BARABASH-NIKIFOROV, I.I.

Distribution of the lesser suslik (Citellus pygmaeus Pall.) in the central Don Valley. Nauch. dokl. vys. shkoly; biol. nauki no.1:37-44 '64. (MIRA 17:4)

1. Rekomendovana kafedroy zoologii pozvonoshnykh Voronezhskogo gosudarstvennogo universiteta.

BARABASH-NIKIFOROV, I.I.; LAKOMKINA, O.A.; PETROVA, G.P.

Prolonged keeping of a desman in a cage for experimental purposes. Zool. zhur. 43 no.10:1572-1575 '64.
(MIRA 17:12)

1. State University of Voronezh.

BARABASHCHUK, O.V.; BAKHMUT, P.G. [Bakhmut, P.H.]; GUBINA, K.M. [Hubina, K.M.]; DEMYANKO, M.D.; KALITA, S.M.; KARACHENTSEVA, L.S.; KONDRAT'YEVA, V.I.; KORZACHENKO, M.N.; LITVINOVA, N.M. [Litvienova, N.M.]; SOKOLOVA, M.I.; STORONSKAYA, O.Y. [Storons'ka, O.I.]; TRINKINA, N.V.; TONKIKH, P., otv. za vypusk; MARCHENKOV, S., red.; KURITSA, G. [Kuritsa, H.], tekhn.red.

[Economy of Drogobych Province; statistical collection] Narodne hospodarstvo Drohobyts'koi oblasti; statystychnyi zbirnyk. Drohobych, 1958. 158 p. (MIRA 12:11)

1. Drogobych (Province) Statisticheskoye upravleniye. 2. Statisticheskoye upravleniye Drogobychskoy oblasti (for all except Tonkikh, Marchenkov, Kuritsa).
(Drogobych Province--Statistics)

BARABASHEV, A.O., inzh.

Sealing of the joints of precast reinforced concrete elements under winter conditions. Prom. stroi. 42 no.4:18-21 '65. (MIRA 18:4)

1. Trest "Sibstal'konstruktsiya".

BARABASHEV, N., akademik

Mystery planet. Av.i kosm. 45 no.3:22-26 Mr '63. (MIRA 16:3)

1. AN UkrSSR.

(Venus (Planet))

BARABASHIN, Ye.A.; TABUYEVA, V.A.

Oscillations of a pendulum subjected to dry friction. Izv.vys. ucheb.zav.; mat. no.5:48-57 '59. (MIRA 13:4)

1. Ural'skiy politekhnicheskiy institut im.S.M.Kirova.
(Differential equations) (Pendulum)

BARBASHIN, Ye.A. (Sverdlovsk)

Evaluation of the mean-square deviation form an assigned trajectory [with summary in English]. Avtom. i telem. 21 no.7:941-950 Jl'60. (MIRA 13:10)
(Trajectories)

L 46913-66 EWT(1) GW

ACC NR: AR6015229 SOURCE CODE: UR/0269/65/000/012/0061/0061

7
B

AUTHOR: Barabashov, N. P.

TITLE: Photometric characteristics of reflected light from the visible surface of Venus and the optical thickness of its atmospheric cover

SOURCE: Ref. zh. Astronomiya, Abs. 12.51.467

REF SOURCE: Vestn. Khar' kovsk. un-ta, ser. astron. vyp. 1, no. 4, 1965, 13-21

TOPIC TAGS: Venus atmosphere, Venus atmospheric cover, Venus light reflection, atmospheric thickness, Venus photometric characteristic

ABSTRACT: Photographic observations made of Venus at phase angles of 40, 90, and 140° at the Khar' kov State University Astronomical Observatory in 1932 were used to determine the dispersion function $f(i, \varepsilon)$ of the particles of the planet' s cloud cover. It was found that neither Eiler' s nor Lambert' s laws, nor Schonberg' s index (for the Earth' s cloud cover) correspond to the photometric properties of the clouds covering Venus. Functions $f(i, \varepsilon)$ are not at a maximum

Card 1/2 UDC: 523.42

BARABOSHKIN, A.N.

Obtaining radiochemically pure preparations of radioactive germanium. Zhur. neorg. khim 2 no.11:2680-2681 N '57.
(MIRA 11:3)

1.Ural'skiy politekhnicheskiy institut im. S.M. Kirova.
(Radiochemistry) (Germanium)

BARABOSHKIN, A.N.; SMIRNOV, M.V.

Time necessary to attain a steady state in electrolysis with a constant current intensity. Trudy Inst.elektrokhim.UFAN SSSR no.1 7-16 '60. (MIRA 15:2)

(Salts)
(Electrolysis)

S/631/60/000/001/002/014
B101/B147

AUTHORS: Komarov, V. Ye., Smirnov, M. V., Baraboshkin, A. N.

TITLE: Equilibrium potentials of zirconium in a fused equimolar mixture of sodium chloride and potassium chloride

SOURCE: Elektrokhimiya rasplavlennykh solevykh i tverdykh elektrolitov, no. 1, 1960, 17-22

TEXT: Measurements were made at 687-978°C in an equimolar NaCl + KCl melt with 0.16-6.8 % by weight of Zr in an argon atmosphere in order to determine the temperature coefficient of the equilibrium potentials of Zr with respect to the chlorine electrode and to clarify the effect of cations on this coefficient. The emf between Zr and Cl was found to be $\varepsilon_1 = 2.560 - 3.62 \cdot 10^{-4}T \pm 0.005$ v for 0.16 % by weight of Zr; $\varepsilon_2 = 2.587 - 4.72 \cdot 10^{-4}T \pm 0.002$ v for 1.24 % by weight of Zr; $\varepsilon_3 = 2.600 - 5.43 \cdot 10^{-4}T \pm 0.003$ v for 6.8 % by weight of Zr. Taking into account the thermo-emf between the carbon current lead to the chlorine

Card 1/4

Equilibrium potentials of zirconium in...

electrode and the molybdenum lead to the zirconium electrode, the following equilibrium potentials are obtained: $E_1 = -2.552 + 3.45 \cdot 10^{-4} T$ v; $E_2 = -2.579 + 4.55 \cdot 10^{-4} T$ v; $E_3 = -2.592 + 5.26 \cdot 10^{-4} T$ v. Owing to the reaction $Zr^{4+}_{melt} + Zr \rightleftharpoons 2Zr^{2+}_{melt}$ (1) the isothermal lines are not linear. At low Zr concentrations, the equilibrium constant of this reaction is given by $K = (1-x)^2 [Zr]/x$, where x = molar part of the Zr^{4+} ions, $1-x$ = molar part of the Zr^{2+} ions, and $[Zr]$ = total concentration of Zr. The average valency of Zr at $[Zr] = 5.83 \cdot 10^{-4}$ is approximately 2. For $[Zr] = 2.46 \cdot 10^{-2}$ it is 2.36 at 1000°K and 2.28 at 1200°K. $\Delta H^{\circ}_{ZrCl_2} = -112.3$ kcal/mole was found in an LiCl + KCl melt, whereas $\Delta H^{\circ}_{ZrCl_2}$ amounts to -117.7 kcal/mole for the NaCl + KCl melt. This difference is due to the interaction of Zr^{2+} with chlorine ions in the

Card 2/4

Equilibrium potentials of zirconium in...

NaCl + KCl melt. It is concluded that ΔZ, ΔH^o, and S^o cannot be determined by extrapolating the data of ideal solutions for melts unless the cations of the solvent or the melt have no comparable e/r ratios. At low concentrations $[Zr] \sim 2$, wherefrom one obtains $E^o = -2.55 + 6.7 \cdot 10^{-4} T$ v. This potential is more negative than in an LiCl + KCl melt. $E^o_{Zr/Zr^{4+}} = -2.62 + 6.7 \cdot 10^{-4} T$ v was calculated from the values for x and 1 - x at $[Zr] = 2.46 \cdot 10^{-2}$. From these data one obtains $E^o_{Zr^{2+}/Zr^{4+}} = -2.69 + 6.7 \cdot 10^{-4} T$ v. The dissociation voltage E_{diss} amounts to $2.62 - 5.2 \cdot 10^{-4} T$ v, and the change ΔZ of the isobaric potential of the reaction $Zr_{(s)} + 2Cl_{2(g)} = ZrCl_{4(melt)}$ is $\Delta Z = -241700 + 48T$. The heat of formation of $ZrCl_4$ in the melt is $\Delta H^o = -242$ kcal/mole. For solid $ZrCl_4$ one obtains $\Delta H^o = -234.7$ kcal/mole. This difference is due to the heat of formation of the complex ions $ZrCl_6^{2-}$.

Card 3/4

Equilibrium potentials of zirconium in...

