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Card 6/6

FRANK, G.M., otv. red.; KUZIN, A.M., otv. red.; KUZNETSOV, I.V.,  
doktor filos. nauk, red.; LIVSHITS, N.N., doktor biol.  
nauk, red.; VEDENOV, M.P., kard. filos. nauk, red.;  
SHATALOV, A.T., mlad. nauchn. sotr., nauchn. red.;  
KREMYANSKIY, V.I., mlad. nauchn. sotr., nauchn. red.

[The essence of life] O sushchnosti zhizni. Moskva, Nauka,  
1964. 350 p. (MIRA 17:8)

1. Akademiya nauk SSSR. Nauchnyy sovet po filosofskim vop-  
rosam yestestvoznaniya. 2. Institut filosofii AN SSSR (for  
Kremyanskiy, Shatalov). 3. Chlen-korrespondent AN SSSR (for  
Frank, Kuzin).

MA

7

**\*Irreversible Electrode Potentials of Tin.** A. Y. Shatalov (*Zhur. Fizich. Khimii (J. Phys. Chem.)*, 1941, 15, 401-409; *Brit. Chem. Abs.*, 1942, [A 1], 130). — [In Russian.] The potentials of tin in solutions of KCl, NaCl, NH<sub>4</sub>Cl, BaCl<sub>2</sub>, HCl, KBr, KI, KNO<sub>3</sub>, Na<sub>2</sub>SO<sub>4</sub>, and NaOH assume nearly constant values after some hrs. or days of immersion. The pretreatment of the electrode affects the potential for only about 1 hr. The corrosion of tin in 4N-NH<sub>4</sub>Cl is greater than that in 0.35N-NH<sub>4</sub>Cl. Oxide films retard the corrosion.

11143

SHATALOV, A. Ya.

Oct 52

USSR/Chemistry - Corrosion

"The Effect of pH on the Electrochemical Behavior of Metals and Their Resistance to Corrosion," A. Ya. Shatalov

DAN SSSR, Vol 86, No 4, pp 775-777

The effect of pH on the electrode potential and the corrosion of 12 metals was studied and curves depicting the change of potential and corrosion with pH were plotted for each of the metals. No simple relationship was found to exist between the above factors. The same metal often had different type curves for potential pH and corrosion pH.

Source #264T21

SHATALOV, A.Ya.

The effect of pH on the electrochemical and corrosive behavior of  
metals. Soob.o nauch.rab.chl.VKHO no.2:12-14 '53. (MIRA 10:10)  
(Electrolytic corrosion)

SHATALOV, A. ya

Irreversible potentials and the corrosion behavior of aluminum in buffer solutions. A. Ya. Shatalov and Yu. A. Mikhailovskii (Voronezh State Univ.). *Zhur. Fiz. Khim.* 27, 1025-31(1953); cf. *C.A.* 47, 3725a. — The potential  $E$  of an Al electrode after 1 day's immersion in a buffer soln. (partly neutralized mixt. of  $H_2BO_3$ ,  $H_2PO_4$ , and  $AcOH$ ) was nearly independent of the  $Cl^-$  concn.  $c$  in the soln. at pH 2 and 3 (0.70-0.77 and 0.48-0.60 v. against  $N/H$  electrode). Between pH 3 and 9,  $E$  depended on  $c$  and had a min. (0.20 v.) at pH 5 at  $c = 0$ . At pH 10-12,  $E$  was again almost independent of  $c$  (e.g. 1.23-1.30 v. at pH 11). The corrosion  $k$  of Al in the same solns. also was independent of  $c$  at pH 2 (0.2 mg./sq. dm. hr.) and pH 12 (3-10 mg./sq. dm. hr.) and had a min., deeper with greater  $c$ , between pH 6 and 8. Similar results were obtained in unbuffered solns. of mixts. of alkali and  $HCl$ ,  $HNO_3$ , or  $H_2SO_4$ . The effect of pH and  $c$  on  $E$  was accounted for by their effect of the anodic polarization of Al, which was detd. at three pH values and  $c$  d. up to 0.016 m./sq. cm. In strongly alk. solns.,  $k$  was proportional to (concn. of  $OH^-$ )<sup>3/2</sup>. J. J. Bikerman

3

Chem Abs, v. 48  
 1-10-54  
 Electrochemistry

ME  
 7-13-54

Shatalov, A. Ya.

