PALATNIK, L. S.

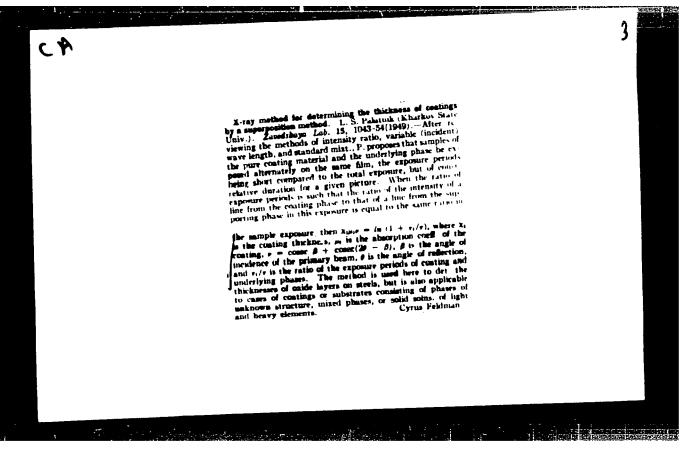
S. S. Brazovskii, L. S. Palatnik, and B. D. Luft, On the mechanism of crystallization of

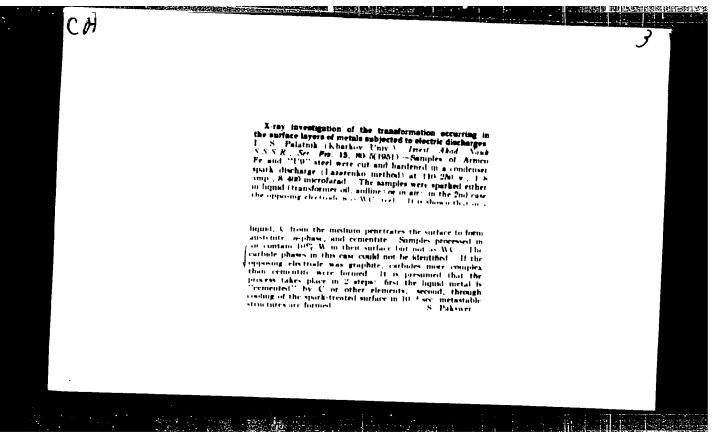
glassy selenium in the nitrogen containing compounds. P. 1934.

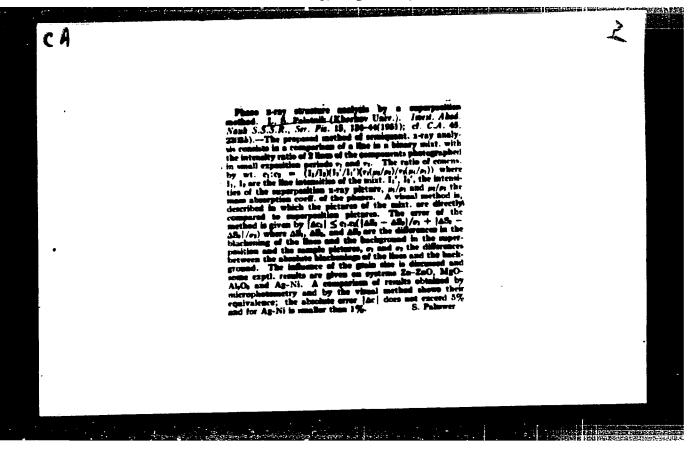
By methods of rontgenographic, microscopic and other forms of analysis, the process of spreading of crystallization into glass selenium sticks in contact with various arines at room temperatures is investigated. In diethylamine samples a process of recrystallization has been observed.

> State University Chemico Technological Institute, Hharkov November 26, 1947

SO: Journal of Physical Chemistry (USSR) 22, No. 9, 1948



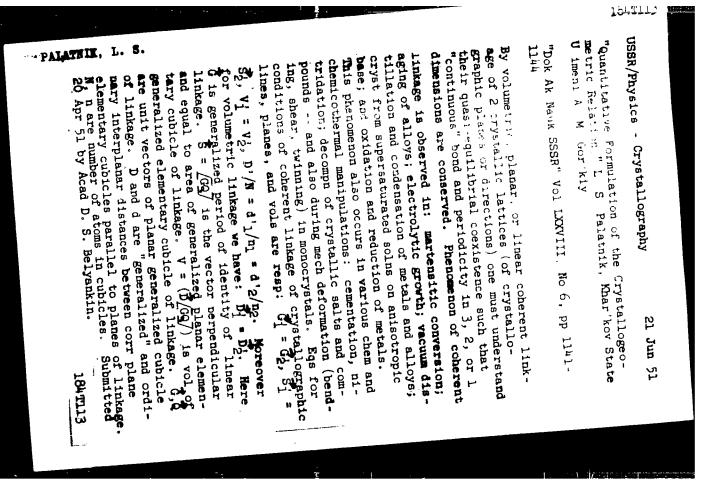




PALATNIK, L. S.	(Cónta) ver 99% C) anode were chose ark treatment under atm pre lectron-microscope study sh changes, sepd into 3 conce tral, which vaporises; medi and peripherial, solid even	1957k9	Palatnik investigates some details of specified phase and structural changes described by him previously (cf. "Iz Ak Hauk, Ser Fis" Vol XV, To 1, 1951). Iron (trademark VIT) cathode and	"In Ak Hauk SSSR, Ser Fiz" Vol XV, No 4, 39 467-471	"Transformations in the Superficial Layer of Metal Under Action of Electric Discharges," L. S. Falatnik, Khar'kov State U imeni Gor'kiy, Khar'- kov Electromech Plant imeni Stalin	USGR/Metals - Iron, Spark Treatment Jul/Aug 51
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USER/Metals - Alloys, Aging Ton Thermodynamic Interpretation of Phenomena in Aging Alloys, " I. S. Palatnik, Khar'kov State U imeni A. M. Gor'kly Then Ar Hauk SSER" Vol LXXI, Hol, pp 39-M2 "Dât Ar Bauk SSER" Vol LXXI, Hol, pp 39-M2 "Poèt Ar Hauk SSER" Vol LXXII, Hol, pp 39-M2 "Poèt Ar Hauk SSER" Vol LXXII, Hol, pp 39-M2 "Poèt Ar Hauk SSER" Vol LXXII, Hol, pp 39-M2 "Poèt Ar Hauk SSER" Vol LXXII, Hol, pp 39-M2 "Poèt	. (_			,		PENSE
	_	198276	upsn/Metals - Alloys, Aging (Contd) (Contd) explanation of various phenomens and anomalies in aging process of binary or more complex alloys. Submitted by Acad I. P. Bardin.	ity of using geometrical method of using geometrical method of anich express qualturfaces, which express qualturfaces, which express qualturfaces, which express qualturfaces or thermodynamic parameters suthermodynamic parameters suthermodynamic parameters and thermodynamic parameters of alloy. Analyzes quasi-equitations of alloy.	Alloys, Aging Alloys, Aging ynamic Interpretation of Phenomena in s," I. S. Palatnik, Khar'kov State U gor'kiy K SSSR" Vol LXXXI, No 1, pp 39-42	
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PALATNIK, L. 3.

Crystallography

Orystalloreometric principle of a clorality and its application. Dekt. 19 1331 July no. 6:9 5-203 F 192.

Khar'kovskiy Josudarstvenmy Universitet im. A.M. Gor'kogo rod. July 2011

SO: Monthly List of Russian Accessions, Library of Congress, 1953, Uncl.

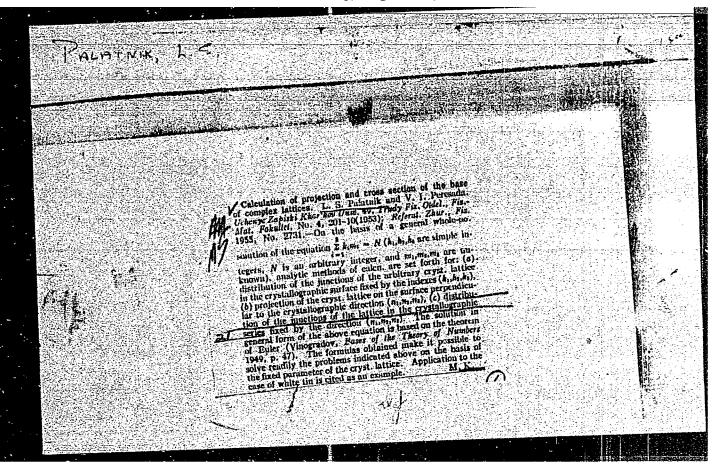
TUGARINOVA, K. N., PALATNIK, P. S.

USSR (600)

Woolen and Worsted Manufacture

New woolen fabrics Tekst. prom no. 5 (1952)

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



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GLUZNAN, M.Kh.; GERSHUNS, A.L.; PALATHIK, L.S.; PLOTKINA, D.Ye.; MIL'NER, R.S.
      Quasi-equilibrial cutectics in systems of the type anhydride - amine. Zhur. (MIRA 6:11) fiz.khim. 27 no.9:1304-1310 S 53.
       1. Khar'kovskiy gosudarstvennyy universitet im. A. M. Gor'kogo.
             (Phase rule and equilibrium) (Butectics) (Amines)
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felotnik, L.S Physics - Spectral analysis Pub. 43 - 24/97 Card 1/1 Lyulichev, A. N., and Palatnik, L. S. Adaptation of spectral analysis to the study of electro-spark treatment processes 1 Isv. AN SSSR. Ser. fiz. 18/2, page 259, Mar-Apr 1954 Investigations were conducted to determine the spectra of 342 combinations of electrodes prepared from technically pure Be, Mg, Al, Si, Ti, Cr, Fe, Co. Ni. Cu. Zn. Mo. Ag. Cd. Sn. Sb. W. Pb and Bi metals. The effect of the material and electrode form on the process of electro-spark treatment was studied by making a spectral analysis of the vaporous phase originating during electro-spark treatment. The results obtained confirm the suitability of the spectral analysis method for the study of all physico-chemical processes involved during electro-arc treatment of metals. Two USSR references (1946-1953). The A. M. Gorkiy State University, Kharkov Institution Submitted

RALATNIK, L.S. Value - I was said of Po. 117 - 10/27 cen 1/1 , Polatnik, L. S., and Kontorovich, V. N. in there Analytical investigation of multi-component heterogeneous systems by the method of prescritized law "of center of gravity". Sher, fis. 184s. 28/7, 1599-1614, Sep 1954 Periodical The development of an aralytical, generalized conter-of-gravity method for the study of midtlecomponent beterogeteous systems, is announced. This the study of midtlecomponent beterogeteous systems, is announced. This method was found to be mathematically quite simple and its application to method was found to be mathematically quite simple and its application to concrete systems consists in actual calculation of the determinants. The Detrect advantages of such analytical methods over prometrical methods are listed. Hass ratios for chases forming during crystallisation processes of any given variance are presented. The various possible ways of the invariant process in relation the component concentration in the basic solution, were discussed . Four USSE references (1937-1954). The A. M. Gorriy State University and the T. I. Lenin Polytechnicum, Kharkov 1 December 21, 1953

Stant tod

DESS/Physical Charlety

Serie 1/1

Sether : Palatnik, L. S.

Nitle : A generalized law, called of "center of gravity" for multi-component systems.

Periodical : Dat. El SSE 95, 6, 127 - 1230, 21 Apr 1954

Abstract : The article explains as malytical method salled "center of gravity" which can be applied to the smallytic of, co-called, component and non-vision component processes in multi-component necessaries systems with a given component of disappearing and forming phases.