Assuming a latent heat of fusion of $ZrCl_4$ equal to 9.0 kcal/mole, the heat of formation of $ZrCl_6^{2-}$ ions in the melt is found to be -16 kcal/mole. A paper of I. S. Morozov, D. Ya. Toptygin (Izv. AN SSSR, OKhN, 1920, 1959) is mentioned. There are 4 figures, 1 table, and 10 references: 6 Soviet and 4 non-Soviet. The four references to English-language publications read as follows: E. M. Larsen, J. J. Leddy, J. Am. Chem. Soc., 78, 5983, 1956; P. Gross, C. Hayman, D. L. Levi, Trans. Farad. Soc., 53, 1285, 1957; A. A. Palko, A. D. Ryon, D. W. Kuhn, J. Phys. Chem., 62, 319, 1958; L. Jang, R. G. Hudson, Trans. Metallurg. Soc. AIME, 215, 589, 1959.

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000103420011-9"

S/631/60/000/001/006/014
B117/B147

AUTHORS: Baraboshkin, A. N., Sazhnov, V. K.

TITLE: Behavior of vanadium-oxide - carbon anodes in electrolysis of chloride melts

SOURCE: Elektrokhimiya rasplavlennykh solevykh i tverdykh elektrolitov, no. 1, 1960, 43-47

TEXT: The dissolution of vanadium-oxide - carbon anodes in chloride melts was studied. Anodes were made of pure vanadium pentoxide mixed with coaltar in benzene medium. After benzene evaporation, cylindrical electrodes were molded from the dry mixture at 1.0 - 1.5 tons/cm^2 pressure. They were annealed below a carbon layer, the annealing temperature being slowly (100°/hr) raised to 800°C. Vanadium pentoxide was reduced to trioxide. The carbon content of the individual batches varied between 12.5 and 29.8% and their weight by volume varied between 1.6 and 2.1 g/cm^2. The electrolysis of oxide - carbon anodes was studied in a pyrex glass vessel

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000103420011-9"

at 680±10°C. An equimolar mixture of sodium and potassium chlorides was used as electrolyte. Pure nitrogen was passed through the apparatus, and thus an inert medium for transferring the anodic gases was obtained. At the beginning of electrolysis dissolution took place with formation of V^{3+} ions only. Tetravalent vanadium seems to form as soon as the anode potential approaches the potential of chlorine separation. This corresponds to data by Laitinen (Ref. 12, see below). Summary: It was shown that oxide - carbon anodes during electrolysis dissolved in the chloride melt to form V^{3+} and V^{4+} ions, i. e., ions without oxygen. The electrolytes obtained can be used for producing metallic vanadium. The authors obtained a vanadium - lead alloy (64% V) by means of electrolysis. The deposit showed a widely ramified, steel-gray, dendritic structure. The laboratoriya elektrokhimii Ural'skogo filial AN SSSR (Laboratory of Electrochemistry of the Ural Branch AS USSR) is mentioned, where the behavior of thorium, beryllium, titanium, and calcium-oxide - carbon anodes during electrolysis of chloride melts was studied in detail. There are 2 figures, 2 tables, and 12 references: 9 Soviet and 3 non-Soviet. The reference to the English-

Behavior of vanadium-oxide - carbon ... S/631/60/000/001/006/014
B117/B147

language publication reads as follows: Ref. 12: H. A. Laitinen, J. W. Pankey. J. Am. Chem. Soc., 81, 1053, 1959.

Card 3/3

Baraboshkin, A.N.

81869
S/020/60/133/02/45/068
B004/B064

5.4600

AUTHORS: Smirnov, M. V., Komarov, V. Ye., Baraboshkin, A. N.

TITLE: Equilibrium Potentials of Zirconium in Mixed Fluoride - Chloride Melts

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 2, pp. 409 - 412

TEXT: The authors carried out their investigations in equivalent mixtures from KCl + NaCl under addition of different amounts of fluorides at 700 - 950°C. The melt was produced from chemically pure salts, the zirconium being introduced by means of anodic dissolution of its iodide into the melt directly in the test cell (Fig. 1). Argon served as protective atmosphere. The potentials of melts 0.17 up to 1.05 wt% Zr and up to 15.82 wt% F were measured. The molar ratio of concentration [F]/[Zr] was varied between 9 and 75. The experiments showed that the potential of Zr is more strongly influenced by the concentration of fluorine than by its own concentration. A reaction equation is written down for the formation of the zirconium - fluoride complexes, in which

Card 1/3

the number of F ions that are bound to Zr as complexes is designated with m, the avarage valency of Zr with n. The equation

$E = \text{const} - 1.984 \cdot 10^{-4} T \log [F^-]$ is set up for the dependence of the potential on the concentration of the free fluorine ions. It was checked at 770°C, variation of the fluorine content of 2.04 to 15.82 wt% and constant Zr concentration of 1.05 ± 0.2 wt%. The graphical representation of the experimental data (Fig. 2) yields for m = 6,5,4 straight line, for which empirical equations are written down. The change of m and n is discussed and the following found: $4 \geq n > 2,5$. Formation of different ions at $[F]/[Zr] > 10$ and $[F]/[Zr] < 10$. Fig. 3 shows the results of experiments at temperatures of from 500 to 1250°K for five melts with $[F]/[Zr]$ from 45 to 9, for which also empirical equations were written down. Assuming that in the case of 10 - 15 wt% Zr the fluoride - chloride melts behave in a similar way as if thorium were added (Ref. 3), the equation is written down for the equilibrium potential. In the case of an excessive quantity of fluorine $75 > [F]/[Zr] > 10$ as occurs in the practical electrolysis of fluorine zirconate, it holds that $4 > n > 3$ and $6 > m > 4$. For approximative

Card 2/3

Equilibrium Potentials of Zirconium in Mixed Fluoride - Chloride Melts

81869
S/020/60/133/02/45/068
B004/B064

Calculations it is possible to assume m = 5 and n = 3.2. There are 3 figures and 9 references: 8 Soviet and 1 American.

ASSOCIATION: Institut elektrokhimii Ural'skogo filiala Akademii nauk SSSR (Institute of Electrochemistry of the Ural Branch of the Academy of Sciences, USSR)

PRESENTED: January 28, 1960, by A. N. Frumkin, Academician

SUBMITTED: January 28, 1960

Card 3/3

S/137/62/000/009/002/033
A006/A101

AUTHORS: Smirnov, M. V., Komarov, V. Ye., Baraboshkin, A. N.

TITLE: Equilibrium between hafnium metal and NaCl-KCl melts containing its ions

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 9, 1962, 8, abstract 9A40 ("Tr. In-ta elektrokhimii; Ural'skiy fil. AN SSSR", 1961, no. 2, 9 - 17)

TEXT: The emf method was used to study the equilibrium between Hf metal and a molten equimolar NaCl-KCl mixture, containing 0.16 , 0.76 and 1.51 weight % Hf. Emf was measured in respect to the chlorine comparison electrode in a thermostated cell with chlorine and hafnium electrodes in a range from 692 - 954°C. It was established that the experimental points were satisfactorily located on the straight lines, corresponding to empirical equations: $E_1 = 2.572 - 3.75 \cdot 10^{-4} T \pm 0.002$ b; $E_2 = 2.598 - 4.47 \cdot 10^{-4} T \pm 0.005$ b; $E_3 = 2.617 - 4.84 \cdot 10^{-4} T \pm 0.005$ b. Isotherms of Hf electrode potentials, represented in the coordinates ion-fractional concentrations on a logarithmic

Card 1/3

scale versus equilibrium Hf potentials, are not straight lines. The bending of isotherms is caused by the presence of ions of different valences in the commensurable quantities. The magnitude of mean Hf valence in the electrolyte at different concentrations is determined from the inclination of tangents to the isotherms. Equations are found for the temperature dependence of equilibrium constants of the reaction $Hf^{+}_{(melt)} + Hf = 2Hf^{2+}_{(melt)}$ and standard values of electrode potentials:

$$\lg K = -0.329 - 2820\ T,$$

$E^{o}_{Hf/Hf^{2+}} = -2.51 + 6.3 \cdot 10^{-4}\ Tb$; $E^{o}_{Hf/Hf^{4+}} = -2.65 + 6.2 \cdot 10^{-4}\ Tb$; $E^{o}_{Hf^{2+}/Hf^{4+}} = -2.79 + 6.0 \cdot 10^{-4}\ Tb$. The authors calculated changes in the isobaric potential Δz at reactions of $HfCl_4$ and $HfCl_2$ formation and $HfCl_4$ reduction in $HfCl_2$ by hafnium metal.

$$Hf(solid) + 2Cl_2(gas) = HfCl_4(melt);$$

$$\Delta z = -245{,}000 + 55.0\ T\ cal/mole$$

$$Hf(solid) + Cl_2(gas) = HfCl_2(melt);$$

Equilibrium between hafnium metal and...

S/137/62/000/009/002/033
A006/A101

$\Delta z = -116{,}000 + 27.7\,T$ cal/mole

$Hf(solid) + HfCl_4(melt) = 2HfCl_2(melt)$;

$\Delta z = 13{,}000 + 0.40\,T$ cal/mole

G. Frents

[Abstracter's note: Complete translation]

Card 3/3

S/137/62/000/008/010/065
A006/A101

AUTHORS: Smirnov, M. V., Komarov, V. Ye., Baraboshkin, A. N.

