

EXCERPTA MEDICA Sec.2 Vol.10/10 Phy.Biochem. Oct 57  
VAGOO.

4445. VAGO O., SPINER A., COMAN AI. and OLTEȚ M. Centr. de Obstet. și Ginecol., Matern. 'Polizu', București. \* Cercetări experimentale asupra baroreceptorilor uterini. (Notă preliminară). Experimental investigations on uterine baro-receptors. Preliminary note OBSTET.GINEC. (București) 1957, 5/2 (122-128) Graphs 3 Illus. 2

The receptors at the level of the cervix and corpus uteri, and of the fallopian tube, were studied by means of a special method of stimulation. Simultaneous plethysmographic recordings of the vaso-motor variations were made. The stimuli used were either mechanical (tractions) or intrauterine, and intratubal pressure variations caused by the slow or sudden introduction of carbon dioxide into the uterine cavity. The plethysmogram showed deviations in all cases of mechanical stimulation of the cervix and in most of the cases of uterine baro-receptor stimulation through pressure variations. The presence of changes in the plethysmogram during the passage of carbon dioxide through the fallopian tubes suggests the existence of baro-receptors at this level. (II, 10\*)

VAGO, Odon, dr.

The new forest law. Erdő 13 no.10:444-447 0 '64.

VAGO, Odon, dr.

Forestry propaganda. Erdo ll no.8:370-373 Ag '62.

VAGO, P.

VAGO, P. - The cow stable with 102 spaces on the special farms of the Hatvan  
Sugar Plant. p. 19, Vol. 11, no. 13, July 1956 -  
Magyar Mezőgazdaság, Budapest, Hungary

SOURCE: East European Accessions List (EEAL) Vol. 6, No. 4 - April 1957

K-7

*VAGO*  
HUNGARY/Chemical Technology - Chemical Products and Their Applications. Leather, Fur, Gelatin, Tanning Agents. Technical Albumen.

Abs Jour : Ref Zhur - Khimiya, No 2, 1958, 6743

Author : Vago, Reti, Malovecz, Varga

Inst : -

Title : On the Storage and the Leaching of Smoke Tree (Variability of Sumac Tanning Agents).

Orig Pub : Bor-es cipotechnika, 1957, 7, No 1, 1-3

Abstract : The tanning (T) content in the wood of the smoke tree bush Rhus cotinus investigated (50-year old) was higher than in the young sprouts or in the bark. Wood dyes powdered hide into yellow (while dyes it bark T into grey-brown), no precipitate with  $CH_2O$  (while bark T gives an abundant precipitate), produces a blue coloration in presence of  $FeCl_3$  (while bark T give a green color). Sumac T is less stable than T from the Chinese nut tree.

Card 1/2

*Some physical properties of barium oxide thermocathodes.* N. D. Morgulis and V. S. Yagolnik (Kiev State Univ.). *Doklady Akad. Nauk S.S.S.R.* 80, 247-50 (1948).—With the aid of probes, in the form of Ni ribbons 7  $\mu$  thick and about 0.16 mm. wide, wound at different heights, at 3 different depths, 50, 80-100, and 150  $\mu$ , of a cylindrical oxide layer of total thickness 200  $\mu$ , deposited on a heated solid Ni cylinder core of 1.25 mm. diam., and with the aid of an opening in the oxide layer haring the core, the depth distribution of the current-voltage characteristics was investigated under voltage impulses of amplitudes up to 1800 v., time const. 50-500 microsec. and frequency of the order of 1 hertz. With the aid of these same probes, the thermoelectromotive force  $E$  across the layer was detd. between the core and each probe separately. At a certain stage of the activation, the sign of  $E$  changes into that corresponding to electronic cond. and then remains unchanged. The change occurs first at the innermost probe (closest to the core) and moves gradually towards the periphery of the oxide layer. Sometimes, a reverse change of sign of  $E$  occurs even on an activated layer on lowering the temp.; e.g., in one case, the "inversion temp." was 1150°K. The total temp. drop across the oxide layer, from the core to the outer periphery, was about 100°. From the set of current-voltage curves at various depths, potential distribution curves were constructed in terms of the depth at various const. emission current intensities  $i$  and temps.  $T$  (975-1185°K.). These curves usually show slight breaks. Extrapolation to zero depth gives the potential jump  $\Delta V$  at the boundary of the core and the oxide layer; its value ranges from a few v.

to a few tens of v. (at low  $T$  and high  $i$ ).  $\Delta V/i$  gives the contact resistance  $R_c$  at the same boundary;  $R_c$  is a function of  $i$  and passes through a max. at lower  $T$  (975 and 1015°K.). If the thickness of the blocking layer is  $10^{-4}$ - $10^{-5}$  cm., the mean elec. field strength at the contact is of the order  $10^9$  v./cm.. Further, the potential depth distribution curves give the total elec. resistance  $R_t$  between any 2 probes. Plots of  $R_t$  between the 1st and the 2nd probe, against  $i$ , at various  $T$ , show that this resistance is ohmic only at higher  $T$  (1120-1185°K.); at 975 and 1015°K.,  $R_t$  passes through a max. The plots of  $R_t$  permit evaluation of several characteristic magnitudes; thus, the internal work function of the electron  $\approx 0.8$  e.v., external work function  $\approx 0.9$ , total work function 1.7 v., emission c.d.  $\approx 0.5$  amp./sq. cm. at 1073°K. and 1500 v., concn. of free electrons  $\approx 10^{19}$  ex. at 1120°K. The Debye screening length can be estd. to  $10^{-4}$ - $10^{-5}$  cm. and the surface concn. of free charges to  $10^{18}$ /sq. cm. N. Thon

A.S.B.-35.A METALLURGICAL LITERATURE CLASSIFICATION

NEKRASOV, I.I.; VAGOBVSKAYA, T.V.

Low-temperature reactions of atoms and radicals. Vest.Mosk.un.Ser.  
2:Khim. 20 no.3:20-22 My-Je '65.

(MIRA 18:8)

1. Moskovskiy universitet, kafedra fizicheskoy khimii.

VAGONENE, Ye M.

USSR/Fern: Animals. The Swine

Q-4

Abr Jour : Ref Zhur - Biol., No 11, 1958, No 50059

Author : ~~Vagonene, Ye. M.~~

Inst : Lithuanian Scientific Research Institute of Animal Husbandry  
and Veterinary Sciences.

Title : The Effectiveness of Substituting Concentrated Foods by  
Corn Ear Silage in Fattening Diets of Growing Pigs.

Orig Pub : Byul. nauchno-tekhn. inform. Lit. n.-i. in-ta zhivotnovodstva  
i veterinarii, 1957, No 1, 25-26

Abstract : No abstract

Card : 1/1



VAGONIS, Z. I. Cand Biol Sci -- (diss) "Effect of various rations upon certain immunobiological and hematological indicators in young cattle." Vil'nyus, 1957. 24 pp (Min of Higher Education USSR. Vil'nyus State Univ im V. Kapsukas), 100 copies (KL, 4-58, 82)

USSR/ Farm Animals. Cattle.

Q-2

Abs Jour: Ref Zhur-Biol., No 12, 1958, 54744:

Author : ~~Vagonis Z. I.~~

Inst : Not given.

Title : The Effect of Different Rations on Certain Immunobiological and Hematological Indexes in Young Cattle.

Orig Publ: Byul. nauchno-tekhn. inform. Lit. n.-i. in-t zhivotnovodstva i veterinarii, 1957, No 1, 33-37.

Abstract: Three groups of heifers, 7 heads in each, fed different rations (1st group was fed concentrates, 2nd - roots, 3rd - silage), were vaccinated thrice against paratyphoid. The highest immunobiological and hematological indexes were obtained in the 1st group, the lowest - in the 2nd one.

Card 1/1

AYZINEUDAS, L.B., VAGONIS, Z.I.

"On the functional stigmata of the constitution of farm animals."

Report submitted, but not presented at the 22nd International  
Congress of Physiological Sciences.  
Leiden, the Netherlands 10-17 Sep 1962

AIZINBUDAS, L.B.; VAGONIS, Z.I.

Physiological trend in the theory of the constitution of farm animals. Zhur.ob.biol.23.no.6 :432-440 N-D'62. (MIRA 16:7)

1. Itovskaya veterinarnaya akademiya i Litovskiy nauchno-issledovatel'skiy institut zhivotnovodstva.  
(VETERINARY PHYSIOLOGY)

NARKEVICH, O.Ye.; TRUKHTANOVA, V.I.; ROYZMAN, V.M.; DUBROVINA, L.M.;  
VAGONOVA, N.A., red.; EL'KINA, E.M., tekhn. red.

[Price determination in enterprises of public dining]TSeno-  
obrazovanie v predpriatiakh obshchestvennogo pitania. Mo-  
skva, Gostorgizdat, 1962. 86 p. (MIRA 16:3)  
(Restaurants, lunchrooms, etc.--Prices)

VAGONOVA, N.A.; TOLPYGO, Ye.A.; TIMOFEYEVA, L.I.; ZAKHAROV, V.I., red.;  
EL'KINA, E.M., tekhn. red.

[New developments in the operations and equipment of public  
eating facilities] Novos v obshchestvennom pitanii. Moskva,  
Gostorgizdat, 1962. 241 p. (MIRA 16:4)  
(Restaurants, lunchrooms, etc.--Equipment and supplies)  
(Restaurant management)

L 52116-65 EWP(k)/EWT(d)/EWP(h)/EWA(d)/EWP(l)/EWP(v) Pf-4

ACCESSION NR: AP5015363

UR/0286/65/000/009/G112/0112

621.914.37

11  
E

AUTHOR: Vagos, P. V.

TITLE: A vertical duplicating milling machine for machining irregular surfaces on two sides. Class 49, No. 170819

SOURCE: 'Byulleten' izobreteniy i tovarnykh znakov, no. 9, 1965, 112

TOPIC TAGS: machine tool industry, milling machine, turbine vane

ABSTRACT: This Author's Certificate introduces a vertical duplicating milling machine for bilateral machining of irregular surfaces, e.g. the blades of turbojet vanes. The device has milling heads on both sides of the vane. The machining accuracy is improved by mounting the milling heads at an angle to the axis of the vane on two pairs of hinged levers which are kinematically connected with the machine tool frame. Followers of the milling heads interact with a master copy which is proportional in thickness to the production scale. This master copy is mounted on a geometrical axis with the part being machined along the bisector of the angle formed by the milling heads.

Card 1/3

L 52116-65

ACCESSION NR: AP5015363

ASSOCIATION: none

SUBMITTED: 30Sep63

ENCL: 01

SUB CODE: IE, MM

NO REF SOV: 000 .

OTHER: 000

Card 2/3



I 52116-65

ACCESSION NR: AP5015363

ENCLOSURE: 01

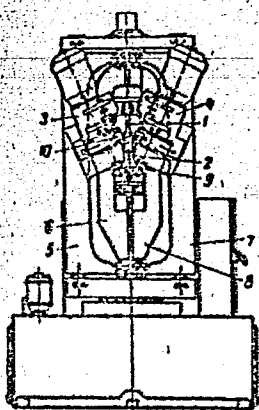


Fig. 1. 1--master copy; 2--vane; 3 and 4--milling heads; 5-8--levers; 9 and 10--followers

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Card 3/3 MB

W. OWEN, A. I.

29808

Intyensivnoye vyrashchivaniye i Otkorm svinney. Sots. zhivotnovodstvo, 1949, No. 5,  
S. 40-42

SO: LITOMIA' NO. 40

21(7)

AUTHORS:

Vagradov, G. M., Sokolova, I. B.

SOV/56-36-3-59/71

TITLE:

On the Scattering of  $\pi$ -Mesons on a Deuteron ( K rasseyaniyu  $\pi$ -mezonov na deytrone)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,  
Vol 36, Nr 3, pp 948 - 949 (USSR)

ABSTRACT:

A number of papers, which are discussed in short in the introduction, already compared theoretical and experimental data concerning elastic  $\pi$ -d scattering, the discrepancy between calculated and measured differential cross sections at small angles, the variation method, and multiple scattering (Refs 1-9). Also the present "Letter to the Editor" makes a short contribution towards solving this problem, i.e. the authors investigate the momentum approximation to the differential cross section of elastic  $\pi$ -d scattering at small angles (according to references 3,4) and the approximation after analysis of experimental data (according to references 2,6,7). The energy dependence of the corrections is discussed in short. For the purpose of illustrating conditions the authors calculate the elastic  $\pi$ -d scattering at 300 Mev

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On the Scattering of  $\pi$ -Mesons on a Deuteron

307/56-36-3-59/71

according to 3 variants: 1) according to momentum approximation, 2) when  $(2\omega_0/M) \rightarrow 0$ , i.e.  $M \rightarrow \infty$  ( $M$ = nucleon mass), and 3) in consideration of double scattering at angles  $\leq 90^\circ$  and in the presence of S- and P-waves in the case of  $(\pi N)$  scattering. In the present paper only the results obtained by these calculations are given in form of curves in a diagram. They show the dependence of the differential cross section on the angle  $\theta_{lab}$ . For comparison, the diagram also contains the experimental values found for  $\pi^+$ - and  $\pi^-$  - mesons. Agreement of these curves becomes satisfactory only at large angles. The curve 1) shows the greatest deviations. The authors finally thank V. Ya. Faynberg for discussions. There are 1 figure and 9 references, 1 of which is Soviet.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR  
(Physics Institute imeni P. N. Lebedev of the Academy of  
Sciences, USSR)

SUBMITTED: November 26, 1958

Card 2/2

83506

S/056/60/038/005/019/050  
B006/B070

24.6510

AUTHORS: Vagradov, G. M., Kirzhnits, D. A.TITLE: The Theory of Nuclear Matter 19PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,  
Vol. 38, No. 5, pp. 1499-1506

TEXT: The authors wanted to develop a simple method for the quantitative description of the ground state of nuclear matter. As usual, nuclear matter is considered to be an infinite, homogeneous system of protons and neutrons, in which only the nuclear forces act - strong, short-range repulsive (range of action  $c$ ) and weak, long-range attractive forces. In the interactions of nucleons, two facts are of basic significance: the Pauli principle (virtual transitions inside the Fermi sphere are forbidden); and the low probability that three or more nucleons collide on account of the smallness of  $\rho c^2$ , so that in collisions the pair correlations of nucleons play the principal role. In the introduction, the authors briefly discuss the method of Brueckner and others, which, however, appears to be too complicated for the present purpose. Also the work of Weisskopf and

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83586

The Theory of Nuclear Matter

S/056/60/038/005/019/050  
B006/B070

others, whose purpose was to simplify the mathematical apparatus, contains additional complications which are superfluous and may be eliminated, as the authors have shown. Following the considerations of Weisskopf and others (Ref. 2), the authors likewise start from the Hamiltonian  $\hat{H} = \sum_i \hat{p}_i^2/2M$

+  $\sum_{i < j} v_{ij}$ . The attractive forces  $v_{ij}$  are assumed to be of the Serber type.

