ASAULYUK, Z.; KLOCHKO, I., kand.sel'skokhoz.nauk

Simmenthal cattle on the Trostyanets' State Farm. Nauka i zhittia 11 no.10:29-30 O '61. (MIRA 15:1)

1. Direktor plemzavodu "Trostyanets'" (for Asaulyuk).
(Ukraine--Simmenthal cattle)

KLOCHKO, I. F.

Acidproof storage for hydrochloric acid. Sakh.prom. 31 no.7:34-36
Jl '57.
(MLRA 10:8)

1.Khodorovskiy sakharnyy zavod.
(Hydrochloric acid--Storage)

KLOCHKO

**KLOCHKO, I.F.**

Machining curved grooves on screw-cutting lathes. Sakh.prom.31 no.9:35-36 S '57. (MIRA 10:12)

1. Khodorovskiy sakharnyy zavod.
   (Sugar industry--Equipment and supplies) (Screw--Cutting machines)

OSOKIN, Grigoriy Alekseyevich; KLOCHKO, I.K., red.; DUKHNO, V.I., tekhn. red.

[In one line] Edinym stroem. Krasnodar, Krasnodarskoe knizhnoe izd-vo, 1961. 23 p. (MIRA 16:10)

1. Starshiy operator, rukovoditel' vakhty kommunisticheskogo truda Tuapsinskogo neftezavoda, Tuapse (for Osokin).
(Krasnodar Territory--Petroleum industry)
(Socialist competition)

KIRILENKO, V.T.; KLOCHKO, I.K.; LAPIDUS, M.A., red.

[Fattening on a commercial basis] Otkorm na promyshlennoi osnove. Moskva, Kolos, 1965. 26 p. (MIRA 18:7)

K[illegible]CHKO, I. M.; SOLOV'YEV, S. V.

Dairy Cattle

Results of efforts to build up a highly productive herd of cows Sov. zootekh. 7 no. 7, 1952. Kandidat Sel'skokhozyaystvennykh Nauk Ukrainskiy Nauchno-Issledovatel'skiy Institut Zhivotnovodstva

SO: Monthly List of Russian Accessions, Library of Congress, September 1952 ~~1953~~, Uncl.

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KI[illegible], I. M.

Razdoy Korov V Kolkhozakh I Sovkhozakh Ukrainy (The Increased Milk Yield of Cows in Collective Farms and State Farms of the Ukraine) 2. Izd. Moskva, Sel'Khozgiz, 1953.

94 p. Illus., Tables.
4N/5
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1953
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KLOCHKO, I. M.

Razdoi korov v kolkhozakh i sovkhozakh Ukrainy [Increasing the milk yield of cows on Ukrainian collective and state farms]. Moskva, Sel'khozgiz, 1954. 96 p.

SO: Monthly List of Russian Accessions, Vol. 7, No. 3, June 1954.

KLOCHKO, I.P.; CHEBOTKOV, I.P., starshiy nauchnyy sotrudnik

Directed boreholes in steeply dipping seams dangerous as to sudden outbursts. Ugol' Ukr. 6 no.8:42-43 Ag '62. (MIRA 15:11)

1. Glavnyy geolog Gosudarstvennogo tresta ugol'nykh predpriyatiy Kalininskoy oblasti kombinata Tulaugol' (for Klochko). 2. Donetskiy nauchno-issledovatel'skiy ugol'nyy institut (for Chebotkov).

(Boring)
(Coal mining machinery)

PROCESSES AND PROPERTIES INDEX

**Batalpashinsk lakes.** M. A. Khabbo. *Ann. sect. anal. phys.-chim.* 6, 233-47(1933). The computation of the total contents of $Na_2SO_4$, NaCl and $MgSO_4$ in Batalpashinsk lakes (North Caucasus) based on the analysis of the brines does not warrant their exploitation without further geological survey of the region and the source of the 2 lakes. Attention is called to the possibility of using the lake mud for balneological purposes. Chas. Blanc

METALLURGICAL LITERATURE CLASSIFICATION

KLOCHKO, M. A.

Double decomposition in the absence of a solvent, XXIV,
J. Gen. Chem. Russ, 1933, p. 1026-1039, No. 3

The equilibrium relations in the system $2LiCl + Na_2SO_4 \rightleftharpoons 2NaCl + Li_2SO_4$ are discussed.

4

**Electrochemical production of light metals from non-aqueous solutions. I. Preliminary experiments on the electrolysis of salts of the alkali metals.** M. A. Klochko. *J. Applied Phys.* (U. S. S. R.) 9, [illegible] (1936); *Chem. Zentr.* 1937, I, [illegible]; cf. *C. A.* 31, 8210. In order to overcome the difficulties encountered in the electrolysis of fused salts (high temps.) and of aq. solns. (impossibility of electrodeposition of certain metals in the free state) expts. were undertaken with complex compds. as electrolytes. Solns. of the bromides or chlorides of the alkali metals and $AlBr_3$ or $AlCl_3$ in $PhNO_2$ served as such complex compds. The bromide of the alkali metal (or the chloride) was previously fused with $AlBr_3$ (or $AlCl_3$) and the fused mass dissolved in $PhNO_2$. The simple bromides and chlorides of the alkali metals are insol. in $PhNO_2$. By this method Li, Na, K and Rb can be deposited on the cathode from bromide solns. and Li and Na from chloride solns. A low c. d. and the use of a diaphragm increase the yield of the metal. The yield calcd. on current consumed reaches 35%, and in individual cases 70%. In the electrolysis the alkali metal serves as the conducting cation while the Al appears in the complex anion. The reaction scheme may be represented as follows: $KAlBr_4 \rightleftharpoons K^+ + AlBr_4^-$; $AlBr_4^- + e \rightarrow AlBr_4 \rightarrow AlBr_3 + Br$. When a Ag electrode is used, the Br combines with it to form AgBr; when a Pt electrode is used, it flows in a thin stream to the bottom of the beaker. The $AlBr_3$ becomes concd. in the anode compartment. The exptl. decompn. potentials for the alkali metals correspond to the calcd. values. M. G. Moore

METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

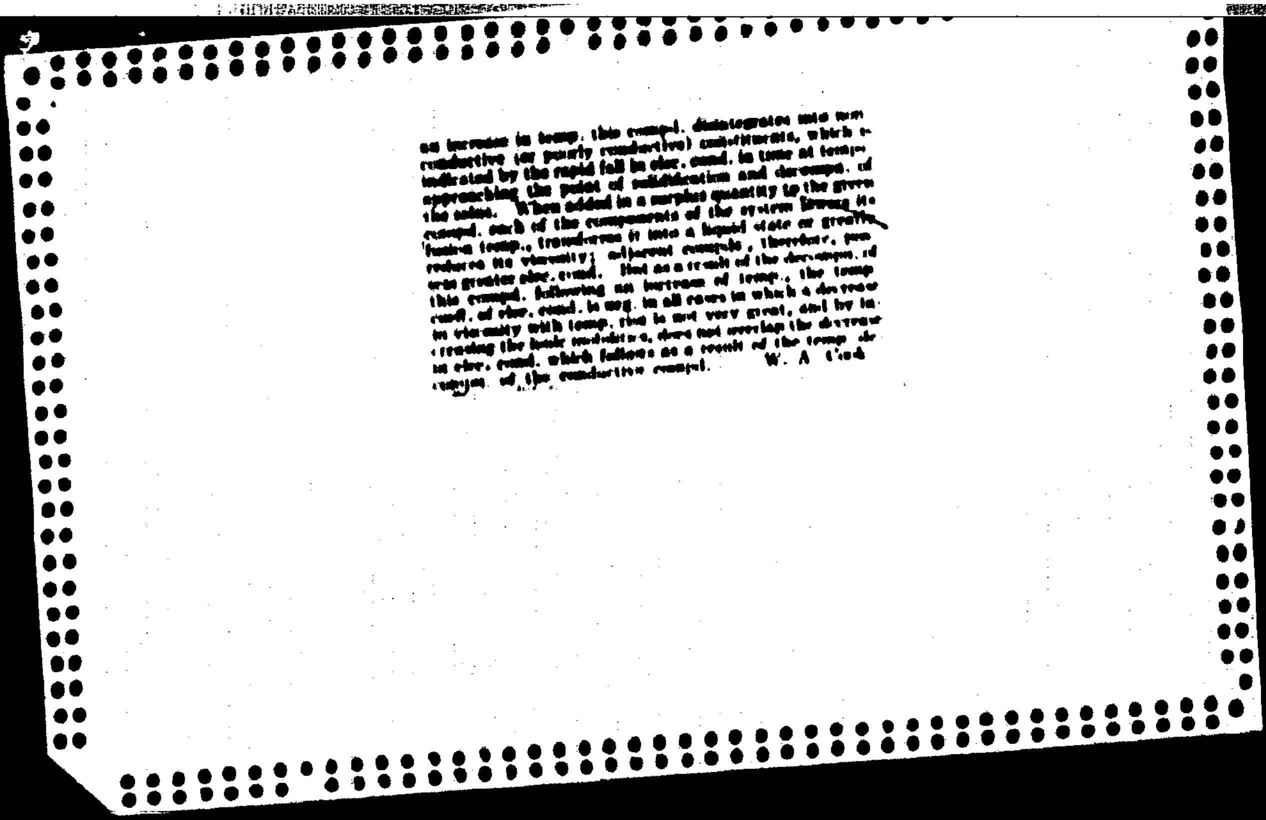
CA

2

**Theory of physicochemical analysis. I. Investigations of nonaqueous solutions by methods of physicochemical analysis.** M. A. Klochko. *Bull. acad. sci. U.R.S.S.*, Classe sci. math. nat., Ser. chim. 1937, 225-51 (in English 251-2). Physicochem. analysis concerns itself with a study of the dependence of various properties of systems in chem. equil. on their compn. and conditions of equil. as well as with the deduction of various generalizations and relations. Such properties may be divided into kinetic energetic and mechanical functions. The rate of change of an equil. system from some stationary condition to equil. and vice versa necessitates the consideration of a no. of properties including time (the so-called kinetic properties), such as rate of reaction, soln., evapn., transition from one state to another, etc. Such properties, in a theory of physicochem. analysis, correlate the conclusions resulting from the geometric method with the principal theses of the kinetic theory of matter. A study of the mech. properties of systems and comparison with others (energetic and kinetic properties) makes it possible to solve the question regarding the causes of the "singularity" of one or the other property. Each point of an equil. diagram is connected with its surroundings by the principle of continuity. The properties of the surroundings help to obtain a general idea of the properties of any point of the diagram and the idea is the more exact the less the extent of the surroundings according to the compn. The method of adding diagrams provides a general aspect of a complex diagram starting from a simple diagram. On the isotherms of the [illegible] of binary systems possessing a singular max. of stability, the maximum of [illegible] correspond appears [illegible], while the minimum correspond to the chem. compn. of compds. The geometrical deductions must be verified on real systems. The method of analogy between geometry and chem. transformations cannot be applied for studying the behavior and properties of chem. systems; this is shown in the case of the analogy existing between the rule of Euler connecting the relation between the number of elements of the three-dimensional closed polyhedra and the Gibbs phase rule. In order to obtain successful results in physicochem. analyses it is necessary to study the systems and their properties "in motion," i. e., when changing all conditions of equil. and in relation to all elements of equil. W. [illegible]