TITLE: Behavior of zirconium and hafnium during fused salt electrolysis

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 8, 1962, 26, abstract 8G186 ("Tr. In-ta elektrokhimii, Ural'skiy fil. AN SSSR", 1961, no. 2, 23 - 28)

TEXT: During Zr deposition from fluoride-chloride melts (e.g. in K_2ZrF_6 electrolysis in a NaCl-KCl melt) Zr and Hf separation is thermodynamically possible; Hf remains in the electrolyte. In such a manner, if $[Hf]/[Zr] = 10^{-2}$ and at 700°C, cathodic Zr is impoverished of Hf by a factor of 20, and at 650°C by a factor of 70. To assure maximum Hf and Zr separation, possible at the given temperature, electrolysis should be conducted in such a way that the ratio of Hf and Zr concentration near the cathode should remain the closest possible to their relationship in the electrolyte volume. According to the difference of oxidizing-reducing potentials, a dependence was established of the degree of Hf reduction on the degree of Zr reduction in chloride melts.

[Abstracter's note: Complete translation] G. Svodtseva

Card 1/1

5.4700

40824

S/631/61/000/002/005/013
I003/1203

AUTHORS: Smirnov, M. V., Baraboshkin, A. N., Saltykova, N. A., and Komarov, V. Ye

SOURCE: Akademiya nauk SSSR. Ural'skiy filial. Institut elektrokhimii. Trudy, no 2, 1961. Elektrohimiya rasplavlennykh solevykh i tverdykh elektrolitov. 63-69

TITLE: Cathodic processes during deposition of hafnium from chloride and chloride-fluoride fused salts

TEXT: There are no published data on the electrode processes of the electrolysis of fused salts containing hafnium. The cathodic polarization of molybdenum and tungsten in chloride and and chloride-fluoride fused salts containing hafnium was invastigated by measuring their electrode potentials against a chlorine reference electrode. Current densities were from 10^{-4} to 2 amp/cm^2 and the temperature range from 700 to 900°C. Hafnium was introduced into the fused salts by addition of hafnium tetrachloride or by anodic dissolution of the pure metal in the bath. The presence of fluorine ions in fused chloride salts decreases the deposition potentials of hafnium and decreases the concentration polarization, particularly when the F/Hf molar ratio is 6. There are 5 figures.

Card 1/1

S/030/61/000/004/012/015
B105/B206

AUTHORS: Baraboshkin, A. N., Candidate of Technical Sciences
Lepinskikh, B. M., Candidate of Technical Sciences

TITLE: Physical Chemistry of Molten Salts and Slags

PERIODICAL: Vestnik Akademii nauk SSSR, no. 4, 1961, 122-123

TEXT: The Vsesoyuznoye soveshchaniye po fizicheskoy khimii rasplavlennykh soley i shlakov (All-Union Conference on Physical Chemistry of Molten Salts and Slags) was convened by the Otdeleniye khimicheskikh nauk (Department of Chemical Sciences) and the Institut elektrokhimii Ural'skogo filiala Akademii nauk SSSR (Institute of Electrochemistry of the Ural Branch, Academy of Sciences USSR) in order to coordinate research in the field of molten salts and metallurgical slags. The Conference was held in Sverdlovsk from November 22 to 25, 1960, and was attended by about 400 delegates from 72 scientific organizations of the Soviet Union. In the Section for Molten Salts, main attention was paid to problems of structure and thermodynamics of melts, the investigation of their physicochemical properties, of the equilibrium in the system metal - salt, and of electrode processes. Reports by M. F. Lantratov, A. F. Alabyshev, A. G. Morachevskiy, M. V. Smirnov, and N. Ya. Chukreyev dealt with the investigation results of complex formation in molten salts.

S/030/61/000/004/012/015
B105/B206

M. V. Smirnov, N. Ya. Chukreyev, and V. Ye. Komarov established by the emf method that the solutions of molten salts are subject to Henry's law in the field of low concentrations. Reports by N. K. Voskresenskaya, I. D. Sokolova, Ye. L. Krivovyazov, R. V. Chernov, Yu. K. Delimarskiy, and B. F. Markov explained the idea of the conformance between the structure of salts and their mixtures in solid and molten state. A. I. Belyayev elaborated a new method for the investigation of melts which is based on measuring the absorption of β-radiation of radioactive substances. Reports dealing with the investigation of the states of equilibrium in the system metal - salt (A. P. Palkin, L. N. Antipin, S. F. Vazhenin, M. V. Smirnov, and N. A. Loginov) showed that the formation of ions of low valency is the main cause of the solving of metals in melts. By means of the emf method, M. V. Smirnov, V. Ye. Komarov, and N. Ya. Chukreyev determined the temperature dependence of the equilibrium constants between the metals zirconium, hafnium, beryllium, and their ions of low and higher valency in chloride melts. M. V. Smirnov, A. N. Baraboshkin, Yu. K. Delimarskiy, B. I. Skirstymonskaya, and M. [illegible] Lantratov showed that the electrode reaction is controlled under usual conditions by the diffusion in the salt- and metal phases, respectively. Ye. A. Ukshe, N. G. Bukun, and D. I. Leykis mentioned measurement results of diffusion coefficients of ions in chloride melts.

S/030/61/000/004/012/015
B105/B206

V. P. Mashovets and I. M. Yegorov discovered a noticeable activation polymerization during the discharge of oxygen-containing ions on graphite. O. V. Travin and L. A. Shvarzman studied conditions of equilibrium distribution of elements of the 5th and 6th group of the periodic system (Nb, Mo, W) between molten iron and slags of simple composition as well as problems of metal refining by means of solid admixtures. Yu. P. Nikitin gave an evaluation of the rate of the transition reaction of Fe^{2+} from metal into slag. V. I. Malkin analyzed the structure of molten slags and pointed out that the acid-basic properties of silicate melts may be described by the theory of screening. Questions of the structure of molten oxidized melts were mentioned in the discussion, the majority of the studies showing that the heteropolar bond is predominant in molten slags. In its resolution, the Conference pointed out the insufficient development of studies on the molecular-statistical theory of ionic melting, the slow introduction of new physical research methods of structures of the melt. The necessity of intensifying studies of thermodynamic properties of molten mixtures and the states of equilibrium of metal melting is pointed out. It was also recommended to pay greater attention to the systems with low melting temperatures, and the study of kinetics and mechanism of electrode reactions,

especially the electrode crystallization of metals. Finally, the proposition was accepted to hold such conferences regularly and to start a clear coordination of scientific investigation in the field of melts.

KOMAROV, V.Ye.; SMIRNOV, M.V.; BARABOSHKIN, A.N.

Anodic solution of zirconium and hafnium in fused salts. Trudy Inst. elektrokhim. UFAN SSSR no.3:25-39 '62. (MIRA 16:6)

(Zirconium) (Hafnium)
(Fused salts—Electric properties)

BARABOSHKIN, A.N.; SALTYKOVA, N.A.

Shape of the switching-off curves in concentration polarization. Trudy Inst. elektrokhim. UFAN SSSR no.3:49-57 '62. (MIRA 16:6)

(Polarization(Electricity))
(Electromotive force)

43055

S/826/62/000/000/005/007
D408/D307

5.4700

AUTHORS: Smirnov, M.V., Baraboshkin, A.N., Komarov, V.Ye. and Saltykova, N.A.

TITLE: Cathodic and anodic processes during the electrolysis of chloride and fluoride-chloride containing zirconium and hafnium.

SOURCE: Fizicheskaya khimiya rasplavlennykh soley i shlakov; trudy Vses. soveshch. po fiz.khimii raspl. soley i shlakov, 22 - 25 noyabrya 1960 g., Moscow, Metallurgizdat, 1962, 257 - 265

TEXT: A continuation of previous investigations of electrode processes during the electrolysis of chloride and fluoride-chloride melts containing other polyvalent transition metals. Anodic and cathodic polarization curves were obtained by measuring the electrode potentials at the moment of switching on the polarizing current. Polarization curves are presented for e.g. the anodic solution of Zr and Hf in molten equimolar mixtures