Chemical Abst.  
Vol. 48 No. 6  
Mar. 25, 1954  
Electrochemistry

③

Behavior of the bismuth electrode. V. A. Kriventsova and A. Ya. Shatalov (State Univ., Voronezh). *Zhur. Fiz. Khim.* 27, 1476-80 (1953).—The potentials  $E$  of Bi buffered on felt was, in mixes of  $H_2BO_3$ ,  $AcOH$ ,  $H_2PO_4$ , and  $NaOH$  approx. 0.24, -0.11, -0.09, and -0.20 v. at pH 2, 7, 9, and 12, resp. The variations of  $E$  with pH were smaller when  $NaCl$  (c.g.,  $N$ ) was added to the buffer soln. When the Bi electrode before measurement was pickled in 20%  $H_2CrO_4$ , the bend of the  $E$ -pH curve between pH 7 and 9 disappeared, and  $dE/d(pH)$  was -0.045 v. in the buffer solns. both in the presence and the absence of  $NaCl$ . The  $E$  in  $HCl$ ,  $HNO_3$ , or  $H_2SO_4$  had max. in 0.01  $N$  solns. (0.15-0.28 v.), while  $E$  in  $NaOH$  solns. decreased from 0.16 to -0.0 v. when the concn. increased from 0.0001 to 10  $N$ . The rate of corrosion of Bi had a min. at pH 10 in buffer +  $NaCl$  soln. and was almost independent of pH between pH 2 and 12 in the absence of  $NaCl$ . In acids  $E$  was detd. by the formation of  $[BiX_3]^-$  or  $[BiX_3]^{--}$  ions, in neutral and near neutral solns.  $E$  was the potential of  $B_2O_3$ , and in alk. solns. Bi behaved as a mixt. of an oxide and an O electrode. J. J. Bikerman



Shatalov, A. Ya.

chem ✓ Bismuth electrode. A. Ya. Shatalov and V. A. Kriventsov. Trudy Voronezh. Univ. 26, 73-4 (1953); Referat. Zhur., Khim. 1955, No. 0262. Electrode potentials ( $E$ ) of Bi were detd. in buffer solns. with addn. of NaCl. The curve  $E$  vs. pH comprised 3 sections: in the region of acid solns. and a small content of  $Cl^-$  the values of  $E$  are close to the potentials of an oxide Bi electrode and the slope of the curve depends on the concn. of  $Cl^-$ . In neutral solns. the values of  $E$  are independent of pH and are poorly reproducible. In alk. solns. Bi acquires the properties of a mixed metal oxide-O electrode, the values of  $E$  are stable and more pos. than the potentials of a true metal oxide electrode. In nonbuffered solns. with the const. concn. of  $Cl^-$ ,  $SO_4^{--}$ , or  $NO_3^-$  the nature of the  $E$  vs. pH curve is the same. The relation between  $E$  and pH are compared with the corrosion resistance of Bi as affected by the pH. M. Hosen

MM 478

The electrolytic and corrosion behavior of magnesium.  
 A. Sokolova, A. A. Yakovleva, and A. Ya. Shatalov.  
 Trudy Voronezh. Univ. 32, 61-9(1963); Referat. Zhur.  
 Khim. 1955, Abstr. No. 67265. — The electrode potentials of  
 Mg in 27 different electrolytes with concns. of 0.0001-  
 1.0M are measured. Three forms of the curves  $E_{Mg}$  vs.  
 $\log c$  are established. The value of  $E_{Mg}$  is detd. by the anions.  
 The effect of pH on  $E_{Mg}$  and the corrosion speed (CS) of Mg  
 in buffered mixts. and solns. with const.  $Cl^-$ ,  $SO_4^{--}$ , and  
 $NO_3^-$  anion concns. is studied. The results are given as  
 diagrams  $E_{Mg}$ -pH and CS-pH. The full curve  $E_{Mg}$ -pH forms  
 3 branches which have the same sequence as the branches  
 of the CS-pH diagram. In the area pH < 3 CS is propor-  
 tional to  $[H^+]^2$ ; in the area pH 4-11 a slower change of CS  
 compared to that of pH is observed; at pH > 11 the Mg is  
 passivated. Several polarization diagrams are given illus-  
 trating the effect of pH on the potential and the CS of Mg.  
 N. Vesiloff

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 4E 48  
 4E 2C  
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11  
*[Handwritten signature]*

SHATALOV, A.Ya.; ISAYEV, N.I.