The authors then endeavour to determine the energy  $\epsilon$  carried by one nucleon, as a function of the limiting momentum  $p_0$ . While the kinetic part of  $\epsilon$  is simply given by  $\epsilon_1 = 3p_0^2/10 M$ , the interaction energy  $\epsilon_2$  is given by

$$\epsilon_2 = \frac{p_0^2}{M} \left\{ \frac{\gamma}{\pi} + \frac{6(11-2 \ln 2)}{35\pi^2} \gamma^2 + (0.13 + \frac{1}{2\pi})\gamma^3 + \dots \right\}$$

The error  $\delta_1 \epsilon_1$  due to neglect of the three-particle correlation, is calculated to be  $\sim 2$  Mev. This is true for the first case considered where the attractive potential  $v_a$  vanishes ( $\gamma = cp_0 = 0.59$ , dilute Fermi gas). By use of the Hartree-Fock method, an expression for the interaction energy is obtained also for the second case where  $v_a \neq 0$ , (compressed Fermi gas). Here,

$\delta_2 \epsilon$  is found to be  $\sim -1$  Mev. In the following, the correction  $\delta_3 \epsilon$

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The Theory of Nuclear Matter

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B006/B070

is calculated in the Hartree-Fock approximation, with  $v_{ij} = v_c(r_{ij}) + v_a(r_{ij})\hat{S}_{ij}$  ( $\hat{S} = (1+\hat{P})/2$ , the exchange operator). The value found is again  $\sim -1$  Mev. It is then shown that with a simplified nucleon dispersion law, this method gives results as accurate as the experimental values. For this purpose, it is assumed that  $E(p) = p^2(1+\mu)/2M$  for  $p < \lambda p_0$ , and

$$E(p) = p^2/2M + p_0^2 \lambda^2 \mu / 2M \text{ for } p > \lambda p_0.$$

It is found that  $\epsilon \approx -11$  Mev/nucleon,  $p_0 \approx 1.4\phi^{-1}$  with  $\mu \approx 0.75$ ,  $\lambda \approx 1.3$ ,  $\epsilon_1 \approx 25$ ,  $\epsilon_2 \approx 32$ , and  $\epsilon_3 \approx -68$  Mev. The error is not greater than

1 Mev/nucleon. The authors thank I. Ye. Tamm, V. L. Ginzburg, and A. S. Davydov for discussions, and L. V. Pariyskaya for computations. There are 5 references: 2 Soviet and 3 US.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR  
(Institute of Physics imeni P. N. Lebedev of the Academy  
of Sciences USSR)

SUBMITTED: November 4, 1959 (initially) and January 16, 1960 (after revision)  
Card 3/3

S/056/62/043/004/026/061  
3108/3186AUTHORS: Vagradov, G. M., Kirzhnits, D. A.

TITLE: Statistical nuclear model accounting for correlations

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43,  
no. 4(10), 1962, 1301 - 1307

TEXT: A method previously proposed (ZhETF, 35, 1499, 1960) is used in considering strong correlation effects in the real interaction potential. The pair interaction potential is split into a sum of two potentials. To one of these (attraction) the Hartree-Fock approximation is applied, the other is treated in gas approximation. To account for inhomogeneity of nuclear matter, the kinetic energy is expanded in terms of an arbitrary function  $q$ . In the case of heavy nuclei it is sufficient to consider only the first term which has the form  $\int d\vec{r} f_0(\rho(r))$ . The same holds for the correlation energy. The function  $q$  can be found by variation. So calculating the total nuclear energy leads to an expression in the form of Weiz-

säcker's formula:  $E/A = U_{\text{vol}} + \epsilon^2 U_{\text{symm}} + \frac{Z^2}{A^{4/3}} U_{\text{Coul}} + U_{\text{surf}}/A^{1/3}$ . The  
Card 1/2



Statistical nuclear model...

S/056/62/043/004/026/061  
3108/3186

coefficients in this formula are calculated by variation:  $U_{\text{surf}} \approx 21$  Mev,  
 $U_{\text{symm}} \approx 30$  Mev.  $U_{\text{vol}}$  was considered in the paper mentioned above.  $U_{\text{Coul}}$   
coincides with its empirical value. There is 1 figure.

ASSOCIATION: Fizicheskii institut im. P. N. Lebedeva Akademii nauk SSSR  
(Physics Institute imeni P. N. Lebedev of the Academy of  
Sciences USSR) ✓

SUBMITTED: March 7, 1962 (initially),  
May 9, 1962 (after revision)

Card 2/2

L 1978-66 EWT(m)/EWA(h)

ACCESSION NR: AT5018595

UR/2504/65/033/000/0158/0171

AUTHOR: Vagradov, G. M.

19

16  
12  
8+1

TITLE: Theory of nuclear reactions and the many-body problem

SOURCE: AN SSSR. Fizicheskiy institut. Trudy, v. 33, 1965. Issledovaniye atomnogo yadra s pomoshch'yu zaryazhannykh chastits i neytronov (Investigation of the atomic nucleus using charged particles and neutrons), 158-171

TOPIC TAGS: nuclear physics, nuclear reaction, inelastic scattering, scattering amplitude, nucleon interaction

ABSTRACT: A microscopic theory, claimed to be simpler than that developed by H. Feshbach (Ann. of Phys. v. 5, 357-390, 1958 and v. 19, 287-319, 1962), is developed for nuclear reactions by introducing the second-quantization formalism, which not only leads to an exact account of the identity of the particles and to a simplification of the mathematics, but also makes possible the use of field methods of many-body theory. It is assumed that the Hamiltonian of the system of nucleons is known and contains the potentials of the interactions between the nucleons. No limitations are imposed on the types of these interactions. Using this Hamiltonian in the second-quantization representation, the unified scattering theory, and specially introduced channel functions, the author determines in general form the various quan-

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L 1978-66

ACCESSION NR: AT5018595

titles needed for the theory (unified optical potential, scattering and reaction amplitudes, etc.). It is shown that these amplitudes can be represented in the form of a two-part sum, one part determining the direct interaction and the other describing the processes that proceed via the compound nucleus. In the particular case of an isolated resonance, the theory leads to the ordinary Breit-Wigner formula with exact expressions for the width and for the energy shift in terms of matrix elements of the internucleon interaction. The method can be used with different nuclear models, as is illustrated by using inelastic scattering of nucleons by nuclei as an example. In addition to simplicity, the theory makes it possible to distinguish the character of interaction forces between the nucleons (for example, by disclosing whether the reaction channels are open or closed for paired or ternary interactions) and to investigate the limits of applicability of any nuclear model. "The author thanks D. A. Kirzhnits and V. A. Sergayev for a discussion and I. M. Frank for interest in the work." Orig. art. has: 1 figure and 26 formulas.

ASSOCIATION: Fizicheskii institut AN SSSR (Physics Institute, AN SSSR)

SUBMITTED: 00

ENCL: 00

SUB CODE: NP

NR REF SOV: 004

OTHER: 006

*KC*  
Card 2/2

VAGRALOV, Z

32535. Magnitofon (sistemy L. A. Demina-ovskogo i B. P. Krylova.) Ill. V. Filatov.  
Tekhnika -- molodezhi, 1988, No 10, s. 2-28

SO: Letopis' Zhurnal'nykh Statey, Vol. 48, Moskva, 1949

VAGRAMYAN, A.S., kand. tekhn. nauk dotsent

New method for measuring temperature on friction surfaces of  
metallic and nonmetallic bodies. Vest. mashinostr. 45 no.1:45  
Ja '65. (MIFA 18:3)

PROCESSES AND PROPERTIES INDEX

7

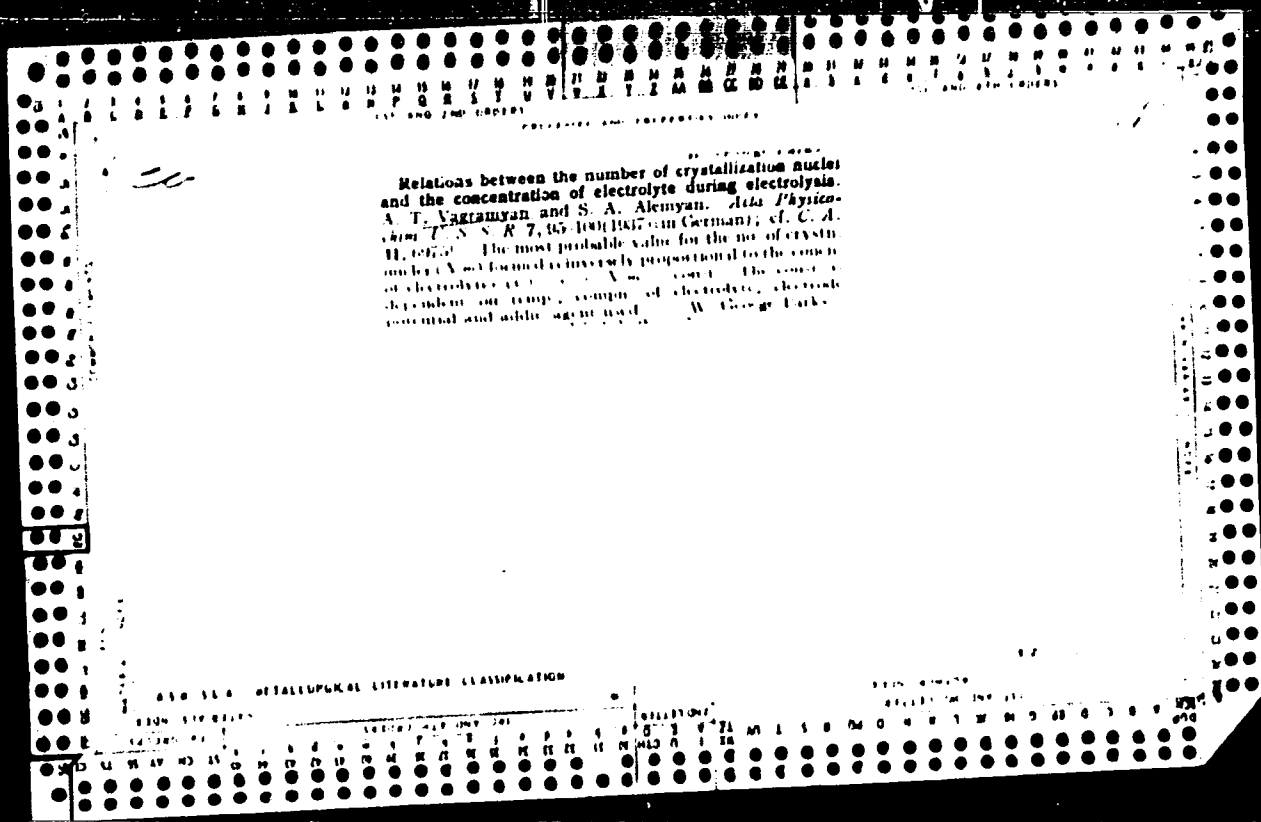
*m*

**Mechanical Activation of Electrode Surface.** K. M. Gorbunova and A. T. Vagrameyan, (*Doklady Akademii Nauk, U.R.S.S. (Compt. rend. acad. sci. U.R.S.S.)*, 1934, [N.S.], 1, 127-128 (in Russian); 128-129 (in French); *C. Abstr.*, 1934, 29, 3696).—A silver cathode submerged into 3-N silver nitrate solution remains passive at polarization up to  $0.6 \times 10^{-2}$  v. Increase of polarization up to  $1.7 \times 10^{-2}$  v. results in the formation of microscopic crystals which are capable of growth at lower potentials. A scratch made on the surface of the electrode enables crystals to form at much lower potentials. Scratching increases the number of active places due to freeing of microcrystalline surfaces where localized separation of metal takes place.—R. G.

