

VORONKOVA, N.M.; MELESHKO, K.Ye.; SEMENCHENKO, I.V.; SNYTKIN, A.V.;
SHISHKINA, T.A.

Use of the spectrovisor in studying the spectral brightness of
landscape elements. Geod. i kart. no. 12:20-25 D '60.

(MIRA 14:1)

(Spectrophotometry) (Aerial photogrammetry)

37330

S/169/62/000/004/046/103
D228/D302

3,2300

AUTHORS: Semenchenko, I. V. and Snytkin, A. V.

TITLE: Investigation of the sea's spectral brightness from an aircraft

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 4, 1962, 15-16, abstract 4V72 Okeanologiya, 1, no. 5, 1961, 856-859)

TEXT: The experimental results of research into the sea's spectral brightness, obtained when operating from the air, are stated. A summer spectrovisor, developed at the Laboratoriya aerometodov AN SSSR (Aeromethods Laboratory, Academy of Sciences, USSR) was employed for the measurements. The results are presented as curves of the spectral brightness coefficient -- determined in overcast and clear weather, and also at different angles between the observation direction and the vertical. The examination of the curves shows that in the presence of cloud the sky radiation, reflected from the water, substantially influences the sea's brightness. The sea's brightness varies with the change in the angle between the direc-
Card 1/2

S/169/62/000/004/046/103
D228/D302

Investigation of the ...

tion of observation and the vertical. The sea brightness coefficients, measured with a summer spectrovisor from an aircraft and with a $\phi M-46$ (FM-46) hydrophotometer from a boat in the same sea areas, are compared. The comparison shows that the results, obtained in the aircraft measurements, much surpass those of the boat measurements. This is due to the presence in the sea-water's surface layer of a large amount of air bubbles which bring about further diffuse scattering. As a result the authors give preference to the measurement of the spectral brightness from an aircraft (despite the smaller precision of the method as compared with boat measurements), since the aerial method allows values to be obtained for the sea brightness coefficient over a large area of the sea in a very short period of time. [Abstracter's note: Complete translation.]

X

Card 2/2

ZDANOVICH, V.G., doktor tekhn. nauk, prof.; RAMM, N.S., kand. tekhn. nauk, st. nauchnyy sotr.; SHARIKOV, Yu.D., kand. tekhn. nauk, st. nauchnyy sotr.; YANUTSH, D.A., kand. tekhn. nauk, st. nauchnyy sotr.; CHERKASOV, I.A., kand. tekhn.nauk; ALEKSEYEV-SHEMYAKIN, V.P., nauchnyy sotr.; KOL'TSOV, V.V., nauchnyy sotr.; KOSHECHKIN, B.I., nauchnyy sotr.; SEMENCHENKO, I.V., nauchnyy sotr.; UGLEV, Yu.V., nauchnyy sotr.; KUZINA, A.M., starshiy laborant; KUDRITSKIY, D.M., kand. tekhn. nauk, dots., retsenzent; VEYNBERG, V.B., doktor tekhn. nauk, retsenzent; LOSHCHILOV, V.S., kand.geogr. nauk, retsenzent; REKHTZAMER, G.R., kand. tekhn.nauk, dots., retsenzent; KOZLYANINOV, M.V., kand. geogr. nauk, retsenzent; BUSHUYEV, A.V., inzh., retsenzent; ZAMARAYEVA, R.A., tekhn. red.

[Use of airborne methods to study the sea] Primenenie aerometodov dlia issledovaniia moria. Pod obshchei red. V.G.Zdanovicha. Moskva, Izd-vo Akad. nauk SSSR, 1963. 546 p. (MIRA 16:4)

1. Akademiya nauk SSSR. Laboratoriya aerometodov. 2. Laboratoriya aerometodov Akademii nauk SSSR (for Zdanovich, Ramm, Sharikov, Yanutsh, Cherkasov, Alekseyev-Shemyakin, Kol'tsov, Koshechkin, Semenchenko, Uglev, Kuzina).

(Aeronautics in oceanography) (Aerial photogrammetry)

SEMENCHENKO, M.

Regional economic council and technical schools. Prof.-tekh.
obr. 19 no.12:7 D '62. (MIRA 16:2)

1. Nachal'nik otдела кадров i uchebnykh zavedeniy Irkutskogo
soveta narodnogo khozyaystva.
(Irkutsk Province--Vocational education)

TARASOV, N.M., inzhener; SEMENCHENKO, M.R., inzhener.

The effect of grain size in 20KhNM steel on the deformation and strength of automobile gears subjected to heat treatment. Metaloved. i obr.met.no.1:53-56 JI '55. (MLRA 9:7)

1.Ger'kovskiy avtomobil'nyy zavod imeni Moloteva.
(Steel, Automobile--Heat treatment) (Automobiles--Transmission devices)

SEMENCHENKO, M. P.

Intensification of the carburizing process in a solid carburizer for automobile parts. R. M. Tarasov and M. P. Semenchenko (Molotov Automobile Factory, Gorki). *Metallurg. i Obrabotka Metallov* 1955, No. 8, 45-51. — The method employed was raising the carburizing temp. from 910 to 950°, thus decreasing the time by 50%. Specimens of steel 20Kh (C 0.22, Cr 0.78%) and 20KhNiM (C 0.21, Cr 0.59, Ni 1.55, and Mo 0.26%) were ~~coarse~~ grained on being quenched directly from the carburizing temp. but were fine grained after a 2nd heating. Specimens of "fine-grain tendency" heats of these steels showed little grain coarsening at 950 relative to 910°. About the same depth of carburizing was produced in 8 hrs. at 950 as in 13 hrs. at 910°. The surface C content was as much as 0.5% lower at 950° but there was still some excess cementite. The properties of parts carburized at 910° or 950° were similar. A. G. Guy

2

of

SEARCHED, P.R.

AUTHORS: Tarasov, A.M., Ing. and Semenchenko, M.R., Ing.
(Gorky Automobile Works "Imeni V. M. Molotov").

TITLE: Influence of the content of $BaCO_3$ in the carburiser
on the quality of the carburised³ layer. (Vliyaniye
soderzhaniya uglekislogo bariya v karbyurizatore
na kachestvo tsementovannogo sloya).

PERIODICAL: "Metallovedenie i Obrabotka Metallov" (Metallurgy and
Metal Treatment), 1957, No.5, pp.49-53 (U.S.S.R.)

ABSTRACT: In the Gorky Automobile Works the carburising mixture
consists of 25% fresh and 75% used carburisation
material whereby the fresh carburising material
contains 60 to 70% peat semi-coke, 20-25% $BaCO_3$,
3.5-5% $CaCO_3$, 0.5-1.5% SiO_2 and up to 0.1% S. ³Data
collected over two years showed that the $BaCO_3$ content
in the carburiser varies between 3 and 11% and for the
most frequently occurring contents, between 5 and 7%,
the carbon content on the surfaces of the carburised
components usually varies between 1.5 to 2.5%,
although the optimum would be between 0.8 and 1.0%.
The work described in this paper aimed at determining
the optimum content of $BaCO_3$ in the carburisation
mixture which would ensure obtaining a carburised
layer with a carbon content near to that of eutectoidal
saturation. The compositions of the investigated

Card 1/1

Influence of the content of $BaCO_3$ in the carburiser⁶¹⁹
on the quality of the carburised³ layer. (Cont.)

steels are given in Table 1, p.50, the carburisation regime and the depths of the carburisation layer in a mixture with various additions of the fresh carburiser are enumerated in Table 2, p.50. The dependence of the carburisation depths on the $BaCO_3$ content is plotted in Fig.2, whilst the distribution of the carbon in the carburised layer for various percentages of the content of fresh carburiser is plotted in Fig.3, whilst Fig.4 shows the carbon content in the carburised layer at depths of 0.025, 0.05, 0.1 and 0.3 mm as a function of the $BaCO_3$ content in the carburiser for two steels. It was found that changes between 0% and 25% of the fresh carburisation mixture containing 20 to 25% of $BaCO_3$ has a negligible influence on the depth of the carburised layer. An increase in the content of $BaCO_3$ up to 5% brings about an increase in the depth of the carburised layer and of the zone with above eutectoidal carbon content; further increase, beyond 5%, does not bring about any further increase in the depth of the carburised layer. It is advisable to reduce the content of $BaCO_3$ in the carburising mixture to between 1 and 3%. 4 figures, 2 tables; 2 Russian references.

Card 2/2

SEMENCHENKO M.R.

Effect of the content of barium carbonate in a carburizer on the quality of the carburized layer. ⁷ S. M. Tarasov and M. R. Semenchenko. *M. Moplar Automobile Factory (Gorki). Metallurg. i Obrabotka Metal.* 1957, No. 6, 49-53.

The steels studied were: 20Kh contg. C 0.20, Mn 0.64, Cr 0.87, Si 0.20, S 0.023, P 0.03%; 20KhNM contg. C 0.22, Mn 0.87, Cr 0.33, Si 0.25, Ni 1.9, Mo 0.22, S 0.021, P 0.021; and 20 KhGR contg. C 0.22, Mn 1.0, Cr 1.03, Si 0.27, Ni 0.19, S 0.018%, P 0.033, and B 0.003%. They were carburized in solid carburizer, contg. 0-25% BaCO₃ at 950° for 7-12.7 hrs. The total depth of the carburized layer increased from 1.4 mm, at 0% BaCO₃, to 3.0 at 5% and remained at this value out to 25%. The surface C content increased steadily with increase in % BaCO₃; the values for steel 20KhGR were: 1.3 C at 5%, 1.8 at 10%, and 2.3 at 25%; the values for steel 20KhNM were 0.0 at 0%, 1.2 at 5%, 1.3 at 10%, and 1.6 at 25%. It was recommended that only 1-2% BaCO₃ be used in spite of its low rate of carburizing.

A. C. Guy

374E4

MT

SOV/129-58-9-9/16

AUTHORS: Tarasov, A.M., Candidate of Technical Science and
Semenchenko, M. R., Engineer

TITLE: The Possibility of Increasing the Carburization
Temperature Inside a Solid Carburizer to 980°C
(Vozmozhnost' povysheniya temperatury tsementatsii
v tverdom karbyurizatore do 980°)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, Nr 9,
pp 39-42 (USSR)

ABSTRACT: The Gorky Automobile Works introduced in 1954 a process
of carburization inside a solid carburizer at 950°C
instead of 910°C. In this paper the possibility is
studied of applying still higher carburization
temperatures for the purpose of increasing further the
productivity of the process. In earlier work of the
authors (Ref 1) it was established that in the case of
carburization inside a solid carburizer at an increased
temperature, the degree of carbon saturation of the
periphery of the carburized layer decreases. The
intensive growth of the austenite grain for fine grain
steels (20, 20Kh, 20KhGR and 20KhNM) begins in the
case of heating above 1000°C. Daily inspection of

Card 1/4

SOV/129-58-9-9/16

The Possibility of Increasing the Carburization Temperature
Inside a Solid Carburizer to 980°C

manufactured components indicates that as regards hardness, the depth of the case hardened layer and warping of the components, carburization at 950°C does not differ from that effected at 910°C. In the experiments described in this paper the carburization temperature was increased to 980°C. Investigation of the quality of the carburized layer and determination of the mechanical properties was effected on specimens of the steels 20KhGR, 20KhNM, 20Kh and 20 for which the C, Mn, Cr contents and the size of the austenite grains are entered in Table 1. The investigations were extended to components (gear, cam) which were case hardened to depths of 1, 1.4 and 1.6 mm. As a carburizing agent a mixture of a solid (peat) carburizer with an addition of 20% fresh carburizing material was used; the content of barium carbonate in the working mixture was 3.4 to 5.1%. Particular attention was devoted to the deformation which was verified on the highest stressed and most complicated components; these measurements were carried out under the guidance of

Card 2/4

SOV/129-58-9-9/16

The Possibility of Increasing the Carburization Temperature
Inside a Solid Carburizer to 980°C

A. A. Shlyapnikov. The results obtained for specimens which were incorrectly case hardened and for specimens after carburization, hardening after reheating and low temperature tempering are entered in Table 2 and these show that the strength, toughness, ductility and surface hardness of the specimens do not deteriorate as a result of increasing the carburization temperature to 980°C. The results obtained for a cross piece of a motor car differential and for gear teeth are also graphed. The obtained results have shown that provided a second heating prior to hardening is applied, it is recommended to carburize components inside a solid carburizer at 980°C; the quality of the case hardened layer as regards carbon content and its distribution improves and the static strength of the components does not decrease. The productivity of the process of carburization at 980°C is 40 to 50% higher than for a carburization temperature of 910°C and

Card 3/4

SOV/129-58-9-9/16

The Possibility of Increasing the Carburization Temperature
Inside a Solid Carburizer to 980°C

15% higher than for a carburization temperature of 950°C.
There are 4 figures, 2 tables and 2 Soviet references.