Kinetics of self-dissolution and stationary potentials of manganese.  
Soob.o nauch.rab.chl.VKHO no.2:38-41 '54. (MIRA 10:10)  
(Manganese) (Electrolytic corrosion)

SHATALOV, A. Ya.

USSR/ Chemistry - Physical chemistry

Card 1/1 Pub. 147 - 8/26

Authors : Shatalov, A. Ya., and Marshakov, I. A.

Title : Electrode potentials and corrosion of Mo and W.

Periodical : Zhur. fiz. khim. 28/1, 42-50, Jan 1954

Abstract : The measurement of electrode potentials of Mo and W in buffer solutions with different Cl-ion contents is announced. The electrochemical properties of Mo and W were investigated in twenty different electrolytes and it was established that the anions of the solution have the greatest effect on the Mo and W potentials. Curves were plotted for anodic polarization in NaCl solutions at various pH. Great reduction in anodic polarization was observed in alkali solutions. The corrosion resistance of Mo and W was tested by the weight and volumetric methods and the results obtained are listed. Ninteen references: 5-USA; 5-English and 9-USSR (1917-1952). Tables; graphs.

Institution: State University, Voronoezh

Submitted : February 19, 1953

Shatalov, M. I.

USSR/Chemistry - Physical chemistry

Card 1/1 Pub. 147 - 6/27

Authors : Shatalov, A. Ya., and Isayev, N. I.

Title : Irreversible potentials and corrosion characteristics of manganese

Periodical : Zhur. fiz. khim. 28/9, 1562-1571, Sep. 1954

Abstract : The electrochemical behavior of pure electrolytic and technical Mn in certain electrolytes was investigated in a wide pH range of buffer and simple unbuffered mixtures. The effect of the nature and electrolyte concentration on the electrode potential of the Mn is explained. The mechanism of Mn corrosion processes in various pH zones was studied by means of the polarization diagram method. The exponential dependence of the rate of corrosion upon the hydrogen ion concentration was observed in acid solutions, and the solution of the Mn was determined by the kinetics of the hydrogen ion discharge. Seventeen references: 14-USSR and 3-USA (1932-1953). Tables; graphs; drawing.

Institution : State University, Voronezh

Submitted : November 4, 1953

SHATALOV, A. YA.

"Study of Corrosion Behavior and Stationary Potentials of Metals in Solutions with various Hydrogen-Ion Concentrations." Inst. of Physical Chemistry of the Acad. Sci. USSR, (Moscow), 1955. (Dissertation for the Degree of Doctor of Chemical Sciences)

SO: Knizhnaya Letopis', No. 22, 1955, pp 93-105

Call Nr: TA462.S4

AUTHOR: Shatalov, A.Ya.

TITLE: Investigation of Corrodibility and Stationary Potentials of Metals in Solutions Containing Hydrogen Ions of Various Concentrations (Issledovaniye korroziionnogo povedeniya i statsionarnykh potentsialov metallov v rastvorakh s razlichnoy kontsentratsiyey vodorodnykh ionov)

PUB. DATA: Voronezh, 1955, 22 pp., 100 copies

ORIG. AGENCY: AN SSSR, Institut fizicheskoy khimii

EDITOR: None given

PURPOSE: This is the author's abstract of his dissertation presented for the degree of Doctor of Chemical Sciences. The dissertation is stated to be the result of a systematic

Card 1/3

Call Nr: TA462.S4

Investigation of Corrodibility and Stationary Potentials (Cont.)

investigation of the effect of hydrogen-ion concentration on the speed of corrosion and on the stationary potentials of various metals. The principal aim of the investigation was to discover the mechanism of the corrosive process.