Labilities : A. N. Gerkiy's State Inst. at Eherkey.

Salmitted : 22 Feb 1954.

PALATEL L. S.

Base/Physics - Technical Physics

1/1

Paletnik, L. S., and Levitin, V. V.

X-ray investigation of alloys Sn-Se, Zn-Se, Cd-Se and Ag-Se

Periodical

Dok1. AN SSSR, 96, Ed. 5, 975 - 978, June 1954

Abstract

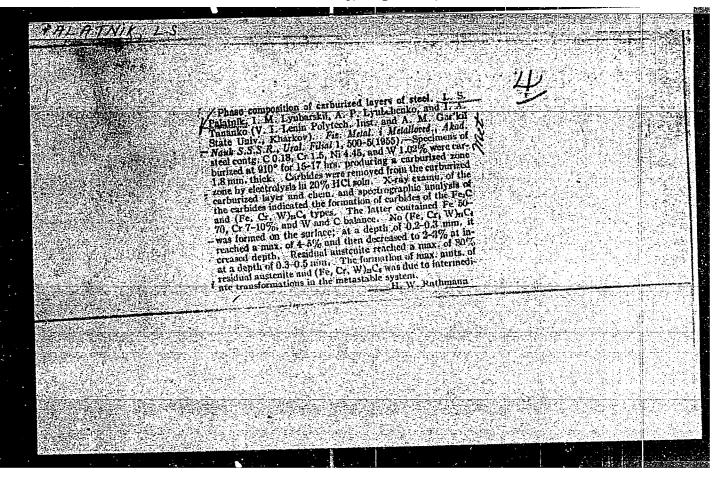
In the present article, the authors present the results of the chemical and thermal investigations of the binary systems of alloys, as listed in and thermal investigations of the binary systems of alloys, as listed in the heading of this article. The preparation of the types of samples the heading by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effect of used in testing by means of X-rays is dealt with, and the effec

Institution :

The A. M. Gorkiy State University of Kharkov

Presented by:

Academician, S. A. Vekshinskiy, April 10, 1954



INVESTIGATION of the spark temperature of electric-spark metal hardening apparatus. Izv. AM SSSR. Ser. fiz. 19 no.1:66-67

Ja-F '55.

(NIRA 8:9)

1. Khar'kovskiy gosudarstvennyy universitet imeni A.N.Gor'kogo

(Spectrum analysis) (Spectrometer)

PALATA

USSR/Thermodynamics. Thermochemistry. Equilibria. Physico-Chemical Analysis. Phase Transitions.

Abs Jour : Ref Zhur - Khimiya, No 8, 1957, 20126.

: L.S. Palatnik, A.I. Landau.

: Study of Processes Occurring with Change of Degree of Free-Autror. dom i. M. Aticomponent Heterogeneous Systems, I, II. Title

Orig Pub : Zh. fiz. khimii, 1955, 29, No 10, 1784-1803; No 11, 2004-2003

Abstract : I. The processes are studied, which occur in multicomponent heterogeneous systems and are connected with a change of the tegree of freedom (variance) of these systems, the variance of the system changing during the process with some limitati ns concerning the disappearing and appearing phases. The results are presented in a shape allowing the generalization for a case without the above ment.oned limitations. A system of equations is derived, which determines the boundaries between the separation regions on an equilibrium graph of a multicomponent system. The above mentioned equation system allows numerically to plot the complete equilibrium graph of a sulticomponent thermodynamic system, if the concrete form

were State law in a ring &

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APPROVED FOR RELEASE: Tuesday, August 01, 2000

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- HER BEST RESERVANCE

USBR/Thermodynamics. Thermochemistry, Equilibria. Physico-Chemical B-c Analysis. Phase Transitions.

Abs Jour : Ref Zhur - Khimiya, No 5, 1957, 20120

of the functional dependence of the chemical potentials on the pressure, temperature and the concentration of components in phases was known. Basing on the derived equation system, the connection between the separation regions and their hyperconnodes (RZhKhim, 1950, 21946) is investigated. The rule of contiguous separation regions (known under the na of the law of contiguous spaces of states in the aplication to ternary systems) is proved and generalized in ref rence to multicomponent systems. An example is given, now to apply the rule of configuous separation regions to the topological analysis of a concrete equilibrium graph. II. Generalization of results obtained in the part I. The general formulation of the rule of contiguous separation reg ons (RCSR) is given: $R : P \propto \alpha^+ - \beta^- - \beta^+ \geqslant a$ wile o R is the dimensionality of the equilibrium graph of a multicomponent meterogeneous system or of a non-nodal (regular) section of this graph; R1 is the dimensionality of the poundar. between two adjacent separation regions in the above graph or

Jari : 2/ -

TSSR Thermodynamics, Thermochemistry, Equilibria, Physico-Chemical BO:
Analysis, Phase Fransitions,

Aps Jour : Ref Z. ur - Khimiya, No 6, 1957, 20126

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section; x and x1, 2 and C'are the numbers of pure components that have disappeared and originated and of solutions that nave disappeared or originated at the transition from one separation region into another respectively. Liquid, solid and gaseous phases or chemical compounds are understood under the term of solutions, and phases, each of which consists of enly one pure component, are inderstoom inder the term of pure compenents. RCSR is applicable to an equilibrium graps. or to mon-nodal sections of an equilibrium graph on condition of removing the degeneration of certain separation regions. the non-modal sections are defined as such, which io not ...tersect any nodes of the equilibrium graph (i.e. expectio and peritectic points, lines etc., and the defenerated separation regions are defined as such, the dimensionality of which is less than that of the corresponding equilibrium graph or of the corresponding section. Examples of nodal (i.e. of node intersecting) and non-nodal sections of var-I us equilibrium graphs are given, and the application of the RCSR to non-modal sections is demonstrated. : 5/3

Category: USSR/Atomic and Molecular Physics - Statistical Physics

D-3

Abs Jour : Ref Zhur - Fiziza, No 1, 195 No 821

Author : Palatnik, L.S., Iandau, A.I.

Title : Investigation of Processes Occurring with a Change in the Number of

Degrees of Freedom in Multicomponent Heterogenous Systems

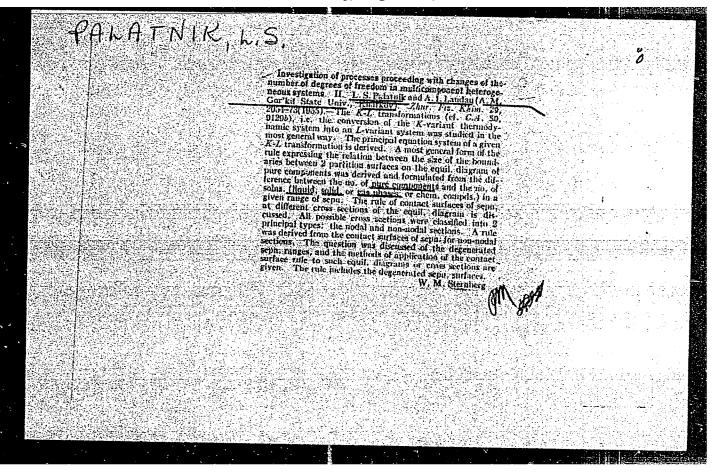
Orig Pub: Zh. fiz. khimii, 1955, 29, No 11, 2054-20.3

Abstract : No abstract

Card : 1/1

"APPROVED FOR RELEASE: Tuesday, August 01, 2000

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PALOT NIC, 4.5.

BSCR/Chemistry - Physical chemistry

Ours 1/1

Pub. 22 - 31/49

Palatnik, L. S., and Landau, A. I.

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On the theory of equilibrium of heterogeneous poly-component systems

Perlettel

Dok. AN SSSR 102/1, 125-128, May 1, 1955

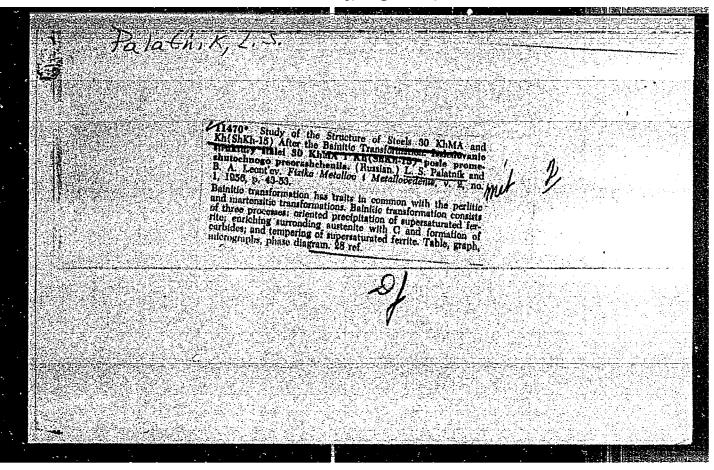
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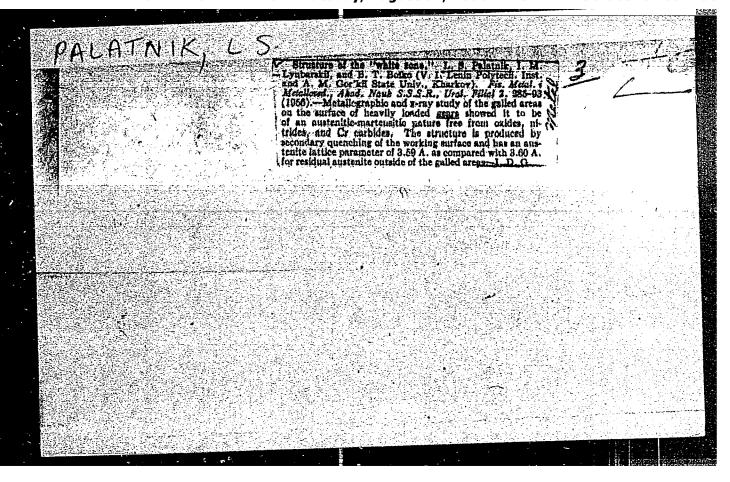
Systems with certain partially closed thereodynamic parameters were investigated to determine the equilibrium processes in poly-component heterogeneous systems. General phase rules as well as equation systems are presented for the determination of the equilibrium in such systems and it is shown that these rules and equations can well be applied to real equilibrium and quasi-equilibrium thermodynamic systems. The external and internal parameters (in addition to the thermodynamic), which affect the physical properties of real systems, are discussed. Seven USER references (1935-1954).

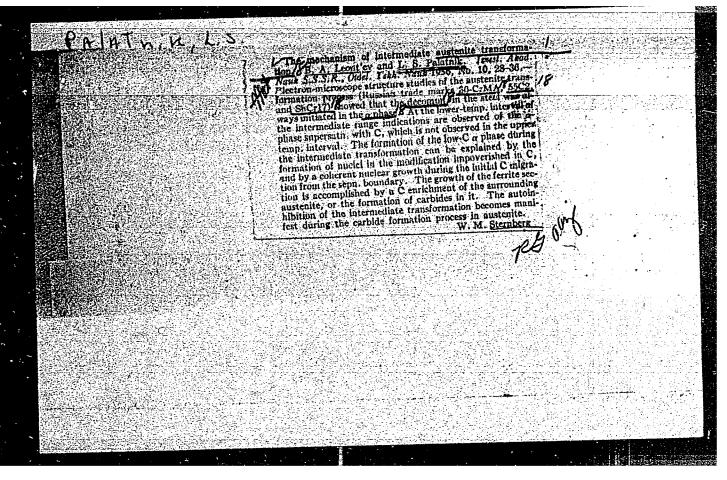
Institution

The Kharkov State University in. A. M. Gorkiy

Academician H. V. Belov, December 24, 1954







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PALATNIK

Category USSR/Optics - Spectroscopy

Abs Jour : Ref Zhur - Fizika, No 2, 1957, No 5005

: Investigation of the Temperature in the Vapor Phase Occurring During the Author Title

Electrical Spark Metal Working

Orig Pub : Zh tekhn. fiziki, 1956, 26, Nc 4, 832-838

Abstract A spectral method is used to determine the temperature of the plasma of the spark obtained in the setup for electric-spark metal hardening.