Card 1/5

of NaCl and KCl at 800°C, for an Mo cathode in NaCl--KCl melts to which a) specific amounts of $ZrCl_4$ (2.5 wt.%) or $HfCl_4$ (3.6 wt.%) were added, at 800°C, and b) 0.9 wt.% Zr was introduced by anodic solution of the metal, at 900, 800, and 700°C, and for an Mo cathode in fluoride-chloride melts (at 800°C) prepared from NaCl--KCl melts by a) the addition of 2.8 wt.% K_2ZrF_6 or 3.7 wt.% K_2HfF_6 and b) the introduction of 0.95 wt.% Zr by anodic solution of the metal and the addition of sufficient NaF to give molar ratios $[F] / [Zr]$ = 0, 2, 6, 16 and 22 in the melts. The anode potentials increased continuously with increasing in current density (i) from 10^{-4} to 10 a/cm^2, indicating that the concentration of Zr ions close to the electrode continuously increased are insoluble Zr chlorides were not formed. Below 3×10^{-3} a/cm^2 concentration polarization was practically absent because the electrolysis current was lower than the self-solution (corrosion) current. In the range 3×10^{-3}-1 a/cm^2 the plots of electrode potential v. log i were nearly linear, but above 1 a/cm^2 the curves deviate from linearity, owing mainly to the increase in metal ion concentration at the electrode surface and consequent increase in activity coefficient,

but partly to change in the diffusion coefficient of the ions in the high concentration region and, thus, to change in the thickness of the diffusion layer. The anodic polarization curves shift to the side of more positive potentials with increase in temperature, but the general character of the dependence of the anodic potential on current density does not change substantially. The following expression was derived for the average valency of the metal ions passing into solution at potential φ:

$$\varphi = E^{o}_{Me^{4+}/Me^{2+}} + 0.992 \times 10^{-4} \log \frac{n-2}{4-n} , \quad (5)$$

where Me--metal; n--average valency of the metal ions = 4 - 2x; x--proportion of Me^{2+}. At low i the experimentally found average Hf ion valencies, were lower than those calculated from Eq. (5); at high current densities the experimental results were higher than the calculated ones. The cathodic polarization of Zr and Hf has the same character as that of Th and Ti but, in contrast to the latter

metals, Zr and especially Hf begin to discharge when the concentrations of M^{2+} and M^{4+} are comparable. For Zr at 800° $E^{o}_{Zr^{4+}/Zr^{2+}}$ = - 2.00v, somewhat more positive than the potential at which the metal is liberated, and the charge exchange, of higher to lower ion valencies, was clearly indicated by an inflection on the polarization curve; For Hf at 800°C $E^{o}_{Hf^{4+}/Hf^{2+}}$ = -2.14v, more negative than the potential at which the metal is liberated, the charge exchange inflection merges with the metal liberation inflection. Polarization curves for the melts in which Zr was introduced by anodic solution of the metal at different temperatures showed that even at low i the potential of the Mo cathode was close to that at which the metal was liberated. In chloride and fluoride-chloride melts, liberation of the metals at the cathodes preceded residual currents which were mainly explained by charge exchange and discharge of impurity ions. Liberation of the metals was accompanied by strong concentration polarization, due mainly to accumulation of free fluoride ions in the vicinity of the cathode. The potential at which zirconium was liberated depended on the [F] / [Zr] ratio. There are 6 figures.

Card 4/5

Cathodic and anodic processes ... S/826/62/000/000/005/007
D408/D307

ASSOCIATION: Institut elektrokhimii UFAN (Institute of Electrochemistry UFAS)

Card 5/5

43056
S/826/62/000/000/007/007
D408/D307

5.4700

AUTHORS: Smirnov, M.V., Komarov, V.Ye., and Baraboshkin, A.N

TITLE: The equilibrium potentials of hafnium and zirconium in chloride and fluoride-chloride melts

SOURCE: Fizicheskaya khimiya rasplavlennykh soley i shlakov; trudy Vses. soveshch. po fiz. khimii raspl. soley i shlakov, 22 - 25 noya brya 1960 g. Moscow, Metallurgizdat, 1962, 353 - 360

TEXT: The above potentials were measured in equimolar NaCl--KCl melts containing a) 0.16 - 6.8 wt.% Zr, or 0.16 -1.51 wt.% Hf and b) 2 - 35 wt.% NaF and 0.17 - 1.05 wt.% Zr, or 0.99 - 3.4 wt.% Hf, between 700 and 950°C, to explain processes occurring during the electrolysis of chloride melts containing Zr and Hf, to calculate the thermodynamic quantities ΔZ, ΔH, and ΔS for the formation of $MeCl_2$ and $MeCl_4$ (Me--Zr of Hf) from their elements in melts of specific composition, and to

Card 1/3

The equilibrium potentials ...

obtain quantitative data concerning the formation of complexes in molten salts. The proportions of Me^{2+} and Me^{4+} at any specific metal concentration [Me] were determined from the slopes of the isotherms of the equilibrium potentials at 1000, 1100, and 1200°K, and were used to calculate the standard oxidation potentials as a function of temperature. Comparison of the latter showed that the ease of reducibility both of the dichlorides and of the tetrachlorides to the metals was similar for Zr and Hf in NaCl--KCl melts at 700 - 900°C, so that cathodic deposition of Zr from the melts is not an effective process for separating the two metals. On the other hand, $ZrCl_4$ reduces more easily to the dichloride than does $HfCl_4$; at 700°C reduction of 50% $ZrCl_4$ to $ZrCl_2$ is matched by the reduction of only 3.7% $HfCl_4$ to $HfCl_2$. With decreasing temperature disproportionation of the dichlorides to tetrachlorides and free metals occurs more easily for Hf than for Zr. The Zr and Hf equilibrium potentials in fluoride-chloride are more negative than in pure chloride melts, owing to the formation of complexes $MeF_m^{(n-m)-}$, where

Card 2/3

The equilibrium potentials ...

n is the average valency of the Zr ions. At 770°C in electrolytes containing 2.04 - 15.82 wt.% F and 1.05 ± 0.2 wt.% Zr, the average Zr valency was $4 \geq n \geq 3.23$, when m decreased from 6 to 5. The equilibrium potential of Hf was found to be more negative than that of Zr in melts containing the same concentrations of Me and F ions, the difference in potential decreasing with increasing temperature. HfF_6^{2-} was shown to be slightly more stable than ZrF_6^{2-}. There are 3 figures.

ASSOCIATION: Institut elektrokhimii UFAN (Institute of Electrochemistry UFAS)

Card 3/3

SALTYKOVA, N.A.; BARABOSHKIN, A.N.

Measurement of polarization in the cathodic isolation and anodic dissolution of copper in molten copper chloride. Trudy Inst.elektrokhim. UFAN SSSR no. 4:35-39 '63. (MIRA 17:6)

SMIRNOV, M.V. (Sverdlovsk); BARABOSHKIN, A.N. (Sverdlovsk); KOMAROV, V.Ye. (Sverdlovsk)

Cathodic processes in the deposition of zirconium from chloride melts. Zhur.fiz.khim. 37 no.8:1669-1676 Ag '63. (MIRA 16:9)

1. Institut elektrokhimii Ural'skogo filiala AN SSSR.
(Zirconium plating) (Fused salts)

SMIRNOV, M.V. (Sverdlovsk); BARABOSHKIN, A.N. (Sverdlovsk); KOMAROV, V.Ye. (Sverdlovsk)

Cathodic processes in the deposition of zirconium from mixed chloride-fluoride melts. Zhur.fiz.khim. 37 no.8:1677-1681 Ag '63. (MIRA 16:9)

(Zirconium plating) (Fused salts)

BARABOSHKIN, A.N.; KOSIKHIN, L.T.; SALTYKOVA, N.A.

Formation of crystal nuclei in the electrolysis of fused salts. Part 1: Deposition of silver from nitrate melts. Trudy Inst. elektrokhim. UFAN SSSR no.5:89-100 '64.

(MIRA 18:2)

SALTYKOVA, N.A.; BARABOSHKIN, A.N.

Electrocrystallization of copper from chloride melts. Trudy Inst. elektrokhim. UFAN SSSR no.5:101-110 '64.
(MIRA 18:2)

BARABOSHKIN, A.N.; KOSIKHIN, L.T.; SALTYKOVA, N.A.

Crystallization overvoltage in the electrolysis of fused salts. Dokl. AN SSSR 155 no. 4:880-882 Ap '64. (MIRA 17:5)

1. Institut elektrokhimii Ural'skogo filiala AN SSSR. Predstavleno akademikom A.N.Frumkinym.

L 2450-66 EWT(m)/EPT(n)-2/EWP(t)/EWP(b)/EWA(h) IJP(c) JD/WW/JG

ACCESSION NR: AP5022013 UR/0286/65/000/014/0081/0081

669.296.472

AUTHOR: Baraboshkin, A. N.; Lebedeva, K. P.; Saltykova, N. A.; Perevozkin, V. K.

TITLE: Method for electrolytic refining of zirconium in a fused chloride bath. Class 40, No. 173010

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 14, 1965, 81

TOPIC TAGS: zirconium, zirconium refining, electrolytic refining

ABSTRACT: This Author Certificate introduces a method for electrolytic refining of zirconium in a fused chloride electrolyte containing low-valence zirconium ions. To obtain coarse grained-zirconium cathode deposits, the electrolyte, prior to electrolysis is held in contact with metallic zirconium at the temperature of electrolysis until a valence ratio approaching the equilibrium with metallic zirconium is reached. [AZ]

ASSOCIATION: Institut elektrokhimii Ural'skogo filiala AN SSSR (Institute of Electrochemistry, Ural Branch, AN SSSR)

Card 1/1

L 2450-66

ACCESSION NR: AP5022013

SUBMITTED: 20Apr63 ENCL: 00 SUB CODE: MM,GC

NO REF SOV: 000 OTHER: 000 ATD PRESS: 4109

fused salt 18

BVK

Card 2/2

BARABOSHKIN, A.N.; KOSIKHIN, L.T.; SALTYKOVA, N.A.