ASSOCIATION: Gor'kovskiy avtomobil'nyy zavod
(Gorkiy Automobile Plant)

1. Steel--Hardening
2. Grains (Metallurgy)--Growth

Card 4/4

TARASOV, A.H., kand. tekhn. nauk; SEMENCHENKO, M.P., inzh.; GUR'YEVA, Z.I.,
inzh.; DZHEISOVA, A.M., inzh.; MALYGINA, T.I., inzh.

Use of structural steels with small additions of boron at the
Gorkiy Automobile Plant. Metalloved. i term. obr. met. no. 12:
16-21 D '61. (MIRA 14:12)

1. Gorkovskiy avtomobil'nyy zavod.
(Gorkiy--Automobile industry)
(Boron steel)

L 31307-66 EWI(1)/T JK

ACC NR: AP6022585 (A,N) SOURCE CODE: UR/0346/66/000/001/0036/0037

AUTHOR: Semenchenko, N. (Chief of section)

21
B

ORG: Veterinary Section, Karel'skaya ASSR (Veterinarnyy otdel)

TITLE: Eradication of foot-and-mouth disease in the primary focus

SOURCE: Veterinariya, no. 1, 1966, 36-37

TOPIC TAGS: foot and mouth disease, disease control

ABSTRACT: This article is a report on the recent foot-and-mouth disease situation in the Karel'skaya ASSR. The author notes that outbreaks in recent years have come mainly from transport of coarse feeds. In all cases the disease was eradicated in the primary foci. A detailed description is given of the largest outbreak--on the "Vidlitskiy" Sovkhoz, Olonetskiy Rayon. Party, militia and farm workers cooperated. It is notable that the many workers with jobs outside the quarantine zone were re-assigned to work on sovkhoses during the outbreak. Veterinary workers were divided into two groups: one in the primary focus and the other in the zone threatened by the disease. The republic has no outbreaks at the present time, but prophylactic measures are still being strictly carried out. [JPRS]

SUB CODE: 06 / SUEM DATE: none

Card- 1/1 10

0915 06.020

SEMENCHENKO, N.A.

Thirtieth anniversary of a republic veterinary laboratory. Veteri-
nariia 35 no.6:69-72 Je '58. (MIRA 11:6)

1. Nachal'nik veterinarnogo otdela Ministerstva sel'skogo khozyaystva
Karel'skoy ASSR.

(Karelia--Veterinary laboratories)

SEMENCHENKO, N. I.

589 Moy opyr rabory na love kaspiyskoy kefali. (sulakskiy rybokolkhov "Pamyat' Chapayeva". Lit. zapis' B. M. Petrova i V. S. Gotfrida). Makhachkala, Dagknigoizdat, 1954. 43 s. s ill. 20 sm. (Dagrybakkolkhozsoyuz). 2.000 ekz. Bespl. - (54-54655) p (639.22 + 639.2.08) (262.8)

SO: Knizhnaya Letopis, Vol 1, 1955

FUKOZ, F.I.; SEMENCHENKO, S.A.

Determination of the potentials of zero charge on solid electrodes from their dispersion rate in the ultrasonic field. Elektrokhimiia 1 no.12:1454-1458 D '65.

(MIRA 19:1)

1. Novocherkasskiy politekhnicheskii institut. Submitted September 21, 1964.

KUKOZ, F.I.; SEMENCHENKO, S.A.

Determination of the potentials of zero charge of solid electrodes
from their vibro-abrasive rate. Elektrokhimiia 2 no.1:74-78 Ja '66.
(MIRA 19:1)

1. Novocherkasskiy politekhnicheskii institut imeni Sergo Ordzhonikidze. Submitted December 7, 1964.

SEMNCHENKO, V.F.

Inversion of the uterus due to passage of submucosal fibromyoma.
Akush. i gin. 32 no.6:86 N-D '56. (MIRA 10:11)

1. Iz rayonnogo rodil'nogo doma g.Lubny (glavnyy vrach - zasluzhennyy
vrach USSR A.V.Kotlyar)
(UTERUS—TUMORS)

MURAV'YEVA, D.A.; SEMENCHENKO, V.F.

Separation and identification of ragweed alkaloids by means
of paper electrophoresis. Apt. delo 14 no. 4:21-26 J1-Ag '65
(MIRA 19:1)

1. Pyatigorskiy farmatsevticheskiy institut. Submitted September
15, 1964.

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

CA

Physical foundations of the theory of activity. V. K. Semenchenko. *J. Phys. Chem. (U. S. S. R.)* 1, 427-32(1970).—S. obtains the Debye equation $P = (dF/dV) - (d\sigma_s/d\sigma) = (RT/V) - (d\sigma_s/dV) = P - (R_s/dV)$ by the method of statistical mechanics. F. H. Rathmann

433-51A METALLOGICAL LITERATURE CLASSIFICATION

SIGNATURE

DATE

PROCESSES AND PROPERTIES INDEX

Properties of mixed electrolytes. II. Electric conductivity of mixed electrolytes. V. K. SHIMCHENKO, B. V. BROFBEV AND V. V. SERPINSKII. *J. Gen. Chem. (U. S. S. R.)* 2, 803-905 (1932); cf. *C. A.* 26, 4524.---The method developed by Jones and Josephs (*C. A.* 22, 1892) and by Shedlovsky (*C. A.* 24, 3181; 26, 2911) for measuring cond. of dil. solns. was used, with some improvements, for measuring cond. of aq. solns. of KCl in the interval 0.0025-2 *N*, to an accuracy of 0.02%. The results agree well with those of Shedlovskii. S. L. MADORSKY

AS N S L A METALLURGICAL LITERATURE CLASSIFICATION

62-11113 CHEM 155

62-11113 CHEM 155

62-11113 CHEM 155

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA BB CC DD EE

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

Modern theory of electrical conductivity and viscosity of solutions. V. K. Semen-
chenko. *Doklady Akad. Nauk SSSR*, 2, 10: 56 (1953). -- The Debye-Huckel-Falkenhagen and other
theories of solns. are reviewed and much exptl. work is cited in support of them.
E. H. Rathmann

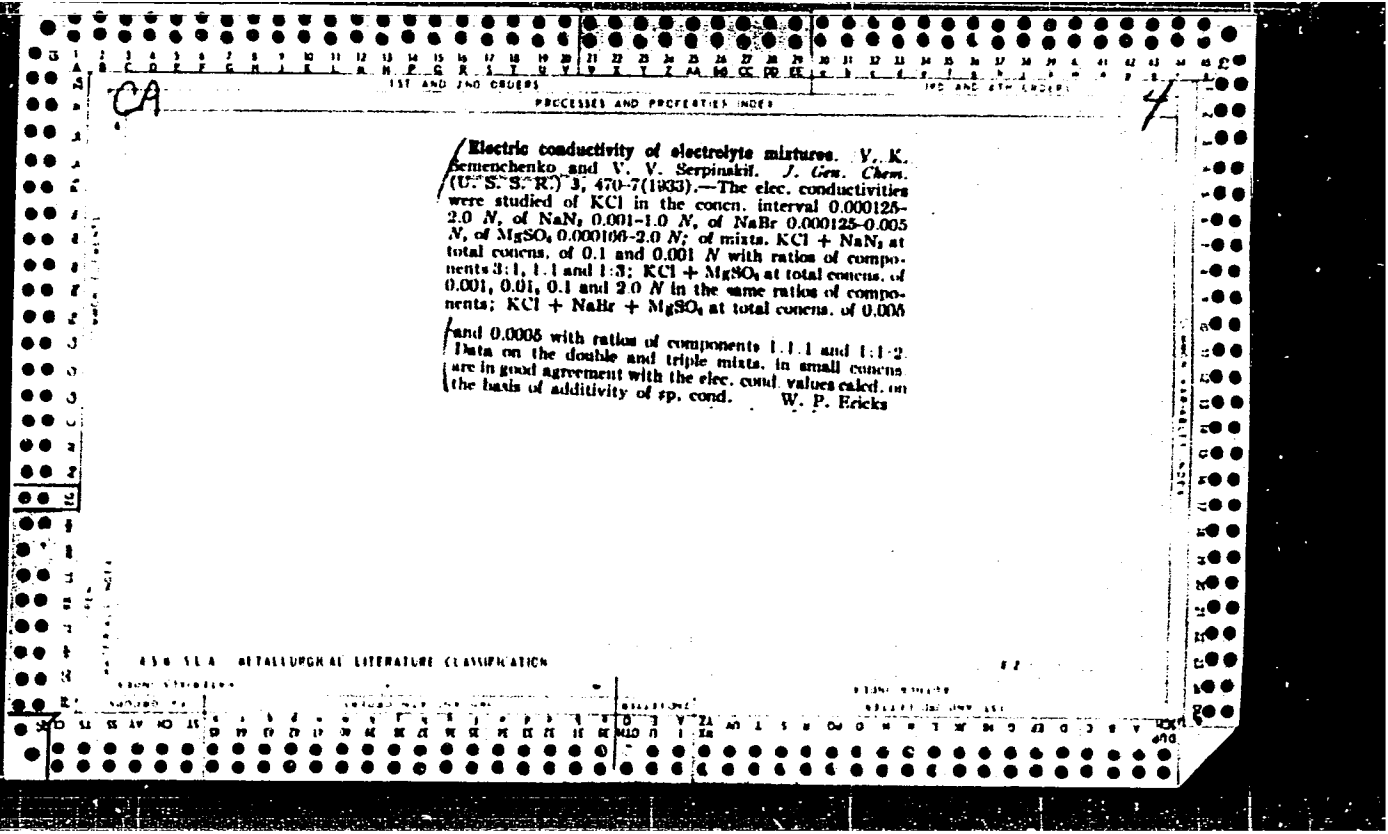
ASME-ISA METALLURGICAL LITERATURE CLASSIFICATION

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA BB CC DD EE

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS



BC

A-1

Solubility and surface tension. V. K. SEMEN-
TSCHENKO (Uspekhi Khim., 1934, 3, 710-751).—
Using the Boltzmann principle and the idea of
generalised moments, solubility and surface tension
are explained on a common basis. Data for the
systems PrOH-NaCl-H₂O, iso-C₈H₁₇-OH-(CH₂-OH)₂-
H₂O, and PrOH-NaBr-H₂O are discussed.

COMMON ELEMENTS

PROCESSES AND PROPERTIES INDEX

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

OPEN

WATERIALS INDEX

A S B - S L A METALLURGICAL LITERATURE CLASSIFICATION

REGIONAL INDEX

REGIONAL INDEX

1ST AND 2ND LETTERS

3RD AND 4TH LETTERS

5TH AND 6TH LETTERS

7TH AND 8TH LETTERS

9TH AND 10TH LETTERS

11TH AND 12TH LETTERS

13TH AND 14TH LETTERS

15TH AND 16TH LETTERS

17TH AND 18TH LETTERS

19TH AND 20TH LETTERS

21ST AND 22ND LETTERS

23RD AND 24TH LETTERS

25TH AND 26TH LETTERS

27TH AND 28TH LETTERS

29TH AND 30TH LETTERS

31ST AND 32ND LETTERS

33RD AND 34TH LETTERS

35TH AND 36TH LETTERS

37TH AND 38TH LETTERS

39TH AND 40TH LETTERS

41ST AND 42ND LETTERS

43RD AND 44TH LETTERS

45TH AND 46TH LETTERS

47TH AND 48TH LETTERS

49TH AND 50TH LETTERS

51ST AND 52ND LETTERS

53RD AND 54TH LETTERS

55TH AND 56TH LETTERS

57TH AND 58TH LETTERS

59TH AND 60TH LETTERS

61ST AND 62ND LETTERS

63RD AND 64TH LETTERS

65TH AND 66TH LETTERS

67TH AND 68TH LETTERS

69TH AND 70TH LETTERS

71ST AND 72ND LETTERS

73RD AND 74TH LETTERS

75TH AND 76TH LETTERS

77TH AND 78TH LETTERS

79TH AND 80TH LETTERS

81ST AND 82ND LETTERS

83RD AND 84TH LETTERS

85TH AND 86TH LETTERS

87TH AND 88TH LETTERS

89TH AND 90TH LETTERS

91ST AND 92ND LETTERS

93RD AND 94TH LETTERS

95TH AND 96TH LETTERS

97TH AND 98TH LETTERS

99TH AND 100TH LETTERS

PROCESSES AND PROPERTIES INDEX

2

***Surface Tension of Amalgams.** V. K. Semenchenko, B. P. Bering, and N. I. Pokrovskiy (*Kolloidnyi Zhurnal (Colloid J.)*, 1935, 1, 203-215; *C. Abstr.*, 1936, 30, 7975).—[In Russian.] Cf. *Met. Abs.*, this vol., p. 523. Amalgams were obtained of silver, cadmium, and zinc by direct solution of metal in mercury, of barium by electrolysis of BaCl₂, and of sodium and potassium by distillation of vapours into mercury. In all cases except that of zinc amalgam the surface tension at first decreases with increasing concentration of metal and then is almost constant. The effect of amalgamated metal decreases in the order potassium, sodium, barium, silver, cadmium, and is negative for zinc. Values for concentrations and corresponding surface tension were: pure mercury 410 dynes/cm.; potassium 0.0024 atom-%, 392; 0.0080 atom-%, 329; 0.0183 atom-%, 290; 0.264 atom-%, 284; sodium 0.0045, 380; 0.133, 337; barium 0.0042, 407; 0.22, 358; cadmium 0.0110, 409; 1.22, 406; silver 0.0120, 409; 0.295, 406; zinc, 0.0245, 411; 1.315, 420.—S. G.