A S U S L A METALLURGICAL LITERATURE CLASSIFICATION

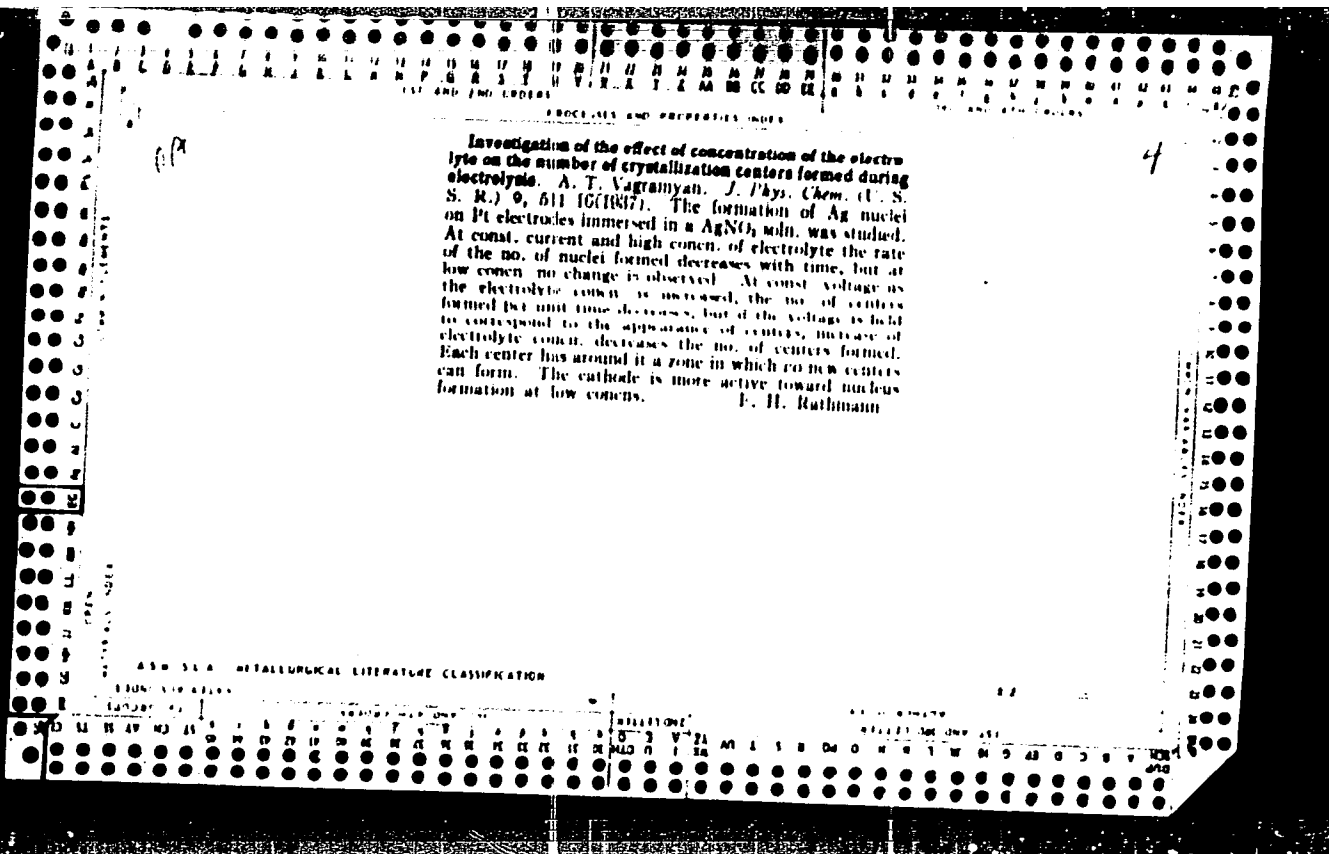
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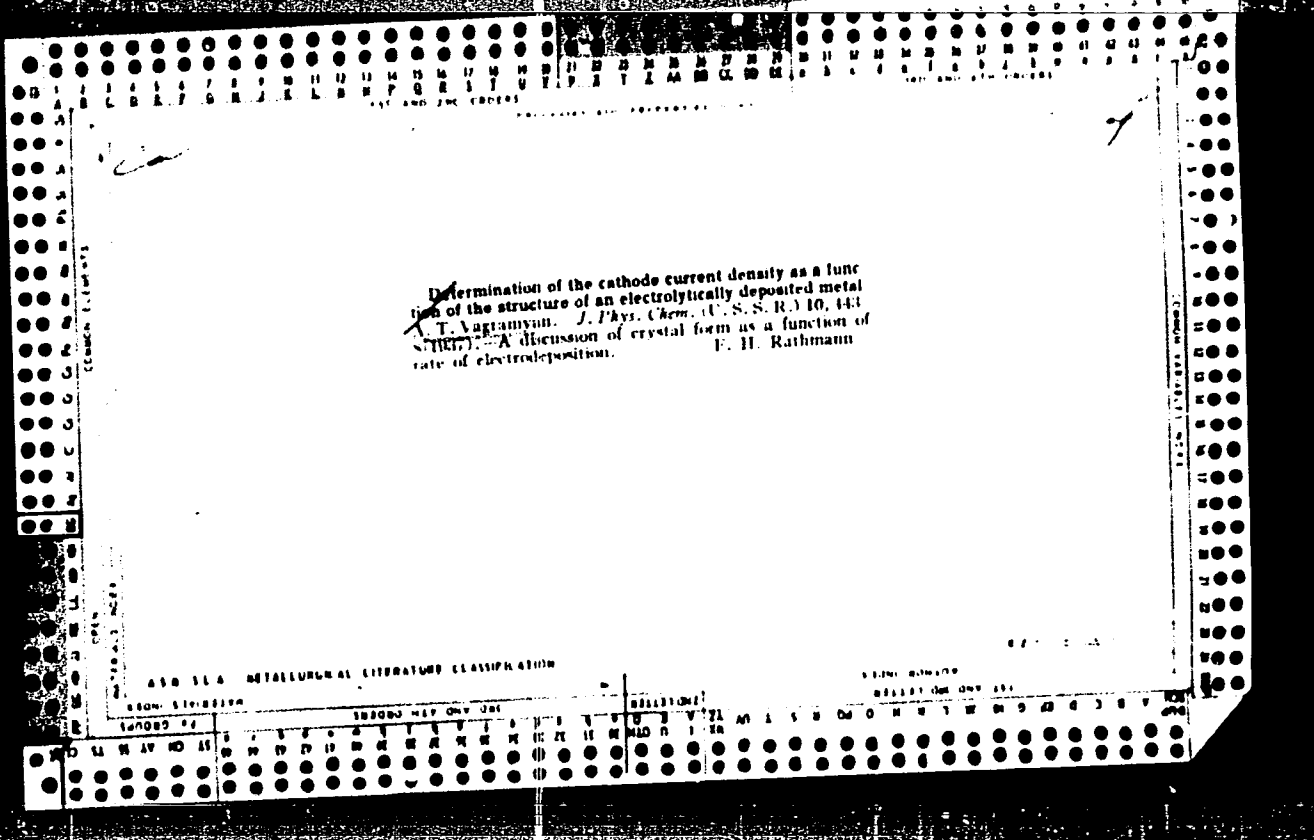


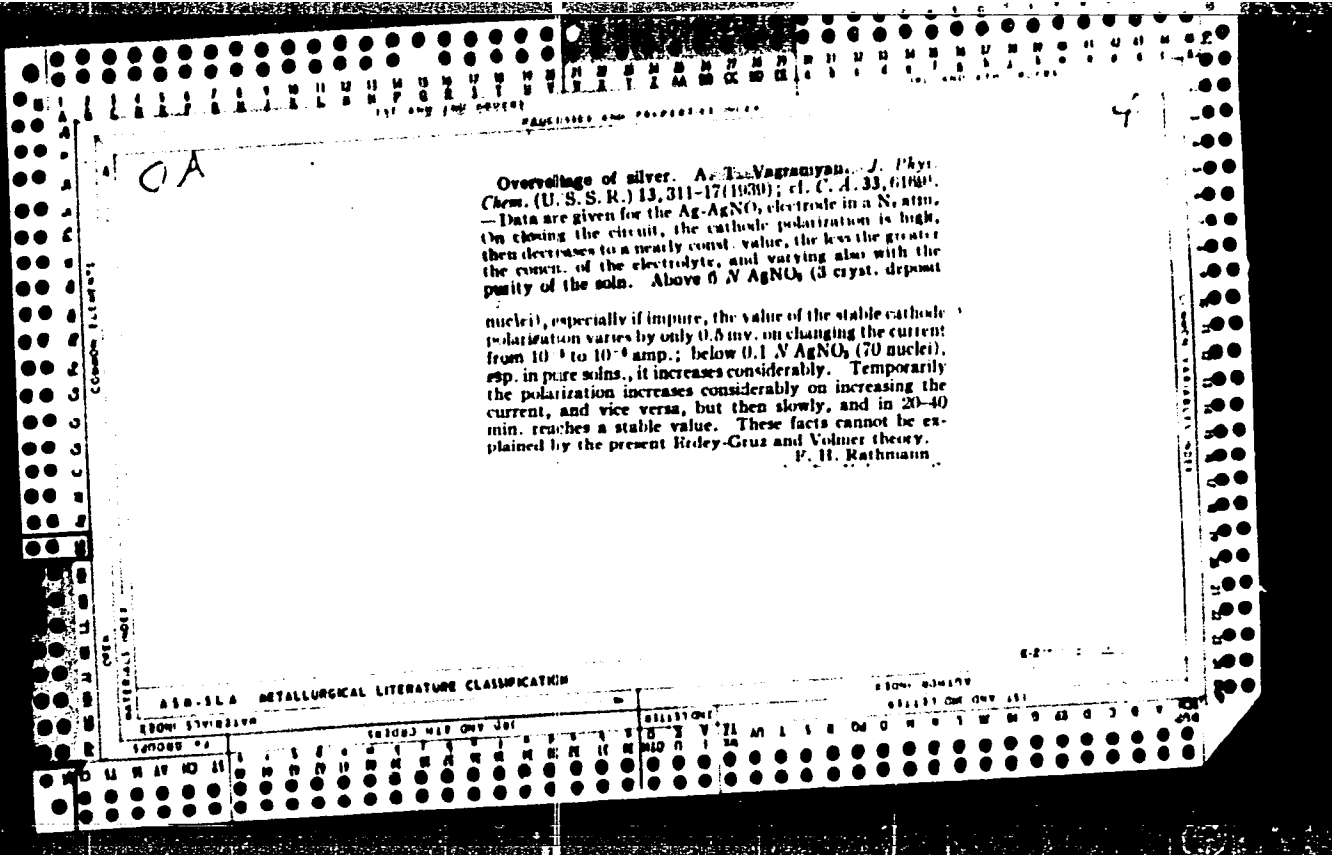


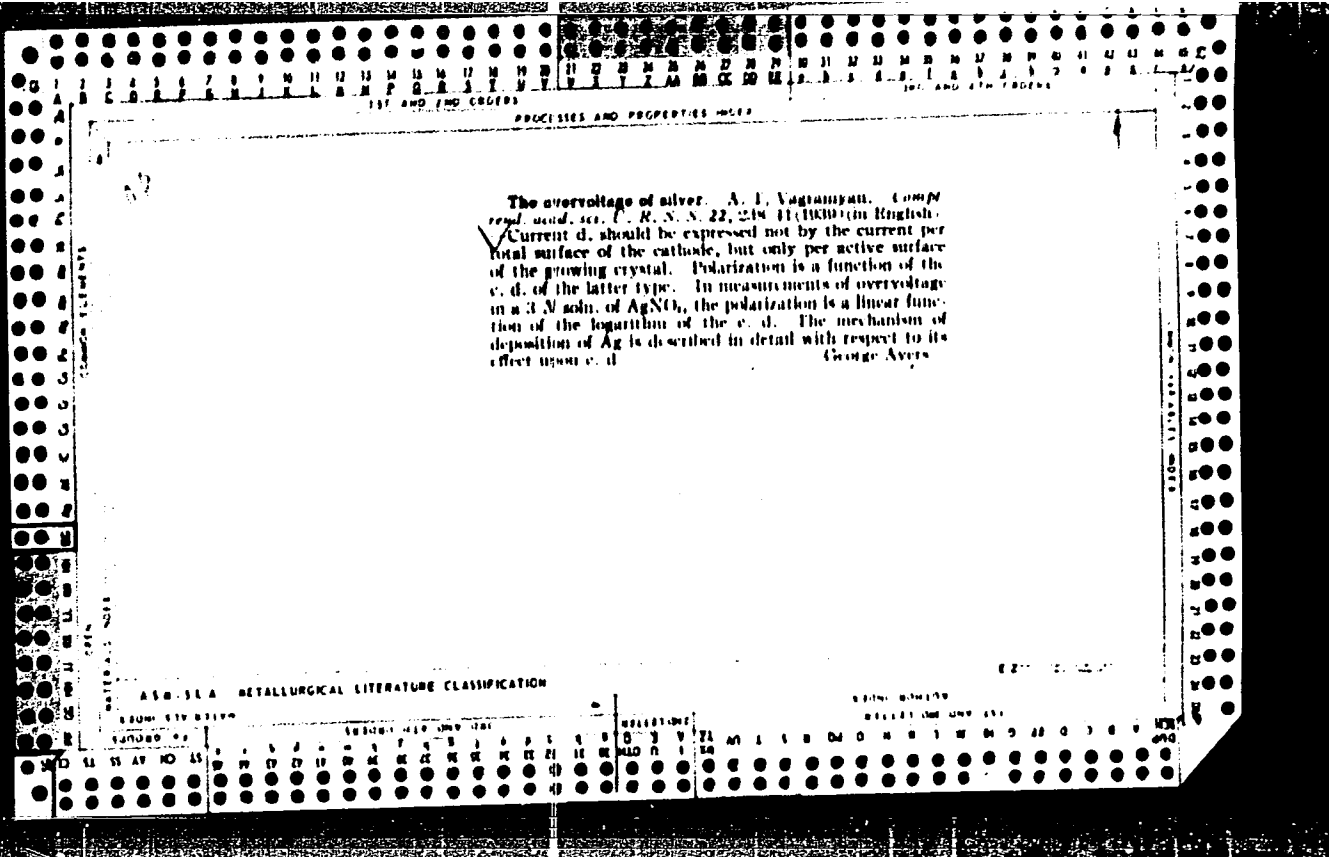


The laws of electrocrystallization of metals. V. I. Vagrameyan and S. A. Akhnyan. *J. Phys. Chem.* 4: 5 S. R., 6, 517-214 (1937). The no. of centers of crystal formed on Pt cathodes in  $AgNO_3$  solns. of various concns. were detd. and it was found that the most probable no. of centers formed was greater the more dil. the soln. The concn. of  $Ag^+$  ions and the concentration of centers of crystal formed varied in inverse proportion (exptl. was for  $2N, 1, 1/2, 1/3, 1/4, 1/5, 1/6$  and  $1/8N$  to  $10^{-4}N$ ). Approx. the law  $n_{cr} = const \cdot c^{-1}$  when  $c = concn.$  and  $n_{cr} =$  most probable no. of centers formed, holds within the range studied. F. H. Rathmann