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

**Investigation of nonaqueous solutions by methods of physicochemical analysis. II. Electrical conductivity, viscosity and specific gravity of the binary system aluminum bromide–nitrobenzene.** M. A. Klochko. Bull. acad. sci. U. R. S. S., Classe sci. math. nat., Sér. chim. 1937, 641–71 (in English 672–3); cf. C. A. 31, 8340⁴. The elec. cond., viscosity and sp. gr. of various solns. of the binary system $AlBr_3$–$C_6H_5NO_2$ from 0 to 100% $AlBr_3$ at temps. from 5° to 100° were detd. The polytherms of elec. cond. for solns. contg. less than 30% $AlBr_3$ pass through their max. at a temp. that rises in accord with the higher concn. of soln. in question (linear dependency). The isotherms of elec. cond. possess 2 max. and 1 min. The former correspond to the sphere of eutectics of the given system and are displaced with temp. in the direction of $AlBr_3$. The latter corresponds to the compn. of the chem. compd. $AlBr_3.C_6H_5NO_2$ and is not displaced with temp. (angular min.). The polytherms of viscosity have breaks (where the fall in viscosity is retarded, slowing down the rise of temp.) which set in at a temp. correspondingly higher with increasing $AlBr_3$ content; the temp. of these breaks coincides with the temp. max. of the elec. cond. polytherms. The viscosity isotherms consist of 2 branches, convex to the compd. axis and crossing it at angle points corresponding with the compn. of the chem. compd. The breaks on the viscosity isotherms correspond roughly to the compn. of max. of the elec. cond. isotherm. The temp. coeff.-compn. curves are similar for viscosity and elec. cond. and, being located on either side from the axis of abscissas, form a mirror reflection of each other; they form a max. corresponding to the compn. of the chem. compd. The isotherms of sp. gr. consist of a straight lines crossing under very obtuse angles with points, the abscissas of which correspond to compn. of the above compd. The temp. coeff. of sp. gr. changes very little with temp. or concn., whereas the extent of the temp. coeff. in the 2 other properties declines sharply with temp. rise or content of $C_6H_5NO_2$ in soln. The results of this research, similar to those of other studies of electrolytic systems, are not to be explained from the viewpoint of the usual conceptions of the theory of electrolytic dissocn., that is, of the existence of some sort of "dissociating force" of the solvent and of the increased decompn. into ions with diln. The cond. of electrolytic systems as well as the changes in this property that depend on variation of equil. conditions of the system, and also the relation of elec. cond. to the changes in viscosity of the system, can be interpreted only when based on the following conceptions: (1) complete dissocn. of electrolyte into ions independent of its concn., (2) the decisive part played by the individual inherent elec. cond. of the components of the system and of their compds., and (3) dependency of the mobility of the ions on changes in viscosity of the system. In the system $AlBr_3$–$C_6H_5NO_2$, the components of which individually are practically non-conductive, the electrolyte is represented by the compd. that they form, $AlBr_3.C_6H_5NO_2$, and is distinguished by a substantial thermal discharge and cond. of current, in the liquid state. Following



an increase in temp. this compd. disintegrates into nonconductive (or poorly conductive) constituents, which is indicated by the rapid fall in elec. cond. in time at temps. approaching the point of solidification and decompn. of the salts. When added in a surplus quantity to the given compd. each of the components of the system lowers its fusion temp., transforms it into a liquid state or greatly reduces its viscosity; adjacent compds., therefore, possess greater elec. cond. But as a result of the decompn. of this compd. following an increase of temp., the temp. coeff. of elec. cond. is neg. in all cases in which a decrease in viscosity with temp. rise is not very great, and by increasing the ionic mobilities, does not overlap the decrease in elec. cond. which follows as a result of the temp. decompn. of the conductive compd. W. A. Cook

PROCESSES AND PROPERTIES INDEX

CA

15

Resources of salts in El'ton Lake and their utilization. M. A. Klochko. *J. Applied Chem.* (U. S. S. R.) 10, [illegible] (French 844) (1937).--The resources of the above lake are described and a simple method of their approx. evaluation is given. An isothermal evapn. of the El'ton lake brine yields a NaCl ppt. and a $MgCl_2$-satd. soln. Freezing out the brine yields a NaCl and $Na_2SO_4 \cdot 10H_2O$ ppts. Twenty-three references. A. A. P.

ASA-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

Ca

2

Conductance of electrolytic systems. M. A. Klochko. Compt. rend. acad. sci. U. R. S. S. 14, 197-201(1937) (in English).—An attempt is made to interpret the change of cond. with simultaneous changes of concn., temp. and pressure. Both binary and ternary systems are discussed. Points considered include cond. of components before admixt., the energy required to produce a liquid state, the amt. of non-conductors present at equil., changes in the no. and mobility of ions, changes in viscosity and the effect of electrostatic forces under varying conditions. Salt water, molten salts and other nonaq. systems are considered. Difficulty is experienced in the interpretation of present exptl. data based on the theory.

R. E. DeRight

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

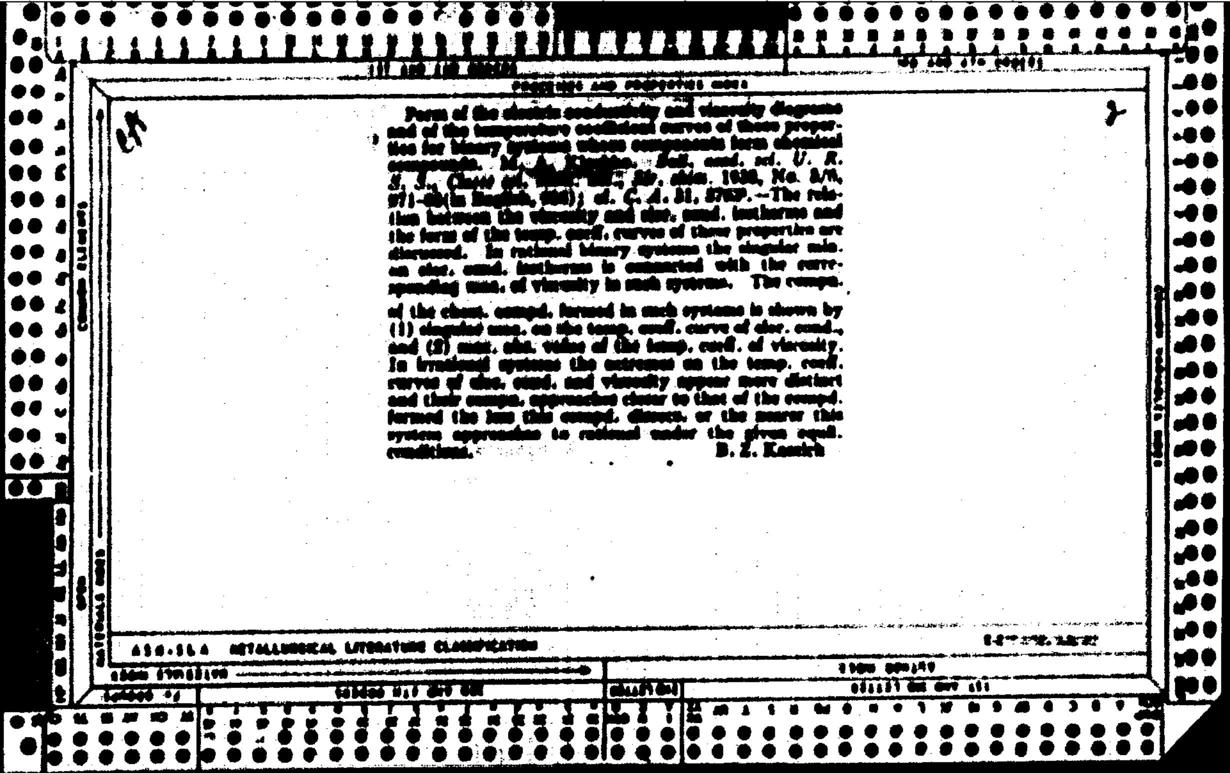
Ca

8

The "lake age" of the Caspian Sea and its volume at the time it became a closed basin. M. A. Klyshko. *Compt. rend. acad. sci. U. R. S. S.* 16, 35-7(1937)(in English).—The concn. of SO₄ and Cl ions, the ratio of their concns. and the percentage of total dissolved salts in (1) the ocean, (2) the Caspian Sea and (3) the Volga were detd. These data were used to calc. that the Caspian Sea lost its connection with the ocean 9000 years ago and that its vol. at that time was [illegible] its present vol.

R. K. DeRight

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION



ca

2

PROCESSES AND PROPERTIES INDEX

Form of the electric conductivity and viscosity diagrams and of the temperature coefficient curves of these properties for binary systems whose components form chemical compounds. M. A. Klochko. *Bull. acad. sci. U. R. S. S., Classe sci. math. nat., Sér. chim.* 1938, No. 5/6, 971-82 (in English, 983); cf. *C. A.* 31, 8763. —The relation between the viscosity and elec. cond. isotherms and the form of the temp. coeff. curves of these properties are discussed. In rational binary systems the singular min. on elec. cond. isotherms is connected with the corresponding max. of viscosity in such systems. The compn. of the chem. compd. formed in such systems is shown by (1) singular max. on the temp. coeff. curve of elec. cond., and (2) max. abs. value of the temp. coeff. of viscosity. In irrational systems the extremes on the temp. coeff. curves of elec. cond. and viscosity appear more distinct and their compn. approaches closer to that of the compd. formed the less this compd. dissocs. or the nearer this system approaches to rational under the given equil. conditions. B. Z. Kamich