The parameters of the setup are capacitance from 0.25 to 280 microfarad. current from 0.5 to 3 amperes, and voltage from 70 to 220 volts. The exposure used in the photography with the aid of the ISP-22 spectrograph using dispositive plates was 1 to 10 minutes. The spark temperature was measured by the Ornshteyn method with the aid of ten Re II lines in the 2562-2756 A interval. It turned out to range from 7200 to 102000. The spectra have a purely spark nature at a temperature of 9,000-10,000, and are of a spark-arc nature at 7,000-8,000°. It is proposed to measure the spark temperature by comparison of the intensity of the arc and

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Kherkow State U um Gorking

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Category USSR/Optics - Spectroscopy

Abs Jour : Ref Zhur - Fizika, No 2, 1957, No 5005

spark lines of iron For this purpose, four pairs of Fe I/Fe II lines were chosen, namely 2592 2593 A, 2594-2593 A, 2733-2731 A, and 2735 The graphs of the temperature dependence of log [FeI/IFeII were plotted for these pairs in the 6,000-10,000° interval The spectrs of sparks were between iron electrodes and electrodes made of iron, cop per, tungsten, aluminum, zinc, cadmium, magnesium, and carbon were photo graphed using capacitances of 280, 140, 80, 20, 8, and 0.25 microfared. It was established that for the same capacitance the sparks obtained by different electrode pairs were in agreement, with the exception of the Fe-C pair (in this case it was 600, 1,000 lower). If the capacitance is kept constant, but different voltages and currents are used, the spark temperature between Fe electrodes remains practically constant over the range 70-220 volts and 1-3 amperes. Reducing the gap in the Fe-Fe pair increases the temperature; the same occurs when the electrode diameter is decreased The following empirical dependence on the capaci tance was established $T = 7200 + 450 \sqrt[3]{C^7} \text{deg. C.}$ It is concluded that the electric-spark processing of production objects is carried out not

Card : 2/3

Category USSR/Optics Spectroscopy

K 6

Abs Jour Ref Zhur - Fizika, No 2, 1957, No 5005

in the spark region, which is the optimum for controlled erosion, but in the spark-arc region. Bibliography, 21 titles.

card : 3/3

USER/Optics - Optical Methods of Analysis, Instruments, K-7

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 35873

Author: Palatnik, L. S., Lyulichev, A. N.

Institution: University imeni Gor'kiy, Khar'kov, USSR

Title: Application of Spectral Analysis to the Investigation of Vapar Phase Occurring During Electric Spark Working of Metals

Periodical: Zh. tekh. fiziki, 1956, 26, No 4, 839-849

Abstract: An investigation was made of the spectra of sparks, obtained directly from the setup for electric working of metals for 377 combinations of electrode-elements Be, C, Mg, Al, Si, Ti, Pb, combinations of electrode-elements Be, Cd, Sn, Sb, and W. The Bi, Cr, Fe, Co, Ni, Cu, Zn, Mo, Ag, Cd, Sn, Sb, and W. The composition of the vapor-like phase was estimated with an accordance to within an order of magnitude with the aid of the apcuracy to within an order of magnitude with the sid of the apcuracy to within an order of magnitude with the sid of the apcuracy to within an order of magnitude with the sid of the apcuracy to within an order of magnitude with the sid of the apcuracy to within an order of magnitude with the sid of the spectra of the spectra of sparks.

proximate expression $c_{\rm a}/c_{\rm c} \simeq I_{\rm a}/I_{\rm c}$, where $c_{\rm a}$ and $c_{\rm c}$ are the concentrations of the anode and cathode in the vapor-like phase and $I_{\rm a}$ and $I_{\rm c}$ are the intensities of the brightest lines of the

Card 1/2

USSR/Optics - Optical Methods of Analysis. Instruments, K-7

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 35873

Abstract: spectra of the anode and the cathode. The interaction and trans... fer criteria, suggested by L. S. Palatnik (Izv. AN SSSR, ser. fiz., 1951, 15, 80, 469), were used. In accordance with this criterion, it turned out that the composition of the vapor-like phase depends principally on the physical and chemical properties of the electrodes, with a decisive role being played by the thermal effect and by the processes of the electric spark working. The mode of the metal working has practically no influence on the composition of the vapor-like phase. The increase in the porosity of the electrodes and the reduction in their diameter leads to poorer heat transfer conditions and to a more intense evaporation of the material of the electrodes. The effect of polarity, as a rule, leads to an increase in the relative contents of the vapors of the element serving as the anode. For lightly-oxidizing elements one observed a contrary effect of the polarity. To strengthen by means of graphite it is advantageous to employ the following polarities: graphite-cathode, part-anode. Investigation of selective evaporation on the binary system Cu-Sn has shown that the composition of the vapor-like phase depends on the shape of the electrodes, on the material of the upper electrode, and on the polarity.

Card 2/2

"APPROVED FOR RELEASE: Tuesday, August 01, 2000

CIA-RDP86-00513R001238

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UBSR/Physical Chemistry, Thermodynamics, Thermochemistry, Equilibriums, Phys-Chem. nal. Phase-Transitions.

Abs Jour : Ref Zhur - Khimiy., No 7, 1957, 2229).

sence of initial, secondary, or in energy of L or E or any other series of exystallization (in any sequence). The in least carried an example to foretell the possibility of our servation of prenomena unknown before: pacudo-congruent and pseudo-ine angruent reversible processes, during which initial crystals in eutectics, and lower eutectics in higher ones, or ginate and disappear at the crystallization and meltin, of multi-component eutectic alloys.

Card 2/2

-99-

PALATHIK, L.S.; KOPELIOVICH, I.M.

Topoanalytical investigation of equilibrium diagrams for multi-component eutectic systems. Part 1. [with English summary in insert] Zhur.fis.khim. 30 no.9:1948-1958 S *56. (MIRA 9:12)

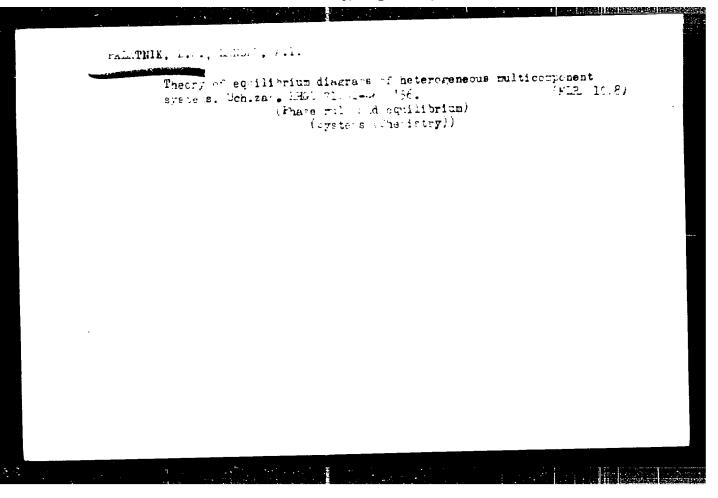
1. Politekhnicheskiy institut imeni V.I. Lenina, Gosudarstvennyy universitet imeni A.M. Gor'kogo, Khar'kov.
(Phase rule and equilibrium) (Eutectics)

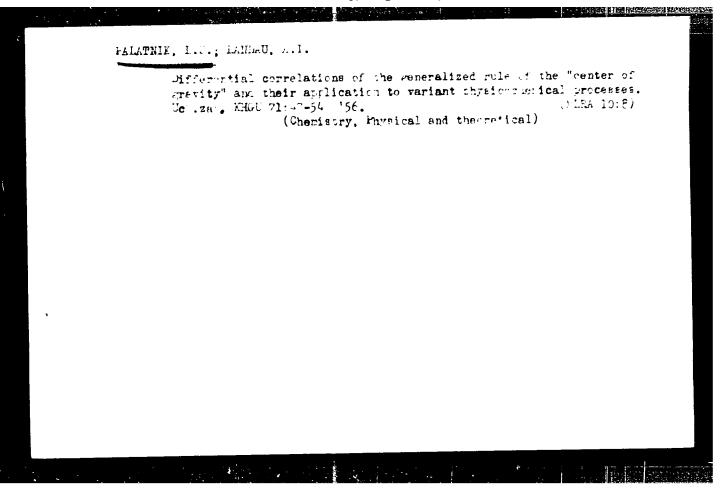
PALATRIE, L.S.; LANDAU, A.I.

Topological investigations of equilibrium diagrams of multicomponent heterogeneous systems and their sections with the aid of the phase heterogeneous systems and their sections with the aid of the phase heterogeneous systems and their sections with the aid of the phase heterogeneous systems and their sections with the aid of the phase heterogeneous rule for contiguous regions. Zhur. fiz. khim. 30 no.11: 2399-2411 H 156.

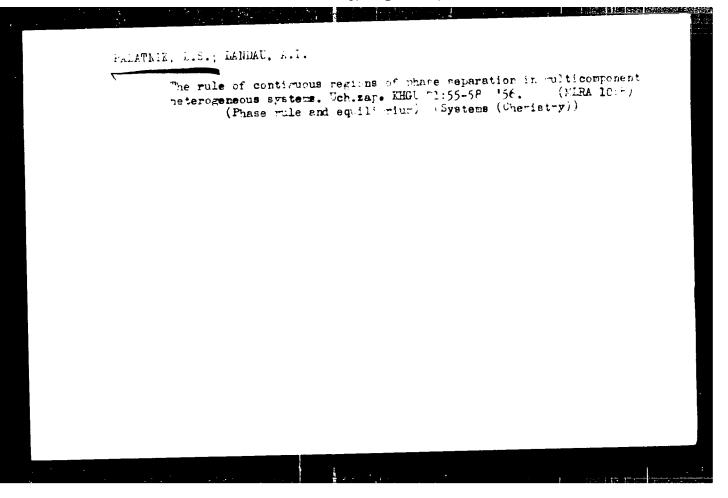
1. Ehar'kovskiy gosudarstvennyy universitet im. A.M. Gor'kogo. (Phase rule and equilibrium)

"APPROVED FOR RELEASE: Tuesday, August 01, 2000 CIA-RDP86-00513R001238





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The part of the pa

Paketnii . :

USSR/Solid State Physics - Morphology of Crystals, Crystall. zation. E-8

Abs Jour : Referat Zhur - Fizika, No 5, 1957, 11803

Author : Palatnik, L.S., Skalyar, M.G., Vaynshteyn, I.A.

Inst

Title : On Quasi-Equilibrium External Forms of Crystals.