МЕТАЛЛУРГИЧЕСКАЯ ЛИТЕРАТУРА КЛАССИФИКАЦИЯ









CA

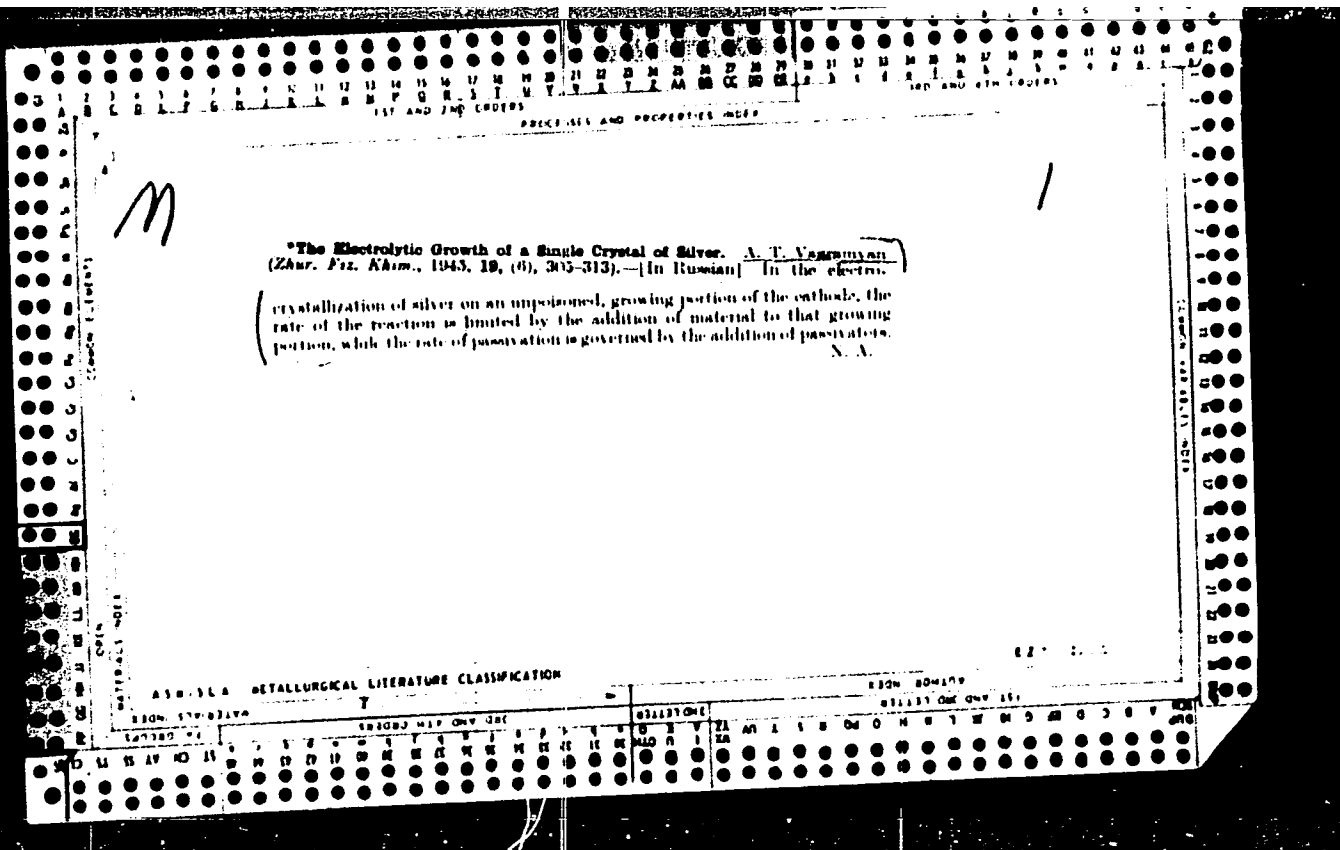
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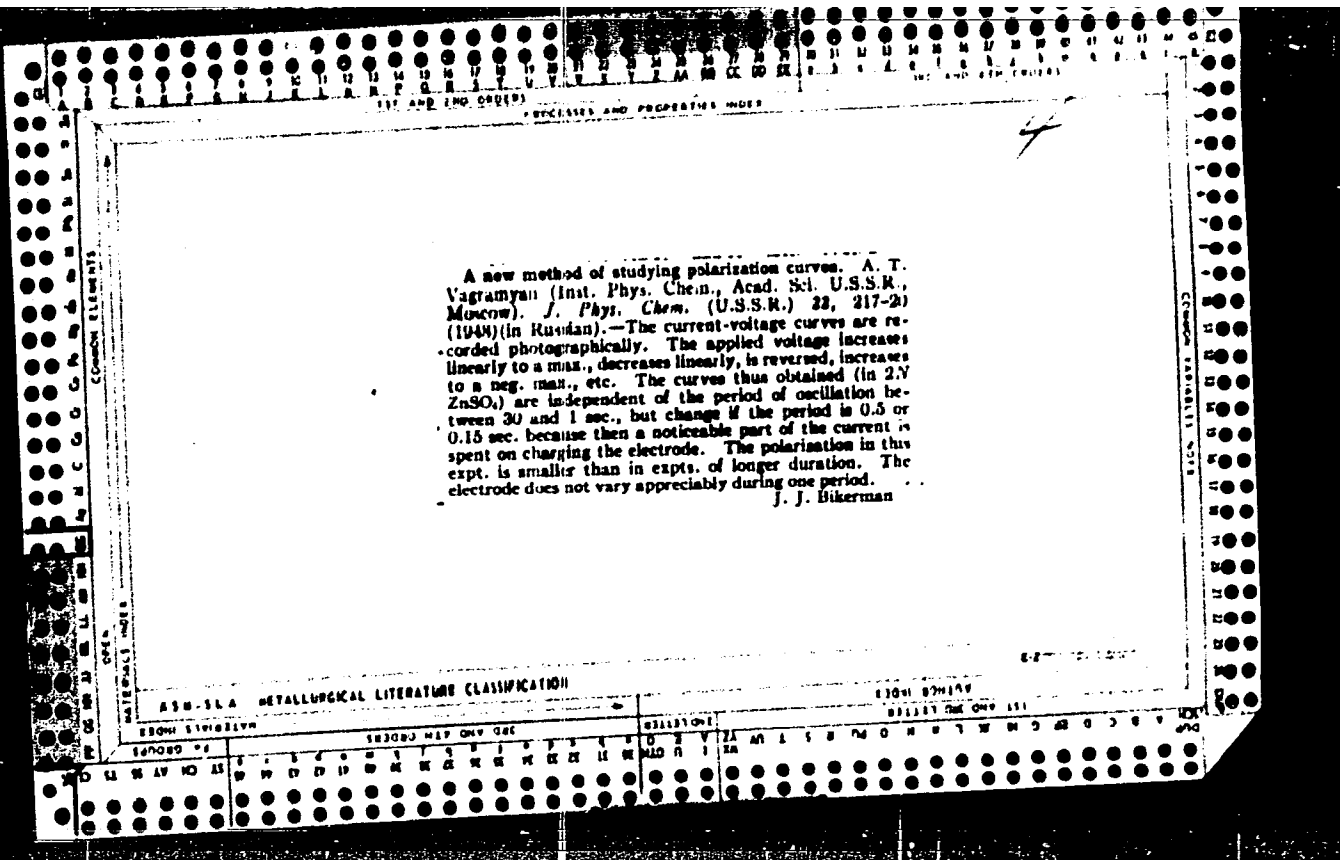
Passivation of silver during electrodeposition. A. I. Vagrasyan. *Compt. rend. acad. sci. U. R. S. S. 27*, 483 (1940) (in English); cf. *C. A.* 34, 12209. Alterations in passivation of a freshly deposited Ag surface (cathode) after intermissions in electrolysis for various intervals of time in basic electrolyte impure with  $AgNO_3$ . Even when re-cryst. twice from double distilled water, gave a soln. in which the Ag surface showed changes in passivation during varying intermissions in electrolysis; however, there was no passivation when the  $AgNO_3$  used had been treated with O in the presence of platinized Pt for 24 hrs.

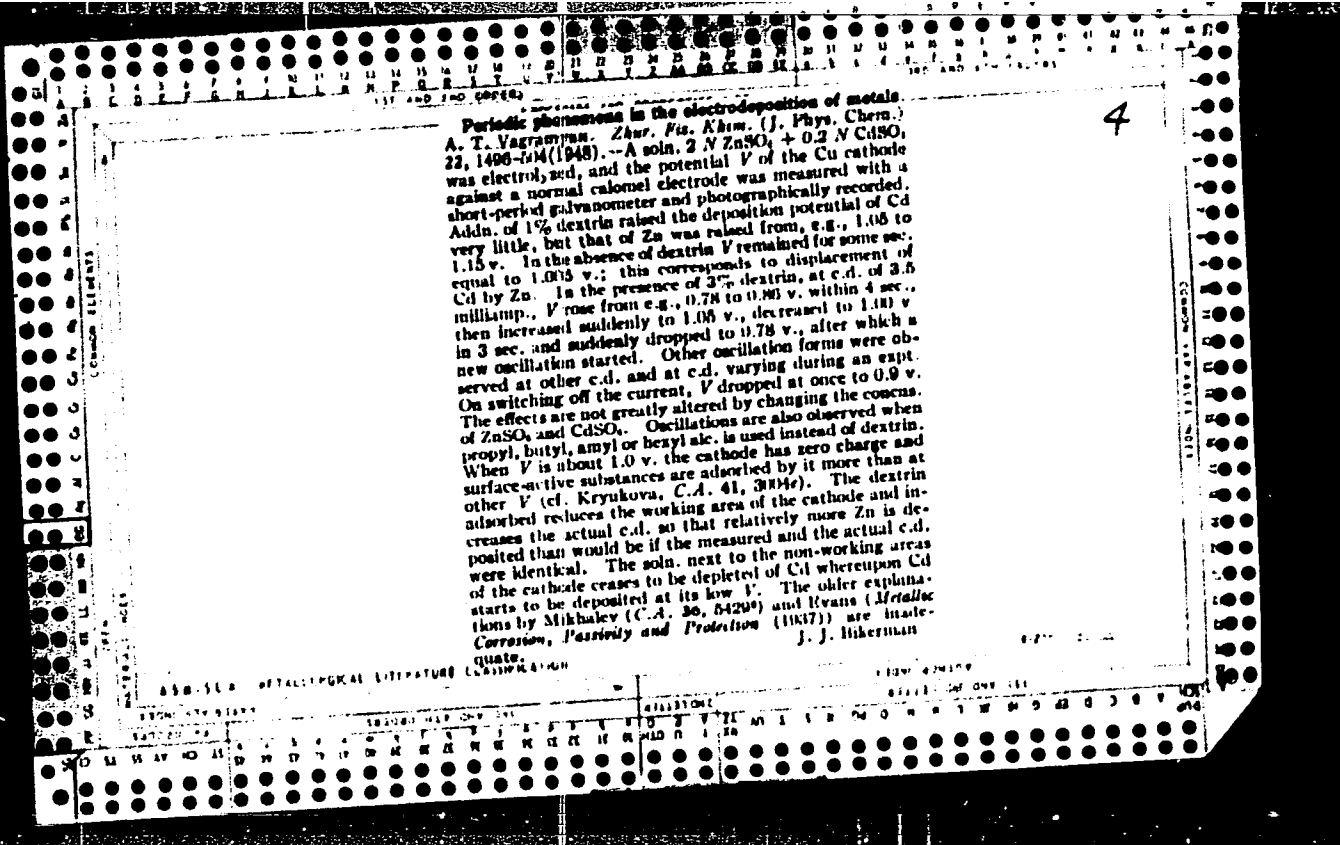
or more, particularly if the oxidation and subsequent electrolysis were carried out at 60°. Addn. of 0.2% of dextrin to the  $AgNO_3$  soln. caused strong passivation. The passivating effect of org. substances or impurities is probably due to adsorption on the active surface of the cathode. Neither removal of dissolved O from the electrolyte (purified from org. impurities) by means of a stream of N nor saturn. of the resulting electrolyte with O caused passivation, showing that passivation is not due to the formation of an oxide film on the cathode. The presence of "semi-valent" Ag ions in the electrolyte was also shown to be without effect on passivation. Geware Avers