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

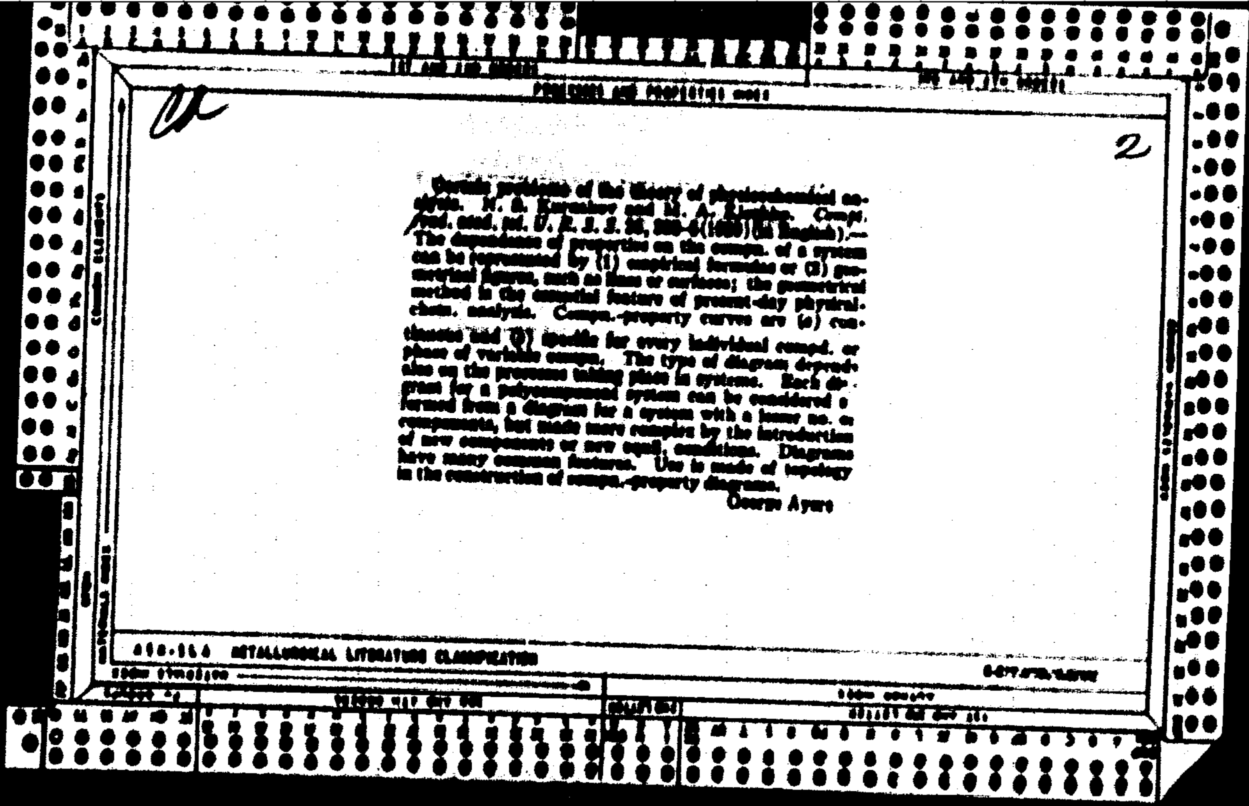
Study of nonaqueous solutions by methods of physico-chemical analysis. III. M. A. Klochko and O. P. Chanukvadze. Bull. acad. sci. U. R. S. S., Classe sci. math. nat., Sér. chim. 1938, 997-1011(in English, 1011-2); cf. C. A. 32, 2810. The elec. cond. κ and sp. gr. of solns. of the system PhNH2-HOAc were measured at 0, 15, 25, 35, detd. Elec. cond. and η were measured at 25, 50 and 75°. Some 50 and 75°; sp. gr. was detd. at 25, 50 and 75°. Elec. cond. measurements were also made at −6.8°. Within the interval −6.8-0° the elec. cond. isotherms had two max. and also a min. at 33 mol. % PhNH2, which corresponds to the compd. 2HOAc.PhNH2 as detd. by thermal analysis. With increasing temp. the min. levels out, the lower max. above 50 mol. % PhNH2 disappears, and the higher max. under 33 mol. % PhNH2 approaches the compn. of 2HOAc.PhNH2. The elec. cond. increases rapidly but rather uniformly with increasing temp. The elec. cond. changes with time, increasing very little at low temp. but decreasing with rising temp. above 55°. κ does not change for several days up to 50°, but at 50 and 75° it increases by 1% per 24 hrs. The isotherms of η have max. which change from 30 mol. % PhNH2 at low temp. to 25 mol. % at 75°. With decreasing temp. the max. of η approaches the compn. of PhNH2.HOAc. The sp. gr. isotherms show a max. at 33 mol. % PhNH2. The elec. cond. κ and sp. gr. measurements were also made of acetanilide and its solns. in HOAc and PhNH2. The sp. gr. and η of all these solns. differ little from those of the system PhNH2-HOAc, but the elec. conductivities of the acetanilide solns. are some thousandths of those of the corresponding binary systems contg. about the same amts. of HOAc and PhNH2 as are present in acetanilide. Elec. cond. of acetanilide in water is small. These facts indicate that 2HOAc.PhNH2 and not acetanilide accounts for the relatively high elec. cond. in the system PhNH2-HOAc. IV. M. A. Klochko. Ibid. 1003-1013(in English, 1013).—The elec. cond. κ and sp. gr. of the system AlBr3-KBr-PhNO2 were detd. for five sections of the system within the temp. interval 25-60° and for concns. up to 60 mol. % AlBr3 and 20 mol. % KBr. The solns. were divided into two groups: (1) const. KBr but varying AlBr3 contents, and (2)

SEE OTHER SIDE →

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

const. ratio of bromides but varying amts. of $PhNO_2$. At a const. KBr content the isotherms of η show a sharp max. while elec. cond. shows a min., both points corresponding to equimol. ratio of $AlBr_3/PhNO_2$. The electrolyte in this system is $KBr.AlBr_3$, which in soln. dissoc. into complex ions. Cond. of $KBr.AlBr_3$ depends little upon the solvent but it is decreased by $AlBr_3.PhNO_2$. At low temp. and high concns. of $AlBr_3$ the cond. is very small on account of the great η and the effect of the KBr upon the cond. is not large. η depends upon $AlBr_3.PhNO_2$. The effect of temp. upon the elec. cond. and the fluidity is the same: both increase with rising temp., the polytherms of each property diverging, but upon decreasing the temp. the polytherms converge at one point (10°). The isotherms of sp. gr. at a const. KBr content show a small break at 40-50 mol. % $AlBr_3$. The polytherms are nearly straight lines.

B. Z. Kamich



PROCESSES AND PROPERTIES INDEX

2

Certain problems of the theory of physicochemical analysis. N. S. Kurnakov and M. A. [illegible]. Compt. rend. acad. sci. U. R. S. S. 25, [illegible](1939)(in English).—The dependence of properties on the compn. of a system can be represented by (1) empirical formulas or (2) geometrical figures, such as lines or surfaces; the geometrical method is the essential feature of present-day physical-chem. analysis. Compn.-property curves are (a) continuous and (b) specific for every individual compd. or phase of variable compn. The type of diagram depends also on the processes taking place in systems. Each diagram for a polycomponent system can be considered as formed from a diagram for a system with a lower no. of components, but made more complex by the introduction of new components or new equil. conditions. Diagrams have many common features. Use is made of topology in the construction of compn.-property diagrams.

George Ayers

A10.15A METALLURGICAL LITERATURE CLASSIFICATION

Ca

**The electric-conductivity isotherms of two-component liquid systems.** M. A. Klochko. *Bull. acad. sci. U. R. S. S., Classe sci. chim.* 1940, 139-49 (in English, 440).—Two-component liquid systems are classified as follows: (1) Both components are nonconducting and form no compds.; their cond. isotherm coincides with the compn. axis ($AlBr_3$-$AsBr_3$); (2) the cond. increases uniformly from the nonconducting to the conducting component ($AlCl_3$-conducting salt, $BeCl_2$-conducting salt); (3) the cond. increases from the less conducting to the more conducting component (KCl-NaCl); (4) a non-conducting compd. is formed which does not change the cond. of the system composed of nonconducting components; (5) a combination of types 1 and 2; (6) 2 diagrams of type 2; (7), (8) and (9) other combinations of the first 4 types. Besides these 9 types there are considered 13 derived types which represent the 9 fundamental types in which the effect of the η is considered. The fundamental types predominate at temps. far removed from the m. p. of the components or in the presence of a 3rd indifferent component. In these cases the effect of the η is not important. In deriving these types it was assumed that the degree of the electrolytic dissocn. is independent of the concn. Therefore, their application to real systems shows that the degree of dissocn. does not increase with diln. The group of systems composed of weak electrolytes and water is an exception. Their cond. isotherms deviate frequently from the typical isotherms. The cond. isotherms of all other systems (fused salts, aq. and nonaq. conducting solns. and systems in which chem. compds. are formed) can be explained qualitatively on the basis of the types derived in the paper. Three factors affect the character of the change of the cond. with the compn.: (1) the relative values of the cond. of the components of the system in the individual liquid state and of chem. compds. formed in this system, (2) the nature of the interaction between the components of the system, (3) the nature of the change of the η isotherm in the system. 43 references.

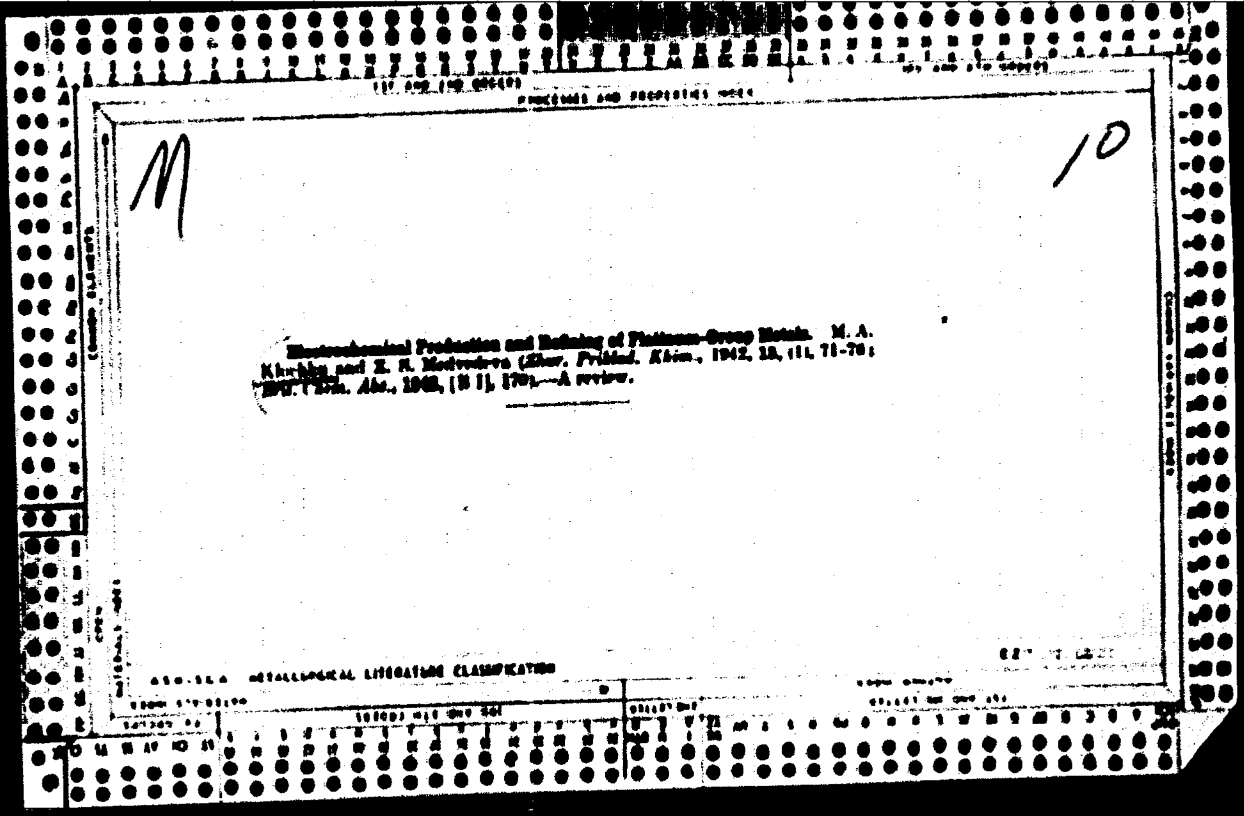
W. R. Henn

METALLURGICAL LITERATURE CLASSIFICATION

KLOCHKO, M. A. and MEDVEDEVA, Z. S.

"Use of Palladium for Electroplating." J. Appl. Chem. Russ., 1942, 15, 25-46.

Bright adherent coatings of Pd cannot be electrodeposited on Fe or Al cathodes. Those forming on Cu cathodes from electrolytes of the type $R_2PdCl_4$-HCl (R = H, $NH_4$, Na, or K) are uneven and discoloured, and non-adherent when thicker than 0.1μ. This is ascribed to a cementation process, involving replacement of Cu by Pd, and proceeding even during passage of current. Better results were obtained with the electrolyte 2.5% aq. $Na_2Pd(NO_2)$ in 3% aq. NaCl (Pd anode, c.d. ≯ 1 ma./cm.$^2$, at 40°), but the thickness of the coating was ≯ 1μ. and the process ~~x~~ is slow. Of a no. of other electrolytes tested, the best results were given by that recommended by Zvyagintsev et al (B., 1939, 535), containing Pd $(NH_3)_2(NO_3)_2$.



PROCESSES AND PROPERTIES INDEX

M

10

**Electrochemical Production and Refining of Platinum-Group Metals.** M. A. Kluchkin and E. N. Medvedeva (*Zhur. Priklad. Khim.*, 1942, 15, (1), 71-78; *Brit. Chem. Abs.*, 1943, (B I), 170).—A review.

METALLURGICAL LITERATURE CLASSIFICATION

KLOCHKO, M. A. and MEDVEDEVA, Z. S.

"Electrochemical deposition of tin from solutions of tin compounds."
J. Appl. Chem. Russ., 1942, 15, 120-127.