Orig Pub : Uch. zap. Khar'kovsk. un-ta, 1956, 71, 59-64

Abstract : Description of a microscopic investigation of intermediate

stages of the variation in the external geometrical form of crystals, occurring after crystallization of KI and KBr from aqueous and alcohol solutions. The substrate employed was a fresh surface of single crystals of mica and glass. To measure the magnitude of the crystals, the authors employed a microphotometer, which makes it possible to determine not only the length and the width, but also the thickness of the small crystal (proportional to the blackening) Several stages of crystallization and recrystallization were observed, and these can be considered as intermediate

Card 1/2

Palaird . . USSP/Thermodynamics. Thermochemistry. Equilibria. Physico-Chemical B-0 Analysis. Phase Transition.

Abs Jour : Ref Zear - Khimiya, No e, 1957, 20127

Althor : L.S. Palatnik

: 1/2

Card

: Determination of Type of Alloy Equilibrium Traphs in Reg.on Title

of High Temperatures by Spectral Analysis Method.

Orig Pass : Dokl. AN SUSR, 1956, 199, No 1, 127-130

Abstract: A spectral method of determination of the type of equilibrium graphs in the temperature region of coexistence of the liquid and the vapor phases of binary and multicomponent alloys is proposed. The method is based on the use of the effect of selective evaporation of the components of the alloy-electrode at electric discharges, which effect is determined by various kinetic factors, as well as by the form of the above mentioned equilibrium graph. Having evaluated the kinetic factors, the author arrives at the conclusion that, in case of an electric discharge in a microscopic volume, melting takes place without diffusion, and boiling takes place by diffusion in accordance with the graph vapor - liquid. The computation formula allowing to determine any of the three possible graph types of vapor-liquid equilibrium is given; Khar kow State clair im A.M. see key

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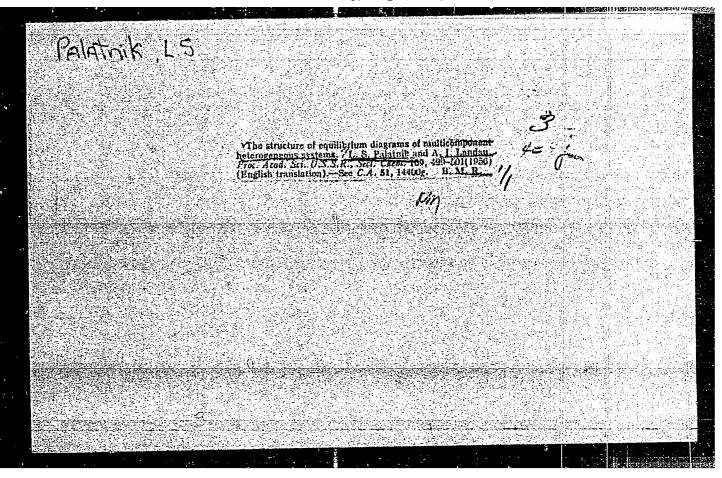
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USSR/Thermodynamics. Thermochemistry. Equilibria. Physico-Chemical B-8
Analysis. Phase Transition.

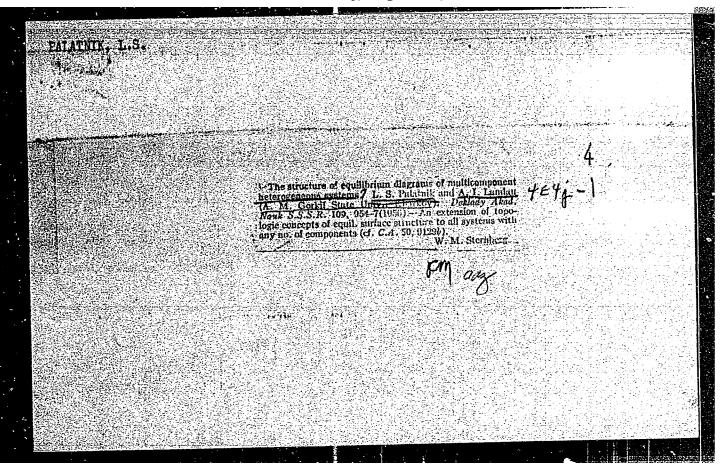
Abs Jour: Ref Zhur - Khimiya, No 8, 1957, 20127

ino possible types are a) a cigar, b) a cigar with a minimum and c) a cigar with a maximum. The problem is solved graphically. The described method also allows to determine the situation of points of equal concentrations in the vapor and the liquid in cases banic.

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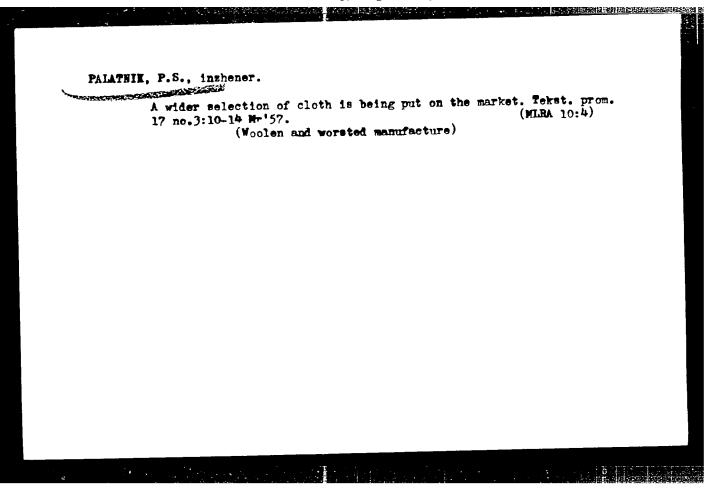
The second secon

PALATNIK, L. S. and SPITSYN, V. I.

"Concerning the Structure of Heteropoly Compounds, especially of Phosp; horous Wolframates, and the great Mobility of oxygen- and hydrogen atoms in them."

report presented at the UNESCO Conference on the Utilization of Radioactive Isotopes in Scientific Research, Paris, 9-20 Sept 1957.

Vestnik AN SSSR, 1958, v. 28, no. 1, pp. 71-78. (author Vinogradov, A. P.)

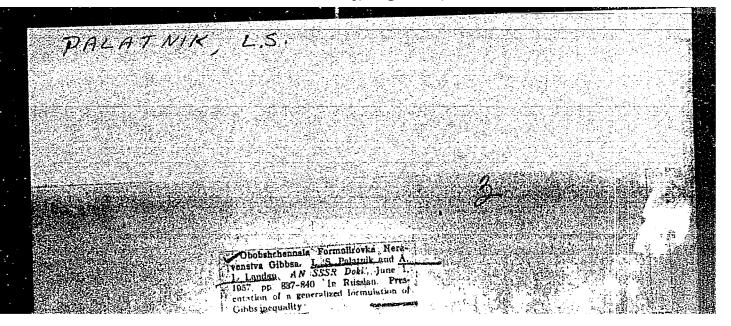


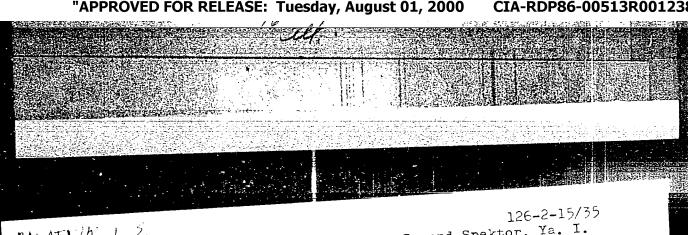
PALATNIK, L. S., LYUBARSKIY, I. M. and LYUBCHENKO, A. I.

"On the structure and wear resistance of case ardened steel," a paper submitted at the International Conference on Padioisatores in Univ tiff the search, Paris, 9-20 Get 57.

London Pugamer Free the Har of

"APPROVED FOR RELEASE: Tuesday, August 01, 2000 CIA-RDP86-00513R001238





PALATATA, L S.

AUTHORS: Leont'yev, B. A., Palatnik, L. S., and Spektor, Ya. I.

Investigation of the kinetics of step-wise transformation of super-cooled austenite. (Issledovaniye kinetiki TITLE:

stupenchatogo prevrashcheniya pereokhlazhdennogo

PERIODICAL: Fizika Metallov i Metallovedeniye, 1957, Vol.5, No.2, pp. 304-317 (USSR)

ABSTRACT: At present no systematic data are available on the interaction of the products of austenite transformation obtained at various temperatures, on the influence of decomposition in one temperature range on the kinetics of transformation at another temperature. Detailed information is available only on the interaction of the products of intermediate and martensite transformation. Numerous authors (Refs.5-8) have pointed out that there is a lowering of the martensitic point after partial transformation of the austenite in the intermediate range.

transformation of the austenite in the intermediate and also pointed out (Refs.7-12) that there is an approved for RELEASE Tuesday August 01, 2000 as the range after partial martensities and sometimes of the restriction of tion on other points is incomplete and sometimes contradictory. Hehemann, R.F., and Troiano, A.R. (Ref.13)

Card 1/7 detected a stabilization of the intermediate transformation

Investigation of the kinetics of step-wise transformation of super-cooled austenite.

range after preliminary annealing at higher temperatures. Stregulin, A. I. and Kotsin, F.S. (Ref.14) found that the partial decomposition of the austenite in the pearlitic range in below-eutectoidal carbon steels, which is accompanied by ferrite separation, slows down the intermediate transformation and that such a decomposition in the eutectoidal steels does not affect the speed of intermediate decomposition. Jolivet, H., and Portevin, A. (Ref.15) also found that partial transformation at 600°C in Crni steel containing of the containin in CrNi steel containing 0.65% C does not influence the process of transformation at 250 C; they observed a marked slowing down of the pearlitic transformation under the influence of partial decomposition at 400°C. In contrast to this A. A. Popov (Ref. 16) indicates that formation of ferrite-carbide mixture in structural alloy steels slows down appreciably intermediate transformation and the latter accelerates the formation of ferrite-carbide The problem of interaction of transformation products obtained in various temperature ranges is of Freat theoretical and practical importance and study of Card 2/7 this problem is likely to yield useful information on the

Investigation of the kinetics of step-wise transform tion of super-cooled austenite.

mechanism and the kinetics of decomposition and serve as a basis for developing more effective methods of heat treatment of steel. In this paper, thermomagnetic, metallegraphic and X-ray investigations are described relating to step-wise decomposition of austenite in the steels 550. and UX15; main attention was paid to the intermediate transformation range. The chemical compositions of the

wwo steels are as 10110ws.
Steel 55C2: 0.53% C, 0.75% Mn, 1.71% Si, 0.019% S, 0.019% P,
0.23% Cr, 0.10% Ni;
0.23% Si, 0.010% S, 0.020% P,

" WX15: 1.04% C, 0.29% Mn, 0.23% Si, 0.010% S, 0.020% P,
1.39% Cr, 0.16% Ni.