ASB-55-A INTERNATIONAL LITERATURE CLASSIFICATION



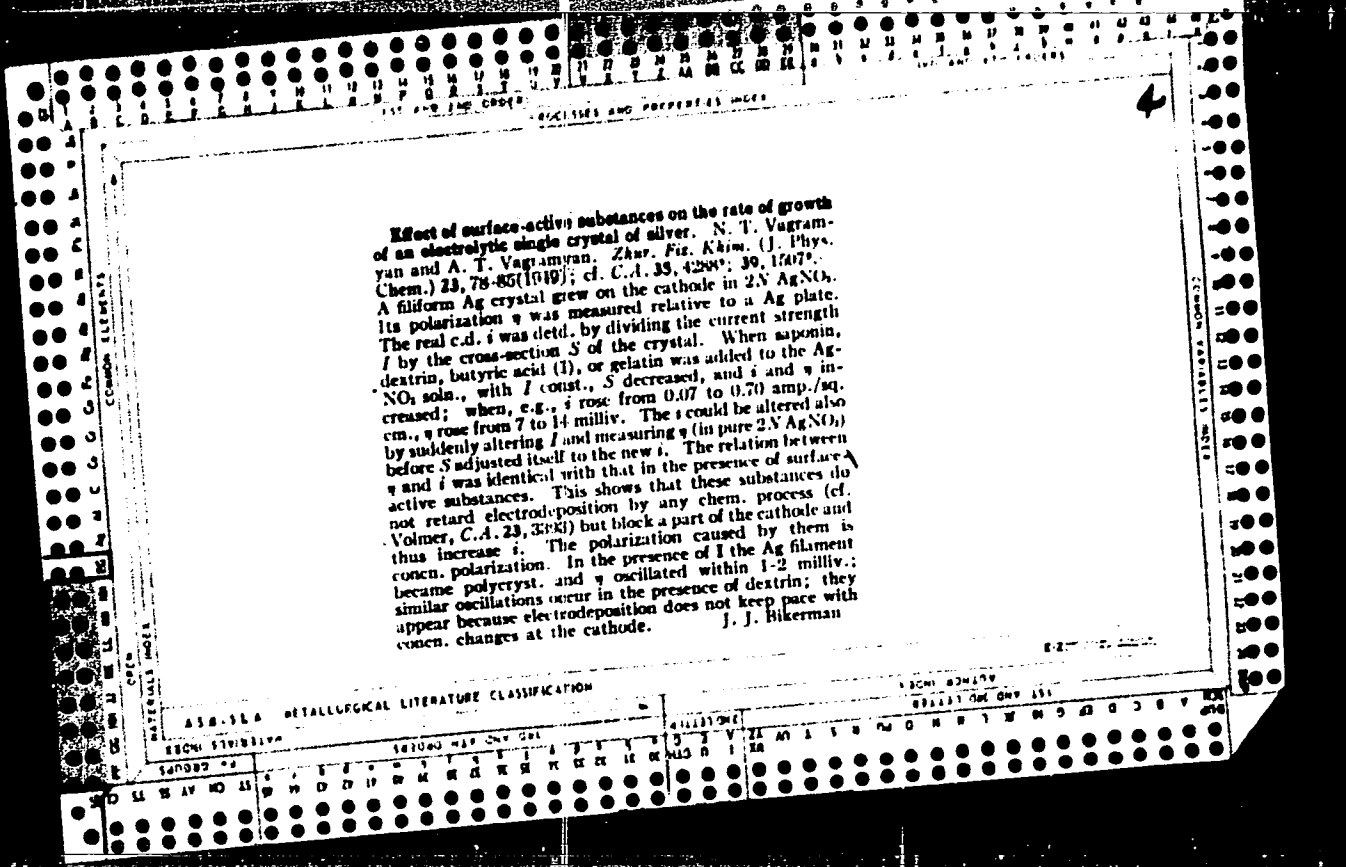






4

Periodic phenomena in the electrodeposition of metals.  
 A. T. Vagramyan. *Zhur. Fiz. Khim.* (J. Phys. Chem.)  
 22, 1496-1504 (1948). -- A soln. 2 N ZnSO<sub>4</sub> + 0.2 N CdSO<sub>4</sub>  
 was electrolyzed, and the potential *V* of the Cu cathode  
 against a normal calomel electrode was measured with a  
 short-period galvanometer and photographically recorded.  
 Addn. of 1% dextrin raised the deposition potential of Cd  
 very little, but that of Zn was raised from, e.g., 1.06 to  
 1.15 v. In the absence of dextrin *V* remained for some sec.  
 equal to 1.065 v.; this corresponds to displacement of  
 Cd by Zn. In the presence of 3% dextrin, at c.d. of 3.5  
 milliamp., *V* rose from e.g., 0.78 to 0.86 v. within 4 sec.,  
 then increased suddenly to 1.06 v., decreased to 1.01 v.  
 in 3 sec. and suddenly dropped to 0.78 v., after which a  
 new oscillation started. Other oscillation forms were ob-  
 served at other c.d. and at c.d. varying during an expt.  
 On switching off the current, *V* dropped at once to 0.9 v.  
 The effects are not greatly altered by changing the concns.  
 of ZnSO<sub>4</sub> and CdSO<sub>4</sub>. Oscillations are also observed when  
 propyl, butyl, amyl or hexyl alc. is used instead of dextrin.  
 When *V* is about 1.0 v. the cathode has zero charge and  
 surface-active substances are adsorbed by it more than at  
 other *V* (cf. Kryukova, *C.A.* 41, 3044). The dextrin  
 adsorbed reduces the working area of the cathode and in-  
 creases the actual c.d. so that relatively more Zn is de-  
 posited than would be if the measured and the actual c.d.  
 were identical. The soln. next to the non-working areas  
 of the cathode ceases to be depleted of Cd whereupon Cd  
 starts to be deposited at its low *V*. The other explana-  
 tions by Mikhalev (*C.A.* 30, 5429) and Evans (*Metallur-  
 gical Corrosion, Passivity and Protection* (1947)) are in-  
 adequate.  
 J. J. Bikerman



CA

Passivation of the cathode and structure of the electrolytic deposit in solutions of simple and of complex salts. A. T. Vngramyan and Z. A. Sotov'eva. *Doklady Akad. Nauk S.S.S.R.* 66, 321-4 (1969). --Ag cathodes of 0.001 sq. cm. were first subjected to a 5-min polarization with a d.c. of  $5.6 \times 10^{-4}$  amp., then the current was turned off for  $\tau$  sec. ( $\tau = 3, 10, 30, 60,$  and  $300$ ), and the cathode polarized again. The cathode potential  $\eta$  (against an equil. Ag electrode) was recorded beginning with the last 4 sec. of the rest period, and for about 20 sec. under the polarizing current. In a 0.2 N soln. of  $\text{AgNO}_3$ , polarization gives rise to a momentary upward jump of the potential to a max.  $\eta$ , followed by a fall to a stationary  $\eta_0$ . The difference  $\eta - \eta_0 = \Delta\eta$  increases with the length  $\tau$  of the preceding rest period, and characterizes the degree of passivation of the surface. Curves of  $\Delta\eta$  as a function of  $\tau$  are termed passivation velocity curves. Addn. of 0.05 g./l. dextrin increases the rate of passivation. In contrast to the simple salt, no potential jump  $\Delta\eta$  is present in the complex electrolyte 0.2 N  $\text{KAg}(\text{CN})_2 + 0.32 \text{ N KCN}$ : after the current is turned off, the potential has a more neg. value which falls slowly with time and reaches a stationary value, in other words, the Ag electrode in a complex electrolyte possesses an increased activity. At const.  $\tau = 60$  sec., and const. polarizing c.d. 0.001 amp./sq. cm., curves of the potential  $\eta$  against the time, show, in  $\text{AgNO}_3$ , a fall of  $\eta$ ; in the presence of dextrin, the initial  $\eta$  ( $\Delta\eta$ ) is markedly higher and the initial fall is somewhat faster. In the complex electrolyte,  $\eta$  increases with time; at a lower c.d., 0.0001 amp./sq. cm., the shape of the curve remains the same, only the  $\eta$  are smaller. The absence of passivation in the complex electrolyte is explained, on the basis of the work of Frumkin and Okruscheva, by adsorption of the complex ions which thus prevents adsorption of extraneous matter.

The smooth structure of the deposit is due to uniformity of the surface (absence of passive regions), and deposition of metal from the adsorbed ions. The dependence of  $\Delta\eta$  (in solns. of simple salts) on  $\tau$  refutes all theories linking the initial max. of polarization with such processes as charge of the double layer, cation polarization or formation of crystal germs. The latter explanation is further refuted by the absence of a max. in complex electrolytes. The increase of  $\Delta\eta$  with the length  $\tau$  of the rest period is due, rather, to a decrease of the active fraction of the surface and a corresponding increase of the true c.d. This phenomenon is suppressed by the adsorption of complex ions.

VAGRAMYAN, N. T.

VAGRAMYAN, N. T.  
"Mechanism of Electrical Reduction in the Nitro-Benzene-Aniline Series and the  
Nature of the Hydrogrnating Agent." Sub 23 Jun 50, Moscow Order of Lenin  
Chemicotechnological Inst imeni D. I. Mendelejev

SO: Vëchernyaya Moskva, Moscow, Jan-Dec, 1950  
Sum 71

VAGRAMYAN, A. T.

"Electrodeposition of Metals," (Elektroosazhdeniye metallov), Institute of  
Physical Chemistry, AS USSR, Izd-vo Akad Nauk SSSR, 198 pp, 1950

Book W-22517, 29 Apr 52

VAGRAMYAN A.T.

3

New methods for the investigation of the polarization of electrodes. A. T. Vagramyan, Akad. Nauk S.S.S.R., Trudy Inst. ~~Metallurgii~~ No. 1, Noveye Metody Fiz. Khim. Issledovan. Poverkhnost. Yulenil. 97-111(1960).—An app. was constructed which allowed the measurement of the polarization with various speeds. The polarization curves according to the quick method were always quite different

from the ones according to a slower method. 20 references. T  
Werner Jacobson



CA

4

**Polarization of metallic electrodes in cyanide solutions.**  
Silver. A. T. Vagramyan and N. N. Balashova (Acad. Sci. U.S.S.R., Moscow). *Zhúr. Fiz. Khim.* 24, 96 (1950). ... Polarization curves of Ag in 0.1-0.2 N AgCN + 0.3 N KCN and in AgNO<sub>3</sub> + 0.3 N KNO<sub>3</sub> were detd. by the usual and by a rapid method (C.A. 42, 6356a). The current yield was > 99% at c.d. smaller than the limiting c.d. and 25-30% at higher c.d. Presumably, deposition of metal follows discharge of the complex anion such as Ag(CN)<sub>2</sub><sup>-</sup>, and the deposit is smooth because the complex anions displace impurities from the electrode surface. Glazunov, *et al.* (C.A. 34, 3903), claimed that metal can be electrodeposited on a glass fiber next to the cathode, but V. and B. could not reproduce this expt. Glazunov's theory that the metal deposition is a secondary process is incorrect. J. J. Bikerman

7

CA

**New method of investigation of cathodic passivation**  
 A. I. Vagtanov and Z. A. Iskyeva (Acad. Sci. U.S.S.R. Institute of Electrochemistry, Moscow) *Dokl. Akad. Nauk SSSR* 24, 1252 (1969); (C. C. T. 44, 4006). After the const. current  $I$  of electrolysis has been interrupted during  $t$  sec., one measures a polarization  $\eta$  at time  $t = 0$ , i.e. when the circuit is closed again which may be higher than  $\eta_0$ , the polarization at  $t = \infty$ . The difference  $\Delta\eta = \eta_0 - \eta_\infty$  is due to the passivation of the cathode during  $t$ . A knowledge of the function  $\Delta\eta = f(t)$  gives information on the rate of passivation in various electrolytes

and on the influence of various surface-active compounds on the rate. An automatic app. is described in detail; it records photographically the changes of  $\eta$  after current interruptions  $t = 3, 5, 10, 30, 60$ , and 300 sec. With this app., passivation during current interruption is observed on a Ag cathode in a 0.2 N AgNO<sub>3</sub> soln. but no passivation is found on the same cathode in a 0.2 N KAg(CN)<sub>2</sub> soln. Surface-active substances increase  $\Delta\eta$  in the first case but have no influence in the second. The adsorption of octyl alc. on a Zn cathode was also studied. First, a polarization curve  $\eta = f(t)$  where  $t$  is the c.d. is detd. for the Zn cathode in a 2 N ZnSO<sub>4</sub> + 0.6 N Na<sub>2</sub>SO<sub>4</sub> soln. From this curve and from the values of  $\eta_0$  detd. in the same soln. without and with octyl alc., one detd. the change in c.d. and thus (since  $I = \text{const.}$ ) the decrease in active surface  $\Delta S$  due to adsorption. Adsorption rate curves ( $\Delta S, S, t$ ) show that the rate is large at first and slows down when satn. is approached. Adsorption isotherms might be detd. in this fashion. The decrease in active cathode surface  $\Delta S/S$  amounts to 81.7% after  $t = 300$  sec. in a soln. satd. with octyl alc. Michel Boudart

C.A.

Electrochemical method of determination of the adhesion of electrodeposits. A. T. Vajramyan and Yu. S. Tsareva (Inst. Phys. Chem., Acad. Sci. U.S.S.R., Moscow). *Doklady Akad. Nauk S.S.S.R.*, 74, 3035 (1970). The adhesion of an electrodeposit to its base metal surface, depending as it does on the fraction of the base metal surface area covered by the deposit in the earliest stage of deposition, is inferred from the excess  $\Delta q$  of the initial polarization of the cathode and the stationary  $q$  established at later stages of the deposition. In the deposition of Cu from Cu-SO<sub>4</sub> 200 g./l. at 20°, c.d. 0.01 amp./sq. cm.,  $\Delta q = q_0 - q$  was pos. on a mechanically ground Cu cathode, and increased as a result of a brief treatment with 1% NaOH, probably on account of partial oxidation of the surface. On the same Cu cathode, additionally etched, degreased, and activated with a KCN soln.,  $\Delta q$  was neg. Mech. adhesion tests by the bending method confirmed the inferences from the  $\Delta q$  detns. The fractions  $f$  of initially accessible surface area of the cathode were evaluated from measurements of the initial  $q_0$  and exptl. curves of  $q$  as a function of the surface area. In this way,  $f$  for a mechanically ground Cu cathode was estd. to 20%; subsequent treatment with 1% NaOH lowered  $f$  to 17.8%. For the HNO<sub>3</sub> (1:1) etched and subsequently KCN-activated Cu surface,  $f$  was found = 64.6%. N. Thom

VAGRAMIAN, A. T.