COVERAGE: The five chapters of the dissertation are concerned with the following: 1) a discussion of the basic assumptions of the electrochemical theory of the corrosion of metals and of studies on irreversible (stationary) potentials; 2) a description of the experimental method used by the author; 3) results of corrosion tests on metals in solutions with various hydrogen-ion concentrations; 4) experimental data on the effect of the concentration of hydrogen ions and extraneous ions on the stationary potentials of metals; 5) a discussion of the results of the corrosion tests and measurements of electrode potentials. Akimov, G.V., is referred to

Card 2/3



SHATALOV, A. Ya.

Irreversible potentials and corrosion resistance of metals.  
A. Ya. Shatalov. Trudy Inst. Fiz. Khim., Akad. Nauk  
S.S.S.R. No. 5, Issledovan. Korrozii Metal. No. 4, 237-86  
 (1955).—Variations of electrode potentials as the function  
 of pH and Cl<sup>-</sup> concn. were detd. in buffered and nonbuffered  
 solns. for 16 metals (Ag, Cu, Mg, Zn, Cd, Al, Sn, Pb, Ti,  
 Bi, Ta, Mo, W, Mn, Fe, Pt) which can be divided into 6  
 groups as far as the effect of pH on the electrode potential  
 and the corrosion resistance are concerned (these groups do  
 not always coincide). All the polarization diagrams con-  
 cerning the 16 metals fall into 8 distinct patterns. However,  
 the form of the polarization diagram depends not only on  
 the nature of the metal but also on pH and Cl<sup>-</sup> concn. of  
 the soln., so that the same metal may give different forms  
 of curves according to the conditions of the electrolyte.  
 The diagrams allow the detn. of the degree of anodic con-  
 trol of the reaction which in fact detcs. the value of the  
 potential. The curves of the variation of anodic control as  
 the function of pH fall into 3 types which correspond to  
 symmetrically reversed curves of corrosion intensity. 121  
 references.

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AID P - 3743

Subject : USSR/Chemistry

Card 1/1 Pub. 152 - 7/22

Author : Shatalov, A. Ya.

Title : ~~Study of the corrosion of cadmium and zinc by the polarographic method~~  
Study of the corrosion of cadmium and zinc by the polarographic method

Periodical : Zhur. prikl. khim. 28, 9, 944-949, 1955

Abstract : The corrosion of technical grade cadmium and zinc proceeds at a higher rate than that of pure cadmium and zinc, due to the presence of impurities. The corrosion of the metals was tested in dilute hydrochloric acid solutions and in buffer solutions. Five tables, 5 diagrams, 7 references, 1 Russian (1952).

Institution : None

Submitted : D 24, 1953

SHATALOV, A. YA.

Distr: 4E2c/4E4j

18

✓ The Effect of pH on the Corrosion-Resistance and Fixed Potentials of Metals. A. Ya. Shatalov (*Problems in the Corrosion and Protection of Metals (Acad. Sci. U.S.S.R.)*, 1956, 86-95).— [In Russian]. The corrosion behaviour of 16 metals was studied over a wide range of pH and concentration of Cl<sup>-</sup> 0-1.0N in buffered soln., as well as in unbuffered soln. with const. total concentration of anions. A classification of graphs showing the effect of pH on the corrosion characteristics of metals is proposed, and some rules of corrosion characteristics are investigated. The relationship between pH and log. corrosion-rate, and between pH and the fixed potential is linear and can be expressed by:  $\log K = \text{const.} - \alpha\text{pH}$ , and  $E = E_0 - \beta\text{pH}$ , where  $\alpha$ ,  $\beta$  are determined from the kinetic equations of ionization of the metal and discharge of H<sup>+</sup>. Experimental detn. of  $\alpha$  and  $\beta$  differ from the theoretical values. Corrosion-resistance and fixed potentials are determined by combining the electrochem. properties of metals with the properties of the oxide films generated on the surface in air. They can also be determined from electrochem. kinetics. 20 ref.—A. W.

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137-1957-12-24515

Translation from: Referativnyy zhurnal. Metallurgiya 1957, Nr 12, p 224 (USSR)

AUTHOR: Shatalov, A. Ya.