Sn can be recovered from solutions of $SnCl_4$ in aq. Hcl (10-140g. of HCl/l.) by electrolysis with Fe anodes in presence of ~ 2g. of glue per l., the cathodic c.d. being 300 amp./m.$^2$ The [Sn] can be reduced from, e. g., 115 to 6 g./l. with a current yield of ~ 100%. Electrolysis of $SnCl_4$ + HCl with a C anode gives low yields ($< 40\%$) of Sn. Elecbolysis of $SnCl_4$ solutions in 2.8% NaOH + 3% NaOAc at cathodic c.d. of 300 amp./m.$^2$ gave high current yields but only ~ $\frac{1}{4}$ of the original Sn was then deposited.

CA

PROCESSES AND PROPERTIES INDEX

4

**Electroplating with Pd and Pt.** M. A. Kljachko and S. M. Mel'nikova. *Ann. secteur platine, Inst. chim. gen.* (U. S. S. R.) No. 19, 109-18(1946).—Review with 68 references. A short section on Rh-plating is included.
H. M. Leicester

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

KLOCHKO, M. A.

USSR/Metals, Rare
Coal

Feb 1947

"Rare Elements in Coal Ashes," M. A. Klochko, Doctor of Chemistry, 3½ pp

"Nauka i Zhizn'" No 2

Statement of the possibility of extracting rare elements from coal ashes. Only the last half of the article treats this directly. Coal was chosen because it is available in large quantities. A table is presented of the content of rare elements in grams per ton of coal ashes.

30237

2

Physicochemical analysis of nonaqueous solutions. V. The binary system aniline-acetic anhydride; melting, electric conductivity, viscosity, and density. M. A. Klochko and O. P. Chanukvadze (N. S. Kurnakov Inst. Gen. Inorg. Chem., Moscow). *Bull. acad. sci. U.R.S.S., Classe sci. chim.* 1947, No. 6, 599-608(in Russian); cf. C.A. 41, 6129f.—The melting diagram has a max. at 33 mole % ($PhNH_2$), 67°, corresponding to the compd. $Ac_2O.PhNH_2$, which is the anhyd. counterpart of the compd. $2AcOH.PhNH_2$ found in the same way by Pushin and Rikovski (C.A. 37, 16). $Ac_2O.PhNH_2$ has a sharper max. and is more stable. There is a eutectic point at 58 mole % ($PhNH_2$), −17.8, and possibly also a eutectic very close to $Ac_2O$. The m. temp. of pure $Ac_2O$ was found somewhat below −65°, not at −73°.

The elec. cond. κ at 50° and 75°, is almost nil up to about 30 mole % ($PhNH_2$), where it bends upwards sharply, passing an inflection at about 35 mole % and reaching a max. at 45 and 50 mole % at 50° and 75°, resp.; the temp. coeff. of κ has a max. at about 30 mole % ($PhNH_2$); the elec. cond. thus appears to belong to the compd. $Ac_2O.PhNH_2$ at the max., κ = 137 and 187 $\times 10^{-6}$ ohm$^{-1}$ cm.$^{-1}$ at 50° and 75°, resp. The viscosity η has a sharp max. at 33.3 mole % ($PhNH_2$), η = 8.3 and 3.7 centipoises at 50° and 75°, resp.; the temp. coeff. of η has a max. at about 40 mole %. The d. has a max. at about 30 mole %. N. Thon

ASO-SLA METALLURGICAL LITERATURE CLASSIFICATION

KLOCHKO, M. A. [illegible]

USSR/Chemistry - Systems, Ternary Jan/Feb 1948
Chemistry - Conductivity, Electric

"Investigation of Anhydrous Solutions by Physical Chemical Analysis, Part III: Triple System, Aniline - Acetic Anhydride - Water; Fusibility, Conductivity, Viscosity," M. A. Klochko, O. P. Chanukvadze, Inst of Gen and Inorg Chem, Acad Sci USSR, 9 pp

"Iz Ak Nauk SSSR, Otdel Khim Nauk" No 1

Describes study of electroconductivity and viscosity at temperatures of 0°-75°, and also of fusibility in triple system, aniline - acetic anhydride - water.

[illegible] 66T56

2

**Physicochemical investigations of anhydrous solutions. VI. The ternary system aniline-acetic anhydride-water: fusion, electric conductivity, viscosity.** M. A. Klochko and U. P. Chanukvadze (N. S. Kurnakov Inst. Gen. Inorg. Chem., Acad. Sci. U.S.S.R., Moscow). *Bull. acad. sci. U.R.S.S., Classe sci. chim.* 1948, 40-9 (in Russian); cf. *C.A.* 42, 6788a.—Detns. of melting temps. $t$, sp. elec. cond. $\kappa$, viscosity $\eta$, and of d. were made, for the primary system (I) $Ac_2O-(PhNH_2)_2-H_2O$, along the 6 sections of const. $H_2O$ (mole %): (1) 21.0, (2) 33.4, (3) 50.0, (4) 57.1, (5) 70.0, and (6) 81.0; sections 1 and 3 correspond, in the secondary system (II) $Ac_2O-(AcOH)_2-(PhNH_2)_2$, to 26.6 and 50.0 mole % $(AcOH)_2$, resp., sections 4, 5, and 6, in the secondary system (III) $(AcOH)_2-(PhNH_2)_2-H_2O$, to 25.0, 57.1, and 77.2 mole % $H_2O$, resp. (1) In the triangular diagram II, the maxima of $t$ correspond, on all sections, to 33.3 mole % $(PhNH_2)_2$ and lie on the straight line running from $2Ac_2O.(PhNH_2)_2$ to $2(AcOH)_2.(PhNH_2)_2$. A 2nd singular secant runs from $(AcOH)_2$ to $2Ac_2O.(PhNH_2)_2$, these being the most stable products in the system. Eutectic points are (1) −17.3°, 6.20 mole % $(PhNH_2)_2$ and −38.8°, 88.73; (2) −8.0°, 3.22, and −25.3°, 88.37. Eutectic lines are drawn tentatively. (2) The 0, 15, 25, 35, 50, and 75° isotherms of $\kappa$ for section 4, against mole % $(PhNH_2)_2$, show maxima and inflections, the latter tending to go over into minima at lower temps. and to disappear at highest temps. On the ternary projection (I), the line of max. $\kappa$ runs from close to $2Ac_2O.(PhNH_2)_2$, first in the general direction of the $H_2O$ corner, but then deviates markedly towards the $(AcOH)_2-H_2O$ side in the 2nd half of the triangle (that corresponding to III). Highest values of $\kappa$ are shown in the region close to the $H_2O$ corner. The isotherms of $\eta$ (section 4) have max., the higher the lower the temp.; equally, the trend of change of $\eta$ with the compn. is reversed with regard to $\kappa$. As the decrease of $\eta$ with rising temp. is greater than the increase of $\kappa$, the product $\kappa\eta$ decreases. The elec. cond. of the system is detd. by the compd. between $Ac_2O$ and $PhNH_2$, and decreases with its increasing dissocn. The effect of $H_2O$ on both $\kappa$ and on $\eta$ is the same as that of the temp.

N. Thon

METALLURGICAL LITERATURE CLASSIFICATION

2

Vyacheslav Petrovich [illegible]. M. [illegible]. Zhur. Priklad. Khim. (J. Applied Chem.) 21, [illegible](1948).— Obituary with bibliography and portrait. O. M. K.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

Analogy between phase rule and the Euler theorem for polyhedrons. M. A. Klochko (N.S. Kurnakov Inst. of Gen. and Inorg. Chem., Acad. Sci. U.S.S.R.). *Izvest. Sektora Fiz.-Khim. Anal., Inst. Obshchei i Neorg. Khim., Akad. Nauk S.S.S.R.* 19, 82-8(1949).—The similarity between the phase rule equation and the Euler (Leonard) theorem in geometry is purely one of form based primarily on the similarity of certain algebraic groupings. M. Hoch

ANOSOV, Viktor Yakovlevich, professor, doktor khimicheskikh nauk; POGODIN, Sergey Aleksandrovich, professor, zasluzhennyy deyatel' nauki i tekhniki RSFSR, doktor khimicheskikh nauk [authors]; VOL'FKOVICH, S.I., akademik; KLOCHKO, M.A., professor, doktor khimicheskikh nauk, laureat Stalinskoy premii [reviewers].

Second awarding of N.S.Kurnakov's prize ("Fundamentals of physicochemical analysis." V.IA.Anosov, S.A.Pogodin. Reviewed by S.I.Vol'fkovich, M.A. Klochko). Izv.Sekt.fiz.-khim.anal. 21:5-9 '52. (MLRA 6:7)
(Chemistry, Analytical) (Pogodin, Sergei Aleksandrovich)
(Anosov, Viktor Iakovlevich, 1891- ) (Chemistry, Physical and theoretical)

Klochko, M.A

**Electroconductivity** and viscosity of the system lithium chlorate water. M. A. Klochko [illegible]
[illegible]
[illegible]
[illegible]
[illegible] 100 [illegible]
[illegible] 42 [illegible]
which at higher [illegible]
higher [illegible]
31.8 and at 100° wit [illegible] respectively the
compn. of the cryohydric point. The viscosity curves had
breaks at points corresponding to the breaks on the cond.
curves. Cond. [illegible] and [illegible] the
curves of cond. and viscosity [illegible]
corresponding to the compn. [illegible]
cond. of aq. solns. [illegible]
to ions of the dissolved salt [illegible]
bining into mole[illegible] by the mobility of these ions decreas-
ing as the viscosity of the soln. [illegible] M. Hoch

KLOCHKO, M. A.

8

**Electroconductivity and viscosity of the system lithium nitrate-water.** M. A. Klochko and I. G. Grigor'ev (N. S. Kurnakov Inst. Gen. 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, 809-10 (1952).— This system was studied at $LiNO_3$ concns. of 0-40.0 mol.% and 25, 50, 75, and 100°. The maxima on the cond. curves shifted from 10.8 mol.% at 25° to 11.8 mol.% at 100°; the cryohydric point is at 11.6 mol.%. On approx. the same points on the viscosity curves a sharp rise started. The trihydrate was marked on the property curves either by breaks or bends. In aq. solns. the viscosity decreases from pure salt to pure $H_2O$. It is also possible that the ions migrate under the influence of an elec. field in a shell of $H_2O$. The dimensions of this shell depend on the concn., considering that at a concn. of 90 mol.% 1 mol. of $H_2O$ is shared by 18 ions and only at 33.3 mol.% does each ion have a mol. of $H_2O$. Pure fused $LiNO_3$ at 200° had a cond. 0.80 $ohm^{-1}cm.^{-1}$ or twice the max. cond. at 100°. M. Hosch

KLOCHKO, M.A.

11

**Electroconductivity and viscosity of the system lithium nitrate–methyl alcohol.** M. A. Klochko and I. G. Grigor'ev (N. S. Kurnakov Inst. Gen. 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, 211–17(1952).—In this investigation the concn. of $LiNO_3$ was 0–24.88 mol.% and the temps. 0, 25, and 50°. The cond. curves had maxima that shifted toward higher concn. with the rise in temp. Thus, at 0° the max. coincided with 8 mol.% and at 50° with 8.8 mol.%. The viscosity curves rose gently at first and then steeply. Generally, the property curves of $LiNO_3$ in MeOH resembled closely analogous curves in $H_2O$ except for the numerical values of the resp. points. At 25° the cond. max. in $H_2O$ coincided with 10.2 mol.% $LiNO_3$ and in MeOH with 8.2 mol.%. The abs. value of cond. at 25° and 50° in $H_2O$ was 5.8–6.9 times the corresponding value in MeOH, whereas the viscosity in MeOH was only 1.34–1.35 times the corresponding value in $H_2O$. Apparently, the interaction of components in the 2 systems is quite different.

M. Hosch

KLOCHKO, M. A.