Vagramian, A. T. and Solov'eva, Z. A. A new method of study of the cathode passivation. Page 1252.

Academy of Sciences, USSR  
Inst. of Phys. Chemistry  
Moscow  
March 7, 1950.

SO: Journal of Physical Chemistry, Vol. 74, No. 10. October 1950.

VAGRAMYAN A. I.

Properties of Nickel Electrodeposits A. I. Vagramyan and  
A. I. Vagramyan, Zh. Fiz. Khim. 41, 1041 (1967)

Abstract: The bath was 0.1M NiSO<sub>4</sub>·6H<sub>2</sub>O + 0.1M Na<sub>2</sub>SO<sub>4</sub> + 0.1M Na<sub>2</sub>C<sub>2</sub>O<sub>4</sub> + 0.1M Na<sub>2</sub>CO<sub>3</sub> + 0.1M Na<sub>2</sub>EDTA + 0.1M Na<sub>2</sub>PO<sub>4</sub>·12H<sub>2</sub>O + 0.1M Na<sub>2</sub>SiO<sub>3</sub>·9H<sub>2</sub>O + 0.1M Na<sub>2</sub>VO<sub>4</sub>·3H<sub>2</sub>O + 0.1M Na<sub>2</sub>MoO<sub>4</sub>·2H<sub>2</sub>O + 0.1M Na<sub>2</sub>WO<sub>4</sub>·2H<sub>2</sub>O + 0.1M Na<sub>2</sub>SeO<sub>4</sub>·10H<sub>2</sub>O + 0.1M Na<sub>2</sub>TeO<sub>4</sub>·3H<sub>2</sub>O + 0.1M Na<sub>2</sub>UO<sub>4</sub>·6H<sub>2</sub>O + 0.1M Na<sub>2</sub>VO<sub>4</sub>·3H<sub>2</sub>O + 0.1M Na<sub>2</sub>MoO<sub>4</sub>·2H<sub>2</sub>O + 0.1M Na<sub>2</sub>WO<sub>4</sub>·2H<sub>2</sub>O + 0.1M Na<sub>2</sub>SeO<sub>4</sub>·10H<sub>2</sub>O + 0.1M Na<sub>2</sub>TeO<sub>4</sub>·3H<sub>2</sub>O + 0.1M Na<sub>2</sub>UO<sub>4</sub>·6H<sub>2</sub>O

porosity decreasing sharply until the thickness reached a certain critical value. At greater thicknesses the number of pores remained approximately constant.

Abstract: The bath was 0.1M NiSO<sub>4</sub>·6H<sub>2</sub>O + 0.1M Na<sub>2</sub>SO<sub>4</sub> + 0.1M Na<sub>2</sub>C<sub>2</sub>O<sub>4</sub> + 0.1M Na<sub>2</sub>CO<sub>3</sub> + 0.1M Na<sub>2</sub>EDTA + 0.1M Na<sub>2</sub>PO<sub>4</sub>·12H<sub>2</sub>O + 0.1M Na<sub>2</sub>SiO<sub>3</sub>·9H<sub>2</sub>O + 0.1M Na<sub>2</sub>VO<sub>4</sub>·3H<sub>2</sub>O + 0.1M Na<sub>2</sub>MoO<sub>4</sub>·2H<sub>2</sub>O + 0.1M Na<sub>2</sub>WO<sub>4</sub>·2H<sub>2</sub>O + 0.1M Na<sub>2</sub>SeO<sub>4</sub>·10H<sub>2</sub>O + 0.1M Na<sub>2</sub>TeO<sub>4</sub>·3H<sub>2</sub>O + 0.1M Na<sub>2</sub>UO<sub>4</sub>·6H<sub>2</sub>O

VAGRAMYAN A.T.

Cathodic Polarization in the Electrodeposition of Nickel  
 A. V. Vagramyan and L. A. Solov'eva (Doklady Akad. Nauk  
 SSSR, 1957, 137, 1037) The Russians V and S.  
 obtained the dependence of polarization potential  $\phi_p$  by  
 increasing the current density  $i$  through the cell from  
 zero to some fixed value and then returning to zero. This  
 was done within a short time (10-15 sec.) and hence being  
 recorded photographically. In some experiments  $\phi_p$  was  
 varied linearly in either direction. The cell used  
 contained (g/l): NiSO<sub>4</sub> 6H<sub>2</sub>O 140, H<sub>2</sub>BO<sub>3</sub> 20, KCl 19,  
 temp. 20°C. After switching off the current, the electrode  
 potential had a high positive value which gradually changed  
 in the positive direction. This change also occurred on the  
 polarization of an electrode by a small current. From curves  
 showing changes in  $\eta$  for a Ni electrode when the c.d. varied  
 linearly from 0 to 30 to 0 m.amp./cm.<sup>2</sup> the value of  $\eta$  at zero c.d.  
 was -306 mV. for a 15-sec. cycle, and -242 mV. for a 1.5-sec.  
 cycle. Taking 390 mV. as the equilibrium potential  $\phi_0$ , the  
 overvoltage is 486 mV. if the "steady" value (at c.d. of 30  
 m.amp./cm.<sup>2</sup>) be taken as  $\phi_p$ , the overvoltage is 790 mV. The  
 curves of  $\eta$  vs c.d. are linear over a greater range of c.d. for  
 a 1.5-sec. cycle than for a 15-sec. cycle, but the max. value of  $\eta$  is  
 independent of cycle time. A possible explanation of anodic polar-  
 ization in terms of an anodic film is given in *J. Chem.  
 Soc.*, 1926, 129, 1987. *J. Ind. Eng. Chem. (Abstracts)*, 1927, 37,  
 627) is not supported by the fact that scraping activates the  
 surface of the electrode; more probably a completely pure  
 Ni surface cannot exist for a prolonged time because foreign  
 particles are abundant on it and cause passivation. The  
 passive film is absent from a scraped surface or from freshly  
 deposited Ni, and hence the potential is more negative.  
 The change in potential of freshly deposited Ni with time to  
 a more positive value is explained either by passivation or  
 by the as-deposited surface not having a normal equilibrium  
 surface but containing excess of active places, and then under-  
 going anodic dissolution. In the latter case, polarization is  
 not wholly produced by the slowness of the discharge on the  
 pure surface, but indicates some change in its physico-chem.  
 constitution. G. V. E.

Effect 4

VAGRAMYAN, A. T.

Electrodes

New method for investigating the polarization of electrodes. Trudy Inst. fiz. khimii  
AN SSSR No. 1, 1952.

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

VAGRANYAN, A. T.

USSR/Chemistry - Electrochemistry, May/Jun 52  
Nickel

The Effect of Alternating Current on the Electrodeposition of Nickel," A. T. Vagranyan, A. A. Sutynina, Inst of Phys Chem, Acad Sci USSR

"Iz Ak Nauk, Otdel Khim Nauk" No 3, pp 410-414

On application of above certain current densities, the structure of the deposit becomes macrocryst. The number of pores in the electrolytic Ni deposit decreases. With increased frequency of the ac, its action gradually ceases. A possible mechanism of

22075

the action of ac on the change of the structure of the deposit and on overvoltage in discharge of Ni ions is suggested.

22075



*Chromocopy*

CA

Gloss of electrolytic nickel deposits during electrolysis.  
 A. T. Vagner and Z. A. Shkur'eva (Inst. Phys. Chem.,  
 Acad. Sci., Moscow). *Zhur. Fiz. Khim.* 36, 910-17 (1962).  
 --A light beam was reflected from a cathode on which Ni was  
 being deposited, and the intensity  $I$  of the reflected beam  
 was measured. Thus the change of gloss caused by air was  
 eliminated. The cathode was of polished Fe, and the soln.  
 contained  $\text{NiSO}_4 \cdot 7\text{H}_2\text{O}$  140,  $\text{H}_2\text{BO}_3$  15,  $\text{NaCl}$  5, and  $\text{NaF}$  1.5  
 $\text{g./l.}$ . The curve " $I$  against  $\delta$ " ( $\delta$  is the thickness of the Ni  
 deposit) had 2 parts. Between  $\delta = 0$  and  $\delta = 2$  or  $3 \mu$   $I$   
 always increased with  $\delta$ . In this region (the surface profile of  
 Ni repeated that of Fe underneath, and the increase of  $I$  was  
 due to the greater reflection coeff. of Ni. At  $\delta$  greater than  
 $3 \mu$ ,  $I$  increased very little with  $\delta$  (up to  $10 \mu$  was investigated)  
 when c.d. was 1-1.5 amp./sq. dm. and decreased on an  
 increase of  $\delta$  when c.d. was 0.3 or 2. This was explained by  
 the properties of the deposit consisted of coarse crystals at  
 high c.d., of crystals of different sizes at small c.d., and of  
 uniform smooth crystals at medium c.d. Addn. of CS-  
 ( $\text{NH}_4$ )<sub>2</sub> (e.g., 0.15 g./l.) or of disulfonaphthalenic acid (e.g.,  
 4 g./l.) raised  $I$  above the highest value observed in inorg.  
 electrolyte and also made  $I$  almost independent of c.d. be-  
 tween 1 and 4 amp./sq. dm. These addns. give rise to  
 small uniform crystals. If the cathode was kept without  
 current for several sec. or min. and current was then switched  
 on,  $I$  decreased for several sec. This was caused by the  
 passivation of the surface during the interruption of cur-  
 rent; when the deposition was resumed it occurred on the  
 spots least passivated and, thus, the cathode became less  
 uniform. *m-Naphthol* at c.d. 2 depressed  $I$ . J. J. B.

VAGRANYAN, A. T.; SOLOV'YEVA, Z. A.

Electrolysis

Investigation of brightness of electrolytic deposits of nickel during electrolysis.  
Zhur.fiz.khim., 16, No. 6, 1952.

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

S/137/62/000/004/150/201  
A060/A101

AUTHOR: Vagramyan, A. T.

TITLE: Joint deposition of chromium with other metals

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 4, 1962, 107, abstract #1654  
(v sb. "Elektrolit. osazhdeniye splavov". Moscow, Mashgiz, 1961, 198 - 215)

TEXT: The article discusses the combined deposition of Cr with other metals, W and Mo with metals of the iron group, and also the deposition of ternary alloys of W and Mo with other metals. Methods are cited for the deposition of Cr alloys from its hexa-valent compounds (Cr-Mn, Cr-Se, Cr-Mo, Cr-W, Cr-Re), and also for the deposition of Cr with metals of the iron group (Cr-Fe, Cr-Ni).

Ye. Layner

[Abstracter's note: Complete translation]

Card 1/1

S/080/61/034/009/008/016  
D204/D305

AUTHORS: Solov'yeva, Z.A., Petrova, Yu.S., and Vagramyan, A.T.

TITLE: Effect of chromic acid concentration on the electrode  
position of chromium

PERIODICAL: Zhurnal prikladnoy khimii, v. 34, no. 9, 1961.  
2007 - 2012

TEXT: This is report II from a series of papers on investigating the rates of linked reactions in the electrodeposition of chromium. The effect of chromic acid concentration at constant and varying  $H_2SO_4$  contents on the rate of deposition of metallic chromium, the rate of intermediate reduction of chromic acid and the rate of hydrogen evolution were studied. Also, the relationship between current distribution and  $CrO_3$  concentration at constant and varying  $H_2SO_4$  contents at various temperatures, and the variation of cathode potential with  $CrO_3$  concentration at constant  $H_2SO_4$  content ✓

Card 1/3

Effect of chromic acid ...

S/080/61/034/009/008/016  
D204/D305

were investigated. It was found that a decrease in chromic acid concentration increases the rate of chromium deposition sharply, the rate of increase depending on  $H_2SO_4$  concentration, temperature and current density. The rate of intermediate reduction of chromic acid also increases and the rate of hydrogen evolution decreases. A decrease of chromic acid concentration with simultaneous decrease in sulphuric acid concentration increases the rate of chromium deposition considerably. However, the rate of intermediate reduction of chromic acid is initially independent of the  $CrO_3$  and  $H_2SO_4$  concentration and subsequently decreases with a decrease in  $CrO_3$  and  $H_2SO_4$  concentration. The authors suggest that on changing the solution composition, the change in the rates of the linked reactions, taking place at the cathode during reduction of chromic acid in the presence of  $H_2SO_4$ , is due to a change in composition and properties of the cathode film formed, from which discharge of  $Cr^{6+}$  ions occurs directly. There are 3 figures, 1 table and 4

Card 2/3

Effect of chromic acid ...

Soviet-bloc references.

SUBMITTED: August 29, 1960

S/080/61/034/009/008/016  
D204/D305



Card 3/3

S/076/61/035/003/018/023  
B121/B206

AUTHORS: Vagramyan, A. T., Usachev, D. N., and Klimasenko, N. L.