Exchange currents in pure molten silver nitrate. Dokl. AN SSSR 160 no.1:145-148 Ja '65. (MIRA 18:2)

1. Institut elektrokhimii Ural'skogo filiala AN SSSR. Submitted July 2, 1964.

L 38374-66 EWT(m)/EWP(t)/ETI IJP(c) WW/JD/JG/JXT(CZ)

ACC NR: AT6021368 (A) SOURCE CODE: UR/2631/65/000/007/0059/0067

AUTHOR: Baraboshkin, A. N.; Lebedeva, K. P.

ORG: none

TITLE: Effect of electrolysis conditions on the structure of zirconium deposits. Part 3: Role of the valence state of zirconium in the melt

SOURCE: AN SSSR. Ural'skiy filial. Institut elektrokhimii. Trudy, no. 7, 1965. Elektrokhimiya rasplavlennykh solevykh i tverdykh elektrolitov; termodinamika i kinetika elektrodnykh protsessov (Electrochemistry of fused salts and solid electrolytes; thermodynamics and kinetics of electrode processes), 59-67

TOPIC TAGS: electrolytic deposition, zirconium

ABSTRACT: The main purpose of the study was to determine the nature of change in the cathodic deposit of zirconium and primarily in its grain size with changing average valence of zirconium ions in a chloride melt. The electrolysis was carried out at a constant concentration ratio of the upper to the lower valence forms, and the electrolyte was an equimolar mixture of sodium and potassium chlorides, to which $ZrCl_4$ was added. The current efficiency was determined from the weight of the deposit. Microscopic analysis established the shape of the crystals, and their size distribution was determined by sieve analysis. The principal factor determining the structure and coarseness of the deposits was found to be the average valence of the zirconium

Card 1/2

L 38374-66
ACC NR: AT6021368

ions in the melt. It is shown that the growth of cathodic deposits in melts with different ratios of the valence forms takes place at different effective current densities which exceed only slightly the limiting current densities at which the tetravalent ions are converted to divalent ones. In the electrolysis of melts close in composition to melts in equilibrium with the metal, a decrease of the initial current density and an increase of the zirconium ion concentration in the electrolyte causes a coarsening of the crystals in the cathodic deposit. Orig. art. has: 5 figures, 2 tables, and 14 formulas.

SUB CODE: 07/ 11/ SUBM DATE: 23Aug65/ ORIG REF: 010/ OTH REF: 003

Card 2/2 MLP

MATVEYEV, G.I.; BARABASHKIN, I.I.

Jet bit for geological exploration drilling. Mash. i neft'. obor. no.1:5-11 '63. (MIRA 17:1)

1. TSentral'noye konstruktorskoye byuro Ministerstva geologii i okhrany nedr SSSR.

TRAVKIN, V.S.; BARABASHKIN, I.I.

Introduction of small-diameter core bit rollers. Biul.tekh.-ekon. inform.Gos.nauch.-issl.inst.nauch.i tekh.inform. 17 no.11:19-24 N '64. (MIRA 18:3)

BARABASHKIN, I.I.; VOLCHKOV, V.I.; RAZHEV, S.M.

Testing pin roller bits used in prospecting. Razved.i okh.nedr. 28 no.11:26-30 N '62. (MIRA 15:12)

1. TSentral'noye konstruktorskoye byuro Ministerstva geologii i okhrany nedr SSSR.

(Boring machinery--Testing)

BARABASHKIN, M.Ya.

BARABASHKIN, M.Ya., red.; SEMENOVA, M.V., red.izdatel'stva; KRYNOCHKINA,K.V., tekhn.red.

[Hydrogeological studies on problems of water supply for agriculture in the Ural Mountains and the trans-Ural region] Gidrogeologicheskiy sbornik po voprosam vodosnabzheniia sel'skogo khoziaistva v raionakh Urala i Zaural'ia. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po geol. i okhrane nedr, 1956. 158 p. (MIRA 10:12)

1. Russia (1923- U.S.S.R.) Ural'skoye geologicheskoye upravleniye.
(Ural Mountain region--Water supply, Rural)

BARABASHKIN, Vladimir Pavlovich; RYKOV, N.A., red. izd-va; MINSKER, L.I., tekhn. red.; MAKSIMOVA, V.V., tekhn. red.

[Hammer and rotary crushers; construction, design, installation, and exploitation] Molotkovye i rotornye drobilki; konstruktsii, raschet, montazh i ekspluatatsiia. Moskva, Gosgortekhizdat, 1963. 130 p. (MIRA 16:7)
(Crushing machinery)

BARABASHKINA, A.P.

Frequency of baric formations in the central months of the seasons of 1954-1958 in the Northern Hemisphere (north of 20-30° N.). Trudy NIIAK no.19:3-51 '62. (MIRA 17:1)

BARABASHKINA, A.P.; LESKOVA, Ye.A.

Studying typhoons blowing into the Sea of Japan and the Maritime Territory. Trudy Dal'nevost. NIGMI no.3:3-32 '58. (MIRA 11:12)

(Japan, Sea of--Typhoons) (Maritime Territory--Typhoons)

BARABASHKINA, A.P.; LESKOVA, Ye.A.

Natural synoptic periods in Eastern Siberia and the Far East.
Trudy Dal'nevost. NIGMI no.3:33-46 '58. (MIRA 11:12)
(Siberia, Eastern--Weather research)
(Soviet Far East--Weather research)

BARABASHKINA, A.P.

Warm and cold summer seasons in the Maritime Territory and Sakhalin. Trudy Dal'nevost.NIGMI no.10:38-67 '60. (MIRA 13:8)

(Maritime Territory--Summer)
(Sakhalin--Summer)

BARABASHKINA, A.P.

Distribution of the constituents of geostrophic wind over the Northern Hemisphere, 1954-1958. Trudy NII[illegible] [illegible] '63.
(MIRA 17:3)

L 10972-67 EWT(m) DS/RM
ACC NR: AP6029926 (A) SOURCE CODE: UR/0413/66/000/0015/0089/0090

INVENTORS: Kolesnikov, G. S.; Tevlina, A. S.; Chuchun, A. Yo.; Barabashkina, I. A.; Yushmanova, V. A.

ORG: none

TITLE: Method for obtaining porous sulfo-ion-exchange resin. Class 39, No. 184450 [announced by Moscow Institute of Chemical Technology imeni D. I. Mendeleyev (Moskovskiy khimiko-tekhnologicheskiy institut)]

SOURCE: Izobret prom obraz tov zn, no. 15, 1966, 89-90

TOPIC TAGS: ion exchange resin, polymerization, porosity, polymer, resin

ABSTRACT: This Author Certificate presents a method for obtaining a porous sulfo-ion-exchange resin by graft copolymerization of styrol and a polymer containing isopropyl groups in the presence of a free-radical type initiator and of divinyl benzene as the cross-linking agent. The polymerization is followed by sulfonation with either sulfuric acid or weak oleum. To obtain a polymer with different porosity (capable of sorbing large organic ions), polyarylenealkyl is used as the isopropyl-group-containing polymer.

SUB CODE: 11/ SUBM DATE: 05Feb65

Card 1/1 UDC: 661.183.123.2:62-405.8:678.746.22-139:66.094.403

L 42795-66 EWT(m)/EWP(t)/ETI IJP(c) JD/HW

ACC NR: AP6029074 SOURCE CODE: UR/0413/66/000/014/0131/0131

INVENTOR: Kudryavtsev, N. T.; Golovchanskaya, R. G.; Baraboshkina, N. K.

ORG: none

TITLE: Electrochemical deposition of nickel-titanium alloy. Class 48, No. 184092

SOURCE: Izobret prom obraz tov zn, no. 14, 1966, 131

TOPIC TAGS: ~~nickel~~ titanium alloy, electrolytic deposition, ~~dense coating~~, NICKEL ALLOY, METAL COATING

ABSTRACT: This Author Certificate introduces a method of deposition of nickel-titanium alloy at temperatures of 18—25C. In order to obtain a dense uniform coating tightly adhering to the metal base, the process is conducted at a current density of 5—10 a/dm^2 and a pH of 0.3—1.8 in an electrolyte containing 500 mg/l hydrofluoric acid, 0.4 mol/l nickel chloride, 0.8 mol/l metallic titanium, 0.50 mg/l lauryl sulfate, and 50 mg/l ethyl alcohol. [WW]

SUB CODE: 11/ SUBM DATE: 12Jul63/ATD PRESS:5066

Card 1/1 XC UDC: 621.357.7:669.24'1'295

L 46843-66 EWT(m)/EWP(t)/ETI IJP(c) JD/HW/GD

ACC NR: AT6024971 (N) SOURCE CODE: UR/0000/65/000/000/0144/0148

AUTHOR: Kudryavtsev, N. T.; Golovchanskaya, R. G.; Baraboshkina, N. K. 40 B+1

ORG: none

TITLE: Electrodeposition of a nickel-titanium alloy from hydrofluoboric acid electrolytes