The graphs, Figs. 1 and 2, p. 305, give the diagrams of isothermal transformation for the two steels. The results of investigation of the kinetics of the step-wise transformation of austenite in the two steels are graphed The values of the relative acceleration of the transformation, brought about by the preliminary decomposition in the other temperature range, defined by the formula:

 $100(v - v_0)/v_0, %,$

 \mathbf{v}_{o} is the maximum speed of the isothermal trans-Card 3/7 where

Investigation of the kinetics of step-wise transformation of super-cooled austenite.

formation at the given temperature, are entered in Table 2, p.307. The results of metallographic investigations are given and some of the obtained micro-photos are reproduced in the Figs. 7-11, pp. 310, 311. Some of the results of the X-ray investigations are entered in After giving some of the obtained results, the author discusses the following: the influence of pearlite on the kinetics of transformation in the intermediate range; the influence of partial transformation in the upper interval of the intermediate range on the kinetics of the intermediate transformation at low temperatures; the influence of partial transformation in the martensitic and the intermediate ranges on the kinetics of intermediate transformation at higher temperatures; the influence of partial transformation in the martensitic and the intermediate ranges on the kinetics of pearlitic transformation. It was established that preliminary transformation of austenite in the martensitic and the intermediate ranges brings about in both steels an acceleration of the intermediate transformation at Card 4/7 higher temperatures which, in the given case, begins without

Investigation of the kinetics of step-wise transformation of super-cooled austenite.

an incubation period. The effect of acceleration increases with decreasing temperature of the intermediate decomposition and also with increasing temperature at which final transformation takes place. Decomposition of the austenite in the upper range of the intermediate interval in the Steel 5502 brings about an appreciable slowing down of the intermediate transformation at low temperatures. there is a considerable quantity of preliminarily decomposed austenite, the remaining part of the austenite stabilizes on lowering the temperature. The influence of such treatment is less pronounced in the case of the steel W X15 and may lead to an acceleration or deceleration of the intermediate transformation at low temperatures, depending on the quantity of the preliminarily deformed decomposition products. A partial decomposition of the austenite in the intermediate and the martensitic ranges in both steels leads to a decrease in the speed of pearlitic transformation and this decrease will be the more pronounced the higher the percentage of the The greatest slowing down is

Card 5/7 preliminary decomposition.

Investigation of the kinetics of step-wise transformation of super-cooled austenite.

observed in the case of preliminary decomposition in the lower region of the intermediate range. Increase of the temperature of pearlitic transformation leads to a decrease of the slowing down effect (Steel WX15).

Depending on the grade of the steel and the temperature of further transformation, the presence of pearlite may accelerate or decelerate the transformation in the intermediate range. The features of the kinetics of step-wise transformation cannot be satisfactorily explained by taking into consideration solely the changes in the concentration of the austenite and the germination effect of the preliminarily deformed transformation The basic cause of the influence of preliminary transformations in the intermediate and the martensitic ranges on the kinetics of transformation at other temperatures are the changes in the fine structure of the austenite accompanying the formation of a structure of the martensitic type. A convincing confirmation of this conclusion is the qualitative identity of the kinetics of step-wise transformation of austenite for the investigated steels, which differed in chemical

Card 6/7

Investigation of the kinetics of step-wise transformation of super-cooled austenite.

composition, structure and character of the carbon redistribution during the process of transformation. There are 11 figures, 3 tables and 24 references, 13 of which are Slavic.

SUBMITTED: June 11, 1956.

ASSOCIATION: Khar'kov Polytechnical Institute imeni V. I. Lenin. (Khar'kovskiy Politekhnicheskiy Institut imeni V.I.Lenina).

AVAILABLE: Library of Congress.

Card 7/7

"APPROVED FOR RELEASE: Tuesday, August 01, 2000 CIA-RDP86-00513R001238

USSR/Physical Chemistry - Thermodynamics, Thermochemistry, Equilibria, Physical-Chemical Analysis, Phase Transitions.

B-8

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 3787.

should be given for the topological plotting of isothermal and polythermal plane sections of equilibrium graphs of eutectic multicomponent systems. The computation of section comes to a calculation of simple determinants. The proposed denotation system permits to write all the necessary equations automatically.

: 2/2 Card

-28-

PALATNIK, LS

AUTHORS: Palatnik, L. S. and Fedorov, G.V. (Khar'kov). 24-9-18/33

TITLE: Graphical calculation of the local composition in three-component alloys of variable concentration. (Graficneskiy raschet lokal nogo sostava v trekhkomponentnykh solavakh peremennoy kontsentratsii).

PERIODICAL: Izvestiya Akademii Nauk SSSR, otdeleniye Tekniloneskiki. Nauk, 1957, No.9, pp. 119-120 (USSR)

ABSTRACT: A description is given of a graphical method of coloniation of the local composition in three-component allogs of variable concentration using experimental distribution The method is applied curves for each of the components. for calculating the concentrations of systems produced by neans of a method developed by S. A. Vekshinskiy (Ref.1). An alloy of variable composition obtained by evaporating various metals from two evaporators represents a binary field of concentrations and in such a field it is possible to calculate a family of circles along which the composition A three-component system of the alloy remains constant. forms a ternary field of concentration and the calculation is correspondingly more complex; families of curves of equal composition no longer exist but families of curves of another type do exist, one representing the lines along Card 1/3

24-9-18/33

Graphical calculation of the local composition in three-component alloys of various concentration.

which the concentration ratio of two components remains constant and the other lines along which the concentration of one component remains constant. In a real collector these families of curves correspond to a family of analogous straight lines on the concentration triangle By photometering of a semi-transparent layer of metal deposited on a glass collector which is perpendicular to the crucible axis, the distribution was studied of the density as a function of various parameters (speed of evaporation of the metal etc.) and, following that, the most suitable conditions of evaporation were The distribution of the condensate represents a mound with a circular symmetry whereby the symmetry axis of the mound coincides with the crucible axis; Fig.1 shows the distribution of a condensate on the collector From these distribution curves, for Sb, Bi and Ag. curves of equal thicknesses for each metal are plotted, finally, a coordinate network is obtained which permits solving the following two basic problems: to determine the composition of the condensate at a given point of the collector and to determine on the collector a point having

Card 2/3

24-3-18/33

Graphical calculation of the local composition in three-component alloys of various concentration.

a given composition. For illustrating the method, the results are included of the calculation of a collector of a real system of Ag-Bi-Sb, Fig.2. The here described method is applicable for any evaporator with a known distribution.

There are 2 figures and 2 Slavic references.

SUBMITTED: April 19, 1957.

AVAILABLE: Library of Congress.

Card 3/3

A STATE OF THE STA

PALATA -, L.S.

24-11-29/31

AUTHORS: Komnik, Yu. F., Palatnik, L.S. and Fedorov, G. V. (Khar'kov)

TITLE: Distribution of the condensate on a plane in the case of

evaporation of metal from a cylindrical crucible. (Raspredeleniye kondensata na ploskosti pri isparenii

metalla iz tsilindricheskogo tiglya).

PERIODICAL: Izvestiya Akademii Nauk SSR, Otdeleniye Tekhnicheskikh Nauk, 1957, No.11, pp. 193-196 (USSR)

ABSTRACT: The authors assume that when using a cylindrical crucible as an evaporator, distribution of the condensate of the molecular flow does not necessarily depend on the level of the metal in the crucible, provided this level is sufficiently distant from the opening of the crucible. They studied the dependence on the metal level in the cylindrical crucible of the condensate distribution on a plane collector for the purpose of verifying their assumptions. They also studied the influence of the temperature on the distribution of the condensate and the influence of the location of the metal level in the crucible on the speed of evaporation of the metal. The condensate distribution on a plane transparent base was studied by photometering of semi-transparent metallic

Card 1/2 layers. The experiments were effected by mens of a

24-11-29/31

Distribution of the condensate on a plane in the cese of evaporation metal from a cylindrical crucible.

> vacuum set-up containing apparatus as shown in Fig.1, Cylindrical porcelain crucibles 4.5 and 8 mm dia. and about 30 mm deep were used as evaporators; these were heated by 1 mm dia. nichrome wire. The metal was fed into the system in the form of balls, whereby the charging apparatus was inside the vacuum system. Fig.2 shows the obtained curves of condensate distribution for various levels of metal (tin) in the crucible. The dependence was studied of the distribution of the condensed metal on the evaporation temperature as well as on the metal level in the crucible. The existence was detected of a range of depths of the metal in the crucible within which the distribution of the condensate on the collector and the speed of evaporation of the metal remained constant. This indicates that cylindrical crucibles can be applied as evaporators for making preparations of three component systems of thicknesses up to 0.1 mm according to the

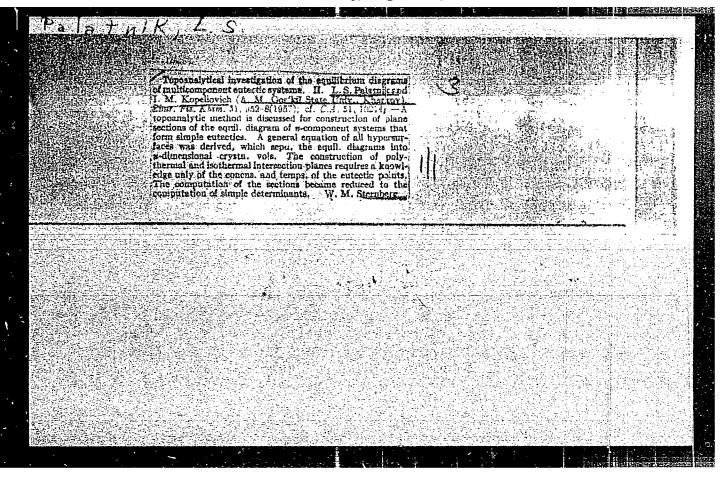
Card 2/2 method of S. A. Vekshinskiy. There are 4 figures and 7 references, all of which are Slavic. SUBMITTED: April 19, 1957.

ASSOCIATION: Khar'kov Polytechnical Institute. (Khar'kovskiy

Politekhnicheskiy Institut)

AVAILABLE: Library of Congress.

"APPROVED FOR RELEASE: Tuesday, August 01, 2000 CIA-RDP86-00513R001238



PALATAIK. L.S

AUTHORS:

Palatnik, L.S., Landau, A.I.

76-12-21/27

TITLE:

Heterogeneous Systems With Many Components and a Non-Maximal Order of the Concentration-Matrix (Enogokomponentnyye geterogennyye sistemy s nemaksimal'nym rangom matritsy kontsentratsiy).

PERIODICAL:

Zhurnal Fizicheskoy Khimii, 1957, Vol. 31, Nr 12, pp.2739-2747 (USSR)

ABSTRACT:

First the distribution of the thermodynamic degrees of freedom in systems with a non-maximal order of the concentration matrix is dealt with. Referring to ref. 2, it is shown that a whole series of heterogeneous systems with many components with a defect of the matrix 6>0 can exist. It was shown that the case 6=1 at 1=1 and Storonkin [Ref.3], is only a special case, whereas the number of possible the modynamic systems with 1=10 0 is essentially greater. Certain heterogeneous systems with many components and with both a pressure— and temperature extreme, such with equal composition of concentration of various phases (e.g. of phases in points of equal concentration, of allotropic phases), as well as some systems with many eraponents where not all components participate in the individual phases of the system belong to these systems.

Card 1/4

In the concentration-matrix $\|x_{i,j}\|$ (i=1,2,..., n; j=1,2,...,r), in which case each $x_{i,j}$ is a concentration of the i.component in the j.