TITLE: Effect of film composition on alloy formation during electro-  
deposition of chromium together with other elements

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 3, 1961, 647-650

TEXT: The effect of film composition on the electrodeposition of chromium together with other elements was studied. It was established that the deposition of metallic chromium depends on the composition of the film and not on the composition of the electrolyte solution. Investigation of the cathodic polarization in an electrolyte consisting of 2.5 moles/l of  $\text{CrO}_3$  and 0.025 mole/l of selenic acid on a gold cathode showed that, in principle, the effect of selenic acid on the electroreduction of chromic acid is the same as that of sulfuric acid. An alloy of chromium with selenium forms on the cathode during this process. This alloy also forms when adding selenious acid instead of selenic acid. The reduction rate of the chromium ions is affected, not by the ion concentration in the electrolyte, but by the ion concentration in the film. The change of the composition of the Cr-Se alloy

Card 1/3

S/076/61/035/003/018/023  
B121/B206

Effect of film . . .

on a change of the concentration of selenic acid in a 2.5 M chromic-acid solution at a current density of  $0.50 \text{ a/cm}^2$  and a temperature of  $20^\circ\text{C}$  was also investigated on platinum electrodes. The results showed that the percentage of selenium in the alloy rises to 0.15 mole/l with an increase of the selenium concentration in the solution. The composition of the Cr-Se alloy remains unchanged with a further increase of the selenium concentration. The same rule was also established for a replacement of selenic acid by selenious acid. During electroreduction the permanganate ion has no reducing effect on chromic acid. The ability of forming a film on the cathode thus depends first of all on the nature of the anions. The effect of the sulfuric-acid concentration on the percentage of selenium in the Cr-Se alloy during deposition from a solution with 2.5 moles/l of chromic acid and 0.1 mole/l of selenic acid was studied, and it was established that the selenium content in the electrolytic deposit decreases with increasing sulfuric-acid concentration. Partial exchange of sulfuric acid for selenic acid in the film results in a decrease of the reduction rate of the selenium ions. There are 3 figures and 5 references: 4 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: C. Kasper, J. Res. Nat. Bur. Standards, 9, 353, 1932.

Card 2/3



Effect of film ...

S/076/61/035/003/018/023  
B121/B206

ASSOCIATION: Institut fizicheskoy khimii Akademiya nauk SSSR (Institute of  
Physical Chemistry Academy of Sciences USSR)

SUBMITTED: July 13, 1959

Card 3/3

S/076/61/035/007/001/019  
B127/B208

AUTHORS: Kuznetsova V. N., Popkov A. P., Uvarov L. A., Vagramyan A. T.

TITLE: Polarization during electrodeposition of iron group metals.  
I. Steady-state potential and overvoltage of iron deposition

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 7, 1961, 1406 - 1410

TEXT: The authors studied deposition and dissolution of iron in 1 N FeSO<sub>4</sub> solution at 25°C. The electrodeposited iron was found to dissolve in these solutions in the absence of polarizing current, particularly in a more acid solution. In this case (pH 1.5-2.5) the rate  $i_c$  of the spontaneous dissolution rapidly decreases with increasing pH ( $i_c = 0.4\text{ma/cm}^2$  at pH 1.5). On further change of the pH from 2.5 to 3.5 the rate of spontaneous dissolution is reduced more slowly ( $i_c = 0.065\text{ma/cm}^2$  at pH = 3). The following reactions take place at the electrode surface:  $\text{H}^+ + \text{e} \rightarrow \frac{1}{2} \text{H}_2$ ,  $\frac{1}{2} \text{H}_2 \rightarrow \text{H}^+ + \text{e}$ ,  $\text{Fe}^{2+} + 2\text{e} \rightarrow \text{Fe}$ ,  $\text{Fe} \rightarrow \text{Fe}^{2+} + 2\text{e}$ . The reaction rates are denoted by  $F_1, F_2, F_3$ , ✓

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S/076/61/035/007/001/019  
B127/B208

Polarization during ...

$F_4$ . The equation for the steady state is then:  $F_1 + F_3 = F_2 + F_4$ . The potential of the Fe electrode being more negative than that of hydrogen, the ionization rate  $F_2$  of  $H_2$  may be neglected. Assuming that the discharge rate  $F_3$  of the Fe ions be much less than that of the  $H^+$ ,  $F_1$ , one may write  $F_1 = F_4$ , i.e., the charge of the electrode is compensated by the discharge of the  $H^+$  ions. The change of dissolution in the presence of 1N  $Al_2(SO_4)_3$  was also studied. At pH = 1.5-3.5 the rate of dissolution increases in this case. (pH = 1.5,  $i_c = 0.52 \text{ ma/cm}^2$ , pH = 3,  $i_c = 0.31 \text{ ma/cm}^2$ ). This is due to  $SO_4^{--}$  absorption on the electrode which accelerates the ionization of the metal atoms. In the presence of aluminum sulfate the polarization of the anode is decreased by 35mv. With rising temperature of the electrolyte the rate of spontaneous dissolution increases, particularly in the presence of aluminum sulfate. At a temperature rise from 25 to 60°C at pH = 1.5 the rate increases to the 7.5-fold, in the presence of aluminum sulfate to the 22-fold. At low pH the steady-state potential changes quickly with a

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Polarization during ...

S/076/61/035/007/001/019  
B127/B208

change in pH, at a higher pH this change is less significant. At low pH the dependence may be expressed by the following formula:

$$\varphi_{st} = A + \frac{RT}{(\alpha + \beta) F} \ln [H^+]$$

At higher pH the potential is shifted more to the negative side. In an oxygen-free inert atmosphere the deviation of the steady-state potential from the rule, expressed by the formula, decreases. At higher pH the steady-state potential is shifted toward the positive side under the influence of aluminum sulfate. The potential of the Fe electrode is irreversible in sulfuric acid solution and is determined by a number of processes. It is therefore impossible to determine the overvoltage by the steady-state potential. The deposition potential was determined relative to a saturated calomel electrode. With increasing pH the deposition potential of Fe is shifted toward the negative side. At a given current density and increasing pH the overvoltage of the deposition has more positive values, except in very acid solutions. The determination of overvoltage by the steady-state potential thus seems to be incorrect and gives contradictory results. There are 5 figures and 6 Soviet references.

Card 3/3

S/076/61/035/007/002/019  
B127/B208

AUTHORS: Vagramyan, A. T., Kuznetsova, V. N., Popkov, A. P., Savostin,  
V. A., Uvarov, L. A.

TITLE: Polarization during electrodeposition of iron group metals  
II. Electrodeposition of iron

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 7, 1961, 1411 - 1415

TEXT: The authors investigated the electrolytic deposition of iron from solutions of 1 N  $\text{FeSO}_4$ , and 1 N  $\text{FeSO}_4 + 1 \text{ N Al}_2(\text{SO}_4)_3$  at a current density of 20 ma/cm<sup>2</sup>. The yield of metal relative to the current changes only little with a change in current density, and increases rapidly with increasing pH in the range 1.5-2.5. By changing the pH by one unit the yield increases from 20 to 90%. At a further pH increase the yield increases but slightly. On aluminum sulfate addition the yield is only 45% at the optimum pH. All curves showing the dependence of the potential of the iron electrode on the pH pass a maximum at pH 2.0-2.2. The maximum of the polarization curves is 60 - 65% of the maximum metal yield. At low pH the current is consumed for hydrogen reduction and liberation. In the descending branch of the curve  
Card 1/3

Polarization during ....

S/076/61/035/007/002/019  
B127/B208

the current is consumed for the metal deposition. The discharge of hydrogen ions is promoted in that part of the curve which corresponds to hydrogen liberation, the reduction of the metal ions in that part of the curve which corresponds to metal deposition. The curves are exactly explained in the papers by A. N. Frumkin, Zh. fiz. khimii, 31, 1875, 1957, Z. Phys. Chim., 207, 321, 1957, and I. A. Bagotskaya, Dokl. AN SSSR, 107, 343, 1956. 110, 397, 1956. Apparently hydrogen deposition is facilitated on an electrode coated by hydrogen. This is confirmed by the paper by M. Smyalovskiy saying that there is a relationship between the hydrogen overvoltage and the tendency of the cathode metal toward supersaturation with hydrogen. The following reactions are assumed to take place at the hydrogen-coated electrode:  $H_3O^+ + H_{ads} + e \rightarrow H_2 + H_2O$  and  $H_3O^+ + e \rightarrow H_{ads} + H_2O$ .

The rate of the first is higher than that of the latter. The increased metal reduction with decreased rate of hydrogen deposition is probably due to the fact that the metal deposition at a surface saturated with hydrogen is far more difficult than at a hydrogen-free electrode surface. pH 3.0-3.5 is most suitable for the metal deposition. The retardation of the metal ion reduction is probably related to an adsorption of foreign particles, hydroxides and others, which are deposited on the surface of the

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S/076/61/035/007/002/019  
B127/B208

Polarization during ...

iron electrode after breaking the contact, and passivate the electrode. A potential jump is observed at the moment of connection. By adding aluminum, polarization of the cathode increases only at pH 2-2.5. Aluminum sulfate inhibits the deposition of the metal, but does not affect H<sub>2</sub> deposition.

There are 6 figures and 5 references: 4 Soviet-bloc and 1 non-Soviet-bloc. The most important references to English-language publications read as follows: Foerster F., J. Electrochem., 22, 85, 1916.- Glasstone S. J. Chem. Soc., 2, 2887, 1926. (given as 1 reference).

ASSOCIATION: Akademiya nauk SSSR Institut fizicheskoy khimii (AS USSR Physico-chemical Institute)

SUBMITTED: August 18, 1958

Card 3/3

L0727

S/062/62/000/009/001/009  
B101/B186

54700

AUTHORS: Vagramyan, A. T., and Uvarov, L. A.

TITLE: Determination of the reversible potential of a nickel electrode at high temperatures

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 9, 1962, 1520-1524

TEXT: The potential in the system Ni - Ni<sup>2+</sup> was measured within the range 18 - 250°C. Its temperature dependence was compared with the values related to a sulfate-mercury standard electrode as calculated from the equation:  $\varphi = \varphi_0 + (RT/nF)\ln a + k_1(T - T_0) + k_2(T - T_0)^2$ , where  $k_1$  and  $k_2$  are respectively the temperature coefficients at  $T_0 = 298^\circ\text{K}$  of the investigated and of the standard electrodes, respectively. Results: With increasing temperature, the potential of the nickel electrode becomes more and more negative; it reaches a maximum at 180 - 200°C and then gradually becomes more positive again. At low temperatures the values

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S/062/62/000/009/001/009  
B101/B186

Determination of the reversible ...

determined are widely scattered and not reproducible, but above  $\sim 120^{\circ}\text{C}$  reproducible values are obtained and above  $200^{\circ}\text{C}$  the potential agrees with the calculated value to an accuracy of  $\sim 0.02$  v. It is concluded that above  $200^{\circ}\text{C}$  there is no adsorption of impurities and no irreversible adsorption of hydrogen and that owing to the absence of adsorption the deposit is free of internal stress. Therefore nickel at high temperatures behaves like a reversible electrode. This is also confirmed by the absence of polarization at high temperatures. The temperature coefficient of the potential agreed with the data by A. J. de Bethune, T. S. Licht and N. Swendeman (J. Electrochem. Soc., 106, 616 (1959)). From this, the standard potential of the nickel electrode at  $25^{\circ}\text{C}$  was calculated as being  $-0.270 \pm 0.005$  v in relation to a standard hydrogen electrode, which deviates by  $0.015 - 0.025$  v from the value calculated on the basis of the thermodynamic data. There are 4 figures.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR  
(Institute of Physical Chemistry of the Academy of Sciences  
USSR)

Card 2/3

Determination of the reversible ...

S/062/62/000/009/001/009  
B101/B186

SUBMITTED: March 3, 1962

Card 3/3

S/080/62/035/007/008/013  
D214/D307

AUTHORS: Vagramyan, A.T. and Kudryavtsev, V.N.

TITLE: Causes of the formation of electrolytic metal powders

PERIODICAL: Zhurnal prikladnoy khimii, v. 35, no. 7, 1962,  
1546-1549

TEXT: During the study of the causes of deposition of powdered Fe by the electrolysis of  $\text{FeSO}_4$ , the surface structure of the deposited metal was determined photoelectrically by reflected light measurements. At low current densities ( $25 \text{ mA/cm}^2$ ), the Fe has a dense and uniform structure while at current density of  $27 \text{ mA/cm}^2$  electrolysis gave powdered Fe. When the pH of the electrolyte was 3.1 a sharp change in the metal surface occurred at a current density of  $25 - 27 \text{ mA/cm}^2$ , i.e. limiting current. With pH = 4.6 the powder began to form at  $11 - 13 \text{ mA/cm}^2$ , i.e. much lower than at the limiting value ( $23 - 24 \text{ mA/cm}^2$ ). The reason for this is that at pH = 3.1 only  $\text{Fe}^{2+}$  are present in the electrolyte; at pH = 4,  $\text{Fe}^{2+}$  gives  $\text{Fe}^{3+}$  which forms  $\text{Fe}(\text{OH})_3$  and this is adsorbed on the surface of the

Card 1/2

Causes of the formation ...

S/030/62/035/007/008/013  
D214/D307

cathode causing Fe to form a powder-like deposit. Addition of ascorbic acid to the electrolyte prevents the formation of  $Fe^{3+}$  and the electrodeposited metal is dense up to the current density of the limiting current. There are 4 figures.

SUBMITTED: September 7, 1961



Card 2/2

S/080/62/035/008/005/009  
D267/D308

AUTHORS: Solov'yeva, Z.A., Petrova, Yu.S., Klimasenko, N.L.,  
and Vagramyan, A.T.

TITLE: Composition and properties of the cathode film forming  
during the electrodeposition of chromium

PERIODICAL: Zhurnal prikladnoy khimii, v. 35, no. 8, 1962,  
1806 - 1811

TEXT: The variation of concentrations of the ions  $\text{Cr}^{6+}$  and  $\text{Cr}^{3+}$   
(volumetric method) and  $\text{SO}_4^{2-}$  (gravimetric method) was studied in  
the deposited film, as a function of the concentration of  $\text{H}_2\text{SO}_4$  and  
 $\text{H}_2\text{CrO}_4$  in the solution, and the variation of the rate of deposition  
from  $\text{H}_2\text{CrO}_4$  to  $\text{Cr}$ , in order to carry out a more complete investiga-  
tion of the film composition. The coatings obtained in the course  
of 2 min on a 6 cm<sup>2</sup> chromium-plated copper strip were either dissol-  
ved in distilled water or directly removed into a test tube. The so-  
Card 1/2

Composition and properties of the ... S/080/62/035/008/005/009  
D267/D308

lutions contained 25, 50, 100 or 250 g/l  $H_2CrO_4$  and 0.5 - 12.5 g/l  $H_2SO_4$ , the temperature was  $\sim 20^\circ C$  and the current density 250 or 500 ma/cm<sup>2</sup>. Formation of two types of films was established: 1) Films obtained in the presence of  $H_2SO_4$  distinguished by a macroscopic structure, soluble in the electrolyte in the absence of current and contributing to the reduction  $H_2CrO_4 \rightarrow Cr$ ; 2) films obtained during an electrolysis without  $H_2SO_4$  or when  $H_2CrO_4$  acts without current on the cathode metal, possessing a microscopic structure, insoluble in the electrolyte. The latter do not contribute to the reduction of  $H_2CrO_4$ . The relative concentration of  $Cr^{3+}$  and  $SO_4^{2-}$  in the films of the first type increases as the current density and the concentration of  $H_2SO_4$  increases and as the concentration of  $H_2CrO_4$  decreases. There are 4 tables.