A S A - I L A METALLURGICAL LITERATURE CLASSIFICATION

AUTOMATIC INDEXING

PROCESSES AND PROPERTIES INDEX

Electrical conductivity of mixtures of electrolytes. V. I. Barmenchenko and V. V. Serpinski. *Trans. VI Moscow Congr. Theoret. Applied Chem.* 1932 2, Pt. 2, 195-200(1935); cf. *C. A.* 27, 3382; 28, 10059.—Elec. conductivities of a series of binary and ternary mixts. at const. total concns. but different ratios of the components and at different total concns. were measured with the aid of a special device that is described. The data obtained were consistent with the Debye-Hückel-Onsager theory and confirmed the adequacy of the method applied. The formula $A = Z_1 z_1 A_1$ seems to be confirmed for the additive cond. (z_1 is the part played by the given electrolyte in the mixt., expressed in equivalents, A_1 the elec. cond. of the pure electrolyte of a concn. corresponding to that of the mixt.).

E. E. Stefanowsky

ASAC-SLA METALLURGICAL LITERATURE CLASSIFICATION

INDEX AND SUBJECT INDEX

1ST AND 2ND GRUERS 100 AND 1TH GRUERS

COMMON ELEMENTS

COMMON MATERIALS

OPEN MATERIALS INDEX

1ST AND 2ND ORDERS													3RD AND 4TH ORDERS												
PROCESSES AND PROPERTIES INDEX																									
<p>The surface tension of simple mixtures. V. K. Semen- enko, A. P. Gracheva and E. A. Davuklovskaya. <i>Soviet Metallurgical Science</i> 1935, No. 5, 159-60. In triple mixts. the surface tension within the limits of 0° and 80° does not depend upon the concn. of any one of the components; therefore it cannot serve as an indication of the presence of certain substances in the mixt. B. V. Shvartsberg</p>																									
ASNT-SSA METALLURGICAL LITERATURE CLASSIFICATION																									
1ST AND 2ND ORDERS													3RD AND 4TH ORDERS												

BC 11-1

PROCESSES AND PROPERTIES INDEX

Mutual solubility and surface tension. II. Surface tension and dipole moment. V. K. SEMENYACHENKO and T. N. IVANOVA (J. Gen. Chem. Russ., 1935, 5, 807-813).—The surface tension, σ , of H₂O, nicotine (I), and PhNO₂ (II) at 25° is depressed by PrCO-NH₂ (III), PrCl, PrCHO (IV), PrCN, PrOH, and PrCO₂H (V), to an extent which increases with the concn. In the case of H₂O no obvious connexion exists between surface activity and dipole moment, μ ; in (I) and (II) it rises with increasing μ for substances not containing N, and falls for those containing N. The crit. temp. of miscibility of (I) with H₂O is raised by (III) and (V), is unaffected by PrOH, and lowered by the remaining substances, to an extent which increases linearly with the concn. The val. of σ at 70° at a H₂O-(I) interface rises with increasing concn. of PrCl, (IV), and PrCN, but is practically unaffected by PrOH, and is lowered by (III) and (V). R. T.

A 58-51A METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS 3RD AND 4TH ORDERS

1ST AND 2ND ORDERS 3RD AND 4TH ORDERS

1ST AND 2ND ORDERS 3RD AND 4TH ORDERS

1ST AND 2ND ORDERS 3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

CR

The surface salting-out effect by electrolytes. II. Surface salting-out and the dielectric constants. V. K. Semchenko and E. A. Davidovskaya. *J. Phys. Chem.* (U. S. S. R.) 6, 37-44(1938).—Measurements on the surface tension of soins. of isoamyl alc. in water and in ethylene glycol in the presence of the electrolyte NaBr show that the salting-out effect of the electrolyte decreases strongly with a decrease of the dielec. const. of the solvent. This is explained on the basis of the generalized moments of the mols. In both solvents at a given concn. of isoamyl alc. the surface tension is independent of the concn. of NaBr. The surface tensions for Pr, Bu and Am alcs. are practically equal at the buffer point in NaBr soins.

III. Dependence of the surface tension on the temperature. V. K. Semchenko and A. F. Gracheva. *Ibid.* 4, 52.—In soins. of Bu alc. in water and in the presence of NaBr the salting-out effect of the electrolyte decreases with increase of temp. At a concn. of 4 M NaBr and for various concns. of Bu. alc. the surface tension is practically const. from 0° to 80°. The equation for surface tension $\gamma = \gamma_0 + \alpha \sqrt{c}$ is applicable from 0° to 40° where $\gamma_0 = 18.8, 254.3$ and 244.86 , and $\alpha = 213.0, 108.9$ and 45.7 at 0°, 20° and 40°, resp. F. H. Rathmann

2

A S M - S L A METALLURGICAL LITERATURE CLASSIFICATION

Science Literature

7 Heterogeneous reactions with atomic hydrogen. Reduction of oxides, sulfides and halogen compounds. Kh. S. Bagdasar'yan and V. K. Semenchepko. *J. Phys. Chem. (U. S. S. R.)* 6, 1005-8(1937). From studies of the reducing action of at. H on compds. of 22 common metals in the solid phase given as (+) or (-), it is concluded that the reducibility or nonreducibility is detd. by the heat necessary for disson. to the elements of the compd. and the ratio of ionic radius to charge, all results obtained being in accord with predictions from these considerations. F. H. Rathmann

GENERAL NOTE

CLASS. S. S. A. METALLURGICAL LITERATURE CLASSIFICATION

Science Literature

1ST AND 2ND ORDERS PROCESSES AND PROPERTIES INDEX 3RD AND 4TH ORDERS

BC a-1

Common Elements

Common Variable Index

Properties of metallic solutions. I. V. K. ШИШКОВИЧЕНКО (Acta Physicochim. U.R.S.S., 1936, 4, 690-704; of this vol., 1192).—The surface tension of amalgams of Mg, Co, Zn, Cd, Ag, Ca, Sr, Pb, Sn, Ba, Li, Na, K, Rb, and Cs has been determined for various concns. There is good agreement with the theory of generalized moments. The effect of minute quantities of impurities on the mechanical properties of metals and alloys, and that of surface-active metals on the mutual solubility of two metals are discussed. The action of promoters may be explained on the theory. A. J. M.

ASA-51A METALLURGICAL LITERATURE CLASSIFICATION

OPEN

MATERIALS INDEX

1ST AND 2ND ORDERS 3RD AND 4TH ORDERS

SEMENCHENKO, V. K.

PROCESSES AND PROPERTIES INDEX

190 AND 2TH ORDERS

La

A 54
5

3043. Properties of Metallic Solutions. Part I. W. K. Semenchenko. *Acta Physicochimica*, 4, 3, pp. 678-704, 1938. In English. The advantages of considering the generalised moment as a characteristic constant of a metal are emphasised. The mutual solubility of metals and the influence of impurities upon it, surface tension and the influence of impurities affecting the surface tension upon crystallisation are discussed from the generalised moment viewpoint. The surface phenomena described are of considerable importance in technology, as is shown. [See also Abstract 1061 (1936).] H. J. H. S.

COMMON ELEMENTS

MATERIALS INDEX

43-11A METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

1ST AND 2ND ORDERS

1ST AND 2ND ORDERS

SEMENCHENKO V. K. A 53
d

5021. Properties of Metallic Solutions. Part III. W. K. Semenchenko, B. P. Boring, N. L. Prokrovsky, in collaboration with E. E. Shvareva. *Acta Physicochimica*, 5. 2. pp. 181-192, 1950. In English.—In the study of the surface tension of amalgams the authors have found it necessary to prepare pure specimens and an account is given of the mode of preparation of those used in the present and in former work [see Abstracts 3043 and 4035 (1950)]. A complete series of values of the surface tension of the amalgams of Cs, Rb, K, Na, Li, Ba, Sr, Pb, Sn, Ag, Cu, Zn, Bi, Co, Mg and Cd at 18-20° C. is given. The data obtained for active metals at low concentrations satisfy Shishkovsky's equation but certain discrepancies are found in the experimental curves which are better represented by an equation derived by integrating the complete equation of Gibbs. The logarithm of the product of the constants in the Shishkovsky equation (= approximate value of the ultimate surface activation) is found to be a linear function of the difference of the generalised moments.

H. J. H. S.

ASB-55A METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

COMMON ELEMENTS

COMMON VARIABLES INDEX

1ST AND 2ND LETTERS

3RD AND 4TH LETTERS

GROUPS

LETTERS

ORDERS

2

***Properties of Metallic Solutions. III.—Surface Tension of Amalgams.**
 V. K. Semenchenko, B. P. Bering, and N. I. Pokrovskiy (with E. E. Scharovoy)
*(Acta Physicochimica U.R.S.S., 1936, 6, (2), 181-192 (in English); and
 Zhurnal Fizicheskoy Khimii (J. Phys. Chem.), 1936, 6, (3), 364-371 (in
 Russian)).— Cf. Met. Abs., this vol., p. 623. The surface tension at 18–20 C.
 and various concentrations was studied in the case of various amalgams con-
 taining caesium, rubidium, lead, tin, silver, copper, potassium, sodium, lithium,
 zinc, bismuth, cobalt, barium, strontium, magnesium, or cadmium. The
 values obtained for active metals at low concentrations satisfy Shishkovsky's
 equation. Divergence of the experimental curves from those of Shishkovsky
 occurs above a critical concentration which is a linear function of the activity
 limit. The experimental curves for surface concentration are much
 better expressed by: $\sigma_2 = \sigma + a \log (c/c_0 + 1) - bc$, obtained by integration
 of Gibbs' equation.—N. A.*

METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND GROUPS PROCESSES AND PROPERTIES

Common Elements

Density, heat capacity and compressibility of solutions of electrolytes. V. K. Semuchenko. *Uspekhi Khim.* 5, 641-61 (1959). - A review with a crit. discussion of data from the literature, chiefly for uni- and bivalent metal salts. F. H. Rathmann