SOURCE: AN SSSR. Otdeleniye obshchey i tekhnicheskoy khimii. Zashchitnyye metallicheskiye i oksidnyye pokrytiya, korroziya metallov i issledovaniya v oblasti elektrokhimii (Protective metallic and oxide coatings, corrosion of metals, and studies in electrochemistry). Moscow, Nauka, 1965, 144-148

TOPIC TAGS: electrodeposition, nickel alloy, titanium alloy, metal coating, protective coating, corrosion resistance

ABSTRACT: Hydrofluoric and hydrofluoboric acid solutions of nickel and titanium salts were used for the codeposition of a nickel-titanium alloy. The alloys deposited from hydrofluoboric acid electrolytes contained about 6% Ti, and those from hydrofluoric acid electrolytes, 2-4% Ti. The quality of the deposits obtained from hydrofluoboric acid electrolytes was better. When the current density is increased, and also when the cathode and anode compartments are separated by a diaphragm in the hydrofluoboric acid electrolyte, the Ti content of the alloy increases to 10-15%, but the current efficiency decreases. As the electrolyte temperature rises, the Ti content of the alloy drops somewhat, apparently because of the corresponding change in the rate of discharge of nickel and titanium ions. The current efficiency decreases with ris-

Card 1/2

L 46843-66
ACC NR: AT6024971

ing current density and increases with rising temperature, owing to a change in the alloy composition. On the average, the current efficiency of the alloy is 40-50%. A coating of Ni-Ti alloy was found to be more corrosion-resistant than a coating of pure nickel. Orig. art. has: 3 figures and 3 tables.

SUB CODE: 11,13/ SUBM DATE: 07Jul64/ ORIG REF: 002

Card 2/2 blg

SEMENOVA, N.Ye.,; BARABASHKINA, T.I.

A case of thominxosis. Med. paraz. 25 no.1:56-58 Ja-M '56 (MLRA 9:6)

1. Iz klinicheskogo sektora Instituta malyarii, meditsinskoy parazitologii i gel'mintologii Ministerstva zdravookhraneniya SSSR (dir. instituta-prof. P.G. Sergiyev, zav. sektorom-prof. N.N Plotnikov) i iz gospital'noy terapevticheskoy kliniki sanitarno-gigiyenicheskogo fakul'teta I Moskovskogo ordena Lenina meditsinskogo instituta imeni I.M. Sechenova (dir. kliniki-prof. Ye.M. Tareyev)

(TAPEWORM INFECTION
Thominx aerophilus of lungs)
(LUNGS, dis.
Thominx aerophilus infestation)

BARABASHOV, M., akademik

New facts about Mars. Nauka i zhyttia 9 no.10:11-15 O '59.
(MIRA 13:2)

1. AN USSR, predsedatel' Planetnoy komissii AN SSSR, direktor astronomicheskoy observatorii Khar'kovskogo gosudarstvennogo universiteta im. O.M.Gor'kogo.
(Mars (Planet))

ACC NR: AP6036828 SOURCE CODE: UR/0021/66/000/011/1423/1425

AUTHOR: Barabashov, M. P. (Academician AN UkrSSR)

ORG: Khar'kov State University (Khar'kovskiy gosudarstvennyy universitet)

TITLE: The structure of lunar soil

SOURCE: AN UkrSSR. Dopovidi, no. 11, 1966, 1423-1425

TOPIC TAGS: lunar surface, lunar probe, lunar environment simulation

ABSTRACT: The data obtained by the Soviet soft landing station Luna-9 indicates that the upper layer of the lunar soil is hard and can withstand a space station with an astronaut. The top soil layers are extremely porous and rough. The lunar surface is densely covered with cavities and protrusions which range in size from one millimeter to several centimeters. The direct observations of the lunar soil indicate that the lunar surface consists of either an extremely porous spongy layer with very thin walls separating individual pores or sharp opaque structures made up of finely divided, probably tufaceous and magmatic rocks which have no luster. It is quite possible that both of these soil structures prevail on the moon. The article makes a comparison between the scanning of the surface of a section of the moon transmitted by Luna-9 and that of two mock-ups, one from finely divided tuff and the other of a spongy surface (Figure 1). The article briefly discusses some of the earlier photometric and

Card 1/2

ACC NR: AP6036828

(a) (b) (c)

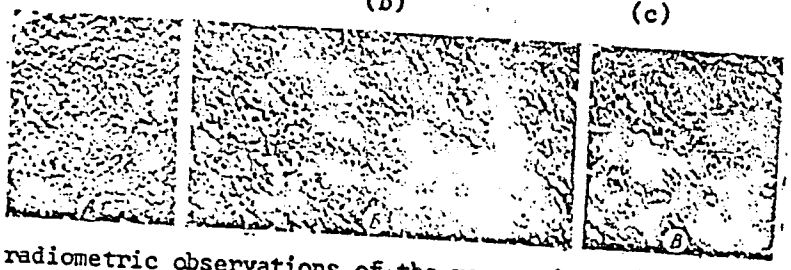

Fig. 1. a--crushed tuff; b--part of the scan of the lunar surface; c--spongy surface.

radiometric observations of the moon. Analysis of the photometric characteristics of the moon using average lunar reflectivity indicate that in some areas deviations from the uniform lunar surface are explained not only by the surface porosity differences, but also by the existence of cliffs. An opinion is expressed that the bright rays from crater Tycho and areas near Copernicus, Caplar and Aristarchus as well as in the Mare Serenitatis are associated in some manner with numerous, extremely small, but very bright craters located along the path of the light of the bright rays. This phenomenon needs further study. Orig. art. has: 2 figures.

SUB CODE: 22,03/ SUBM DATE: 27Apr66/ ORIG REF: 003

Card 2/2

BARABASHOV, M.P., akademik

Astronomical observations. Nauka i zhyttia 10 no.2:22 F '60.
(MIRA 13:6)

1. Direktor Astronomicheskoy observatorii Khar'kovskogo gosudarstvennogo universiteta im. A.M.Gor'kogo; AN USSR.
(Kharkov--Astronomy--Observations)

3.2500

S/035/62/000/007/048/083
A001/A101

AUTHOR: Barabashov, N. P.

TITLE: Comparison of lunar formations with terrestrial rocks

PERIODICAL: Referativnyy zhurnal. Astronomiya i Geodeziya, no. 7, 1962, 73, abstract 7A520 ("Tsirkulyar Astron. observ. Khar'kovsk. un-t", 1958, no. 19, 3 - 26)

TEXT: To compare formations on the lunar surface with terrestrial rocks in albedo and color, were used both old data of observations by Wilsing and Scheiner at the Potsdam Astrophysical Observatory in 1908 - 1910 and the results of new measurements carried out at the Khar'kov Observatory under author's supervision. Data for lunar formations are based on processing of 132 photographs of the Moon taken through 5 light filters (λ_{eff} 840, 650, 502, 415 and 365 mμ) by means of a lunar-solar camera mounted on the 200-mm refractor. Best photographs were selected for measurements on a МФ-2 (MF-2) microphotometer. Altogether 72 regions were studied. Brightnesses of the measured regions are expressed in stellar magnitudes, the value of stellar magnitude of brightness at λ = 500 mμ being adopted as zero-point for every object; therefore, the data obtained express the relative

Card 1/2

variation of albedo over the spectrum. In the same system are expressed the data for terrestrial rock specimens, while 49 specimens were measured by the photographic photometry method through the same light filters, and for 38 specimens were used measurement results with a СФ-2М (SF-2M) spectrophotometer. Specimens are listed which are sufficiently similar in albedo with some objects on the Moon. Polarization curves are recommended to be construed in two variants: a simpler one - for different phases and the conditions $i = \epsilon$, which calls for piling into one curve of data for a series of objects of the same type, and a more perfect one which consists in the following: A section on the lunar surface is studied during the period of one lunation, which corresponds approximately to a constant value of reflection angle at variable values of incidence angle i and azimuth difference. This study makes use of materials on polarization of the lunar surface published earlier (See RZhAstr, 1959, no. 7, 5501; no. 11, 9134). Their comparison with data for rocks in combination with the result of studying the light and brightness coefficients, leads to the conclusion that volcanic rocks (porous tuff, vesicular lava, ashes) approach best the lunar objects in optical characteristics. A list of lunar formations is presented, which are supposed to be observed at the Khar'kov Observatory by various methods in the first and second series. There are 10 references.

[Abstracter's note: Complete translation] I. Lebedeva

Card 2/2

BARABASHOV, N.P.

Structure of the lunar surface and the processing of the first photographs of its far side. Isk.sput.Zem. no.9:56-61 '61. (MIRA 14:11)

(Moon--Photographs, charts, etc.) (Lunar probes)

BARABASHOV, N.P.; GARAZHA, V.I.

Microstructure of the lunar surface. TSir.Astron.obser.Khar.un. no.24:3-13 '61. (MIRA 15:3)

(Moon--Surface)

BARABASHOV, N.P.; IVANCHENKO, V.M.; CHIRKOVA, R.M.