THE REPORT OF THE PARTY OF THE

Heterogeneous Systems With Many Components and a Non-Maximal Order of the Concentration-Matrix

76-12-21/27

phase (n and r is the number of components, or of the phases of the system respectively) it is assumed that the defect of the concentration-matrix is equal to zero [Ref.1]. The inequality $r \le n+2$, set up by Gibbs, can be generalized for all these enumerated systems. For this purpose the value X (kappa) is introduced. This is the greatest of the numbers r-n and 0. $J=\max\{r-n,0\}$ and the inequality of Gibbs reads then $0 \le J \le 2$, and the generalized form of it is $0 \le \chi + \sigma \le 2$. Equations (7) are derived here. These equations form the conditions which are imposed to the concentration xii of the thermodynamic system and which are correlated with the value of by means of the equality of the concentration-matrix-defect, where 0>0, and each u_{ij} in the equation (5) represents the chemical potential of the i.component in the j.phase. It is shown that the sense of the equation (4) ... $0 \le 1+6 \le 2$ consists in that, that with $\sigma + \lambda > 2$, in the basic equations (5)-(7), which express the investigated open thermodynamic system, an indetermination arises in any arbitrary case and that also when the pressure and temperature of the system are not previously fixed. A redundance in determination arises in the set of equations (5) to (7) at G = 0 and $\chi > 2$. It is shown that the nonvariant-determination of the variables at

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Heterogeneous Systems With Many Components and a Non-Maximal Order of the Concentration-Matrix

76-12-21/27

 $6 + \chi = 2$, or the monovariant-determination of the variables at $G + \chi = 1$, in the general case does not belong to the whole equation-system (5) to (7), but to an individual group of this system of equations. The generalizing terms of the nonvariant and monovariant state of a thermodynamical system are given in the second part of the work. It is shown that at 6 + 1 = 2 in the thermodynamical system a certain group of phases which is in nonvariant equilibrium (y1=0) with each other, must be contained, whereas all other phases of the same system in the general case can have a degree of freedom $y_2 = y \geqslant 0$, different from zero. Thereby, the total amount of degree of freedom of the thermodynamical system is equally equal to y, and can be greater than 0: y > 0. Such a state of the thermodynamical system, in which case a part of the phases is in nonvariant equilibrium, whereas the total-amount of thermodynamical degrees of freedom of the system y in the general case can be different from 0, is called by the authors the nonvariant state of the thermodynamical system. consequently, the conception of the nonvariant state of the thermodynamical system is a more general term than that of the nonvariant equilibrium, provided that the total amount

Card 3/4

Heterogeneous Systems With Many Components and a Non-Maximal Order of the Concentration-Matrix

76-12-21/27

of the degrees of freedom of the system is equal to zero. In the special case y=0, all phases of the given system are in nonvariant equilibrium. In such a case the terms of nonvariant state and nonvariant equilibrium coincide. Analogously it is shown that a thermodynamical system at G+X=1 is in monovariant state, i.e. it contains a certain group of phases which are in monovariant equilibrium $(y_1=1)$ with each other, whereas the other phases of the system in the general case have a greater number of degrees of freedom. Concluding, examples are given. There are 3 Slavic references.

ASSOCIATION:

Khar'kov State University imeni A.M. Gor'kiy (Khar'kovskiy

gosudarstvennyy universitet im. A.M.Gor'kogo).

SUBMITTED:

October 17, 1956

AVAILABLE:

Library of Congress

Card 4/4

SOV-137 58 8 17811

Translation from: Referationly zhurna' Metallargiva 1958 Nr 8 p 131 (USSR)

Palatnik L.S., Lyuharskiv I.M. Tvubchenki, A.P. AUTHORS.

On the Formation of the Carbur zed Tayer Structure of Steel 10 tormirovanii struktury tsementiro annego siova statil TITLE.

PERIODICAL: Uch zap Khar korsk un t. 1957 Nr. 95 Tr. Khim tak i N - in ta khimi: KhGU Vol 18 pp 75 9

In estigations were performed in order to determine how the wear resistant properties of steel 18KhNVA are affected by the structure of steel obtained as a result coar ous neathreatment ABSTRACT. precedures applied to the steel after carburization. The wear resistance (WR) was determined with the aid of radicactive iso Lopes on roller shaped specimens 50 mm in diameter and 7 mm wide The steel was rendered active by introduct on of radio active Co⁶⁰ into molten metal. The active rollers operated in contact with three inactive rollers 50 mm in d ameter and 10 mm wide mounted in a special stand which s miulited the operation of a gear transmission. The extent of wear was de termined by measurement of the radioact . t. of the 'ulir cant by means of a counter. In one revolution, the elocity of Card 1/3

APPROVED FOR RELEASE: Tuesday, August 01, 2000

CIA-RDP86-00513R0012388

SOV 137 58 8 17811

On the Formation of the Carbinized layer Structure in Steel

sliding on the surface of a roller changed from [1 to +1 m seclished that quenching the metal in water or of immediately after cashiriza tion greatly increases WR and resistance to pitting las compared a triffe procedure in which the part is quenched and tempered at 1500C after the cementation pot had been cooled in air. The impro-ement of WR properties can not be explained by transformation of the retained austicities to marters te during the process of friction (because metallographic and X ray analyses indicate that the amount of austen te present in the spec met is the same before and after the tests for wear. The $W\dot{R}$ is impaired as the content of related austenite in the carborized layer is increased urder sink cooling after carbo rization. Rapid cooling after carburization results in a consideral concernasc in WR. X-ray analysis of the substructure of austenite crostae lattice after slow and rapid cooling lindicates that the lattice suffers a slight microdefor mation it cooled abruptly from the carburization temperature, the send sold tion exhibits a maximum of Cr and C saturation which determines the high WR of the carbur-zed layer. A significant microdeformation of the crystal lattice occurs upon s'ow coole g. Slowly cooled auster to leses a good deal of its ability for deformat on and hardening when resisting external forces. The results of the present work were verified on 6 and 10-mm thick gears with a module (rec. procal of pitch diameter) of 5 and a root o role diameter Card 2/3

SOV/137-58-8-17811

On the Formation of the Carburized-layer Structure in Stee!

of 100 mm. Quenching of the gears in water immediately after carburization increased their WR by a factor of 2.5. An explanation is given for the nature of the "white zone" which appears in a thin surface layer during triction, as well as under impact and in the course of hardening by shot peening

N K

1. Steel--Nechmical projecties
2. Steel--Carbonization
3. Steel--Carbonization
4. Cobalt isotopes
(Indicactive)--Applications

Card 3/3

ABSTRACT

THE SELECTION OF SECURITY OF S

PA - 2658 PALATNIK L.S., FEDOROV G.V. A photometric determination of the thickness of semitransparent AUTHOR TITLE (Fotometricheskoye opredeleniye tolshchiny poluposrachnykh metalliches-

Doklady Akademii Nauk SSSR, 1957, Vol 113, Nr 1, pp loo-lo3, (U.S.S.R.) Reviewed 6/1757 PERIODICAL Received 5/1957

The present work discusses a microphotometric method for the measuring of the absolute density of semitransparent metal layers obtained by evapostion in the vacuum and the density distribution of the condensate of the transparent witreous base on the occasion of the employing of vapori-

zers of any type. The method of photometrizing semitransparent layers:

The symmetry axis of the evaporator must be placed vertical to the collector plane. The density distribution o the condensed layers then forms a circular mound with the maximum of density and thickness on the symmetry axis. Apparently the height of the maximum is proportional to the duration of precipitation. If the metal layers are precipitated on several collectors, the dependence of the blackening S of the collector can be obtaimed from the duration 7 of precipitation. Thus, also the dependence S = S(h) is obtained, because for the thickness of the layer h = kT, applies, where k denotes a proportionality factor. If now one of the ecllectors is photometrized along a straight line passing through the ma-

ximum, the dependence of the blacking S on the distance up to a given Card 1/2

PA - 2658 A Photometric Determination of the Thickness of Semitransparent Metal Layers.

point of the collector can be determined. The corresponding dependences S ($\mathcal T$) and S ($\mathcal S$) are shown in form of a diagram. From these two dependences the dependence $\mathcal{I}(\mathfrak{g})$ is then determined, which is equivalent to the dependence $h_{rel}(\rho)$ in relative unities on the ordinate axis. Experimental Part: Experiments were carried out in a vacuum chamber. A sylindrical ferfort crucible served as evaporator and heating took place by means of a michromium spiral. At a distance of about homm from the crucible an immobile metal screen with a long narrow gap was fitted vertical to the crucible axis. Them a glass collector was fitted on to this metal screen. The here discussed photometric method was tested on bismuth films. Bismuth was vaporized on at 600° and 680°, and vaporizingon velocity was changed 6 to 7 times. On this occasion the authors noticed no influence exercised by condensation velocity on the dependence of the blackening of the thickness of the film. From data obtained from some experiments a diagram was determined for the dependence of S on the thickness h of the bismuth layer; this method is well suited for the determination of the thickness of semitransparent metal layers. (2111.)

ASSOCIATION

Polytechnical Institute KHAR'KOV

PRESENTED BY Member of the Academy S.A.VEKSHINSKIY

SUBMITTED AVAILABLE 24.11.1956

Library of Congress

Card 2/2

AUTHORS:

Palatnik, L. S., Landau, A. I.

20-114-4-43/63

TITLE:

A Generalized Formulation of Gibbs Inequality (Obobshchennaya

formulirovka neravenstva Gibbsa)

PERIODICAL:

Doklady Akademii Nauk SSSR, 1957, Vol. 114, Nr 4,

pp. 837-840 (USSR)

ABSTRACT:

The terms V, S, P, T mean: volume, entropy, pressure and temperature of the total heterogeneous system. M_1 and \mathcal{M}_1 , on the other hand, mean the quantity and the chemical potential of the i-th-component in the whole system; further v_j , s_j , m_j denote the specific volume, specific entropy and the mass of the mass of the j-th-phase of the system; $x_{i,j}$ and $\mu_{i,j}$ are the concentration and the chemical potential i-th-component in the j-th-phase; n and r denote the number of components and the number of phases in the system. In the case of an analytical study of the thermodynamic systems it is usually considered a foregone conclusion that the rank of this matrix is a maximum, i.e. that its defect is $\sigma = 0$. Thus the phase rules and the inequality deduced by Gibbs $r \leqslant n + 2$ concern only such thermodynamic systems with $\sigma = 0$. One can, however, imagine really existing thermodynamic systems with a $\sigma \geqslant 0$.

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A Generalized Formulation of Gibbs Inequality

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They were mentioned by Gibbs and discussed more in detail by Storonkin. As may be seen from the following, the case of a system with $\sigma = 1$ at $r \leqslant n$ is only a special one, and the number of possible systems with o 0 is considerably higher. To this belong certain thermodynamic systems with a pressure- and temperature maximum, with equal concentration composition of various phases, some systems in whose individual phases not all components participate. It is the purpose of the present paper to determine the rules to which the systems with $\sigma > 0$ are subjected. If any additional conditions are added to a thermodynamic system, these conditions have to be added apparently to the equations of Gibbs-Duham or to the equality of the chemical potentials before computing the number of the thermodynamic degrees of freedom of a system. In the present case the additional conditions are those connected with the equality of the defect of the concentration matrix by the value σ , where $\sigma > 0$. Furthermore the equations of the chemical potentials are discussed together with the above-mentioned conditions. Then follow in an analogous manner the equations of Gibbs-Duham together with the conditions of the non-maximum of the matrix rank. From the results obtained the meaning of the conditions $0 \leqslant \sigma + x \leqslant 2$ (7) becomes clear.