ASH 51A METALLURGICAL LITERATURE CLASSIFICATION

147080

147082

147084

147086

147088

147090

147092

147094

147096

147098

147100

147102

147104

147106

147108

147110

147112

147114

147116

147118

147120

147122

147124

147126

147128

147130

147132

147134

147136

147138

147140

147142

147144

147146

147148

147150

147152

147154

147156

147158

147160

147162

147164

147166

147168

147170

147172

147174

147176

147178

147180

147182

147184

147186

147188

147190

147192

147194

147196

147198

147200

147202

147204

147206

147208

147210

147212

147214

147216

147218

147220

147222

147224

147226

147228

147230

147232

147234

147236

147238

147240

147242

147244

147246

147248

147250

147252

147254

147256

147258

147260

147262

147264

147266

147268

147270

147272

147274

147276

147278

147280

147282

147284

147286

147288

147290

147292

147294

147296

147298

147300

147302

147304

147306

147308

147310

147312

147314

147316

147318

147320

147322

147324

147326

147328

147330

147332

147334

147336

147338

147340

147342

147344

147346

147348

147350

147352

147354

147356

147358

147360

147362

147364

147366

147368

147370

147372

147374

147376

147378

147380

147382

147384

147386

147388

147390

147392

147394

147396

147398

147400

147402

147404

147406

147408

147410

147412

147414

147416

147418

147420

147422

147424

147426

147428

147430

147432

147434

147436

147438

147440

147442

147444

147446

147448

147450

147452

147454

147456

147458

147460

147462

147464

147466

147468

147470

147472

147474

147476

147478

147480

147482

147484

147486

147488

147490

147492

147494

147496

147498

147500

147502

147504

147506

147508

147510

147512

147514

147516

147518

147520

147522

147524

147526

147528

147530

147532

147534

147536

147538

147540

147542

147544

147546

147548

147550

147552

147554

147556

147558

147560

147562

147564

147566

147568

147570

147572

147574

147576

147578

147580

147582

147584

147586

147588

147590

147592

147594

147596

147598

147600

147602

147604

147606

147608

147610

147612

147614

147616

147618

147620

147622

147624

147626

147628

147630

147632

147634

147636

147638

147640

147642

147644

147646

147648

147650

147652

147654

147656

147658

147660

147662

147664

147666

147668

147670

147672

147674

147676

147678

147680

147682

147684

147686

147688

147690

147692

147694

147696

147698

147700

147702

147704

147706

147708

147710

147712

147714

147716

147718

147720

147722

147724

147726

147728

147730

147732

147734

147736

147738

147740

147742

147744

147746

147748

147750

147752

147754

147756

147758

147760

147762

147764

147766

147768

147770

147772

147774

147776

147778

147780

147782

147784

147786

147788

147790

147792

147794

147796

147798

147800

147802

147804

147806

147808

147810

147812

147814

147816

147818

147820

147822

147824

147826

147828

147830

147832

147834

147836

147838

147840

147842

147844

147846

147848

147850

147852

147854

147856

147858

147860

147862

147864

147866

147868

147870

147872

147874

147876

147878

147880

147882

147884

147886

147888

147890

147892

147894

147896

147898

147900

147902

147904

147906

147908

147910

147912

147914

147916

147918

147920

147922

147924

147926

147928

147930

147932

147934

147936

147938

147940

147942

147944

147946

147948

147950

147952

147954

147956

147958

147960

147962

147964

147966

147968

147970

147972

147974

147976

147978

147980

147982

147984

147986

147988

147990

147992

147994

147996

147998

148000

1ST AND 2ND ORDERS PROCESSES AND PROPERTIES INDEX

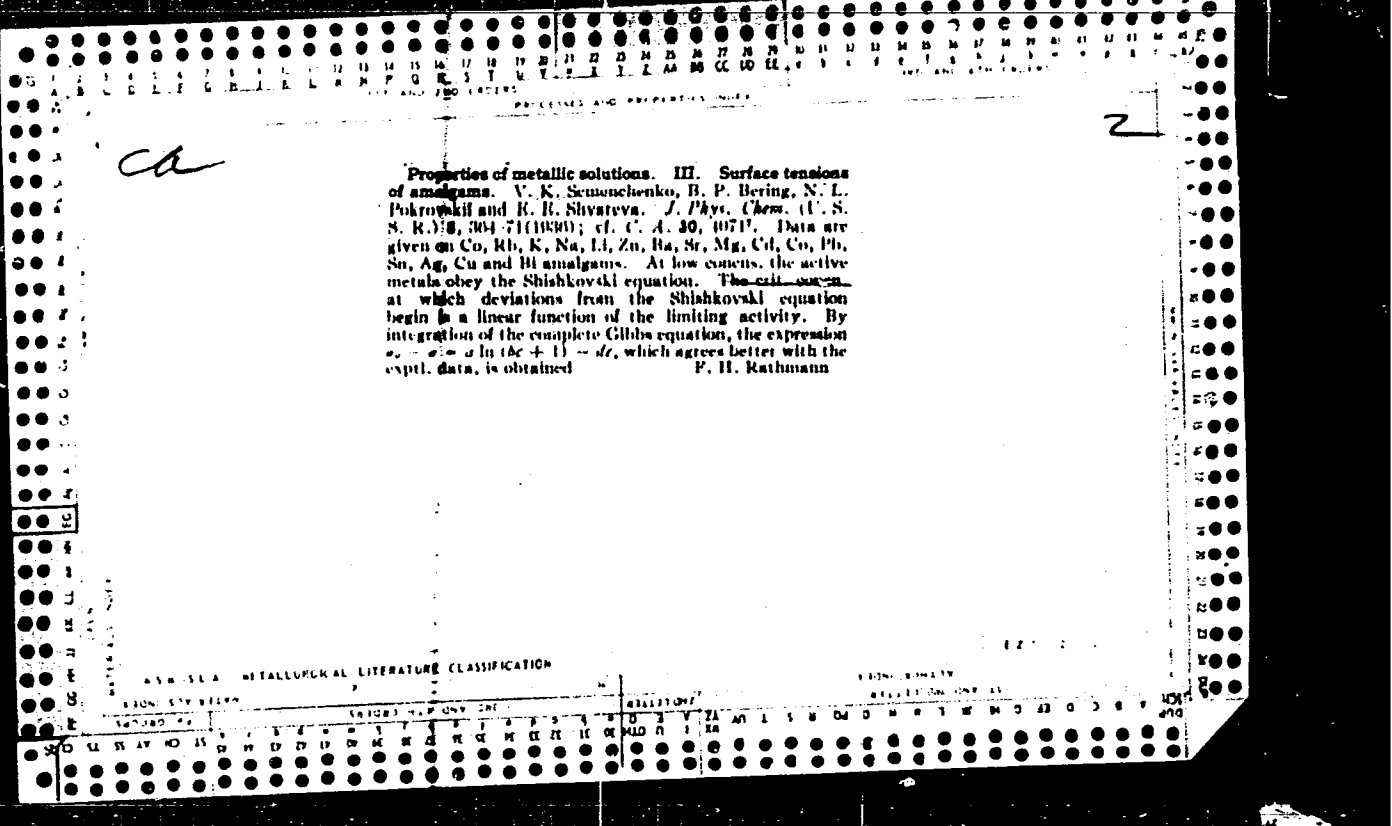
M

Z

*Properties of Metallic Solutions. I.—Theoretical. V. K. Semonchenko
(Zhurnal Fizicheskoy Khimii (J. Phys. Chem.), 1936, 7, (4), 601-608). — (In Russian.) In cases of mutual solubility and surface phenomena, the behaviour of the solute is determined by the difference between two quantities, one referring to the solvent and the other the solute, which S. calls "generalised moments." Liquid metal consists of ions, the potential energy of which is primarily determined by their relation to the surrounding electronic atmosphere, and $m \sim \frac{KZ}{r}$ may be taken as the "generalised moment," where $K = 4.774 \times 10^{-20}$, Z is the valency of the ion, and r the ionic radius. Expressions are derived for the surface tension and limiting surface activity. Determinations of the surface tension of different metal amalgams confirm the theory. Problems connected with the modification of alloys and the mutual solubility of metals are examined from the theoretical point of view. N. A.

A.S.M. S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---



SEMENOV, V. K., jt. au.

PAVLOV, Boris Alekseyevich, 1892-1947 short course in chemistry Izd. 2., stereotipnoe.
MOSKVA, Glav. red. khim. lit-ry, 1937. 326 p. Diamasterov sotsialisticheskogo truda)
(54-46986)

QB33.F355 1937

PROCESSES AND PROPERTIES INDEX

7

Surface tension of molten metals and alloys. II. Theory

of the surface tension of metals and alloys. V. K. Spichenchenko and N. L. Pokrovskii. *Vysokii Kataliz*, 6, 945 (1967); cf. C. A. 32, 8447. S. and P. discuss the electron theory of surface tension in pure metals from the standpoint of the thermodynamics of a two-dimensional electron gas, while for alloys they consider the ionic forces acting. By combining the mutual effects of both ions (and nuclei) and electrons, they obtain the equation $\ln G = \ln B' + \gamma (m_0 - m_1) - \ln (V_0 - V_1)$, where G is the surface tension, m_0 and m_1 are the generalized moments of the solvent and solute ions, γ is a function of temp. and nature of the solvent, V_0 and V_1 are the at. vols. of solvent and solute and B' is a characteristic const., and find that it agrees quite well with exptl. data from the literature.
F. H. Rathmann

ASA-SSA METALLURGICAL LITERATURE CLASSIFICATION

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45

1ST AND 2ND ORDERS PROCESSES AND PROPERTIES INDEX 3RD AND 4TH ORDERS

LA

Association of molecules in solutions of electrolytes.
V. K. Samoshenko, *Ispolki Khim.* 7, 667-712 (1938).—
The Debye-Hückel theory, quasi-molecules and complexes, the Bjerrum function theory and the Fuoss-Kraus complex-ion theory, anomalous elec. cond. and its theoretical interpretation and av. relative kinetic energies of ions are discussed and mathematically treated. F. H. R.

2

GROUP LETTERS

GROUP LETTERS

ASAC-5/A METALLURGICAL LITERATURE CLASSIFICATION

GROUP LETTERS

GROUP LETTERS

CA

2

Dispersed phase and phase transitions of the second order. V. K. Semenovich (Inst. of Gen. and Inorg. Chem., Acad. Sci. U.S.S.R.), *Izv. Sektora Fiz. Khim. Akad. Nauk S.S.S.R.*, 19, 39 (1949). The dispersed phase, usually regarded as a nonequilibrium phase, is considered an equilibrium state indeed, as in the case of vapor condensation near its critical point. First are formed molecular or atomic complexes with an increasing number of units. The complexes increase to an extent where opalescence appears. At this point the system is, for example, an aerosol. Gradually, the aerosol may change to a foam, which phase differs but slightly from a liquid. Given certain T , p , and μ conditions, the dispersed phase can remain as such indefinitely. A phase transition of the 2nd order is defined as one in which: (1) The heat of transition is zero, i.e., the entropies of both phases are equal. (2) The heat capacities either have a break or pass through a very sharp maximum. (3) The thermal coefficients change in a manner similar to the heat capacities. The contention that a dispersed phase is an equilibrium phase is analyzed and illustrated with the case of ferromagnetic \rightarrow paramagnetic transformation and of order being attained in alloys. M. Hoesch

1ST AND 2ND ORDERS PROCESSES AND PROPERTIES MORE 3RD AND 4TH ORDERS

ca

The action of admixtures upon the mutual solubility of fused salts. V. K. Semenchko and T. I. Shashkina. *Compt. rend. acad. Sci. U.S.S.R.* 30, 126-8(1941)(in English).—Values are given in tabular and graphic form for the crit. soln. temp. of 1 mol. % of CsCl, RbCl, KCl, LiCl, BaCl₂, SrCl₂, CaCl₂, MgCl₂, BeCl₂, KI, KBr, KCl or KF in 1:3, 1:1 and 3:1 mols., resp., of TlBr and KNO₃. The value of Δt (change in crit. soln. temp. per 1 mol. % of added salt) varies with the generalized moment (z/r , where z is the charge and r the radius) of the ions except with Cs. When the Δt values are plotted against values of the generalized moment of the ions, sep. groups of curves are obtained for alk. and alk. earth cations, which indicates that generalized moment values only roughly approximate the characteristics of ions. The results agree with the theory of Semenchko and Davidovskaya (*C. A.* 29, 7762¹).
G. W. Avers

7762. Lab. Chemical Synthesis, All-Union Inst. General and Applied Chem., Penzance Inst. - 1941

ASS-51A METALLURGICAL LITERATURE CLASSIFICATION

GROUPS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

12/1/66

12. 5. *Admixture*
crystal

Generalisation of the Gibbs-Curie theorem for mixed crystals.
V. K. Sementchanko (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **22**,
175—177).—The effect of admixtures on equilibrium crystal form
depends on the manner of their adsorption at the liquid-crystal
interface. Positive adsorption retards crystal growth at low concn.
and accelerates it at high concn.; negative adsorption has the
reverse effect. L. J. J.

SEYMEN, S. S.

"Mendeleev and Atomic Physics"

Komsomol'skaya Pravda, Sept. 20, 1945

Abstracted in USAF "Treasure Island" Report No. 64217 on file in Library of Congress,
Air Information Division.

BC

PROCESSES AND PROPERTIES INDEX

Effect of admixtures on the liquefaction of salt systems. V. K. Seimentschenko and T. I. Schaschkina (*J. Phys. Chem. Russ.*, 1945, 19, 132-141).—The temp. θ of complete mixing of TlBr and KNO₃ melts is determined from the electrical conductivity of the system; the max. val. of θ is 800° at 50 mol.-%. 1 mol.-% of CaCl₂ does not affect θ ; other salts lower it in the orders Ca < Rb < K < Li < Na < Sr < Ca < Mg < Ba and I < Br < Cl < F; 1 mol.-% of BaCl₂ lowers the max. θ by 115°. The effect of an ion is $\propto z/r$, z being valency and r the crystallographic radius of the ion. Small admixtures of salts lower θ relatively > do larger admixtures.