TITLE: The Effect of the pH on the Corrosion Resistance of Metals  
(Vliyaniye pH na korroziionnuyu stoykost' metallov)

PERIODICAL: Tr. Voronezhsk. un-ta, 1956, Vol 40, pp 73-86

ABSTRACT: A study has been made of the effect of the pH on the corrosion resistance of Cu, Mg, Zn, Cd, Al, Sn, Pb, Bi, Mo, W, Mn and Fe in buffer solutions with differing  $Cl^-$  content (from 0.0 to 1.0 N) and in simple non-buffer solutions with fixed anion concentrations. Five types of curve showing the dependence of corrosion (K) on pH are obtained, the breakdown of the tested metals by curve type being as follows: 1) Mo, W; 2) Ag, Pt, Ta, Ti; 3) Cd; 4) Cu, Zn, Al, Sn, Pb, Bi; 5) Mg, Mn, Fe. Metals of the first type are completely corrosion-resistant for the full range of the pH scale, down to the strongest alkaline solutions, where the K curve rises. Metals of the second type are absolutely corrosion-resistant throughout the entire pH range. The rate of solution of Cd diminishes very quickly during transition into the neutral portion, and declines still more in the alkaline

137-1957-12-24515

## The Effect of the pH on the Corrosion Resistance of Metals

media. With metals of the 4th type there is a characteristic rise in the  $K$  curve on both sides of the neutral solutions, in which maximum corrosion resistance is attained. With metals of the 5th group the dissolution rate declines abruptly as the pH increases in acid solutions; in the neutral portion of the pH range there is a band in which the  $K$  rate is constant, but in alkaline solutions further passivation occurs and  $K$  practically ceases completely. In the case of Cu, maximum resistance to corrosion in the absence of  $\text{Cl}^-$  occurs at pH 9.5. Introduction of  $\text{Cl}^-$  into the buffer solution causes the maximum-resistance points to shift toward higher pH values. The corresponding points for Al occur at pH 7, but in solutions of 1 N with respect to  $\text{Cl}^-$  they occur at pH 8-8.5. Solution of Mg and Mn in acid solutions follows the law:  $K = \text{const} [\text{H}^+]^a$ , the value of  $a$  being approximately 2 for both elements. For alkaline solutions of Al the relationship  $K = \text{const} [\text{OH}^-]^a$  is obtained, in which  $a = 1.3$ . The dependence of the anodic control on the pH value is calculated for the series of metals. From a comparison of the corrosion-resistance values and stationary potential curves eight separate schematic diagrams of the corrosion process are obtained.

Ya. L.

Card 2/2

1. Metals-Corrosion resistance-Test results
2. pH Corrosive

137-58-5-10168

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 5, p 183 (USSR)

AUTHORS: Shatlov, A. Ya., Lavrova, N. N.

TITLE: The Effect of pH and Anion Concentration on the Steady-state Potential and the Corrosion of Iron (Vliyaniye pH i kontsentratsii aniona na statsionarnyy potentsial i korroziyu zheleza)

PERIODICAL: Tr. Voronezhsk. un-ta, 1956, Vol 40, pp 87-92

ABSTRACT: The electrochemical and corrosive properties of Fe are investigated in relation to pH with simultaneous consideration of the influence of the anions in the solution. Armco Fe electrodes were used to measure irreversible potentials by the capacitor-charge method. The corrosion strength was measured by the weight change in solutions of Britton's universal buffer mixture with the following additions: 0.01 N HCl, 0.1 N HCl, 1.0 N HCl, and 1.0 N KBr, a chloride mixture in which the total concentration of Cl ions was 0.1 N and 1.0 N, and a sulfate mixture with a decinormal concentration of  $\text{SO}_4^{2-}$ . At pH of 0 to 5.5 the Fe potentials are in linear relation to the pH in accordance with the equation  $E_{\text{Fe}} = -0.245 - 0.04 \text{ Z pH}$  and are independent of the anion concentration. A change of 1 unit in pH changes the

Card 1/2

137-58-5-10168

The Effect of pH (cont.)

potential by 0.040 v. When  $\text{pH} > 5.5$ , the potential changes sharply toward the positive, is dependent upon the concentration of Cl ions, and is independent of the pH of the solution. At a pH of 2, corrosion attains  $160 \text{ mg/dm}^2$  per day. An increase in pH markedly reduces the rate of corrosion, which is  $\leq 2 \text{ mg/cm}^2$  per day at a pH of 6.5. In pH 4 solutions of Britton's mixture with normal concentrations of Cl and Br ions, corrosion attains a maximum rate. In the 2 to 3.5 pH interval, the K-pH curve presents an anomaly that confirms the passivating action of Cl and Br ions.