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A Generalized Formulation of Gibbs Inequality

20- 114-4-43/63

It must evidently be ascribed to the fact that at $\sigma + \kappa > 2$ in a thermodynamic system a "percopredelennost" originates also if P and T of the system have not been fixed previously. By means of the generalized rule of the "center of masses" it is not difficult to realize, that o + k = z, where z is the figure of the phase quantities m; which may alter arbitrarily at fixed values P, T, and Mi. From this follows a criterium of the non-variant and mono-variant properties of a thermodynamic system: at z = 1 the system possesses mono-variant and at z = 2 non-variant properties. By analogy one should assume negative values for the "variability", if z = 3, 4...In reality a thermodynamic system cannot be realized at z) 2. To a negative "variability" corresponds in the mathematical sense "pereopredelennost". Thus at $\sigma + x = z > 2$ a thermodynamic system is either not unequivocally solvable (this should not be principally admitted), or the fundamental equation is incomplete and reflects, in the here discussed case, the thermodynamic system and thereby loses the name of a fundamental equation. As could be seen the matrix condition of the phase equilibrium solves all difficulties. since it forbids the existence of equilibrium systems with

Card 3/4

A Generalized Formulation of Gibbs Inequality

20-114-4-43/63

o + x > 2.

There are 9 references, 9 of which are Soviet.

ASSOCIATION:

Khar'kovskiy gosudarstvennyy universitet im. A. M. Gor'kogo

(Kharkov State University imeni A. M. Gor'kiy)

PRESENTED:

December 26, 1956, by N. V. Belov, Member, Academy of

Sciences, USSR

SUBMITTED:

February 17, 1956

Card 4/4

20-3-14/52

AUTHORS:

12 15 1

Palatnik, L. S., Lyubchenko, A. P.

TITLE:

Diffusion in Solid Solutions of Variable Concentration (O diffuzii v tverdykh rastvorakh s peremennoy kontsentratsiyey)

PERIODICAL:

Doklady AN SSSR, 1957, Vol. 117, Nr 3, pp. 407 - 410 (USSR)

ABSTRACT:

In the present paper an equation is suggested which describes the diffusion in alloys (solid solutions) with variable concentration of the components and in systems with tension- or temperature gradients. In deriving the equations the non-constancy of the values of α_i (the significance of α_i is not mentioned) and of M_i (number of atoms impinging on a surface of 1cm2) is taken into account. No new parameters are introduced and no special assumptions are made. The authors verified this equation experimentally, on which occasion they discovered the effect of counter-diffusion in the cementation of the steel. This counter-diffusion manifests itself by a current of iron atoms and of the atoms of the alloying metals towards the surface of the sample to be cemented. On this occasion a gradient of the activation energy Q of the self-diffusion of the iron is produced. For the computation of the current of the counter-diffusion the authors use the solution of the diffusion equation. The computation is described in detail. A formula forthe

Card 1/3

Diffusion in Solid Solutions of Variable Concentration

20-3-14/52

computation of the excess concentration of the Fe-vacancies in the cemented layer is then given. For the determination of the diffusion curve during cementation a thin layer or radioactive iron was applied electrolytically on to the samples to be investigated. The following cementation took 15 hours at a temperature of 910 in a carburizer. The radioactivity of the sample was measured by registering the X-quarta. The dependence of the specific activity of the layers upon depth thus obtained is illustrated by a diagram. The curve has a maximum with a considerable decrease of the specific activity near the surface, which confirms the existence of a counter-diffusion of the iron. The existence of a counter-diffusion can be confirmed by an additional series of experiments. The relaxation times necessary for the coalescence of the vacancies in the macroscopic pores have the same order of magnitude as the duration of the diffusion annealing. Therefore, the concentration of vacancies can be somewhat lower than the computed value. There are 2 figures, and 6 non-Slavic references.

Card 2/3

20-3-14/52

Diffustion in Solid Solutions of Variable Concentration

ASSOCIATION: Khar'kov State University imeni A. M. Gor'kiy

(Khar'kovskiy gosudarstvennyy universitet im. A. M. Gor'kogo)

PRESENTED: June 17, 1957, by S. A. Vekshinskiy, Academician

SUBMITTED: June 15, 1957

AVAILABLE: Library of Congress

Card 3/3

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PALATNIK, L.S.; LANDAU, A.I.

A generalized formulation of Gibbs inequality. Dokl. AN SSSE 114
(MIEA 10:9)
no.4:837-840 Je '57.

l. Khar'kovskiy gosudarstvennyy universitet imeni A.M. Gor'kogo.
Predstavleno akademikom N.W. Belovym.
(Systems (Chemistry)) (Thermodynamics)
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PALATNIK, L S.

PHASE I BOOK EXPLOITATION

sov/1310

- Soveshchaniye po eksperimental noy i tekhnicheskoy mineralogii i petrografii, 5th Leningrad, 1956.
- Trudy ... (Transactions of the Fifth Conference on Experimental and Applied Mineralogy and Petrography) Moscow, Izd-vo AN SSSR, 1958. 516 p. 1,800 copies printed.
- Sponsoring Agency: Akademiya nauk SSSR. Institut geologii rudnykh mestorozhdeniy, petrografii, mineralogii i geokhimii, and Akademiya nauk SSSR. Institut khimii silikatov.
- Resp. Ed.: Tsvetkov, A.I.; Ed. of Publishing House: Ivanov, B.V., Tech. Ed.: Kiseleva, A.A.
- PURPOSE: This book is intended for scientists and students of mineralogy and petrography.
- COVERAGE: The present collection of articles are reprints of reports presented at the Fifth Conference on Experimental and Applied Mineralogy and Petrography, held in Leningrad on March 26-31, 1956. The

Card 1

Transactions of the Fifth Conference (Cont.)

sov/1310

purpose of the Conference was to exchange information and coordinate the activities in the fields of experimental and applied mineralogy and petrography, and to stress the increasing complexity of practical problems. The Conference was sponsored by the Academy of Sciences of the USSR and organized by its Institute of Ore Deposits, Geology, Petrography, Mineralogy and Geochemistry of the Division of Geological-Geographical Sciences, and the Institute of Silicate Chemistry of the Division of Chemical Sciences. During the Conference special tribute was paid to Academician D.S. Belyankin, (died 1952), founder of applied petrography in the USSR and organizer of the first four conpetrography ferences and Academician A.N. Zavaritskiy, (died 1953), out-standing petrographer and mineralogist. Of the 76 reports presented, 53 are reprinted in the present volume. Bach article is accompanied by diagrams, tables, and bibliographic references.

Card 2/11

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21(8)

PHASE I BOOK EXPLOITATION

SOV/1764

- Vsesoyuznaya nauchno-teknicheskaya konferentsiya po primeneniyu radioaktivnykh i stabil'nykh izotopov i izlucheniy v narodnom khozyaystve i nauke Moscow, 1957.
- Trudy... Mashinostroyeniye i priborostroyeniye (Transactions of the All-Union Conference on the Use of Radioactive and Stable Isotopes and Radiation in the National Economy and Science; Machine and Instrument Manufacturing) Moscow, Izd-vo AN SSSR, 1958. 358 p. 4,500 copies printed.
- Sponsoring Agencies: USSR. Glavnoye upravleniye po ispol'zovaniyu atomnoy energii, and Akademiya nauk SSSR.
- Editorial Board of Set: V.I. Dikushin, Academicain (Resp. Ed.), N.N. Shumilovskiy (Deputy Resp. Ed.), Yu. S. Zaslavskiy (Deputy Resp. Ed.), L.K. Tatochenko, B.I. Verkhovskiy, S.T. Nazarov, L.I. Petrenko, and N.G. Zelevinskaya (Secretary).

Ed. of Publishing House: P.N. Belyanin; Tech. Ed.: T.P. Polenova.

Card 1/20

Transactions of the All-Union Conference (Cont.) SOV/1764

PURPOSE: This book is intended for specialists in the field of machine and instrument manufacture who use radioactive isotopes in the study of materials and processes.

COVERAGE: This collection of papers covers a very wide field of the utilization of tracer methods in industrial research and control techniques. The topic of this volume is the use of radioisotopes techniques. The instrument-manufacturing industry. The indinin the machine- and instrument-manufacturing industry. The indinin the study of metals and alloys, problems of friction and lubrinin the study of metals and alloys, problems of friction and lubrinin the study of metals and alloys, problems of friction and lubrinin the study of metals and alloys, problems of friction and lubring the several papers are devoted to the use of radioisotopes in the autoseveral papers are devoted to the use of radioisotopes in the autoseveral papers are devoted to the use of radioisotopes, radiaquality control, flowmeters, level gauges, safety devices, radiaquality control, flowmeters, level gauges, sa

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PALATNIK, L. S., KOSEVICH, V. M.

"The Investigations of Diffusive and Undiffusive Transformations in Amorphous Antimony Films."

report presented at the Conf. on Mechanical Properties of Non-Metallic Solids, Leniggrad, USSR, 19-26 May 1958.

University, Polytechnical Inst., Khar'kov.

PALATHIK, L.S.; BOYKO, B.T.

Aging of Al-Cu alloys of variable composition [1] in thin films.

Isv. vys. ucheb. sav.; fis. no.3:112-116 '58. (MIRA 11:9)

1. Khar'kovskiy gosuniversitet imeni A.M. Gor'kogo i Khar'kovskiy politekhnicheskiy institut imeni V.I. Lenina.

(Aluminum-copper alloys--Metallography)

79-3 3 16/47

AUTHORS:

Palatnik, L. S. Landau A.I.

TITLE:

Problems on the General Theory of the Equilibrium Diagrams of Polycomponent Heterogeneous Alloys (Voprosy obshchey teorii diagramm ravnovesiya mnogokomponentnykh geterogennykh splavov)

PERIODICAL:

Zhurnal Necrganicheskoy Khimii 1958 Vol. 3 Nr 3 pp.637 649 (USSR)

ABSTRACT:

The problem of the general topological and analytical theory of polycomponent heterogeneous alloys, their equilibrium diagrams and the sections of the equilibrium diagrams were treated. The peculiarities of the topological method of the topological method of Gibbs N. S. Kurnakov, as well as the analytical method of Gibbs were discussed. The results of the application of the topological theory to the thermodynamic problem of polycom analytical theory to the thermodynamic problem of polycom ponent heterogeneous alloys were used. The suggested method ponent heterogeneous alloys were used. The suggested method for the determination of the chemical composition of phases by their mass is also employed in the heterogeneous phases with any number of phases and components. Different thermination of the components.

Card 1/2

APPROVED FOR RELEASE: Tuesday, August 01, 2000

CIA-RDP86-00513R0012388

78-3 3 16/47

Problems on the General Theory of the Equilibrium Diagrams of Polycomponent Heterogeneous Alloys

dynamic degrees of freedom were introduced; an extensive and an intensive degree of freedom. The formula for the calculation of the extensive thermodynamic degree of freedom is as follows:

yext = qext + qint + P

The polycomponent heterogeneous alloys with pseudoextreme pressure and temperature are considered alloys with a small number of components, whereby the investigation and construction of the polycomponent heterogeneous alloys is facilitated. Special potentional functions can also be introduced in these calculations. The employment of the topolarly tieal theory for investigations of the geometric construction of the equilibrium diagrams of polycomponent heterogeneous alloys was studied. There are 8 figures and 21 references. 21 of which are Soviet.