**Properties of lithium nitrate solutions in equimolecular mixtures of water and dioxane.** M. A. Klochko and I. G. Grigor'ev (N. S. Kurnakov Inst. ~~Gen. Inorg.~~ Chem., Acad. Sci. U.S.S.R., Moscow). *Izvest. Sektora Fiz.-Khim. Anal., Inst. Obshchei Neorg. Khim., Akad. Nauk S.S.S.R.* 27, 314 [illegible].—Cond., viscosity, d., layer-sepn. temp., and crystn. temp. of 0.90–34.40 mol. % $LiNO_3$ were studied in equimol. mixts. of $H_2O$ and dioxane at 15–75°. The cond. of the $H_2O$-dioxane mixt. was 2.17 × 10[illegible], 3.34 × 10[illegible] and [illegible].34 × 10[illegible] mhos/cm. at 25, 50, and 75°, resp. The temp. of appearance of crystals rose with the $LiNO_3$ content from 7.5° in soln. free of $LiNO_3$ to 8[illegible]° at 28.17 mol. % of $LiNO_3$. At 11 mol. % there was a bend in the [illegible] as no layer sepn. at 1-115° if the $LiNO_3$ [illegible] %. Nor was layer sepn. [illegible] exceeded 24.41 mol. %. [illegible] layer sepn. zone presents [illegible] 5.6 and [illegible] mol. % $LiNO_3$ [illegible] from [illegible] to 14 mol. % at 50° from 10 [illegible] at 75° from 7 to 28 mol. % $LiNO_3$. [illegible] polytherm of a compn. entirely outside the layer sepn. zone (5.39 mol. %) rose uniformly with temp. The cond. polytherm for 5.81 mol. % $LiNO_3$ had a bend at a point close-by, where layer sepn. began. The cond. polytherm for 11.30 mol. % $LiNO_3$, which compn. is entirely within the layer sepn. zone, had two bends and rose sharply with temp. The cond. was detd. in the lower layer which contained practically all of the $LiNO_3$. Cond. isotherms had bends on the boundary of the layer sepn. zone. Upon entering the layer sepn. zone the cond. rose sharply and dropped upon emergence from it. The viscosity and d. curves behaved in an analogous manner. For comparative concns. of $LiNO_3$ at 25° in $H_2O$, MeOH, and $H_2O$-dioxane (1:1) the resp. data for cond. ($\kappa$), viscosity ($\eta$), and temp. coeff. of cond. ($\alpha$) and of viscosity ($\beta$) are: for 8.01 mol. % $LiNO_3$ in $H_2O$ $\kappa$ = 0.1659 mho/cm., $\eta$ = 1.48 centipoise, $\alpha$ = 1.425, $\beta$ = 1.818 and $\alpha/\beta$ = 0.822. For 8.09 mol. % $LiNO_3$ in MeOH $\kappa$ = 0.0220, $\eta$ = [illegible], $\alpha$ = [illegible].309, $\beta$ = 1.790 and $\alpha/\beta$ = [illegible]. For 5.81 mol. % $LiNO_3$ in $H_2O$-dioxane $\kappa$ = [illegible], $\eta$ = 2.704, $\alpha$ = 1.340, $\beta$ = 2.105, and $\alpha/\beta$ = [illegible]. Qualitatively, the decrease in cond. can be explained by a decrease in the dielec. const. and a decrease in [illegible] dipole moments of the 3 components. [illegible]

KLOCHKO, M.A.; LUNEVA, V.S.

Chemical and electrochemical dissolving of palladium in solutions of certain acids and salts. Izv.Sekt.plat.i blag.met. no.27:239-244 '52. (MLRA 7:5)

(Palladium) (Solubility)

CA

2

**The effect of Kara-bogaz-gol Bay on alteration of salt balance in the Caspian Sea.** M. A. Kharlov. *Doklady Akad. Nauk S.S.S.R.* 82, [illegible] ([illegible]). From considerations of the known rate of flow of streams and rivers into the area, and from the analyses of the mineral content of the water therein, the flow of 7.8 cu. km. of Caspian waters into the bay would suffice to lower the chloride content and the sum of mineral salts so as to prevent accumulation of sulfates. In acting as a salt-removing agent the bay over the past 400 years was said to have reduced the salt content of the sea by 0.1%, so that the present salinity of 1.3% would have been 1.4% had the bay been nonexistent. Generally speaking, however, the desalting action of the bay is rather small, and is of interest mainly for theoretical considerations of stabilization of salinity in connecting bodies of water. G. M. Kosolapoff [illegible], N.A.

USSR.

Relation between the composition at maximum electrical conductivity and that at the eutectic point in salt-water [illegible] In binary systems salt-water the sp. conductivities pass through a max. at which the compn. coincides (within 1-2 mole %) with the compn. at the eutectic, if the salt forms cryst. hydrates. If the salt does not form cryst. hydrates, these compns. do not coincide. J. Rovtar Leach

KLOCHKO, M. A.

Physical Chemistry, Physicochemical Analysis (12494)

Izv. Sektora Fiz. -Khim. Analiza Inst. Obshch. i Neorgan. Khimii AN SSSR, Vol. 22, 1953
pp 298-312

Klochko, M. A.; Uchurkhanov, M. M.

Investigation of the System Silver Perchlorate - Water by the Method of Physicochemical Analysis

Studied the above system and determined its electrical conductivity, density, viscosity, and other physical properties.

SO: Referativnyy Zhurnal -- Khimiya, No. 2, 1954 (W-30907)

KLOCHKO, M.A.; UCHURKHANOV, M.M.

Physicochemical study of the system silver perchlorate — acetone.
Izv.Sekt.fiz.-khim.anal. 22:313-319 '53. (MLRA 7:5)

1. Institut obshchey i neorganicheskoy khimii im. N.S.Kurnakova
Akademii nauk SSSR. (Silver perchlorate) (Acetone)

KLOCHKO, M. A.

6

Anodic behavior of silver-palladium alloys in *N* nitric acid. M. A. Klochko and Z. S. Medvedeva. *Izvest. Sektora* [illegible] Akad. *Nauk S.S.S.R.* 23, 131-8(1953).—Polarization curves were obtained for Ag, Pd, and 7 of their alloys contg. 10-75% Pd. As the potential of the external circuit rose, the anodic potential first changed rapidly without changing the current; then, as either the anode began to dissolve or O started to be evolved on it, the current rose sharply while the potential remained the same. The polarization curves formed 2 groups: (1) on Ag and alloys with up to 28% Pd, (2) Pd and alloys with more than 28% Pd. Alloys with up to 28% Pd dissolved in *N* $HNO_3$ with current. Alloys with higher Pd content were passive. In the course of electrolysis an anodic sludge formed, the compn. of which was the same as that of the anode.

M. Hoseh

KLOCHKO, M.A.

**Röntgenographic investigation of sludge from anodic solution of silver-palladium alloys in normal nitric acid.** M. A. Klochko, A. N. Khlopova, and I. S. Medvedeva. [redacted] Khim., Akad. Nauk S.S.S.R. 31, 139-41(1955).—X-ray analysis of the anodic sludge formed during electrolytic dissolving of Ag-Pd alloys showed it to be the same solid soln. as the anode from which they formed. The sludge forms as a result of uneven dissolving of the surface of the anode of which individual areas can have different electrode potentials. In the course of electrolysis these areas fall off the anode, forming the sludge.

M. Hosch

✓ Investigation of the silver perchlorate-pyridine system by the physicochemical method of analysis 5

2 and 2.8 v. (nearer 2 v.). Electrolysis of soln. yields finely cryst. dull ppt. of Ag.

F. S. Beig

5(2)

SOV/78-4-8-41/43

AUTHOR: ~~Klochko, M. A.~~

TITLE: Symposium on the Chemistry of the Coordination Compounds in Agra (India) (Simpozium po khimii koordinatsionnykh soyedineniy v g. Agra (Indiya))

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 8, pp 1937-1939 (USSR)

ABSTRACT: The symposium took place in February 1959. The following scientists from the USSR attended the symposium: Academicians A. N. Terenin and S. I. Vol'fkovich, Ya.I.Gerasimov, Corresponding Member of the ASUSSR, and M. A. Klochka, A.S. Kotel'nikova, M. N. Lyashenko, L. A. Nazarova, G. V. Shevchenko and Ye. V. Shenderetskaya, scientific collaborators of the Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova AN SSSR (Institute of General and Inorganic Chemistry imeni N. S. Kurnakov of the AS USSR). A report is given on the scientific institutes of India and the lectures heard. Eastern scientists delivered the following lectures: A. N. Terenin: "Infrared Spectra of Molecular Compounds of Metallic Halides"; Ya. I. Gerasimov: "The Influence Exercised by the Crystal Structure on the Thermodynamical Properties of Tungstic Oxides With Variable

Card 1/2

SOV/78-4-8-41/43

Symposium on the Chemistry of the Coordination Compounds in Agra (India)

Coordination Number" and Doctor L. Sommer (Czechoslovakia) on the analytical application of some complex compounds of the polyphenols.

Card 2/2

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Klochko M. A.

USSR / Theory of Solids. Geometrical Crystallography.

**Abs Jour** : Ref Zhur - Fizika, No 4, 1957, No 9154

**Author** : Klochko, M.A.

**Title** : Connection Between the Coordination Numbers and Complex Compounds and the Number of Vertices of Regular Convex Polyhedra.

**Orig Pub** : Izv. Sektora platiny AN SSSR, 1955, vyp. 29, 133-140

**Abstract** : Starting with the assumption that the activity of the central atom in the complex is spherically symmetrical, the author calculates the possible coordinate numbers as the numbers of the vertices of regular convex polyhedra, inscribed in a sphere, in whose center the central atom (ion) is located. The fundamental coordination numbers are 4, 6, 8, 12 and 2. Coordination numbers 5, 7, 9, 10 and 11 have low probability, and are hardly ever observed in practice. The coordination number 3 corresponds to the placement of the substitutes in one plane.

**Card** : 1/1

**The anodic behavior and potentials of gold-platinum alloys.** M. A. Klochko and V. K. Nikitina. *Izvest. Sektora* [illegible] *Neorg. Khim., Akad. Nauk S.S.S.R.* 29, 197 [illegible]. The anodic [illegible] the e.m.f. and the electrode [illegible] of the Au-Pt system were studied over the whole [illegible] range and in the annealed as well as quenched state. The nature of the compn.-potential curve in the annealed and the quenched states was analogous, and [illegible] regions of the existence of solid [illegible]. The straight-line section of the [illegible] with [illegible] heterogeneous range. In the annealed samples, the [illegible] in Au was the 1st to dissolve. The dissolved [illegible] the alloys in the heterogeneous range had the [illegible] starting soln. [illegible] 75% Au and [illegible]

[illegible] by [illegible] and solutions of silver 4E3d

[illegible] in nitrobenzene [illegible] and toluene

M. [illegible]

[illegible]
NO$_3$ gave the following [illegible]
AgClO$_4$ C$_6$H$_5$NO$_2$ and [illegible]
the last compd. is the [illegible]
tend. to decrease [illegible]
at concns. 1 to 5% and [illegible]
10$^{-7}$ mho./cm.

KLOCHKO, [illegible] A.

6

3

**Study of copper-palladium alloys by electrochemical methods.** M. A. Klochko and M. E. Mironova. *Izvest. Sektora Fiz.-Khim. Anal., Inst. Obshchei i Neorg. Khim., Akad. Nauk S.S.S.R.* 23, 118-30(1953).—Cu-Pd alloys with 0-100% Pd were prepd. from electrolytic Cu and sponge Pd. Impurities did not exceed 0.1%. A portion of the alloy specimens hardened from 900° in cold $H_2O$, and a portion was annealed starting at 600° for 48 hrs. and ending at 150° for 94 hrs. On both the annealed and hardened specimens, Brinell hardness was detd. The e.m.fs. of a series of specimens were detd. in a cell Cu/*N* $CuSO_4$/Cu-Pd. This was done after 1, 2, and 3 anneals. Repeated annealing changed the shape of the curve, compn. *vs.* e.m.f. Furthermore, the e.m.f. was detd. with annealed and hardened specimens in $CuSO_4$ and in HCl. Also studied was the anodic soln. of the alloys in $CuSO_4$ + $H_2SO_4$, 2*N* $H_2SO_4$, and 2*N* HCl. All alloys dissolved in HCl. In $H_2SO_4$ and $CuSO_4$ + $H_2SO_4$ only alloys with up to 25 at. % Pd dissolved. M. Hosch

**KLOCHKO, M.A.**; KURBANOV, M.Sh.

Use of physicochemical analysis in the study of the system : phosphoric acid - water. Izv.Sekt.fiz.-khim.anal. 24:252-263 '54. (MIRA 8:4)

1. Institut obshchey i neorganicheskoy khimii im.N.S.Kurnakova Akademii nauk SSSR.
(Phosphoric acid)

KLOCHKO, M.A.; KURBANOV, M.Sh.