I. I. B.

434-51A METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS PROCESSES AND PROPERTIES INDEX 4TH AND 5TH ORDERS

CA

2

Thermodynamics of small bodies. II. -V. K. Semenchenko (Inst. Phys., Univ. Moscow). *J. Phys. Chem. (U.S.S.R.)* 19, 350-7(1948); cf. C.A. 40, 511'.—Two-component crystals are discussed. III. *Ibid.* 420-32.—Effect of surface tension on m.p., etc., is discussed. I. I. Bikerman

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

COMMON ELEMENTS

COMMON LITERATURE

1ST AND 2ND ORDERS 4TH AND 5TH ORDERS

BC

11

Influence of admixtures on the liquefaction of salt systems. V. Sementschenko and T. Schaschkina (*Acta Physicochim. U.R.S.S.*, 1945, **20**, 753—768).—The crit. solution temp., T_m , of two fused salts can be determined with an accuracy of 0.5% from the change in the electrical conductivity when two phases unite into one or vice versa. The system KNO_3 - $TlBr$, as modified by the addition of numerous halides (1.0 and 0.5 mol. %), has been examined by this method. The reduction in T_m is determined by the generalised moment of the ions of the added halide, the effect in increasing mutual solubility increasing in the orders $Ca' < Rb' < K' < Li' < Ba'' < Sr'' < Ca'' < Mg'' < Be''$, and $I' < Br' < Cl' < F'$. The phenomena are interpreted as follows: the introduction of ions with high generalised moments increases the adsorption of the surface-active component at the interface of the liquid phases. This increase of adsorption not only compensates the increase of the surface tension (γ) at the interface produced by the introduction of the admixture, but even overcomes it and γ decreases. The decrease of γ is equiv. to the decrease of the potential barrier at the interface and leads to an increase in the solubility and a reduction of T_m .

C. R. H.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

117 AND 118 COLUMNS

119 AND 120 COLUMNS

COMMON ELEMENTS

COMMON ELEMENTS

CA

PRINCIPLES AND PROPERTIES INDEX

Determination of the free surface energy of crystals.
V. K. Semakhanov: *Compt. rend. acad. sci. U.R.S.S.* 48, 96-9 (1948); *Doklady Akad. Nauk S.S.S.R.* 48, 102-3 (1948).—Math. A method of detg. the free surface energy of solids and solid solns. is presented. It has the advantage of being rigorous, but its chief shortcoming is the narrow temp. range in which it is applicable.
Frank Conet

AS. M. I. A. METALLURGICAL LITERATURE CLASSIFICATION

RESEARCH SUBJECTS

117 AND 118 COLUMNS

119 AND 120 COLUMNS

GROUPS	ORDER	LETTERS	LETTERS
U	S	A	Q
L	R	Z	P
K	Q	Y	O
J	P	X	N
I	O	W	M
H	N	V	L
G	M	U	K
F	L	T	J
E	K	S	I
D	J	R	H
C	I	Q	G
B	H	P	F
A	G	O	E
Z	F	N	D
Y	E	M	C
X	D	L	B
W	C	K	A
V	B	J	Z
U	A	I	Y
T	Z	H	X
S	Y	G	W
R	X	F	V
Q	W	E	U
P	V	D	T
O	U	C	S
N	T	B	R
M	S	A	Q
L	R	Z	P
K	Q	Y	O
J	P	X	N
I	O	W	M
H	N	V	L
G	M	U	K
F	L	T	J
E	K	S	I
D	J	R	H
C	I	Q	G
B	H	P	F
A	G	O	E
Z	F	N	D
Y	E	M	C
X	D	L	B
W	C	K	A
V	B	J	Z
U	A	I	Y
T	Z	H	X
S	Y	G	W
R	X	F	V
Q	W	E	U
P	V	D	T
O	U	C	S
N	T	B	R
M	S	A	Q
L	R	Z	P
K	Q	Y	O
J	P	X	N
I	O	W	M
H	N	V	L
G	M	U	K
F	L	T	J
E	K	S	I
D	J	R	H
C	I	Q	G
B	H	P	F
A	G	O	E
Z	F	N	D
Y	E	M	C
X	D	L	B
W	C	K	A
V	B	J	Z
U	A	I	Y
T	Z	H	X
S	Y	G	W
R	X	F	V
Q	W	E	U
P	V	D	T
O	U	C	S
N	T	B	R
M	S	A	Q
L	R	Z	P
K	Q	Y	O
J	P	X	N
I	O	W	M
H	N	V	L
G	M	U	K
F	L	T	J
E	K	S	I
D	J	R	H
C	I	Q	G
B	H	P	F
A	G	O	E
Z	F	N	D
Y	E	M	C
X	D	L	B
W	C	K	A
V	B	J	Z
U	A	I	Y
T	Z	H	X
S	Y	G	W
R	X	F	V
Q	W	E	U
P	V	D	T
O	U	C	S
N	T	B	R
M	S	A	Q
L	R	Z	P
K	Q	Y	O
J	P	X	N
I	O	W	M
H	N	V	L
G	M	U	K
F	L	T	J
E	K	S	I
D	J	R	H
C	I	Q	G
B	H	P	F
A	G	O	E
Z	F	N	D
Y	E	M	C
X	D	L	B
W	C	K	A
V	B	J	Z
U	A	I	Y
T	Z	H	X
S	Y	G	W
R	X	F	V
Q	W	E	U
P	V	D	T
O	U	C	S
N	T	B	R
M	S	A	Q
L	R	Z	P
K	Q	Y	O
J	P	X	N
I	O	W	M
H	N	V	L
G	M	U	K
F	L	T	J
E	K	S	I
D	J	R	H
C	I	Q	G
B	H	P	F
A	G	O	E
Z	F	N	D
Y	E	M	C
X	D	L	B
W	C	K	A
V	B	J	Z
U	A	I	Y
T	Z	H	X
S	Y	G	W
R	X	F	V
Q	W	E	U
P	V	D	T
O	U	C	S
N	T	B	R
M	S	A	Q
L	R	Z	P
K	Q	Y	O
J	P	X	N
I	O	W	M
H	N	V	L
G	M	U	K
F	L	T	J
E	K	S	I
D	J	R	H
C	I	Q	G
B	H	P	F
A	G	O	E
Z	F	N	D
Y	E	M	C
X	D	L	B
W	C	K	A
V	B	J	Z
U	A	I	Y
T	Z	H	X
S	Y	G	W
R	X	F	V
Q	W	E	U
P	V	D	T
O	U	C	S
N	T	B	R
M	S	A	Q
L	R	Z	P
K	Q	Y	O
J	P	X	N
I	O	W	M
H	N	V	L
G	M	U	K
F	L	T	J
E	K	S	I
D	J	R	H
C	I	Q	G
B	H	P	F
A	G	O	E
Z	F	N	D
Y	E	M	C
X	D	L	B
W	C	K	A
V	B	J	Z
U	A	I	Y
T	Z	H	X
S	Y	G	W
R	X	F	V
Q	W	E	U
P	V	D	T
O	U	C	S
N	T	B	R
M	S	A	Q
L	R	Z	P
K	Q	Y	O
J	P	X	N
I	O	W	M
H	N	V	L
G	M	U	K
F	L	T	J
E	K	S	I
D	J	R	H
C	I	Q	G
B	H	P	F
A	G	O	E
Z	F	N	D
Y	E	M	C
X	D	L	B
W	C	K	A
V	B	J	Z
U	A	I	Y
T	Z	H	X
S	Y	G	W
R	X	F	V
Q	W	E	U
P	V	D	T
O	U	C	S
N	T	B	R
M	S	A	Q
L	R	Z	P
K	Q	Y	O
J	P	X	N
I	O	W	M
H	N	V	L
G	M	U	K
F	L	T	J
E	K	S	I
D	J	R	H
C	I	Q	G
B	H	P	F
A	G	O	E
Z	F	N	D
Y	E	M	C
X	D	L	B
W	C	K	A
V	B	J	Z
U	A	I	Y
T	Z	H	X
S	Y	G	W
R	X	F	V
Q	W	E	U
P	V	D	T
O	U	C	S
N	T	B	R
M	S	A	Q
L	R	Z	P
K	Q	Y	O
J	P	X	N
I	O	W	M
H	N	V	L
G	M	U	K
F	L	T	J
E	K	S	I
D	J	R	H
C	I	Q	G
B	H	P	F
A	G	O	E
Z	F	N	D
Y	E	M	C
X	D	L	B
W	C	K	A
V	B	J	Z
U	A	I	Y
T	Z	H	X
S	Y	G	W
R	X	F	V
Q	W	E	U
P	V	D	T
O	U	C	S
N	T	B	R
M	S	A	Q
L	R	Z	P
K	Q	Y	O
J	P	X	N
I	O	W	M
H	N	V	L
G	M	U	K
F	L	T	J
E	K	S	I
D	J	R	H
C	I	Q	G
B	H	P	F
A	G	O	E
Z	F	N	D
Y	E	M	C
X	D	L	B
W	C	K	A
V	B	J	Z
U	A	I	Y
T	Z	H	X
S	Y	G	W
R	X	F	V
Q	W	E	U
P	V	D	T
O	U	C	S
N	T	B	R
M	S	A	Q
L	R	Z	P
K	Q	Y	O
J	P	X	N
I	O	W	M
H	N	V	L
G	M	U	K
F	L	T	J
E	K	S	I
D	J	R	H
C	I	Q	G
B	H	P	F
A	G	O	E
Z	F	N	D
Y	E	M	C
X	D	L	B
W	C	K	A
V	B	J	Z
U	A	I	Y
T	Z	H	X
S	Y	G	W
R	X	F	V
Q	W	E	U
P	V	D	T
O	U	C	S
N	T	B	R
M	S	A	Q
L	R	Z	P
K	Q	Y	O
J	P	X	N
I	O	W	M
H	N	V	L
G	M	U	K
F	L	T	J
E	K	S	I
D	J	R	H
C	I	Q	G
B	H	P	F
A	G	O	E
Z	F	N	D
Y	E	M	C
X	D	L	B
W	C	K	A
V	B	J	Z
U	A	I	Y
T	Z	H	X
S	Y	G	W
R	X	F	V
Q	W	E	U
P	V	D	T
O	U	C	S
N	T	B	R
M	S	A	Q
L	R	Z	P
K	Q	Y	O
J	P	X	N
I	O	W	M
H	N	V	L
G	M	U	K
F	L	T	J
E	K	S	I
D	J	R	H
C	I	Q	G
B	H	P	F
A	G	O	E
Z	F	N	D
Y	E	M	C
X	D	L	B
W	C	K	A
V	B	J	Z
U	A	I	Y
T	Z	H	X
S	Y	G	W
R	X	F	V
Q	W	E	U
P	V	D	T
O	U	C	S
N	T	B	R
M	S	A	Q
L	R	Z	P
K	Q	Y	O
J	P	X	N
I	O	W	M
H	N	V	L
G	M	U	K
F	L	T	J
E	K	S	I
D	J	R	H
C	I	Q	G
B	H	P	F
A	G	O	E
Z	F	N	D
Y	E	M	C
X	D	L	B
W	C	K	A
V	B	J	Z
U	A	I	Y
T	Z	H	X
S	Y	G	W
R	X	F	V
Q	W	E	U
P	V	D	T
O	U	C	S
N	T	B	R
M	S	A	Q
L	R	Z	P
K	Q	Y	O
J	P	X	N
I	O	W	M
H	N	V	L
G	M	U	K
F	L	T	J
E	K	S	I
D	J	R	H
C	I	Q	G
B	H	P	F
A	G	O	E
Z	F	N	D
Y	E	M	C
X	D	L	B
W	C	K	A
V	B	J	Z
U	A	I	Y
T	Z	H	X
S	Y	G	W
R	X	F	V
Q	W	E	U
P	V	D	T
O	U	C	S
N	T	B	R
M	S	A	Q
L	R	Z	P
K	Q	Y	O
J	P	X	N
I	O	W	M
H	N	V	L
G	M	U	K
F	L	T	J
E	K	S	I
D	J	R	H
C	I	Q	G
B	H	P	F
A	G	O	E
Z	F	N	D
Y	E	M	C
X	D	L	B
W	C	K	A
V	B	J	Z
U	A	I	Y
T	Z	H	X
S	Y	G	W
R	X	F	V
Q	W	E	U
P	V	D	T
O	U	C	S
N	T	B	R
M	S	A	Q
L	R	Z	P
K	Q	Y	O
J	P	X	N
I	O	W	M
H	N	V	L
G	M	U	K
F	L	T	J
E	K	S	I
D	J	R	H
C	I	Q	G
B	H	P	F
A	G	O	E
Z	F	N	D
Y	E	M	C
X	D	L	B
W	C	K	A</