Radio observations of the partial solar eclipse of February 15, 1961 on the $\lambda \cong$ 1.5m. wave. TSir.Astron.obser.Khar.un. no.24: 36-38 '61. (MIRA 15:3)

(Eclipses, Solar--1961) (Radio astronomy)

BARABASHOV, N P.

PHASE I BOOK EXPLOITATION SOV/5265

Akademiya nauk SSSR

Atlas obratnoy storony Luny; obrazovaniya, vyyavlennyye na obratnoy storone Luny po fotografiyam, poluchennym avtomaticheskoy mezhplanetnoy stantsiyey 7-go oktyabrya 1959 goda (Atlas of the Far Side of the Moon; Formations Discovered on the Far Side of the Moon From Photographs Received by an Automatic Interplanetary Station on October 7, 1959) Moscow, 1960. 149 p. 5,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR.

Eds.: N. P. Barabashov, A. A. Mikhaylov, and Yu. N. Lipskiy.

PURPOSE: This atlas is intended for astronomers, earth scientists, and space specialists.

COVERAGE: The atlas contains 30 photographic plates of the far side of the Moon, obtained during the circumlunar flight of the third Soviet cosmic rocket, and an overall diagrammatic sketch

Card 1/4

indicating some 500 lunar features. The catalog of lunar features in the work lists the numerical designation, coordinates, photographic interpretation data, and descriptive information of 498 lunar landforms. The accompanying text describes the procedures followed in interpreting the photographic material, and in compiling the catalog listings and maps. The processing work was done in Moscow in the Gosudarstvennyy astronomicheskiy institut imeni P. K. Shternberga (State Astronomical Institute imeni P. K. Shternberg) under the direction of Yu. N. Lipskiy, and in cooperation with the Tsentral'nyy nauchno-issledovatel'skiy institut geodezii, aeros''yemki i kartografii (Central Scientific Research Institute of Geodesy, Aerial Surveying, and Cartography) under the direction of N. A. Sokolova. Simultaneously and independently, the same work was performed under the direction of A. V. Markov in Pulkovo by the Glavnaya astronomicheskaya observatoriya Akademii nauk SSSR (Main Astronomical Observatory, AS USSR), and in Khar'kov by the Astronomicheskaya observatoriya pri Khar'kovskom gosudarstvennom universitete im. A. M. Gor'kogo (Astronomical Observatory at the Khar'kov State

University imeni A. M. Gor'kiy) under N. P. Barabanov. There are no references.

TABLE OF CONTENTS:

Atlas of the Far Side (Cont.) SOV/5265

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Card 4/4

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6/28/61

PHASE I BOOK EXPLOITATION SOV/4313

Barabashov, N.P., V.A. Bronshten, M.S. Zel'tser, N.L. Kaydanovskiy, A.V. Markov, K.P. Stanyukovich, N.N. Sytinskaya, A.V. Khabakov, Sh.T. Khabibullin, V.V. Sharonov, and A.A. Yakovkin

Luna (The Moon) Moscow, Fizmatgiz, 1960. 384 p. 4,500 copies printed.

Ed.: (Title page): A.V. Markov, Doctor of Physics and Mathematics; Ed.: G.A. Manova; Tech. Ed.: N.Ya. Murashova.

PURPOSE: This book is intended for astronomers, astrophysicists, and other scientific and technical personnel interested in lunar research.

COVERAGE: The book, written by 11 Soviet authorities, summarizes and evaluates research done to date in selenology. The motion, rotation, and figure of the Moon, physical properties of the lunar surface, the question of the existence of lunar atmosphere, mapping of the Moon, radar investigations, and the effect of external cosmic forces on the Moon are discussed. An index of Russian and Latin designations of lunar features is included. The text is illustrated with 110 figures and 32 tables. There are 74 references: 34 Soviet, 32 English, 6 German, and 2 French.

Card 1/6

The Moon SOV/4313

TABLE OF CONTENTS:

Card 2/6

AVAILABLE: Library of Congress (QB 581.M3)

Card 6/6

JA/dwm/sfm
10/13/60

BARABASHOV, N. P.

Mikhaylov, A. A., ed.

Stantsii v kosmose; sbornik statey (Space Stations; Collection of Articles) Moscow, Izd-vo AN SSSR, 1960. 44 p. 25,000 copies printed. (Series: Akademiya nauk SSSR. Nauchno-populyarnaya Seriya)

Resp. Ed.: A. A. Mikhaylov; Compiler: V. V. Fedorov; Ed. of Publishing House: Ye. M. Klyeus; Tech. Ed.: I. D. Novichkova.

PURPOSE: This book is intended both for the space specialist and the average reader interested in space problems.

COVERAGE: The book contains 73 short articles by various Soviet authors on problems connected with space travel and the launching of artificial earth satellites and space rockets. Some possibilities of future developments are also discussed. The articles were published in the period of 1957-1960. No personalities are mentioned. There are no references.

III. ARTIFICIAL PLANET. FIRST ROCKET ON THE MOON

BARABASHOV, N.D.

Mikhaylov, A. A., ed.

Stantsii v kosmose; sbornik statey (Space Stations; Collection of Articles) Moscow, Izd-vo AN SSSR, 1960. 144 p. 25,000 copies printed. (Series: Akademiya nauk SSSR. Nauchno-populyarnaya Serlya)

Resp. Ed.: A. A. Mikhaylov; Compiler: V. V. Fedorov; Ed. of Publishing House: Ye. M. Klyaus; Tech. Ed.: I. D. Novichkova.

PURPOSE: This book is intended both for the space specialist and the average reader interested in space problems.

COVERAGE: The book contains 13 short articles by various Soviet authors on problems connected with space travel and the launching of artificial earth satellites and space rockets. Some possibilities of future developments are also discussed. The articles were published in the period of 1957-1960. No personalities are mentioned. There are no references.

TABLE OF CONTENTS:

BARABASHOV, N. P.; YEZERSKIY, V. I.

"On The Photometric Uniformity of The Lunar Surface".

paper presented at IAU Symposium on the Moon, Leningrad, USSR, 6-8 Dec 60.

The main properties of the reflection of light from the lunar surface, common for different formations, can be explained by the extreme roughness (microrelief) of the lunar surface. The comparision of the brightness of different objects, the study of intensity distribution on the lunar disk for different phase angles and the comparison of the indicatrice of reflection of separate details confirm the high photometric uniformity of the Moon's surface. This is evidence of the considerable influence of external cosmic factors on the formation of the microrelief of the Moon.

Barabashov - Dir, Astronomical Observatory, Kharkov

BARABASHOV, N. P.
~~BARBASHOV, N. P.~~

"On Rocks Possibly Composing The Lunar Surface."

paper presented at IAU Symposium on the Moon, Leningrad, USSR, 6-8 Dec 60.

At the Kharkov Observatory a complex investigation of the lunar surface was made. The following characteristics were studied: (a) brightness, (b) law of reflection, (c) smoothing factor, (d) reflection properties in dependence on wave length, (e) degree of polarization, (f) thermal conductivity, (g) luminescence. It was found that the lunar surface is covered probably by tuff-like rocks in a strongly crushed state with grains of the size 3-10 mm. The Moon cannot be covered by fine powders as the dust substances do not have the observed properties of light reflection. Surfaces covered by sharp-edged fragments and furrows with vertical and sloping sides give the best representation of observations.

30271
S/035/61/000/010/025/034
A001/A101

3,1550 (1041, 1057)

AUTHOR: Barabashov, N.P.

TITLE: On atmosphere and surface of Mars

PERIODICAL: Referativnyy zhurnal. Astronomiya i Geodeziya, no. 10, 1961, 65, abstract 10A455 ("Izv. Komis. po fiz. planet", 1960, no. 2, 3 - 23)

TEXT: The author presents the results of analysis of photographic photometry of the Mars disk from observations of 1939, 1954 and 1956. Two concepts of the possible structure of Martian atmosphere are discussed and compared; one of them assumes a dispersing atmosphere of small optical thickness τ, and the other ascribes to the atmosphere considerable actual absorption and a comparatively high value of τ. Formulae are presented and discussed, which express absolute brightness and contrast of various surface sections in dependence on the surface albedo A and coefficient of atmosphere transparency.p. These formulae are applied to numerous calculations of parameters characterizing the surface and atmosphere of the planet according to observations conducted in Khar'kov in different ranges of spectrum. The author arrives at the conclusion that the dispersing model of the atmosphere explains better the observed phenomena than the ab-

Card 1/2

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On atmosphere and surface of Mars

sorbing one. In particular, the author objects the N.A. Kozyrev opinion that the Martian red color is the consequence of exclusive action of the planet atmosphere. A comparison with terrestrial rocks shows that felsite tuffs, volcanic slags, tuff-lavas, andesite and andesite-basalt lavas, do not reveal, as a rule, a similarity with the Mars surface in color, although individual red specimens of these rocks can be compared with Mars. Limonite, ocherous hematite and red sandstone have the greatest similarity with the Mars surface. The author arrives at the conclusion that at least in the visible portion of spectrum the observed spectral features of the Martian surface are determined by the color of the planet solid surface; the cover of continents and seas is characterized by the fact that contrasts of their reflection ability in blue and violet rays are small. There are 7 references.