SUBMITTED: June 22, 1961

Card 2/2

KRASNOVSKIY, A.I.; KOBOSNIDZE, G.I.; VAGRAMYAN, A.T.

Role of passivation in the electrodeposition of nickel. Zhur.  
fiz. khim. 36 no.4:714-719 Ap '62. (MIRA 15:6)

1. Akademiya nauk SSSR, Institut fizicheskoy khimii.  
(Passivation) (Nickel plating)

SOLOV'YEVA, Z.A.; VAGRAMYAN, A.T. (Moskva)

Oscillographic study of film formation on the cathode surface  
in the electrolytic reduction of chromic acid. Zhur. fiz. khim.  
36 no.4:752-756 Ap '62. (MIRA 15:6)

1. Akademiye nauk SSSR, Institut fizicheskoy khimii.  
(Oscillography) (Chromic acid) (Electrolysis)



S/020/62/146/003/015/019  
B101/B144AUTHORS: Vagramyan, A. T., Uvarov, L. A.

TITLE: Mechanism of electrodeposition of nickel from sulfate solutions

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 146, no. 3, 1962, 635-637

TEXT: The effect of passivation on the electrodeposition of nickel was studied by a method already described (Izv. AN SSSR, OKhN, 1962, no. 9).  
Results: The overvoltage of nickel referred to a steady potential at low temperature is much greater than when referred to an equilibrium potential. Above 180°C this difference disappears as the electrode becomes reversible. Between 20 and 120°C, the temperature coefficient of overvoltage is 2 mv/deg, whereas above 150°C it becomes zero. At low temperature, the overvoltage-versus-current density function shows two sections: first, the overvoltage increases rapidly with increasing current density and H<sub>2</sub> is liberated; then the increase becomes flatter, the current yield for Ni being 60-80%. Above 150°C the current yield is 100%. If the polarization curves are plotted slowly, no dependence of polarization

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S/O20/62/146/003/015/019  
B101/B144

Mechanism of electrodeposition ...

on current density is observed at high temperatures. Ni deposition at high temperatures does not cover the entire electrode surface but occurs only in spots; hence the overvoltage as measured refers to much higher current densities than those calculated from the electrode area.

Conclusions: The slight dependence of polarization on current density at high temperatures is due to the area of deposition becoming larger as current density increases, and in fact the current density remains nearly unchanged. The deposition area adapts itself to the polarization current just as is the case with metals deposited at low overvoltage. When the polarization curve is plotted quickly, this self-adaptation is not given time to occur. There is no essential difference in the mechanism of metal deposition as between high and low overvoltages. The transition from coarse-crystalline deposits at high temperature to fine-crystalline at low temperature is due to the quicker passivation in the latter, which also results in higher overvoltage. At high temperature, a diffusion zone impoverished in nickel appears near the growing deposit of nickel. The concentration overvoltage of Ni at 180°C is calculated from the thickness of the diffusion layer: it is about 15 mv at a current density of 10 ma/cm<sup>2</sup>. There are 2 figures.

Card 2/3

Mechanism of electrodeposition ...

S/020/62/146/003/015/019  
B101/B144

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute  
of Physical Chemistry of the Academy of Sciences USSR)

PRESENTED: May 18, 1962, by V. I. Spitsyn, Academician

SUBMITTED: May 10, 1962

Card 3/3

5/062/03/000/002/008/020  
B144/3186

AUTHORS: Vagramyan, A. T., and Kudryavtsev, V. N.

TITLE: Regularities of the formation of electrolytic iron powders

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 2, 1963, 263 - 268

TEXT: The formation of Fe electrodeposits was studied to clear up the relation between the form of the deposit and the current density. The limiting current was determined by plotting the polarization curves obtained in an electrolyte containing 70 g/l  $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$  and 120 g/l  $\text{K}_2\text{SO}_4$  (pH 3) at 20°C by the compensation method and the oscillographic potential-time curves. At low pH, powder formation was observed in the region of the limiting current. The curve characterizing the transition from compact to powder deposits was plotted using pulsed current, and showed that the current density is not the determining factor. Compact deposits were obtained below and above the limiting current and the formation of powders proved time-independent. Powder formation above the limiting current results from a change in the near-electrode layer brought about by a pH

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5/062/53/000/002/000/020  
B144/5186

Regularities of the formation...

change due to discharge of  $H^+$  ions. The near-electrode layer is alkalinized and the hydroxide forming is adsorbed on the surface of the cathode. This favors the formation of powder deposits. Thus, the deposition of powders at current densities below the limiting current could be expected from electrolytes of low acidity and was actually confirmed photometrically (Zh. prikl. khimii 35, 450 (1962)). Whereas the structure of the deposit in pH 3 solutions changed in the 25 - 27  $ma/cm^2$  range, which coincides with that of the limiting current density, in the structural change in pH 4.6 solutions took place at 11 - 13  $ma/cm^2$  and the limiting-current density was 23 - 24  $ma/cm^2$ . This was also confirmed by reflectance studies. Powder formation is explained by formation of colloidal ferric hydroxide in electrolytes with  $pH > 4.2$ . Adsorbed on the electrode surface, ferric hydroxide prevents normal crystal growth and consequently the formation of a compact deposit. The correctness of this theory was proved by adding 12 g/l of ascorbinic acid, which inhibits the formation of  $Fe^{3+}$  ions, to a pH 4.6 electrolyte. The deposit obtained was compact below the critical current density. There are 7 figures.

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Regularities of the formation...

S/062/63/000/002/00A/020  
B144/B186

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of  
Physical Chemistry of the Academy of Sciences USSR).

SUBMITTED: May 7, 1962

Card 3/3

VAGRAMYAN, A.T.; UVAROV, L.A.

Mechanism of the electrodeposition of nickel from sulfate solutions.  
Dokl. AN SSSR 146 no.3:635-637 S '62. (MIRA 15:10)

1. Institut fizicheskoy khimii AN SSSR. Predstavleno akademikom  
V.I.Spitsynym.

(Nickel plating)

VAGRAMYAN, A.T.; UVAROV, L.A.

Determination of the reversible potential of a nickel electrode at high temperature. Izv.AN SSSR.Otd.khim.nauk no.9:1520-1524 S '62. (MIRA 15:10)

1. Institut fizicheskoy khimii AN SSSR.  
(Electrodes, Nickel)



VAGRAMYAN, A.T.; KUDRYAVTSEV, V.N.

Regularities of the formation of electrolytic iron powders.  
Izv. AN SSSR. Otd. khim. nauk no. 2: 263-268 F '63. (MIRA 16:4)

1. Institut fizicheskoy khimii AN SSSR.  
(Iron plating) (Powder metallurgy)

VAGRAMYAN, A.T., doktor tekhn. nauk, prof.; SOLOV'YEVA, Z.A., kand.  
khimich. nauk

Electrolytic precipitation. *Nauka i zhizn'* 30 no.1:16-21  
Ja '63. (MIRA 16:4)

1. Zaveduyushchiy laboratoriyey elektrosashdeniya metallov  
Instituta fizicheskoy khimii AN SSSR.  
(Electrometallurgy)

VAGRAMYAN, A.T.; ZHAMAGORTSYAN, M.A.; UVAROV, L.A.

Effect of temperature on the kinetics of nickel ion discharge.  
Izv.AN SSSR.Ser.khim. no.2:301-304 F '64. (MIRA 17:3)

1. Institut fizicheskoy khimii AN SSSR.

ACCESSION NR: AP4025007

8/0062/64/000/003/0435/0439

AUTHOR: Lezhava, T. I.; Vagramyan, A. T.

TITLE: The stationary potential of liquid and solid gallium

SOURCE: AN SSSR. Izv. Seriya khimicheskaya, no. 3, 1964, 435-439

TOPIC TAGS: liquid gallium, solid gallium, stationary potential, electrode design

ABSTRACT: When there is no change in the free energy of a metal in changing its aggregate state, the equilibrium potential of the solid and liquid metal should be the same. The literature on the potentials for solid and liquid gallium is contradictory and shows differences of as much as 170 millivolts. The stationary potential of solid and liquid gallium in alkaline solutions of potassium gallate was determined in the 7-38 C temperature interval with electrodes of two designs (fig. 1.); the potential curves are shown in fig. 2. The change in voltage noted with one electrode 1a is attributed to penetration of the electrolyte to the platinum contact, forming a Ga-Pt macrocell. Readings with the glass encapsulated electrode 1b show the voltage does not change from 7-29 C (-1.632 v.), then there is a slight change to -1.638 v, a drop to -1.636 v, and then no change from

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ACCESSION NR: AP4025007

30-38 C. The cause for this change of 4-6 millivolts was not determined. The discrepancies in the literature are attributed to improperly set up experiments in which the electrode structure was faulty. Orig. art. has: 2 figures.

ASSOCIATION: Institut fizicheskoy khimii AN SSSR (Institute of Physical Chemistry, AN SSSR)

SUBMITTED: 18Sep63

DATE ACQ: 17Apr64

ENCL: 02

SUB CODE: GP

NO REF SOV: 003

OTHER: 004

Card 2/4

ACCESSION NR: AP4025007

ENCLOSURE: 01



fig. 1

Electrode used for the investigation: 1-gallium; 2-platinum contact; 3-hydrogen bubble; 4-glass

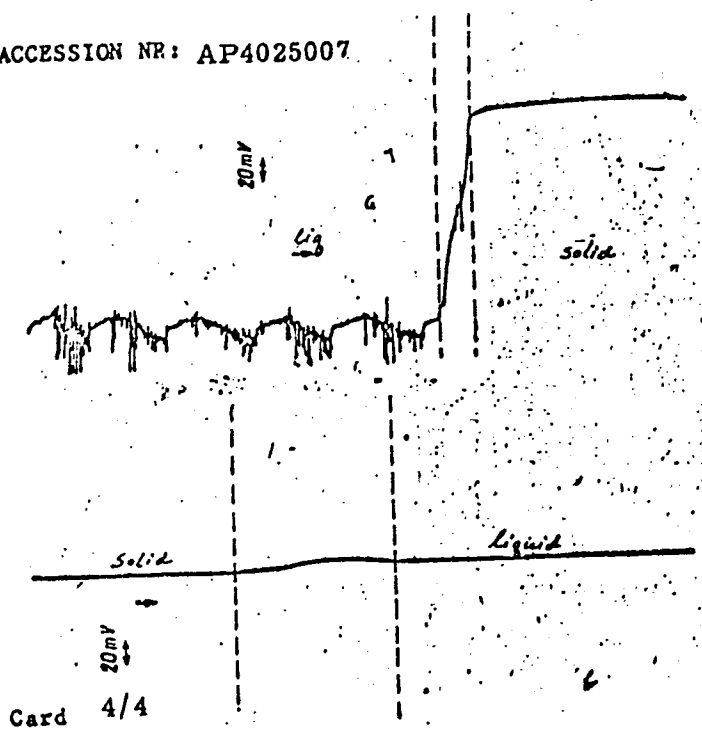
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ACCESSION NR: AP4025007

ENCLOSURE: 02

fig. 2

Change of potential of the gallium electrode during the time of transition from one aggregate state to another: a-using electrode in fig. 1a b-using electrode in fig. 1b



VAGRAMYAN, A.T.; ZHAMAGORTSYAN, M.A.

Effect of hydrogen on the reduction rate of cobalt ions.  
Zhur. fiz. khim. 38 no.3:788-789 Mr '64. (MIRA 17:7)

1. Institut fizicheskoy khimii AN SSSR.



YASTREBOVA, E.R.; VAGRANYAN, A.T.

Equilibrium potentials of a copper electrode in pyrophosphoric acid solutions. *Zhur. fiz. khim.* 38 no.6:1551-1556 1962.  
(CIRA 18:3)

1. Institut fizicheskoy khimii AN SSSR.

YASTREBOVA, E.K.; VAGRANYAN, A.T.

Mechanism of the electrodeposition of copper from pyrophosphate electrolytes. Zhur. fiz. khim. 38 no.10:2503-2506 6 '64.  
(MIRA 18:2)

1. Institut fizicheskoy khimii AN SSSR.

SOLOV'YEVA, Z.A.; VAGRANYAN, A.T.

Effect of the cathode surface as affecting the character  
of an electrochemical reaction. Dokl. AN SSSR 154 no.4:  
918-921 F '64. (MIRA 17:3)

1. Institut fizicheskoy khimii AN SSSR.

UVAROV, L. A.; ZAMAGORTSYANTS, M. A.; VAGRAMYAN, A. T. Moscow

"Die elektrolytische Abscheidung von Nickel aus wabrigen Losungen bei Temperaturen uber 100° C."

paper submitted for 2nd Intl Symp on Hyperpure Materials in Science and Technology, Dresden, GDR, 28 Sep-2 Oct 65.

Institut fizicheskoy khimii Akademii nauk SSSR, Moscow.