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200

PROCESSES AND PROPERTIES INDEX

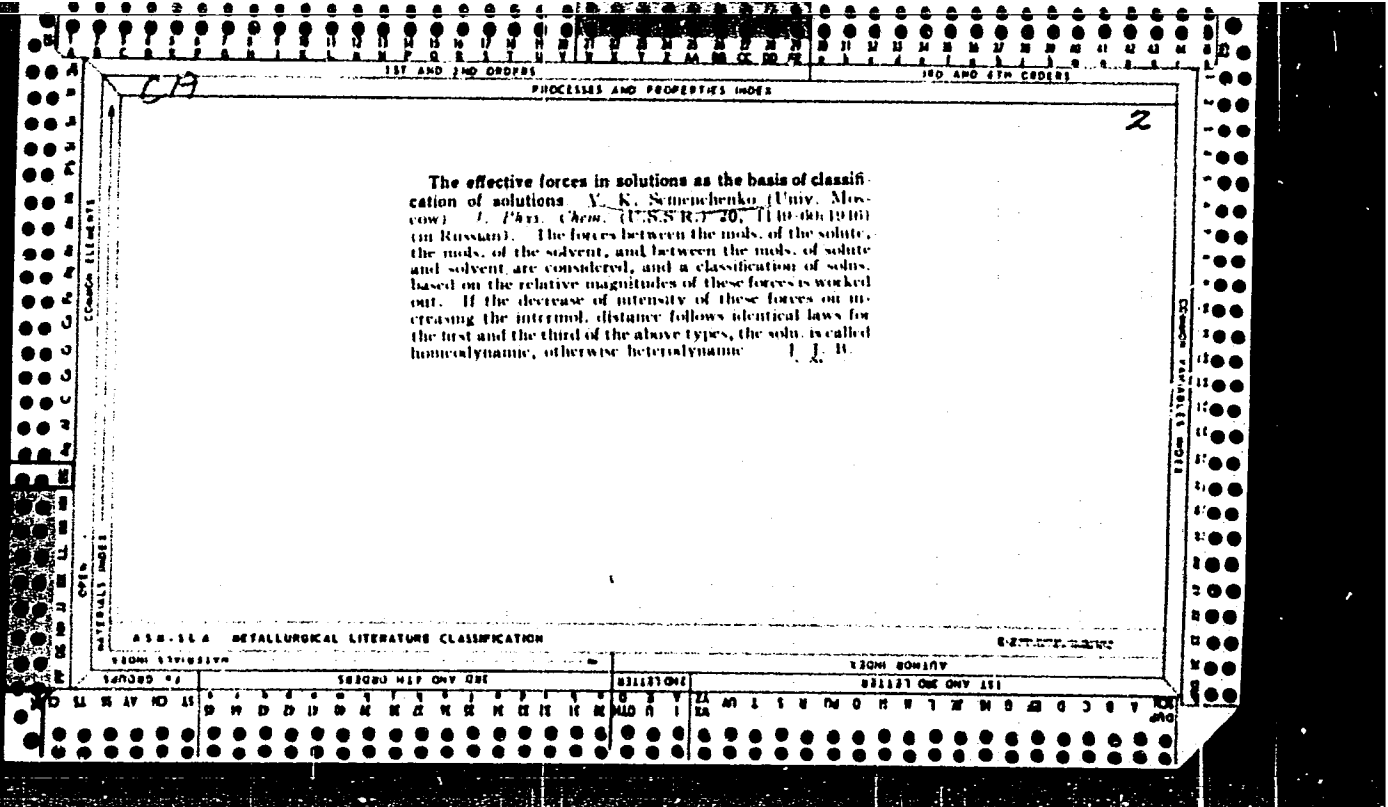
3

CA

Present state of the periodic law and the new elements.
V. K. Semmchenko and V. V. Kerobov. *Uspekhi Khim.*
15, 667-84(1946).- Crit. review of recent advances in
nuclear structure and transmutations, including Np and
Pu. 30 references. N. Thon

ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION

101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200



PROCESS AND PROPERTY INDEX

2

Some statements of the general theory of solutions. V. K. Semchenko. *Vysish Moskov. Univ.* 1967, No. 5, 40-52. (1) Soly. is represented as a function of the difference of the "generalized moments" m of solvent and solute, the m expressing the reaction of the given mol. sort to the mol. field. In the simplest case, m is the proportionality factor between the potential energy of the mol. considered and the potential of the mol. field of the other mol. sort. The generalized soly. curve as a function of the difference of the m consists of an ascending portion, a max. corresponding to equality of m of solute and solvent, and a descending branch. Verification is attempted by identifying m with either the dielec. consta. ϵ or the dipole moments multiplied by Avogadro's no. and divided by the mol. vols. With this convention, the solubilities of α -HOC₂H₄NO₂ and of PhCO₂H in various solvents, plotted as a function of the difference (ϵ), give the complete curve with ascending branch, max., and descending branch; the soly. curve of Rn shows only the descending branch; that of KBr only the ascending branch. For metals, m is assumed to be represented by es/r here e = elementary charge, s = valence of the metal ion, r = its radius. With this assumption, the soly. of Ag in various liquid metals (at 774°) gives the complete curve with max.; the soly. of Ca (at 450° and at 786°) gives only the descending branch. (2) Expressions are derived for the activity coeff. of the solute, the vapor pressure of the solvent, the heat of diln., the sp. heat of the soln., and the surface activity of the solute, as a function of the difference of the m . It is shown that at equality of the m of solvent and solute, the soln. is ideal at any concn. (3) The properties of a given soln. are detd. by its position on the generalized soly. curve as a function of the difference of the m . Solns. represented by a point on the ascending branch have an activity coeff. less than 1, a vapor pressure of the solvent lower than that of the ideal soln., a neg. heat of diln., and a neg. surface activity, and vice versa. Solns. represented by points situated symmetrically on both sides of the max., are "corresponding solns." in the sense that the solubilities are equal and the above thermodynamic properties of opposed signs. Such corresponding solns. have the same form of the soly.-temp. curve. The closer a soln. is situated to the max. of the generalized soly. curve, the more nearly linear its soly.-temp. curve. N. Thompson

ASB-15A METALLURGICAL LITERATURE CLASSIFICATION

FROM SOLNTRY

1ST AND 2ND ORDER

3RD AND 4TH ORDER

SEMENCHENKO, V. K.

PA 18T93

USSR/Chemistry - Surface Tension
Chemistry - Crystallization

May 1947

"Surface Tension and Crystallization--I: The Surface
Tension of Melted Salts," V. K. Semenchenko, L. P.
Shitobalova, 10 pp

"Zhur Fiz Khim" Vol XXI, No 5-~~pp~~. 613-12

Experiments carried out on melted salts with tempera-
tures of 315 to 900 degrees C. Graphs, table and
diagrams included. For the theoretical explanation
of the effect of salt, there was evolved the formula
which determines the relative deliquescence of crystals
from concentrations of ingredients measurements of
crystals and their surface tension. Published 10 Nov
18T93

USSR/Chemistry - Surface Tension (Contd) May 1947
Chemistry - Crystallization

1946. Moscow State University, Imeni Lomonosov,
Laboratory of the Physics of Solutions.

18T93

SEMENCHENKO, V. K.

FA 14T108

USSR/Surface Tension
Salts

Jun 1947

"The Surface Tension of Solutions of Fused Salts,"
V. K. Semenchenko, L. P. Shikhobalova, 8 pp

"Zhur Fiz Khim" Vol XXI, No 6

Method of experiment and evaluation of results.
Diagram of apparatus and tables of results derived
from using salts composed of $\text{Li}_2\text{SO}_4 + \text{KCl}$, $\text{Li}_2\text{SO}_4 + \text{CsCl}$, $\text{Li}_2\text{SO}_4 + \text{Ba Cl}_2$, and $\text{Li}_2\text{SO}_4 + \text{RbCl}$.

14T108

2

Surface tension of solutions of molten salts. II. V. K. Semerchenko and L. P. Shikobalova (State Univ., Moscow) *Phys. Chem. (U.S.S.R.)* 21, 707-14 (1947) (in Russian); cf. *C.A.* 41, 6788f. — Surface tension σ of 6 binary melts was detd. by the method of the max. bubble pressure. The σ of unmixed salts at 900° and 1100°, resp., are: Li_2SO_4 , 224 and 211 dynes/cm., NaCl 109 and 95, KCl 91 and 75, RbCl 83 and 68, CaCl_2 72 and 59 (at 1050°), and BaSO_4 , 175 (1000°) and 172 (1050°). K_2SO_4 at 1075° has $\sigma = 144.3$. The error is ± 1 dyne/cm. The σ of Li_2SO_4 is lowered by the above chlorides, more so the smaller the σ of the chloride. At about 1-5 mol.% of the chloride σ is independent of its concn.; otherwise, the curve of σ against mole fraction is regular and slightly convex toward the origin of the coordinates. The curve for $\text{Li}_2\text{SO}_4 + \text{BaCl}_2$ has a min. (163 at 1000°) at the equimol. compn. For all melts the curve of σ against temp. is slightly concave toward the origin of the coordinates. The value of σ is detd. by the "generalized moment" of the ion, i.e., its charge divided by its crystallographic radius. The greater the difference between the "generalized moments" of the ions of solvent and solute, the greater the surface activity. J. J. Bikerman

COMMON ELEMENTS
COMMON VARIABLES INDEX
MATERIALS INDEX
METALLURGICAL LITERATURE CLASSIFICATION
A 5 N 5 L A
1ST AND 2ND LETTERS
1ST AND 2ND LETTERS

PROCESSING AND PROPERTIES INDEX

2

ca

Surface tension of solutions of molten salts. III. V. K. Semenchenko and L. P. Shaikholova (State Univ., Moscow). *J. Phys. Chem. (U.S.S.R.)* 21, 1387-1401 (1947) (in Russian); cf. *C.A.* 42, 2169f.—The surface tension σ of molten alkali sulfates steeply decreases on addn. of alkali chlorides, then remains const., and decreases again to the σ of molten chlorides. The σ of mixts. of Li_2SO_4 with NaCl , KCl , RbCl , and CsCl is const. between 1 and 3, 1 and 3, 0.5 and 1, and 0.35 and 1 mol. %, resp., of the chloride. The σ of mixts. of Na_2SO_4 with NaCl , RbCl , and NaI is const. between 1 and 2, 1 and 3, and 0.35 and 1% of the halide; and the σ of mixts. of K_2SO_4 with KCl and RbCl is const. between 1 and 2, and 1 and 4%, resp., of the chloride. There is no region of const. σ in the system LiCl-RbCl . The σ of Na_2SO_4 at 900° and 1000° is 192 and 183 dynes/cm., resp.; and of LiCl and RbCl at 780° , 127 and 96 dynes/cm., resp. The adsorption calcd. from σ passes through 3 max. The first max., at small chloride concns., is connected with the adsorption of Cl^- , and the 2nd max. represents adsorption of cations. Equations are derived for the relation between σ , concn., and the "generalized moments" of the ions; they account for the exptl. σ -concn. curves.

J. J. Bikerman

ASB-31A METALLURGICAL LITERATURE CLASSIFICATION

Common Variable Index

Common Element Index

Material Index

Open

ASB-31A METALLURGICAL LITERATURE CLASSIFICATION

Common Variable Index

Common Element Index

Material Index

Open

SEMNICHENKO, V.K.

Second Order Phase Transitions
and Critical Phenomena

V.K. Semnichenko

Transitions which occur without changes in volume or entropy, but which show discontinuities in specific heat and thermal expansion have been designated second order transitions by Ehrenfest, and include transformations of ferro-magnetics into paramagnetics and the two transitions in the superstate, surface conductivity and surface viscosity. The thermodynamic basis for the transitions derived by Ehrenfest from the Clausius-Clapeyron equation is shown. Second order phase transitions in two-component systems, particularly solid solutions, are discussed. The molecular mechanism is also treated, and finally thermal and other coefficients are interpreted statistically.

(BIBL. 15)

(N.R.C. tech Transl. (TT-108), 13pp., 1949, Canada)

Zh. fiz. Khim.
21 (12), 1461-1469
1947

U.S.S.R.

SEMENCHENKO, V. K.

PA 64T16

USSR/Chemistry - Solubility, Equation of Feb 1948
Chemistry - Organic Compounds

"A Check of the General Equation of Solubility,"
V. K. Semenchenko, Moscow State U imeni M. V.
Lomonosov, M. I. Shakhparonov, Lab of Phys Solu-
tions, Moscow, 11 $\frac{1}{4}$ pp

"Zhur Fiz Khim" Vol XXII, No 2

Previously submitted equations for solubility were confirmed on the basis of experimental data obtained during studies on the organic bonds of the aromatic series, aliphatic series, and weak, average, and strong electrolytes and elements having dipole

64T16

SEMENCHENKO, V.K.