Ya. L.

1. Hydrogen ion concentration--Corrosive effects 2. Iron--Corrosion 3. Ions--Chemical effects 4. Corrosion--Test methods

Card 2/2

SOV/137-58-7-16199

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 7, p 326 (USSR)

AUTHORS: Shatalov, A. Ya., Lavrova, N. N.

TITLE: On the Tantalum Electrode (O tantalovom elektrode)

PERIODICAL: Tr. Voronezhsk. un-ta, 1956, Vol 40, pp 93-96

ABSTRACT: The behavior of the tantalum electrode in solutions of buffering salts in a broad pH range, in the solutions of certain salts, acids, and NaOH, was investigated. The potentials of Ta electrodes (in the form of thin Ta foil) were measured by the PPTV-type potentiometer with a mirror galvanometer opposite a calomel semielement which was in contact with the Ta electrode. In the presence of reducing agents or in alkaline solutions Ta develops negative potentials up to  $-0.35$  v; in acid or oxidizing solutions the potential attains  $+0.95$  v. The relationship of the stationary potentials of Ta to the pH for buffer mixtures is expressed as follows:  $E_{Ta} = 0.450 - 0.035 \text{ pH}$ . The serviceability of the Ta electrode is proved experimentally as an indicator in the potentiometric titration for the reactions of neutralization, precipitation, and oxidation-reduction. A jump in the potential occurs at the

Card 1/2



SOV 7137-58-7-16199

On the Tantalum Electrode

equivalence point and reaches 0.5 v in the case of iodometric titration of hyposulfite. 0.3 - 0.4 v in the titration of Mohr's salt with permanganate, and is sufficient for titrating 0.005-N acid solutions.

Ya. L.

1. Tantalum electrodes--Performance
2. Tantalum electrodes--Electrical properties
3. Electrical potential--Measurement

Card 2/2

USSR Corrosion - Protection From Corrosion.

J.

Abs Jour : Ref Zhur - Khimiya, No 2, 1957, 6866

Author : Avdeyeva, V.I., Povalyayeva, L.P., Shatalov, A.Ya.

Inst : Voronezh University

Title : Corrosion Resistance of Aluminum and Copper

Orig Pub : Tr. Voronezhsk. un-ta, 1956, 42, No 2, 79-80

Abstract : Results of determinations of the rate of corrosion (RC) of pure Cu and Al in buffer solutions in the presence of different additions of 0 - 1.0 N Cl-ions, encompassing the pH range of 2 - 12. Cu showed minimum RC at pH 10 - 11.0, depending upon Cl-ions; minimal RC of Al was at a pH 7.0 - 7.5 irrespective of the Cl-ion content of the solution. Activating action of Cl-ions on corrosion of Cu and Al in buffer solutions is limited to a definite pH region adjoining, on either side, the neutral point.

Card 1/1

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S/137/60/000/005/008/015  
ACC6/ACC1

Translation from Soderativnyy zhurnal, Metallurgiya, 1960, No. 6, p. 312,  
# 13988

AUTHOR: Shebalov, A.Ya.

TITLE: Investigation Into Corrosion Behavior and of Steady Potentials of Metals in Solutions With a Different Concentration of Hydrogen Ion

✓

PERIODICAL: Tr. Vsesoyuznogo un-va, 1958, Vol. 49, pp. 95-110

NOTE: The author investigated the corrosional and electro-chemical behavior of Al, Cu, Mg, Zn, Cd, Au, Sn, Fe, Ti, Bi, Ta, Mo, W, Mn, Fe and Pt in solutions with different concentrations of  $H^+$  and corrosion-active anions. He established the dependence on pH of the corrosion rate and determined the range of the steady potential E. Two different cases were discovered for the dependence of the corrosion rate and the steady potential of the metal on the  $H^+$  concentration. The "normal" dependence, when pH affects only the cathode process, is expressed by a power equation for the corrosion rate and by a logarithmic equation for the steady potential. In the other case, conditions of the anode process may vary,