I. Lebedeva

[Abstracter's note: Complete translation]

Card 2/2

30273

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A001/A101

3,1550 (1041, 1057)

AUTHORS: Barabashov, N.P., Koval', I.K., Chekirda, I.T.

TITLE: Some results of photometry of cloudy formations on Mars

PERIODICAL: Referativnyy zhurnal. Astronomiya i Geodeziya, no. 10, 1961, 66, abstract 10A457 ("Izv. Komis. po fiz. planet", 1960, no. 2, 36-40)

TEXT: Blue clouds observed mainly in the equatorial zone of the planet are described on the basis of photographs taken in 1958 by means of a 10" reflector of the Khar'kov Observatory with the equivalent focus equal to 15.3 m in ultraviolet (λ3600) and blue (λ4200) portions of spectrum. The existence of a photometric scale makes it possible to obtain the curves of brightness distribution along the equator of intensity, when the clouds are present and at their absence. The analysis of materials has shown that the presence of clouds on the disk and terminator does not depend on the albedo of the underlying solid surface of Mars. The value of cloud-background contrasts, and the albedo of the clouds on the terminator are higher than on the disk. On an average, the bright-

Card 1/2

30273
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Some results of photometry ...

ness of clouds exceeds the background brightness by 14%. On assumption that the clouds studied are analogous, in their nature, to cirrus clouds of the Earth's atmosphere, their thickness was estimated to be 3 - 6 m.

I. Lebedeva

[Abstracter's note: Complete translation]

Card 2/2

30275

S/035/61/000/010/029/034
A001/A101

3,2500 (1080)

AUTHORS: Barabashov, N.P., Yezerskiy, V.I.

TITLE: Reflection indicatrices of individual sections of the lunar surface

PERIODICAL: Referativnyy zhurnal. Astronomiya i Geodeziya, no. 10, 1961, 66-67, abstract 10A464 ("Izv. Komis. po fiz. planet", 1960, no.2, 65-72)

TEXT: To study the law of lunar surface reflection, the authors made use of the principle of reciprocity which permits photometrical comparisons of sections located symmetrically relative to intensity equator at approximately the same longitude. The method was applied to data of the catalog of V.A. Fedorets. The results are presented in graphs whose consideration leads to the following conclusions. As a rule, indicatrices of the compared sections coincide within the limits of possible errors. In those cases when there are marked differences, the latter can be explained by the difference in the inclinations of the sections compared to the surface of the lunar sphere. The data of this work complement and develop the conclusions, drawn earlier, on the photometric uniformity of the lunar surface. Indicatrices of the light rays and the neighboring regions coincide completely. This means that light rays adopt the photometric structure

Card 1/2

Reflection indicatrices ...

of those regions in which they are located. This can be the case only when the particles forming the cover of the rays are considerably smaller than unevenness of the general microrelief of the lunar surface. Some parts of the Clavius crater and the Wood spot are noted as anomalous objects. As to the latter, a conjecture is expressed that its surface is extremely uneven. There are 6 references.

I. Lebedeva

[Abstracter's note: Complete translation]

Card 2/2

35052

S/030/60/000/010/003/016
B021/B058

3.1550 (1057, 1062, 1129)

AUTHOR: Barabashov, N. P., Academician AS UkrSSR

TITLE: New Phase of Lunar Research

PERIODICAL: Vestnik Akademii nauk SSSR, 1960, No. 10, pp. 32-36

TEXT: Numerous formations were discovered on the visible lunar surface by means of telescopic investigations. So far there is, however, no uniform opinion on the state of the lunar surface layers and on the composition of its rocks, which is of great significance for a safe landing of interplanetary space ships. On the basis of investigations by the Khar'kovskaya astronomicheskaya observatoriya (Khar'kov Astronomic Observatory), it can be assumed that the rocks of the lunar surface are similar to the tufaceous terrestrial rocks and volcanic ashes. N. A. Kozyrev pointed out that some lunar rocks show luminescent properties. It can be assumed that the lunar surface consists of highly porous tufaceous rocks in a crushed state with a grain size of from 1 to 3 mm. N. N. Sytinskaya assumed that the unevenness forming the lunar microrelief is within the limits of from 1 mm to 1 cm. Radiometric investigations showed that

Card 1/3

the temperature of the outer lunar layers varies greatly. A. Ye. Salomonovich discovered average temperature variations of from 165 to 229°K on the 8 mm wavelength. It was established that the variations of the lunar temperature, measured by radio waves below 10 mm wavelength, are very considerable, as can be seen from the papers by A. A. Amenitskiy, R. I. Noskova, and A. Ye. Salomonovich. Radar investigations of the moon are described as great achievements, the idea having been conceived by Academicians L. I. Mandel'shtam and N. D. Papaleksi in 1928. Spectral observations by means of the giant telescope of the Krymskaya astrofizicheskaya observatoriya (Krym Astrophysical Observatory), conducted by N. A. Kozyrev and V. I. Yezerskiy, showed that remains of volcanism are present on the moon. The moon has no atmosphere. On the basis of polarimetric observations, the Soviet astronomer Yu. N. Lipskiy assumes that there is a gas atmosphere on the moon, the mass of which per unit of surface amounts to only 1/10,000 of that on the Earth. There is no water on the moon. By means of Soviet cosmic rockets it was ascertained that the moon has no magnetic field; the possibility of the presence of an ionosphere was studied; the part of the moon invisible from the Earth was photographed and the picture was transmitted to the Earth. The sides of the moon, visible

New Phase of Lunar Research

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B021/B058

and invisible from the earth show a great difference which could not be elucidated so far. It is suggested that first of all new photographs of the moon should be taken, and an automatic interplanetary station brought to the moon, transmitting to the Earth new data on density, chemical composition and temperature of the lunar ground. Only after human landing will it be possible to explore the moon and the cosmos more thoroughly. A radar picture of the lunar surface, recorded with 8 mm wave by the Fizicheskiy institut im. P. N. Lebedeva (Institute of Physics imeni P. N. Lebedev) is shown. There is 1 figure.

Card 3/3

29501
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A001/A101

3.1550 (1057, 1559)
3.2500 (1080)

AUTHORS: Barabashov, N.P., Garazha, V.I.

TITLE: On the structure of surface layers of the Moon and Mars

PERIODICAL: Referativnyy zhurnal. Astronomiya i Geodeziya, no. 9, 1961, 70-71, abstract 9A616 ("Tsirkulyar Astron. observ. Kar'kovsk. un-t", 1960, no. 21, 3 - 18)

TEXT: The authors determine more precisely dimensions and shape of unevennesses covering the surface of the Moon and the size of grains which form the surface cover on Mars. Reflection law was investigated, by means of a photometric device, for 33 specimens; a part of them were artificial models built of gypsum and covered with unevennesses of various shapes, another part were magmatic rock crushed into grains ranging in size from 0.1 to 8 mm. The results of measurements are presented in tables and graphs. A comparison of this material with d on the lunar surface shows that crushed tuffs with pointed unevennesses and grains from 2 to 5 mm are most similar to the lunar surface. Volcanic ashes cond, to some extent, to lunar seas, and volcanic slag to continents, a iffers from the lunar surface in polarization. Data for dust a

On the structure of surface layers ...

29501
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molten rocks are not fit for the Moon. The consideration of an analogous material for Mars leads to the conclusion that fine powders with grain sizes from 0.05 to 0.1 mm correspond best to seas and continents of this planet, according to photometric data. A plant cover, represented by two samples of moss, differs very strongly from the surface of Mars. Ocherous hematite resembles best the surface of Mars, in its law of light reflection and spectral coefficients of brightness. There are 9 references.

I. Lebedeva

[Abstracter's note: Complete translation]

Card 2/2

AUTHOR: Barabashov, N., Academician of the AS UkrSSR, Chairman of the Planetary Commission of the Astronomical Council of the AS USSR

S/029/60/000/04/016/032
B008/B009

TITLE: Venus, Unmask!

PERIODICAL: Tekhnika molodezhi, 1960, Nr 4, pp 14-17 (USSR)

TEXT: The author reports on the investigation of Venus and mentions in this connection a number of Russian and Soviet scientists: M. V. Lomonosov, astronomer Aristarkh Apollonovich Belopol'skiy, V. I. Yezerskiy, and N. A. Kozyrev. On the basis of precise data a preliminary picture of the physical conditions prevailing on Venus can be drawn. These data show that Venus exhibits certain characteristics similar to those of the Earth. For instance, observations made in the course of several years at the observatory of the Khar'kovskiy gosudarstvennyy universitet (Khar'kov State University) suggest that Venus is surrounded by a dense atmosphere which renders it impossible to observe the surface of this planet directly. This layer is subject to continuous fluctuations in altitude, which results in certain changes in the coloring of the planet. Systematic changes in the distribution of brightness on the northern and southern hemispheres, which are probably due to the seasons, suggest that the equatorial plane is inclined by 32° relative to the plane of the planet's orbit. In 1949 the author of this

Card 1/2