ASSOCIATION:

Khar'kovskiy gosudarstvennyy universitet im. A. M. Gor kogo

(Khar'kov State University imeni A. M. Gor kiy)

SUBMITTED:

June 25, 1957

Card 2/2

AUTHORS: Palatnik, L.S. and Finkel', V.A. SOV/70-3-4-10/26

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TITIE: On Certain Regularities in the Structures of Triple Metallic Compounds (O nekotorykh zakonomernostyakh v strukturakh troynykh metallicheskikh soyedineniy)

PERIODICAL: Kristallografiya, 1958, Vol 3, Nr 4, pp 467-472 (USSR)

ABSTRACT: Analysis of the data published on triple intermetallic

compounds shows that the basic regularities established for two-component phases continue to apply to three-component phases. As a rule, two metals have similar values of atomic radii in a three-component system (Cu and Au or Fe and Ni, etc.). For interstitial phases this need not be so and a third metal can be interstitial

in an alloy of two others. Numerous regularities

(standard types of structures) are observed but there are

some alloys which cannot be fitted in. These are characterised by a high Al content and extremely various

structure. They are, for example, Mg3Cr2Al18,

 $\operatorname{Cr}_{4}\operatorname{Si}_{4}\operatorname{Al}_{13}$, $\beta-\operatorname{Cu}_{2}\operatorname{ReAl}_{7}$, $\operatorname{Ni}_{4}\operatorname{Mn}_{11}\operatorname{Al}_{60}$. The main regular

classes are:

card 1/2

SOV/70-3-4-10/26

On Certain Regularities in the Structures of Triple Metallic Compounds

1) Triple electron compounds with electron concentrations of 3/2.

2) Triple interstitial phases. (23 examples quoted)

3) Laves phases, NiAs structures and Sigma phases. There are 4 tables and 50 references, 17 of which are Soviet, 15 English, 6 German and 12 Scandinavian.

ASSOCIATION: Khar kovskiy gosudarstvennyy universitet

im. A.M. Gor'kogo (Khar'kov State University imeni A.M. Gor'kiy)

SUBMIMED: January 22, 1958

Card 2/2

SOV/70-3-5-13/24

Palatnik, L.S. and Levchenko, A.A.

On the Nature of Electric Erosion in Single Crystals (O kharaktere elektricheskoy erozii na monokristaliakh) AUTHORS:

PERIODICAL: Kristallografiya, 1958, Vol 3, Nr 5, pp 612-616 (USSR)

The traces left on the surfaces of single crystals of 15 elementary metals after single sparks (as used in the ABSTRACT:

electro-erosion process) were passed to them have been examined microscopically. The holes melted in the anodes had the form of circles and were accompanied by

plastic deformation; holes in the cathode surface

reflected the characteristic symmetry of the particular

crystal planes concerned. The anodic plastic deformation

may be of any of the known types. Previous workers have examined the traces left after multiple discharges (or oscillatory discharges) and not single strokes as here. In general, they confirmed the hypothesis of thermal attack on the surface. Here, the metals Ag, Al, Bi, Cd, Cr, Cu, Fe, Mg, Mo, Ni, Pb, Sb, Sn, W and Zn have been studied. The plastic deformation

occurring is classified in each case as gliding, twinning or cleavage and is compared with the kinds of deformation

Card 1/3

SOV/70-3-5-13/24 On the Nature of Electric Erosion in Single Crystals

> occurring in the same metals under static loading. the same conditions, the holes produced in any one metal were of very constant size. In order of increasing diameter, different metals fell into the series, Bi, Sb, Pb, Sn, Cd, Zn, Mg, Cr, Al, Fe, Ni, Cu, Mo and W. Discharges were made in air and under alcohol. The zones of melted metal were not found to be oxidised. The cathode erosion would be expected to be due to the sudden melting and vaporisation causing a pressure impulse and consequently similar to a "micro-explosion". On an anode surface, the diameter of the damaged area is significantly larger and the pressure wave seems to decay more slowly with time. The thermal conductivity is here an important factor and as the faces examined all had a symmetry axis of order greater than 2, the conductivity surface has here a circular section. There are 3 figures, 1 table and 13 references, 11 of which are Soviet and 1 Scandinavian, 1 German.

Card 2/3

SOV/70-3-5-13/24

On the Nature of Electric Brosion in Single Crystals

Khar'kovskiy politekhnicheskiy institut imeni V.I. Lenina (Khar'kov Polytechnical Institute imeni V.I. Lenin) ASSOCIATION:

September 4, 1957 SUBMITTED:

Card 3/3

SOV/70-3-6-9/25

AUTHORS:

Palatnik, L.S. and Kosevich, V.M.

TITLE:

An Investigation of the Crystallisation of Antimony in Thin Films (Issledovaniye kristallizatsii surimy v tonkikn plenkakh) Part I. The α - and β -transformations (I. α - i β -prevrashcheniya)

PERIODICAL: Kristallografiya, 1958, Vol 3, Nr 6, pp 709-715 (USSR)

ABSTRACT:

It has been earlier established that an amorphous phase occurs in thin films of antimony. Two transformations α — and β — were distinguished when these layers crystallised. Here the crystallisation of amorphous layers of antimony, evaporated onto amorphous substrata (quartz or collodion) is examined. Observations were made of the electrical resistance and also metallographically and electronographically. Films were condensed at

 $8 \times 10^{-7} \text{ g/cm}^2 \text{sec.}$ Initially, the Sb appears chestrut and then develops blue spots, the latter (as shown electronographically) being a crystalline phase. This is the α -transition. A graph of the dependence of the time for full transition to the crystalline state on the thickness of the layer is given. h_{α} is the thickness

Cardl/4 less than which crystallisation does not occur and h_1

Consideration of the control of the

SOV/70-3-6-9/25 An Investigation of the Crystallisation of Antimony in Thin Films Part I. The α - and β -transformations

is the thickness for which crystallisation is complete in one minute. The time of condensation of the film t is given by t = dh/w = 0.074 h secs (d is the density ofSb and $w = 8 \times 10^{-7} \text{ g/cm}^2 \text{sec}$ the rate of condensation). The rate of growth of crystalline spherulites in an amorphous layer as a function of its thickness was measured microscopically. The stability of the Sb as an amorphous thin film can be explained if it is regarded as a super-cooled liquid with a co-ordination number of 3. On the sudden cooling, a compression of the film arises but at a temperature below that of crystallisation, bonds with the substrate are established and the substrate is compressed. The resulting tension stabilises the amorphous phase. This tension decreases in the Sb as the thickness increases. Amorphous phases are known in other metals for layers of 30-50 Å (Co, V, Cr. Be) but here the thickness of a stable layer can be 270 Å. Using diffraction methods, a diagram of the $\alpha-$ and $\beta-$ transformations has been established. There are three

Card2/4

SOV/70-3-6-9/25

An Investigation of the Crystallisation of Antimony in Thin Films Part I. The $\alpha-$ and $\beta-$ transformations

regions, amorphous Sb up to about 250 % thickness, then a region of amorphous + crystalline and then a region of crystalline Sb divided orf by the lines "end of $\alpha\text{-transformation"}$ and "\$\beta\transformation". The latter run from a thickness of 500 Å at a deposition rate \$\omega\$ of 10^{-7} g/cm²sec to 1 500 Å at a rate of 10^{-4} g/cm²sec. For low rates of deposition a phenomenon of "superthickening" can occur where the α -transformation stops and the β - has not yet begun; this can amount to 100-300 Å. The \beta-transformation takes place almost instantaneously. I-ray diffraction shows that the structures formed by the β - and α -transformations are identical. α-transformation can be regarded as a diffusion separation of amorphous Sb into "holes" and crystalline Sb. The β-transformation is a definite step like the known diffusion-less martensitic transformation. Although diffusionless, in amorphous Sb the co-ordination number is 4 whereas in the crystalline material it is 3. Other resemblances and differences to the martensitic transformation are discussed.

Card3/4

SOV/70-3-6-9/25

An Investigation of the Crystallisation of Antimony in Thin Films. Part I. The α - and β -transformations

There are 5 figures and 13 references, 11 of which are Soviet and 2 English.

ASSOCIATIONS:

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Khar kevskiy gosudarstvennyy universitet im
A.M. Gor kogc (Khar kev State University im.A.M. Gor kiy)

Politekhnicheskıy institut im. v.I. Lenina

(Polytechnic Institute imeni V. I. Lenin)

SUBMITTED:

January 14 1958

card 4/4

BUV/126-6-3-22/32

AUTHORS: Palatnik L. S., Levercou, A. a., Decimers, A.F. and Terletokiy, V. Ye.

Determination of the Type of Equilibrium Phase Diagram for Cu-Ni at Hi). I apertures by Spectral Analysis.

II. (Opredelenive tiph diagramsy ravnovesiya C)-Ni V TITIE: oblasti vycolikh temperatur setodom spestralinogo

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol., No. 2, pp 540-544 (USSR)

ABSTRACT: Polatnik's spectral method (Ref 1) is applied to bystems consisting of liquid plus vapour; the method utilises the fact that the selective evaporation (or retention) of a component is dependent on the type of inversetion (i.e. ultimately the type of euilibrium diagram). Spark discharges ere passed through the vapour, using a solid electrode & semple of the alloy; the surface of the electrode recomes depleted by selective ev morasion (solii-state diffusion negligible). The main application is to binary systems, in which only three types of diagram exist, and where the type of diagram can therefore Card 1/3 be resaily established (from the deviations from Recolution

SUV/126-6-3-22/32

Determin tion of the Type of Equilibrian Phase Diagra: for Cu-. . at High Temperatures by Spectful Analysis. II.

law on verying the composition). The Cu-Ni elloys and were prepared by sintering the free ed ponders in at 950°C for one hour. The Sa wer electrolytic; the in was prepared from missel oxalate by hydrogen industrial.

Fifteen alloys were used. Spar's lines of Cu II and Ki II were used as reference lines; the vavelenths are lives in Table 2. Fig. 2 shows he the experiental curve (to:) compared with the liquid-vopour (middle) and olid-like (bottom) equilibrium curves. It is jointed out that the midule curves are really only leduced from the enterisentel spack curves, and one only very approximately correct. The tendency to selective everciention, all page slight, indicated to a marrow two-phase region may emist in the liquid. Then is a Soviet original and the one of the society original and the one of the society original and the one of the original and the original a tronglation of worr my handen.

Card 2/3

SCV/126-6-3-22/32

Determination of the Type of Equilibrium Phase Diagram for Cu-Ni at High Temperatures by Specials Analysis. II.

ASSOCIATIONS: Khar'kovskiy tot darstvennyy universitet imeni

A. M. Gor'kogo (Khar'kov State University imeni

A. M. Gorikiy) and

Khar'kovskiy politekhnicheskiy institut ideni V.I.Lenina (Khar'kov Polytechnical Institute ideni V. I. Lenin)

SUBMITTED: September 15, 1950

1. Copper-nickel alloys--Analysis 2 Copper-nickel alloys--Sintering

3. Copper-nickel alloys--Phase studies 4. Hydrogen--Applications

Card 3/3

AUTHOR: Palatnik, L. S.

30**V/126-6-3-26/**32

TITLE:

Use of Spectral Analysis with Multicomponent Alloys at High Temperatures (O primenenii spektral'noso analiza k issledovaniyu mnogokomponentnykh splavov v oblasti

vysokikh temperatur)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6, Nr 5, pp 565-567 (USSR)

ABSTRACT: Palatnik attempts to dispose of the objections made in the previous paper by saying that the processes occurring at electrodes in spark discharges have not been studied at very high temperatures; he tries to support his diffusion theory by saying that the period of lattice vibration is much shorter than 10-6 sec, though this has no real bearing on the issue. Some other theoretical arguments regarding the general application to determining types of phase diagram he advanced are considered (in a note from the editors) to indicate that further discussion on the topic is useless until more experimental and theoretical work has been done. There are 7 references, all Soviet.

SUBMITTED: March 16, 1957

Card 1/1

Metals—Spectrographic analysis
 Spectrographic analysis—Temperature factors
 Electric disbharge

--Properties 5. Diffusion--Theory