Use of physicochemical analysis in the study of the system: sulfuric anhydride - water. Izv. Sekt.fiz.-khim.anal. 24:264-276 '54. (MIRA 8:4)

1. Institut obshchey i neorganicheskoy khimii im. N.S.Kurnakova Akademii nauk SSSR.
(Sulfur trioxide)

KLOCHKO, M.A.

USSR.

General types of composition-property diagrams of binary two-phase systems. M. A. Klochko. Izvest. Sektora Fiz.-Khim. Anal., Inst. Obshchei i Neorg. Khim., Akad. Nauk S.S.S.R. 25, [illegible](1954).—A discussion. R. M.

aI

**KLOCHKO, M.A.; MIRONOVA, M.Ye.**

Anodic solution of copper -- sulfur alloys. Izv.Sekt.fiz.-khim.anal. no.25:128-133 '54. (MLRA 8:5)

1. Institut obshchey i neorganicheskoy khimii im. N.S.Kurnakova Akademii nauk SSSR.
(Copper-sulfur alloys)

KLOCHKO, M. A.

GRINBERG, A.A. (Leningrad); BABAYEVA, A.V. (Moscow); YATSIMIRSKIY, K.B. (Ivanovo); GOREMYKIN, V.I. (Moscow); BOKIY, G.B. (Moscow); FIALKOV, Ya.A. (Kiyev); YAKSHIN, M.M. (Moscow); KEDROV, B.M. (Moscow); GEL'MAN, A.D. (Moscow); FEDOROV, I.A. (Moscow); MAKSIMYUK, Ye.A. (Leningrad); VOL'KENSHTEYN, M.V. (Leningrad); ZHDANOV, G.S. (Moscow); PTITSYN, B.V. (Leningrad); ABLOV, A.V. (Kishinev); VOLSHTEYN, L.M. (Dnepropetrovsk); TROITSKAYA, A.D. (Kazan'); KLOCHKO, M.A. (Moscow); BABAYEVA, A.V.; TRONEV, V.G. (Moscow); RUBINSHTEYN, A.M. (Moscow) CHERNYAYEV, I.I.; GRINBERG, A.A.; TANANAYEV, I.V.

Explanation of the transeffect. Izv.Sekt.plat.i blag.met. no.28: 56-126 '54. (MLRA 7:9)
(Compounds, Complex) (Platinum)

KLOCHKO, M.A.

USSR.

**Anodic behavior of silver-lead alloys in normal nitric acid.** M. A. Klochko and Z. S. Medvedeva. *Izvest. Sektora Fiz.-Khim. [illegible] Anal., Inst. Obshchei i Neorg. Khim., Akad. Nauk S.S.S.R.*, 25, 310-7(1954); cf. C. A. 48, 9842d.—The anodic behavior of Ag, Pb, and 14 intermediate alloys in *N* $HNO_3$ at room temp. and a c.d. of 25 ma./sq. cm. was studied. All alloys were anode sol. E.m.f. curves of Ag-Pb alloys in *N* $Pb(NO_3)_2$ and *N* $HNO_3$ had a sharp break at 3.3% Pb, indicating limit of solid soln. of Pb in Ag.

H. W. Rathmann

KLOCHKO, M.A.

4

USSR.

Anodic behavior of palladium-lead alloys in normal nitric acid. M. A. Klochko and Z. S. Medvedeva. Izvest. Sektora Fiz.-Khim. Anal., Inst. Obshchei i Neorg. Khim., Akad. Nauk S.S.S.R. 25, 268-72(1954); cf. C.A. 48, 9642d.—The anodic behavior of Pd, Pb, and alloys contg. 5.0, 21.3, 25.1, 26.0, 36.8, and 44.0 wt. % Pd was studied in N $HNO_3$ at room temp. and at c.d. of 10 ma./sq. cm. Alloys contg. 5.0-36.8% Pd dissolved in N $HNO_3$. E.m.f. curves in N $Pb(NO_3)_2$ and N $HNO_3$ had a break at 21.3% Pd, corresponding to the compd. $Pb_3Pd$.

H. W. Rathmann

KLOCHKO, M. A.

USSR

Anodic behavior of palladium in hydrochloric acid. M. A. Klochko, [illegible], and M. K. Mironova. Izvest. Sektora Platiny i Drug. Blagorod. Metal., Inst. Obshchei i Neorg. Khim., Akad. Nauk S.S.S.R. 28, 274-8 (1954).—Anodic behavior of Pd in 0.1, 0.5, 1, 2, and 3 N HCl at room temp. was studied. Pd was passive in 0.1 and 0.5N HCl and active in 1, 2, and 3N HCl. Anodic potentials of Pd were measured at various c.d. J. W. R.

KLOCHKO, M.A.

[redacted]

Sergei Aleksandrovich Pogodin; on the 60th anniversary of his birthday.
Izv.Sekt.fiz.-khim.anal. 26:5-13 '55. (MLRA 8:9)
(Pogodin, Sergei Aleksandrovich, 1894- )
(Bibliography--Chemistry)

KLOCHKO, M.A.

Anodic behavior of alloys of palladium-sulfur. M. A. Klochko and M. V. Mironova. Izvest. Sektora Fiz.-Khim. Anal., Inst. Obshchei i Neorg. Khim., Akad. Nauk S.S.S.R. 26, 68-74(1955).—Anodic soln. of alloys of Pd and S in 2N $H_2SO_4$ produced a large proportion of slime. Raising c.d. lowered yield of slime and increased amt. of Pd and S going into soln. Anodic soln. in 2N $H_2SO_4$ at an anodic c.d. of 200 amp./sq. m. caused 87-98% of S found in the anode to be oxidized and admitted into the electrolyte. Yield of slime represented 20-80% of anode loss, whereupon the slime contained a lower percentage of S than the anode. Pd and S alloys had a greater anode potential than did pure Pd. This was explained by the greater ease of transition of Pd into the electrolyte in the form of ions in comparison to decompn. of a sulfide and oxidation of S (1300 mv.). V. N. I.

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Inst. Gen. & Inorganic Chem im N.S. Kurnakov
AS USSR

KLOCHKO, M.A.

Anodic behavior of a triple alloy of copper, palladium, and sulfur. M. A. Klochko and M. E. Mironova. *Izvest. Sektora Platiny i Drug. Blagorod. Metal., Inst. Obshchei i Neorg. Khim., Akad. Nauk S.S.S.R.* 30, 73-81(1955).—Triple alloys of Cu, Pd, and S formed considerable amts. of anodic slime in electrolysis in 2N HCl approaching 78% of anode loss with anodes contg. 1.3-1.4% S and 41% loss with anodes contg. 11-20% S. Cu and Pd dissolved first, the sulfides essentially entering the slime. Current yield was 46-70% for alloys contg. up to 1.4% S and nearly 100% for S content over 11.87%. Potentials of triple alloys in HCl changed little with compn. and, at a c.d. of 200 amp./sq. m., changed little with time of electrolysis. At 800 amp./sq. m. the potential rose 1 v. at the end of the expt. The potential of these alloys in HCl was close to that of Cu. Some alloys contg. 18-20% S stratified in the liquid state and formed inside the ingot an alloy contg. 2-6% S. V. N. B.

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KLOCHKO, M.A

V **Anodic behavior of alloys of palladium and nickel.** M. A. Klochko and E. S. Medvedeva. *Izvest. Sektora Fiz.-Khim. Anal., Inst. Obshchei i Neorg. Khim., Akad. Nauk S.S.S.R.* 26, 81-90(1955).—The e.m.f. and anodic behavior of pure Ni and Pd and their alloys was detd. in Ni-salt solns., in N $HNO_3$, and in HCl. It was established that the relation of e.m.f. and anodic potential of annealed alloys of Ni and Pd to their compn. corresponded to the change of these properties in a continuous series of solid solns. In $HNO_3$ the alloys were passive but were anodically sol. in HCl.

V. N. Bednarski

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Klochko, M. A.

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**The anodic solution and potentials of the platinum-copper alloys. M. V. Klochko and V. K. Nikitina.** *Izvest. Sektora Platiny i Drug. Blagorod. Metal., Inst. Obshchei i Neorg. Khim., Akad. Nauk S.S.S.R.* 29, 207-43 (1955). The electrode potentials, e.m.f. [illegible] anodic soln. and the polarization curves of the Pt-Cu alloy system were investigated over the whole range of concns., both in the annealed and quenched states. The nature of changes in [illegible] potential curves (in 5*N* HCl soln. and the [illegible] CuSO4 soln.) depended strongly [illegible] the existence of transformations in the solid state [illegible] of compds. from a continuous series of solid soln. [illegible] found on curves for quenched alloys [illegible] the compds. PtCu and PtCu3. This was due [illegible] alloys of these compns. were the furthest removed from the equil. state, and therefore had a max. free energy in comparison with the annealed alloys of the same compn. which were true chem. compds. The difference in the electrode potentials in the quenched and annealed states of the PtCu compd. in 5*N* HCl reached 500 mv. The nature of anodic soln. was not affected by the thermal treatment. Under the influence of the elec. current, in alloys contg. 0-[illegible]% Pt, Cu primarily entered the soln. In the middle part of the diagram with a Pt content between 25 and 60%, the dissolved anode had the compn. of the alloy. Alloys with 60-100% Pt were almost insol. The electrode potential measurements permitted the detection of chem. compds. formed in continuous series of solid solns. at lower temps. not only on annealed samples but equally clearly on quenched samples.

W. M. S.

**KLOCHKO, M.A.**

Congress of Austrian and German chemists in Salzburg. Zhur.neorg. khim. 1 no.10:2430 O 56. (MIRA 10:1)
(Salzburg--Chemistry--Congresses)

KLOCHKO, M.A.

[redacted] Conference of Austrian and German chemists. Izv.AN SSSR. Otd.khim.
nauk no.11:1426-1428 N '56. (MIRA 10:3)
(Salzburg--Chemistry--Congresses)

KLOCHKO, M.A., doktor khimicheskikh nauk.

[redacted]

Conference of Austrian and German chemists. Vest. AN SSSR
26 no.10:78-79 O '56. (MLRA 9:11)

(Salzburg--Chemistry--Congresses)

Klochko, M.A.

Change of the ionic conductivity of melted individual chemical compounds and systems with temperature. M. [illegible] Klochko. Zhur. Obshchei Khim. [illegible]

[illegible] is equal [illegible]

[illegible] and their [illegible]

[illegible] with temp [illegible]

KLOCHKO, M.A.

Works of N.N.EFREMOV in the field of electrochemistry. Izv.Sekt.
fiz.-khim.anal. 27:28-29 '56. (MLRA 9:9)

1.Institut obshchey i neorganicheskoy khimii imeni N.S.Kurnakova
AN SSSR.
(Electrochemistry) (Efremov, Nikolai Nikolaevich, 1886-1947)

KLOCHKO, M.A.

