cm band were carried out on clystrons with an outside resonator;
             the regulation of the feedback factor was performed by the change of the
             beam current. The measurements in the 3 cm band were performed on clystrons
             with inside resonators; a special device for reduction of the loaded cir-
             cuit quality was used. The obtained values of the amplification coefficient
             and graphs of dependence of the pass-band of the amplifier on the amplifica-
             tion coefficient are supplied. The maximum attainable amplification for
             clystrons of both types is approximately 30 - 35 db. On the clystron of the
             3 cm band it was possible to obtain a pass-band of approximately 10 Mc at an
             amplification of 10 - 15 db. The sensitivity of clystrons of both types was

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