USSR/Chemistry - Solubility
Chemistry - Metals

Apr 1948

PA 67718
"Solubility of Metals and Generalized Moment,"
V.K. Semenchenko, P.P. Puzoshevich, Moscow State U
niversity; Sci Res Inst of Phys, Moscow,
4 pp

"Zhur Fiz Khim" Vol XXII, No 4

Graphic method to calculate the solubility of Na, Au, Ag, As, Ga, Bi, Cu, and Si in various metals. Makes use of state diagrams. Shows how the generalized moment can be determined from the state of the metal and the compressibility curve or the curve showing
67718

USSR/Chemistry - Solubility (Contd) Apr 1948
thermal expansion. Submitted 4 Jul 1947.

67718

SEMENCHENKO, V. K.

PA 45/49T25

USSR/Chemistry - Colloids
Chemistry - Absorption

Mar/Apr 49

"Molecular Theory of Surface Phenomena in Solutions:
II, Absorption in Mixtures With Many Components,"
V. K. Semenchko, Phys Faculty, Moscow Ord of
Lenin State Univer. M. V. Lomonosov, 6½ pp

"Kolloid Zhur" Vol XI, No 2

Purely mathematical treatment of problem. Sub-
mitted 2 Apr 48.

45/49T25

CA

2

Viscosity of binary liquid systems in the critical region.
V. K. Semenchenko and E. I. Zorina. *Doklady Akad. Nauk S.S.S.R.* 73, 331-2(1950).—The previously reached conclusion that the process underlying most Tur-outer transitions is the formation of disperse system (C.A. 42, 5221A), and that the point of reversal of the emulsion formed near the crit. temp. of mixing of a binary liquid system calls for a max. of the viscosity η at that point (*Vestnik Moskov. Gosudarst. Univ.* 3, No. 11, 103 (1948)), was tested by detns. of η as a function of the temp., for mixts. of $C_{12}H_{10}$ with $PhNO_2$, 38.5, 40.2, 42.4, 43.0, and 43.7 mol. % of the latter. Near the crit. temp., readings were made by temp. intervals of the order of 0.02°. At all the above compos., the curves showed very sharp peak-shaped maxima, extending over a temp. interval of 1.25-1.75°. Even more pronounced are the peaks of the temp.-coeff. $d\eta/dt$. Their position can be used for an accurate detn. of the crit. temp. of mixing of the given system.
N. Tsau

CA

Chemocritical phenomena. V. K. Semenchko. *Doklady Akad. Nauk S.S.S.R.* 74: 335-7(1958).—Thermodynamic formulation of the point of view according to which the crit. region, which has a finite extension, rather than a single crit. point, represents a region of progressive "thawing" of one phase, remaining distinct from the other phase throughout the process, implies the identity of crit. phenomena and of phase transitions of the 2nd kind. From the expression of the thermodynamic potential of a system of 2 phases, a general expression is derived for heat capacity, thermal expansion, and the temp. coeffs. of magnetic and elec. polarization, or, in a general form, for the deriv. of a generalized coordinate with respect to a generalized force, involving passage of the corresponding function through a max. The equations remain valid for a system involving chem. changes not accompanied by a change of the total no. of mols., e.g. isomerization. Such systems can be the seat of chemocrit. phenomena manifesting themselves in a max. of the heat capacity or of thermal or force coeffs. Inasmuch as He II can be thought of as a dynamic isomer of He I, or more exactly as a soln. of a zero-entropy dynamic isomer of He in He I, the transition between He I and He II can be interpreted as a chemocrit. phenomenon. Generally, the crit. region has 2 limits, one corresponding to zero concn. of mols. of one phase, the other to zero concn. of mols. of the other phase. Consequently, there may exist 2 crit. temps.; this so far has been observed only in some solns. and semiconductors. Certain anomalies of the heat capacity and other thermal and force coeffs. observed in polymers may also represent chemocrit. phenomena. . . . N. Thon

SEMENCHENKO, V.K.

28/1010(OT/1003) 536.763

Phase Transitions of the Second Zh.fiz.Khim.
Order and the Critical Phenomena; 2- 25,121-126
The Thermodynamics of the Generalized 1951
Critical Phenomena

V. K. Semenchenko

U.S.S.R.

Equations for the generalized critical phenomena are deduced on the basis of the general condition of thermodynamic stability in the critical phase. The equations obtained have been compared with the Ehrenfest equations, and the conditions under which they are transformed into the Ehrenfest equations are explained. (Bibl.6)
(N.R.C. tech. Translation (TT-242), 15pp., 1952, Canada)

SEMENCHENKO, V. K.

185T14

USSR/Chemistry - Phase Conversions Mar 51

"Phase Conversions of the Second Order and Critical Phenomena: III. Heat Capacity of Liquid Binary Systems in the Critical Region of Layer-Formation," V. K. Semenchenko, V. P. Skripov, Inst Phys, Moscow State U imeni M. V. Lomonosov

"Zhur Fiz Khim" Vol XXV, No 3, pp 362-368

Using specially designed calorimeter, measured heat capacity of binary mixts (triethylamine-H₂O and nitrobenzene-hexane) in crit region of layer-formation by method of cooling. Results

185T14

USSR/Chemistry - Phase Conversions Mar 51
(Contd)

compared with those by direct measurement. Heat capacity in crit region, rising after 1-1.50 to temp of layer-formation, passes through finite max. Secondary max appears in absense of crit concn of mixt.

185T14

Fundamental concepts and definitions of thermodynamics of solutions. V. K. Semenchenko. *Doklady Akad. Nauk S.S.S.R.* 77, 839-41(1951); Properties of the activity coeffs. f are derived for 4 types of soly. in binary systems: (I) the soly. of both components is limited, i.e. there can be thermodynamic equil. of the mixt. with the pure phases; (II) the soly. of both components is limited, but the mixt. cannot be in equil. with the pure phases, only with a mixt. of another compn.; (III) the soly. of one component is limited and the soln. can be in equil. only with that component; the soly. of the other component is unlimited; (IV) the soly. of both components is unlimited, and the soln. can be in equil. only with a mixt. of the given compn. The component that at no finite concn. can be in equil. with the mixt. is defined as the solvent. Und. this definition, in aq. soln. of $AgTi(NO_3)_3$ and $AgNiH(NO_3)_3$, the soly. of which increases to complete miscibility at the temp. of fusion, H_2O is the solvent even when its concn. is of the order of 0.0001%. In case I, one has for the thermodynamic potentials $\mu_1 = \mu_{1,m}$, $\mu_2 > \mu_1$, $\mu_2 = \mu_{2,m}$, $\mu_2 > \mu_1$.

where μ_i^* refers to the single substance, μ_i to the same substance in mixt., and $\mu_{i,m}$ at satn. For $\mu_{i,m}$ (i th component in a mixt. satd. in f), $\mu_{i,m} < \mu_i^*$ and $\mu_{i,m} < \mu_i$. This gives for f in terms of c (mole fractions), $(1/c_1^*) < (f_1/f_1^*) < (1/c_1)$; $(f_2/f_{2,m}) < (c_2^*/c_2) < 1$, and the obvious analogs for component 2. In other words, if the satd. soln. of one of the components is taken as reference, the relative activity coeff. of that component is always greater than the reciprocal of the soly. and, hence, than unity; for the 2nd component it is less than unity. Both components are equiv. In the case of formation of 2 phases (II), with component 1 considered as the solvent in phase' and component 2 the solvent in phase'', one has $(f_1/f_1^*) > (1/c_1)$ and $(f_2/f_2^*) > (1/c_2)$. With the infinitely dil. soln. taken as reference state, $(f_1/f_{1,m}) < (c_1^*/c_1) < 1$ and $(f_2/f_{2,m}) < (c_2^*/c_2) < 1$. In case III, one phase only, the components are not equiv., and $1 < (f_1/f_1^*) < (1/c_1)$ and $(f_2/f_2^*) < (c_2^*/c_2) < 1$. In case IV, the components are equiv., the choice of the reference state is arbitrary, and $1 < (f_1/f_1^*) < (1/c_1)$; $(f_2/f_{2,m}) < 1$; $1 < (f_2/f_2^*) < (1/c_2)$; $(f_1/f_{1,m}) < 1$.
N. Thon

USSR/Chemistry - Viscosity

21-Oct 51

"The Viscosity of Binary Liquid Systems in the Critical Region," V. K. Semenchenko, Ye. I. Zorina, Inst of Gen and Inorg Chem imeni N. C. Kurnakov, Acad Sci SSSR

"Dok Ak Nauk SSSR" Vol LXXX, No 6, pp 903-905

Viscosity polytherms were constructed for the systems triethylamine - water, and nitro - benzene - hexane at varying temps and concns. Found that these systems exhibit a max in viscosity at a certain crit temp. Concluded that the initial process of formation of disperse systems consists

217110

of passing into a microheterogeneous state characterized by a max viscosity. The micro-heterogeneous state arises at the crit conditions of temp and concn, after which there is a sudden coalescence of mol aggregates and appearance of an ordinary disperse state characterized by a milky turbidity.

SEMENCHENKO, V. K.

217110

SEMPERICH LIKS VIK

Molecular theory of adsorption in solutions. V. K. Semenchenko (N. S. Kurnakov Inst. Gen. and Inorg. Chem., Acad. Sci. U.S.S.R., Moscow). *Izvest. Sektora Fiz.-Khim. Anal., Inst. Obshchei Neorg. Khim., Akad. Nauk S.S.S.R.* 21, 14-20 (1952).—For adsorption in terms of vol. concn. (v_i) and in terms of mole fractions (Γ_{i1}) are derived the formulas: $\Gamma_{i1} = \delta(e^{-\Delta/kT} - 1)(1 - v_{i1})m_1 / (1 + (e^{-\Delta/kT} - 1)v_{i1})$ and $\Gamma_{i1} = N(e^{-\Delta/kT} - 1)(1 - v_{i1})c_1 / (1 + (e^{-\Delta/kT} - 1)v_{i1})$, where δ is the thickness of the surface phase, k the Boltzmann const., v_i vol. concn. of mols. in a random chosen space, and c_i is mole fraction. In the 1st of these equations it is assumed that $v_{i1} = v_i$, subscript 1 indicating surface layer. If $v_{i1} \neq v_i$, then $\Gamma_{i1} = \delta[(e^{-\Delta/kT} v_2(1 - v_{i1}m_1) - v_{i1}(1 - v_{i1}m_1)) / (v_2 + (e^{-\Delta/kT} v_2 v_{i1} - v_{i1}m_1))]$, where subscript 2 indicates solvent. A math. analysis of the proposed equation and that of Langmuir shows that at $n \rightarrow \infty$, $\Gamma_{i1} \rightarrow -\delta$, i.e. that adsorption approaches a neg. limit, a situation never observed experimentally. By the proposed equation at the interphase pure solvent-pure solute $\gamma \approx 0$. By differentiating the basic equation with respect to concn. it is shown that adsorption has to pass through an extreme. Where $-\Delta > 0$, as is the case with surface-active substances, the extreme is a max., and where $-\Delta < 0$, as is the case with inert substances, the extreme is a min. Δ is defined as the isothermal work of transferring one mol. from one phase (body of soln.) to the other (surface).

Differentiating with respect to temp. shows that as T increases, the extreme values of concn. increase and the extreme values of adsorption decrease. The basic equation is linked to the Lewis concept of activity through $f_{i1} \approx e^{-\psi/kT}$, where f_{i1} is the activity coeff. and ψ is the mean potential energy of a mol. The potential energy of a mol. ψ is considered to be a product $\psi = \varphi m$, where m is referred as the generalized moment of the mol. and depends on the properties of the mol. itself, and φ depends on the properties of the surrounding medium. It can be assumed that generally m is a function of the ratio of charge to ionic radius or, in the case of dipoles, the ratio of the moment to the square of the radius. Substituting m in the basic equation shows that the sign of adsorption is detd. by the value of the difference between m_1 (for solvent) and m_2 (for solute). Thus, for surface-active substances $m_1 > m_2$ and for inactive substances $m_1 < m_2$. This enables one to predict adsorption without having to det. f_{i1} experimentally. A modification of the basic formula can be applied for testing the Traube rule for the surface activity of homologs. This shows that the Traube const. decreases as the length of the chain increases. The application of the basic equation to multicomponent systems is discussed.

M. Hosen

Handwritten initials and marks.

SELENICHENKO, V. K.

Quantum Theory

Fundamental principles of application of quantum theory to chemistry., Usp.
khim, 21, no. 6, 1952

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

SEMENCHENKO, V. K.

Kurnakov, Nikolai Semenovich, 1866-1941

N. S. Kurnakov's investigations of crytical phenomena in the solid state.
Usp.khim. 21 No. 9, 1952.

Monthly List of Russian Accessions, Library of Congress, December 1952. Unclassified.