USSR/Physical Chemistry - Solutions. B-11
Theory of Acids and Bases

Abs Jour : Referat Zhur - Khimiya, No 2, 1957, 3899

Author : Klochko M.A.
Inst : Institute of General and Inorganic Chemistry, Academy of Sciences USSR
Title : Changes in Electrolytic Conductivity of Individual Liquids and Solutions Depending on the Temperature.

Orig Pub : Izv. Sektora fiz.-khim. analiza IONKh AN SSSR, 1956, 27, 50-74

Abstract : Subdivision of electrolytes into strong and weak is of limited utility. A more general subdivision is that of autolytes, which conduct the current in the liquid state, and heterolytes, which conduct the current only in solutions of suitable substances. The existing theories do not take into account the influence, upon conductivity, of thermal motion. In order to take this into

Card 1/2 - 167 -

KLOCHKO, M. A.

USSR/Physical Chemistry - Thermodynamics. Thermochemistry. B-8
Equilibrium. Physico-Chemical Analysis. Phase Transitions

Abs Jour : Referat Zhur - Khimiya, No 2, 1957, 3729

Author : Klochko M.A., Medvedeva Z.S.
Inst : Institute of General and Inorganic Chemistry, Academy of Sciences USSR
Title : Electrochemical Investigation of Silver-Tellurium Alloys

Orig Pub : Izv. Sektora fiz.-khim. analiza IONKh, AN SSSR, 1956, 27, 133-140.

Abstract : Electrochemical investigation of eight Ag-Te alloys, over the component concentration range from pure Ag to 37.2% by wieght Te, corresponding to the composition of the compound $Ag_2Te$. Electrolysis was carried out in 1 N $AgNO_3$ acidified with 0.1 N solution of $HNO_3$, with determination of electrode potential by comparison with a saturated calomel electrode. Investigated were the products of electrolysis -- sludge, electrolyte,

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Klochko, M.A.

81-2-3759

Translation from: Referativnyy Zhurnal, Khimiya, Nr 2, p. 51 (USSR)

AUTHORS: Klochko, M.A., Gubskaya, G.F.

TITLE: Electric Conductivity and Viscosity of the System Ammonium Nitrate-Acetamide (Elektroprovodnost' i vyazkost' sistemy nitrat ammoniya - atsetamid)

PERIODICAL: Izv. Sektora fiz.-khim. analiza IONKh AN SSSR, 1956, 27, pp. 393-401

ABSTRACT: Electric conductivity, viscosity, and density of the system $NH_4NO_3$ (I) - $CH_3CONH_2$ (II) have been investigated at 75, 125, and 175°C. It was found that variation in the conductivity is expressed by a marked rise, up to 25-30 mol.% of I on the 125 and 175°C isotherms which corresponds to the hypoeutectic area on the state diagram. In the hypereutectic area the isotherms have a sloping shape. The viscosity curve for 175°C is slightly convex to the axis of the compound. The density values change almost linearly, increasing from II to I. The conductivity temperature coefficients are hardly affected by

Card 1/2

Klochko, M.A.

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

Abs Jour : Ref Zhur - Khimiya, No 8, 1957, 26162

Author : M.A. Klochko, G.F. Gubskaya

Title : Electrical Conductivity and Viscosity of System Ammonium Nitrate - Water.

Orig Pub : Izv. Sektora fiz.-khim. analiza IONKh AN SSSR, 27, 402-411, 1956

Abstract : The electrical conductivity, density and viscosity of solutions of the system $NH_4NO_3$ (I) - $H_2O$ were measured at 25, 75 and 125° and the temperature factors of these properties were computed. The conductivity curves pass through a maximum at 18 to 20 mol. % of I. A shift of the maximum towards greater concentrations of I is observed at the temperature rise. Viscosity rises sharply with the rise of the I content in the solution. The curves of the temperature factors of conductivity pass through a minimum, and those of the viscosity pass through a maximum corresponding to the composition with the conductivity maximum which does not coincide with the eutectic composition. The appearance of the

Card : 1/2

Inst. Gen. & Inorganic Chem im N.S Kurnakov

Klochko, M.A.

Distr: 4E4j 4E2c

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**Electrochemical behavior of gold-copper alloys.** M. A. Klochko and V. K. Nikitina. *Zhur. Neorg. Khim.* 2, 808(1957); cf. C.A. 50, [illegible]. – The electrode potentials E, e.m.f., anodic soly., and the polarization curves of Au-Cu alloys water quenched from 800° and others cooled at the rate of 100°/day to 600° and held at this temp. 3 days were detd. The E vs. compn. curves in 6N HCl and the e.m.f. vs. compn. curves in N $CuSO_4$ showed deep min. which in quenched alloys were attributed to higher free energies compared with those in annealed alloys. These min. corresponded to the compns. of the compds. AuCu, [illegible], $AuCu_3$, and $Au_3Cu$. In alloys contg. from [illegible] to 30 at. % Au, the Cu dissolved preferentially. Only Cu dissolved from $AuCu_3$. With alloys contg. from 40 to 60% Au the proportion of Cu in the soln. was twice that in the initial alloy. In alloys contg. from 60 to 100% Au the compn. of the soln. approached that of the alloys. I. Bencowitz

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KLOCHKO, M.A.,

KLOCHKO, M.A.; MIRONOVA, M.Ye. [deceased]

Studying anodic dissolution and potentials of copper-selenium alloys. Zhur.neorg.khim. 2 no.9:2235-2238 S '57. (MIRA 10:12)
(Copper-selenium alloys) (Electrolysis)

Klochko, M. A)

**KLOCHKO, M.A.**

Maria Efimovna Mironova; obituary. Zhur.neorg.khim. 2 no.9:2239 S '57. (MIRA 10:12)

(Mironova, Maria Efimovna, 1904-1957)

**AUTHORS:** Klochko, M. A., Gubskaya, G. F. SOV/78-3-10-24/35

**TITLE:** Investigation of the System Lithium Nitrate - Acetamide (Issledovaniye sistemy nitrat litiya-atsetamid)

**PERIODICAL:** Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 10, pp 2375-2381 (USSR)

**ABSTRACT:**

The system lithium nitrate - acetamide was investigated by the determination of the conductivity, viscosity and density, as well as by thermal analyses in order to ascertain the character of the chemical interaction between the components of the system. It can be seen from the phase diagram of $LiNO_3$-$CH_3CONH_2$ that two compounds are formed in this system, which are $LiNO_3$. 2 $CH_3CONH_2$ and $LiNO_3.CH_3CONH_2$. The first eutectic point lies between 15-16 mol % lithium nitrate and 140°C. The conductivity was investigated in this system at 75, 125, 175 and 225°C. A maximum occurs in the isothermal lines at 75, 175 and 125°C. The viscosity and density were investigated in the temperature range of from 75 to 175°C. Some solutions have a considerable viscosity. The absolute value of the temperature coefficient of

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SOV/78-3-10-24/35

Investigation of the System Lithium Nitrate - Acetamide

conductivity is slowly increased. The isothermal lines of conductivity belong to the type 8, according to M. A. Klochko's classification. The eutectic area corresponds to the maximum of the isothermal lines of conductivity.
There are 7 figures, 5 tables, and 5 references, 5 of which are Soviet.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova Akademii nauk SSSR (Institute of General and Inorganic Chemistry imeni N. S. Kurnakov of the Academy of Sciences, USSR)

SUBMITTED: August 3, 1957

Card 2/2

AUTHORS: Klochko, M. A., Gubskaya, G. F. SOV/78-3-11-22/23

TITLE: The Conductivity and Viscosity of the Systems From Eutectic Mixtures of the Lithium- and Ammonium Nitrate With Acetamide or Water (Provodimost' i vyazkost' sistem iz evtekticheskoy smesi nitratov litiya i ammoniya i atsetamida ili vody)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 11, pp 2571-2581 (USSR)

ABSTRACT: The conductivity, viscosity, and density of the system lithium nitrate-ammonium nitrate was investigated at 125 and 175°C, and the property diagram of the system was constructed. The viscosity of the system increases with the increase in concentration of the higher melting component. The density changes almost linearly. The course of the conductivity curves shows that the conductivity curve of this system belongs to the type III. The system of the eutectic composition of lithium nitrate-ammonium nitrate-acetamide was investigated and plotted on the ternary diagram. The liquidus curve of the ternary system investigated consists of three parts. From the course of the conductivity isothermal lines may be concluded that the system ammonium nitrate-acetamide belongs to the second class according

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The Conductivity and Viscosity of the Systems From Eutectic Mixtures of the Lithium- and Ammonium Nitrate With Acetamide or Water

to the classification by M. A. Klochko. No great change of the volume occurs in the case of a formation of solid mixtures from the components in the ternary system lithium nitrate-ammonium nitrate-acetamide. The viscosity and density of the eutectic mixture lithium nitrate-ammonium nitrate-water was investigated.
There are 13 figures, 11 tables, and 19 references, 10 of which are Soviet.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova Akademii nauk SSSR (Institute of General and Inorganic Chemistry imeni N. S. Kurnakov, AS USSR)

SUBMITTED: August 3, 1957

Card 2/2

KLOCHKO, M.A.

Conductivity of individual electrolytes and systems. Itogi
nauki: Khim.nauki 4:6-47 '59. (MIRA 13:4)
(Electrolytes--Conductivity)

5(2)

AUTHORS: Klochko, M. A., Gubskaya, G. F. SOV/78-4-3-29/34

TITLE: On the Compounds of Lithium Nitrate With Acetamide
(O soyedineniyakh nitrata litiya s atsetamidom)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 3,
pp 684-687 (USSR)

ABSTRACT:

The crystallization of the compound $LiNO_3.CH_3CONH_2$ from various solvents, e. g. acetone, benzene, ethyl alcohol, ether , and methyl alcohol was investigated. The compound can be crystallized in pure state and as uniform crystals only from acetone solution. In water at 25° the solubility of this compound amounts to 70.91 wt %. The compound is practically insoluble in benzene and nitrobenzene. The flat rhombic crystals have the following refraction indices: $N_1 = 1.57-1.59$ and $N_2 = 1.450$.

It was not possible to isolate the compound $LiNO_3.2CH_2CONH_2$ in pure form from acetone, methyl alcohol, and ethyl alcohol. The existence of this compound was only found by thermal analysis, determination of the electric conductivity, and microscopic investigation. There are 1 figure, 2 tables, ~~and~~

~~Card 1/2~~

GODNEVA, M.M.; KLOCHKO, M.A.

Limits of homogeneity in water-dioxane and water-acetone systems with lithium, sodium, or potassium hydroxides at temperature of 25 and 75°. Izv.Kar.i Kol.fil.AN SSSR no.5:122-129 '58. (MIRA 12:9)

1. Institut khimii i tekhnologii redkikh elementov i mineral'nogo syr'ya Kol'skogo filiala AN SSSR.
(Systems(Chemistry))

5(2)

AUTHORS: Klochko, M. A., Godneva, M. M. SOV/78-4-9-32/44

TITLE: The Study of the Electroconductivity and Viscosity of Aqueous Solutions of the Hydroxides of Sodium and Potassium

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 9, pp 2127-2135 (USSR)

ABSTRACT: The numerous publications on the electroconductivity of solutions (Refs 1-18) contain only few data regarding electroconductivity in the case of higher concentrations and temperatures. The research workers mainly dealt with diluted solutions at low temperatures, among them M. I. Usanovich and T. N. Sushkevich (Ref 13), P. M. Korotkov and N. N. Sokolov (Ref 11), G. L. Kobus (Ref 14), M. G. Manvelyan (Ref 15), A. F. Skryshevskiy, A. V. Romanova, and V. I. Danilov (Ref 18). In some solvents there is a particular conductivity mechanism, e.g. if the components of a system possess common ions but differ with regard to the degree of dissociation. In aqueous solutions of acids and bases there is to be found, besides the transfer of electricity by the movement of ions along the lines of force of the field, yet another migration mechanism which causes the great mobility of the $H^+$- and $OH^-$ ions. In order to investigate the part played by water

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in regard of this phenomenon the field of the transition from the pure molten electrolyte to compositions with a low water content had to be studied. It is intended to use an equimolar NaOH and KOH mixture melting at 170°. For the time being, however, an account of the measurement of the conductivity and viscosity of the two above components between 25 and 200° is given. The results are summarised in tables 2-7 and figures 3-7. The different conductivities of the aqueous solutions of the alkali hydroxides are due to the radius of the cation and the hydration. The small lithium ion is inhibited in its speed by a large hydrate shell. In melts and highly concentrated solutions hydration is limited, and the smaller ion reaches its respective greater velocity than a larger ion with the same charge. This change in hydration accounts for the fact that the conductivity $\varkappa_{NaOH}$ becomes greater at high temperatures than $\varkappa_{KOH}$. The temperature coefficients of the viscosity $\eta$ and conductivity $\varkappa$ change homologously (Fig 3).