SEMENCHENKO, V. K. ZORINA, E. L.

Phase Rule and Equilibrium

Phase transitions of the second degree and critical phenomena.

Par 4. Viscosity of binary liquid systems in the critical region.

Zhur.fiz.khim. 26, no. 4, 1952.

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

SEMENCHENKO, V. K.

Sept 52

USSR/Chemistry - Critical Phenomena

"Fundamental Properties of Generalized Critical Phenomena," V. K. Semenchenko,
Moscow State

Zhur Fiz Khim, Vol 26, No 9, pp 1337-1348

Refers to the work of P. Ehrenfest who, in 1933, in order to explain the transition of He I to He II, introduced the idea of the so-called phase transitions of the II type which are distinguished from the usual phase transitions by the absence of a heat of transition and of changes in volume. States that both in the theoretical and experimental study of generalized crit phenomena, one can proceed either from the single-phase system or from the 2-phase system. Adds that the Ehrenfest formula always results from an examination of the 2-phase system, whereas an examination of the single-phase system leads to different results. The author discusses chemocrit phenomena; experimental proofs of the identity of phase transitions of the II variety and crit phenomena; false crit points and a determination of the crit region and crit temperature; certain characteristics of the crit regio; thickness of the surface layer; and the structure of th crit region. Adds that I. R. Krichevskiy (Moscow, 1946) showed the feasibility of separating mixtures of compressed gases in a gravitational field.

261T40

SEMENCHENKO, V. K. ; ZORINA, YE. L.

Hysteresis

Hysteresis of viscosity in the critical region, Dokl. AN. SSSR 84, No. 6, 1952.

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

SEMINCHENKO, V. K., SKRINOV, V. P.

Heat - Radiation and Absorption

Thermal capacity of binary liquid mixtures in the critical area of stratification. Dokl. AN SSSR 85 no. 5, 1952.

Monthly List of Russian Accessions, Library of Congress, December 1952. Unclassified.

TRUBNIKOV, V. I.; ZILBERMAN, V. F.

Liquids

Thermal conductivity of binary liquid mixtures in the critical area of stratification. Dokl. Akad. Nauk SSSR No. 6, 1982.

Monthly List of Russian Accessions, Library of Congress, December 1952. Unclassified.

SEMENCHENKO, V. K.

PA 245T14

USSR/Chemistry - Physical-Critical Region 21 Nov 52

"Concerning the Physical Concepts of the Critical Region and the Critical Point and Their Experimental Determination," V. K. Semenchenko

"Dok' Ak Nauk SSSR" Vol 87, No 3, pp 441-443

On the basis of new evidence, the author proposes to define the critical region as the region where the first derivatives of thermodynamic coordinates xi of forces Xi and T pass through extremes, and the critical point as the

245T14

place where these extremes are the greatest. The author also proposes new methods for finding the boundaries of the critical region and the position of the critical point in it. Presented by Acad G. G. Urazov 25 Sep 52.

245T14

SEMENCHENKO, V.

"Fundamental problems of quantum chemistry. Tr. from the Russian", p. 23 (Analele
Romano-Sovietice. Seria Chimie, Series a III-a, v. 5, no. 1, 1953, Bucuresti)

SO: Monthly List of East European Accessions, Vol. 2, No 9 Library of Congress, September 1953, Uncl.

SEMENCHENKO, V. K. Prof.

"Concerning the Influence of Admixtures on Phase Transformations of Types I and II," a paper given at the All-University Scientific Conference "Lomonosov Lectures", Vest. Mosk. Un., No.8, 1953.

Translation U-7895, 1 Mar 56

SEMENCHENKO, V. K.

Chemical Abstracts
Vol. 48 No. 5
Mar. 10, 1954
General and Physical Chemistry

J. W. Gibbs and his basic work on thermodynamics and statistical mechanics. V. K. Semenchenko. *Khim.* 22, 1278-84 (1953).—Summary of scientific work on occasion of 50th anniversary of his death. G. M. K.

[Handwritten signature]

SEMENCHENKO, V. K., POKROVSKIY, N. L. and LAZAREV, V. B.

"Effect of Minor Admixtures on Polymorphic Transformations in Tin,"
Dokl. AN SSSR, 89, No.6, pp 1021-24, 1953

Explains mechanism of spontaneous transformation of beta-Sn to alpha-Sn as follows: substances which reduce surface tension of liquid Sn immunize it against formation of alpha-Sn crystals, while elements which increase surface tension promote beta-to-alpha-Sn transition. Corroborates this assumption by expts using 2 kinds of impurities: Al, which accelerates phase transition, and Ag and Bi, which are inhibitors of modification. Presented by Acad G. G. Urazov 25 Feb 1953.

25721

SEMENCHENKO, V.K.; CHERNYAYEV, I.I., akademik.

Pseudo-critical points and overcritical transitions. Dokl. AN SSSR 9:2 no.3:
625-627 S '53. (MLBA 5:9)

1. Akademiya nauk SSSR (for Chernyayev). (Phase rule and equilibrium)

SEMENCHENKO, V. K.

The Committee for State Prizes of the Council of Ministers of the USSR, on the basis of reports and investigations announced that the following scientific works, popular science articles, and textbooks have been submitted for competition for State Prizes for the year 1954. (Sovetskaya Kultura, Moscow, No. 22, 1954, p. 100)

<u>Name</u>	<u>Title of work</u>	<u>Submitted by</u>
Semenchenko, V.K.	Basic properties of generalized critical phenomena (series of articles)	Moscow State University imeni M.V. Lomonosov

Semenchenko, V. K.

USSR !

Effect of the concentration of impurities on the mutual miscibility of fused salts. V. K. Semenchko and T. I. Shashkin (M. V. Lomonosov State Univ., Moscow). *Zhur. Fiz. Khim.* 28, 735-44 (1954); cf. *C.A.* 39, 3998.

The consolute temps. (T_c) (at temps. far from the m.p. of either component) of mixts. of $TlBr$ and KNO_3 in the ratios (r) 1:3, 1:1, and 3:1 with amts. from zero to 10 mole % of $NaCl$, $LiCl$, $BeSO_4$, $AgCl$, Na_2SO_4 , and $AlCl_3$ were detd.; T_c for $TlBr$ - KNO_3 mixts. in the given r in the absence of impurities was 506, 528, and 503°, resp. The decrease of T_c (ΔT_c) resulting from addn. of one mole % of $NaCl$ was 29, 32, and 21° when r was 1:3, 1:1, and 3:1, resp. The corresponding ΔT_c for $LiCl$, $BeSO_4$, and $AlCl_3$ was 31, 63, and 34° ($r = 1:3$), resp., and for $AgCl$ and Na_2SO_4 was 21 and 31° ($r = 3:1$), resp. T_c for a mixt. of $AgCl$ and KNO_3 ($r = 1:4$) was 500°; ΔT_c due to addn. of 0.3 mole % $BaCl_2$ was 12°. Addn. of $BaCl_2$ to the $AgCl$ - KNO_3 system in the region of partial miscibility resulted in complete miscibility. Graphs are shown of $\Delta T_c/C$ with respect to C , where C is the mole fraction of added impurity; $\Delta T_c/C$ decreases very rapidly with increase of C as ΔT_c becomes nearly const. when C is 0.05-0.10. There is no correlation between ΔT_c and the generalized moment of the added ions for values of C above 0.02-0.03. Mixts. of $TlNO_3$ and KBr gave about the same ΔT_c upon addn. of $NaCl$, as did mixts. of I and II; this indicates that the $TlBr$ - KNO_3 system is wholly ionized.

J. W. Loweberg, Jr.

USSR/ Physics - Physical Chemistry

Card 1/1 Pub. 22 - 42/63

Authors Semenchenko, V.K.

Title Beyond critical conversions and phase conversions of second order

Periodical Dok. AN SSSR 99/6, 1045-1048, Dec 21, 1954

Abstract Experimental data show that up to the critical point a substance can exist in the form of two phases capable of being in equilibrium with each other. Beyond the critical point the phases may retain their existence with respect to the presence of definite physical properties but otherwise they appear as if separated from each other because a certain "interphase space", in which the physical properties change rapidly and continuously, is being formed between the separating phases. Since these pseudo phases are separated from each other a certain interval equilibrium between them becomes impossible. The physical cause for the impossible equilibrium is explained. Six references: 3-USSR; 1-Dutch and 2-German (1933-1953).

Institution: The M.V. Lomonosov State University, Moscow

Presented by: Academician I.I. Chernyayev, July 17, 1954

SEMENCHENKO, V. K.

"Phase Transitions in the Critical and Transcritical Regions," a paper presented at the second conference on the Liquid State Of Matter, Kiev, 30 May to 3 June 1955, Usp. Fiz. Nauk, April 1955

SEMENCHENKO, V. K.

"The Theory of Liquid State and Initial Crystallization." From the book
"Heat Treatment and Properties of Cast Steel," edited by N. S. Kreshchanovskii,
Mashgiz, Moscow 1955.

SEMENCHENKO, V. K.

USSR/Physical Chemistry - Liquids and Amorphous Bodies. Gases, B-6

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 60969

Author: Semenchenko, V. K.

Institution: None

Title: Theory of Liquid State and Primary Crystallization

Original
Periodical: Sb: Term. obrabotka i svoystva litoy stali, Moscow, Mashgiz, 1955,
5-13

Abstract: It is reported that experimental and theoretical investigations lead to the conclusion that in a liquid a part of the atoms is disposed in a definite order close to their disposition in the solid state. The notion is being developed of critical crystalline nuclei which exist in a liquid and are in equilibrium therewith; in this connection essential is the consideration of a certain surface layer (in a general sense) having macroscopic properties. On evaluation of the difference in thermodynamic quantities on either side of the layer it is important to take into account the surface

Card 1/2

SEMENCHENKO, V.K.; AZIMOV, M.

Liquid seignettoelectric substances. Zhur.fiz.khim. 20 no.7:
1342-1344 J1 '55. (MLRA 9:3)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.
(Ferroelectric substances)

Category : USSR/Atomic and Molecular Physics - Statistical Physics
Thermodynamics

D-3

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3458

Author : Semenchenko, V.K.

Title : On Critical Phenomena in Phase Transitions of the Second Kind

Orig Pub : Izv. Sektora fiz.-khim. analiza, IONKh AN SSSR, 1955, 26, 56-61

Abstract : Lecture delivered to the Moscow Society of Investigators of Nature,
containing a survey of the author's works.

Card : 1/1

SEMENCHENKO, V. K.

USSR/ Chemistry - Physical chemistry

Card 1/2 Pub. 147 - 21/26

Authors : Skripov, V. P., and Semenchenko, V. K.

Title : Phase conversions of the second order and critical phenomena. Part 5. Specific heat maximum in the critical zone of separation of binary liquid systems.

Periodical : Zhur. fiz. khim. 29/1, 174-184, Jan 1955

Abstract : The construction of a calorimeter for the determination of specific heat is announced. The new instrument was used in measuring the specific heat of a triethylamine-water system in the lowest critical temperature zone. The specific heat maximum in the critical zone has a lambda-shaped form which was found to be characteristic for phase conversions of the 2nd order.

Institution : The M. V. Lomonosov State University, Moscow

Submitted : June 9, 1954

Periodical : Zhur. fiz. khim. 29/1, 174-184, Jan 1955

Card 2/2 Pub. 147 - 21/26

Abstract : The specific heat for the nitrobenzene-heptane system with an upper critical temperature was determined by the cooling method. The reliability of the cooling method was tested with good results on a triethyl amine-water system. Sixteen references: 12 USSR; 2 USA; 1 Indian and 1 German (1935-1954). Tables; graphs; drawings.

SEMENCHENKO, V. K.

USSR/ Chemistry - Physical chemistry

Card 1/1

Pub. 147 - 23/26

Authors : Semenchenko, V. K. and Skripov, V. P.

Title : Phase conversions of second order and critical phenomena. Part 6.
Effect of small admixtures on the specific heat of the triethylamine-water system in the critical separation zone.

Periodical : Zhur. fiz. khim. 29/1, 194-197, Jan 1955

Abstract : In order to determine the effect of admixtures on the specific heat in the critical zone the authors investigated a triethylamine-water mixture of critical concentration with admixtures of tetraethylammonium iodide and isoamyl alcohol. The tetraethylammonium iodide acted as a surface-active substance increasing the lower critical temperature and reducing the specific heat maximum. The isoamyl alcohol acted as an inert substance thus reducing the critical temperature and the specific heat maximum. The results obtained are briefly described. Seven references: 6 USSR and 1 USA (1934-1955). Diagrams.

Institution : The M. V. Lomonosov State University, Moscow

Submitted : June 24, 1954