The Study of the Electroconductivity and Viscosity of Aqueous Solutions of the Hydroxides of Sodium and Potassium SOV/78-4-9-32/44

which also suggests a close connection between these properties. The polytherms of conductivity (Fig 6) become steeper as the concentration increases, which is due to the greater viscosity. A temperature increase is acconpanied by a homologous drop of the product $x\eta$ . (Fig 7). There are 7 figures, 6 tables, and 23 references, 15 of which are Soviet.

SUBMITTED: January 17, 1959

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5(2)

**AUTHORS:** Klochko, M. A., Godneva, M. M. SOV/78-4-9-33/44

**TITLE:** Electric Conductivity and Viscosity in the Transitional Region of the Melt of Sodium and Potassium Hydroxide and Their Aqueous Solutions

**PERIODICAL:** Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 9, pp 2136-2142 (USSR)

**ABSTRACT:** The melting point diagram of the system mentioned in the title (Fig 1) was investigated, inter alia, by V. A. Khitrov (Ref 4), G. M. Unzhakov (Ref 5), and N. A. Reshetnikov and G. M. Unzhakov (Ref 6). The authors had pointed to the role played by water in the so-called migration mechanism in connection with the investigation of concentrated aqueous solutions of hydroxides (Ref 1). This effect is now being investigated in the range of transition from the solution to the melt. An equimolar mixture of NaOH and KOH proved most favorable for such an investigation, since it melts at as low a temperature as 170°. For the purposes of this abstract this mixture will be referred to below as $MeOH(=\frac{NaOH + KOH}{2})$. The measurement of the electric conductivity

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has already been described (Ref 1). The measurement of the viscosity was carried out at 125° by glass or quartz viscosimeters. For higher temperatures the method developed by R. S. Dantuma (Ref 7) proved impracticable on account of the formation of a crust. For this reason the rotation - vibration viscosimeter by Ye. G. Shvidkovskiy (Ref 8, Fig 2) was used. The results are shown in tables 1-3 and figures 3-9. (Table 1: electric conductivity of the system $MeOH$ - water; Table 2: viscosity and density of this system; Table 3: temperature coefficient $\alpha$ of the conductivity and temperature coefficient $\beta$ of the viscosity as well as their relationship $\gamma = \frac{\alpha}{\beta}$ ).

As is seen from figure 3, the conductivity $\kappa$ of the solution passes through a maximum as the ion concentration increases, and then drops. Since, however, the descending branches are higher when the temperature is higher, it is assumed that there is a connection with viscosity $\eta$ (Fig 4) and therefore a correction is made by the product $\kappa\eta$ (Fig 5). The maxima of the $\kappa\eta$ isotherms are attributed to the effect of the migration mechanism. At an increasing concentration the conductivity of the

Electric Conductivity and Viscosity in the Transitional Region of the Melt of Sodium and Potassium Hydroxide and Their Aqueous Solutions SOV/78-4-9-33/44

NaOH solutions exceeds that of the KOH solutions. This is attributed to the greater mobility of the Na ion due to the reduced hydration. The values for MeOH lie between those of NaOH and KOH. The conductivity of the electrolytes decreases as the temperature rises, which becomes apparent if the viscosity is not much influenced by temperature. M. A. Klochko explains this tendency toward a reduction of conductivity as a consequence of the increasing heat motion of the ions. There are 9 figures, 3 tables, and 14 references, 11 of which are Soviet.

SUBMITTED: January 17, 1959

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5(2) SOV/78-4-10-27/40

AUTHORS: Klochko, M. A., Godneva, M. M.

TITLE: Electric Conductivity and Viscosity of Solutions of Lithium-, Sodium- and Potassium Hydroxide in Water - Dioxane Mixtures

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 10, pp 2347 - 2353 (USSR)

ABSTRACT: Previous investigations (Refs 1,2) dealt with the electric conductivity and viscosity of aqueous solutions of NaOH and KOH and of their mixtures in order to determine both the influence exercised by concentration and temperature upon the migration mechanism of the ions and the concentration at which the inversion of conductivity of the K and Na ions occurs, i.e. at which the latter become more mobile than the potassium ions owing to the loss of the hydrate shell. Now the influence exerted by a non-aqueous component (dioxane) upon these processes is investigated. The system water - dioxane has been repeatedly investigated, also with respect to its conductivity $\kappa$ (Refs 1-12, 14). In the experiments pure anhydrous dioxane was used and in the device according to P. P. Pugachevich (Ref 15) distilled water. The results are summarized in tables 1-4 and figures 2 and 3. If a part of the water molecules is replaced by dioxane, the conductivity decreases without any change of viscosity. This decrease is due to the missing of the migration mechanism of the ions as can also be seen from

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Electric Conductivity and Viscosity of Solutions of SOV/78-4-10-27/40
Lithium-, Sodium- and Potassium Hydroxide in Water - Dioxane Mixtures

a comparison of the conductivity of KCl with KOH (Table 4). The maximum of viscosity at a dioxane content of 17-25 mole% indicates the formation of dioxane hydrates. The substitution of dioxane for water changes the hydration of the ions in a way that at 50 mole% inversion takes place and $\kappa_{NaOH} < \kappa_{KOH}$. There are 3 figures, 4 tables, and 16 references, 11 of which are Soviet.

SUBMITTED: January 17, 1959

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5(2) S07/78-4-1o-28/4o

**AUTHORS:** Klochko, M. A., Godneva, M. M.

**TITLE:** Electric Conductivity and Viscosity of Solutions of Lithium-, Potassium- and Sodium Hydroxide in Water - Acetone Mixtures

**PERIODICAL:** Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 1o, pp 2354 - 2359 (USSR)

**ABSTRACT:** The effect of a non-aqueous solvent on hydration and migration mechanism of the electric conductivity of alkali hydroxides is investigated. The electric conductivity of electrolytes in water - acetone mixtures was also studied by S. V. Serkov (Ref 5). As can be seen from table 1 and figures 1 and 2, the electric conductivity decreases with increasing acetone content. The conductivities of KOH and NaOH approach to each other at increasing acetone content and increasing temperature, but more slowly than in water - dioxane mixtures. At 5o mole% acetone only the conductivities of NaOH and KOH are equal. The dehydrating property of acetone is less than that of dioxane, accordingly, and the elimination of the migration mechanism is attained more slowly. There are 4 figures, 3 tables, and 7 references, 5 of which are Soviet.

**SUBMITTED:** January 17, 1959

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**AUTHORS:** Klochko, M. A., Mikhaylova, M. P.

**TITLE:** Thermal Analysis of Systems Formed From Hydrazine With Acetone, Sulfur, and Lithium Chloride

**PERIODICAL:** Zhurnal neorganicheskoy khimii, 1960, Vol. 5, No. 10, pp. 2319-2324

**TEXT:** The authors describe an investigation of the electrical conductivity of systems, one component of which is hydrazine. To determine the conditions under which the components form homogeneous liquid phases, they studied the binary systems hydrazine - acetone, hydrazine - sulfur, hydrazine - hydrogen sulfide, and hydrazine - lithium chloride by thermal analysis. The system hydrazine - acetone was studied in the entire concentration range (Table 1, Fig. 1). Compound $N_2H_4 \cdot 2(CH_3)_2CO$ with the melting point at -37.8°C is formed. The crystallization temperature of the eutectics could not be exactly determined due to the high viscosity of the solutions. In the system hydrazine - sulfur (Table 2, Fig. 2),

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Thermal Analysis of Systems Formed From Hydrazine With Acetone, Sulfur, and Lithium Chloride

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B004/B067

compound $N_2H_4S$ (melting point +15.0°C) is formed. The system has two eutectics, one at 33 mole% S (melting point -78.0°C) and the other at 65 mole% S (melting point -23.3°C). Since hydrogen sulfide is formed when adding sulfur to hydrazine, also the system $N_2H_4$ - $H_2S$ was studied (Table 3, Fig. 3). Crystals having the composition $3N_2H_4.2H_2S$ are formed; they may be conserved only in $H_2S$ atmosphere, and melt at +44.5°C. A $H_2S$ content higher than 41.8 mole% could not be obtained in this system. The eutectic with 21.0 mole% $H_2S$ melts at -38.0°C. The system $N_2H_4$ - LiCl was studied up to a content of 60 mole% LiCl (Table 4, Fig. 4). Compounds $3N_2H_4$.LiCl (melting point +58.7°C) and $2N_2H_4$.LiCl (melting point +115.0°C) are formed. The system shows three eutectics, one with 13.7 mole% LiCl (crystallization temperature -16.0°C), one with 29.5 mole% LiCl (crystallization temperature +45.5°C), and one with 39.0 mole% LiCl (crystallization temperature +67.0°C). There are 4 figures, 4 tables, and 10 references: 3 Soviet, 3 US, and 4 German.

SUBMITTED: October 9, 1958

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S/078/60/005/010/016/021
B004/B067

**AUTHORS:** Klochko, M. A., Batova, K. T.

**TITLE:** Solubility of the Fluorides and Iodides of Lithium and Cesium in Water and Some Other Solvents

**PERIODICAL:** Zhurnal neorganicheskoy khimii, 1960, Vol. 5, No. 10, pp. 2325-2328

**TEXT:** The authors wanted to study the relationship between solubility and other physical data, such as ionic radius and dielectric constant. The solubility of LiF, LiI, CsF, and CsI was determined at 25°, 50°, and 75°C in water, hydrazine, nitrobenzene, dioxane, toluene, and benzene, and at 0°, 25°, and 50°C in acetone. The experimental data for water are given in Table 1, those for the other solvents in Table 2. Table 3 shows the ratio $r_k/r_a$ of the ionic radii for LiF, LiI, CsF, and CsI (according to A. F. Kapustinskiy). The solubility of these salts depends clearly on $r_k/r_a$. The more this ratio becomes equal to one, i.e., the more symmetric the configuration of the salt, the lower is its solubility in water. The symmetry of the salt is also significant for the solubility of

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Solubility of the Fluorides and Iodides of Lithium and Cesium in Water and Some Other Solvents

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B004/B067

nonaqueous solvents. In this case, however, the solubility decreases above all with the dielectric constant of the solvent. The exceptionally high solubility of CsI in hydrazine is probably due to the formation of a compound. The authors mention I. V. Tananayev et al. (Ref. 4). There are 3 tables and 11 references: 10 Soviet and 1 US.

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Electric conductivity and viscosity of the system ammonium nitrate - urea. Zhur. neorg. khim. 5 no.11:2483-2490 N '60. (MIRA 13:11)
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Study of the system silver nitrate - acetamide by methods of physicochemical analysis. Zhur. neorg. khim. 5 no.11:2491-2498 N '60. (MIRA 13:11)

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Academician Nikolai Semenovich Kurnakov; on the one hundredth anniversary of his birth. Zhur. ob. khim. 30 no.11:3509-3513 N'60. (MIRA 13:11)
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