Card 1/2

S/137/60/000/006/008/015  
A006/A001

Investigation Into Corrosion Behavior and of Steady Potentials of Metals in Solutions With a Different Concentration of Hydrogen Ions

and the deviation from the "normal" dependence is observed. According to case No. 1, self-dissolving of Mg, Mn, Zn, Cd and Fe occurs in acid solutions. The effect of pH on Cu corrosion in acid chloride solutions is caused by the changes in the overvoltage of oxygen ionization. In neutral solutions and at a free access of the air, the corrosion resistance of a series of metals is determined by the properties of oxide films or corrosion products whose appearance may considerably increase the degree of the anode control of the corrosion process. There are 19 bibliographical titles.

R.A.

Translator's note: This is the full translation of the original Russian abstract.

Card 2/2

PALKIN, A.F., prof., otv. red.; ZAVGORODNIY, S.V., red.; OCHNEVA,  
O.S., red.; PEROVA, A.P., red.; UGAY, Ya.A., red.; SHATALOV,  
A.Ya., red.; SHATALOV, V.P., red.

[Transactions of the Voronezh Branch of the D.I.Mendeleev All-  
Union Chemical Society] Sbornik trudov Voronezhskogo otdele-  
niia Vsesoiuznogo khimicheskogo obshchestva imeni D.I.Mende-  
leeva. Voronezh, Voronezhskoe knizhnoe izd-vo. No.2. 1959.  
184 p. (MIRA 17:5)

1. Vsesoyuznoye khimicheskoye obshchestvo imeni D.I.Mendeleyeva.  
Voronezhskoye otdeleniye.

SHATALOV, A.Ya.; MOROZOV, B.A.

Structure of the surface of aluminum during anodic treatment in  
neutral solution. Trudy VGU 57:101-106 '59.

(MIRA 13:5)

(Aluminum)

PHASE I BOOK EXPLOITATION

SOV/5225

Mikhant'yev, Boris Ivanovich, Anatoliy Yakovlevich Shatalov, and Igor'  
Kirillovich Marshakov

Polimery - novyye korrozionno-stoykiye materialy (Polymers; New Corrosion-  
Resistant Materials) Voronezh, Izd-vo Voronezhskogo univ., 1960. 106 p.  
5,000 copies printed.

Scientific Ed.: I. Ya. Klinov, Doctor of Technical Sciences, Professor,  
Ed. of Publishing House: G.F. Biryukov, Tech. Ed.: M.V. Novikov.

PURPOSE: This book is intended for teachers in higher schools of education. It  
may be used by chemical engineers and technicians of plant laboratories, tech-  
nologists and foremen, as well as workers who are interested in improving their  
skills.

COVERAGE: The book reviews the causes and types of corrosive destruction to metals  
and alloys exposed to external conditions, and discusses methods and means of  
replacing nonferrous metals and alloyed steels with new corrosion-resistant

Card 1/3

Polymers; New Corrosion-Resistant Materials

SOV/5225

materials based on synthetic polymers and natural and synthetic resins. The main physicochemical properties are given for the structural plastics which have received wide practical application in the national economy, and especially in anticorrosion engineering. No personalities are mentioned. There are 68 Soviet references (including 2 translations).

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SHAFILOV, A. ER.; ...

Study of the electric conductivity in the aqueous boric acid -  
nitrocellulose - glycerol system. Zhur. Khim. 5 no. 3:347-347 1960.  
(Chem. 14:2)

1. Voronezhskiy gosudarstvennyy universitet.  
(Boric acid) (Nitrocellulose) (Glycerol)

SHATALOV, A.Ya., MARSHAKOV, I.K., RUBTSOVA, T.A.

Effect of oxidizing agents on the inhibiting properties of phosphates. Zhur.prikl.khim. 33 no.5:1030-1036 My '60.

(MIRA 13:7)

(Steel--Corrosion) (Phosphates)

18.8310

10199

S/080/61/034/011/012/020  
D243/D301

AUTHORS: Shatalov, A.Ya., and Bondareva, T.P.  
TITLE: Electrochemical investigation of the passivation of zirconium in acid solutions  
PERIODICAL: Zhurnal prikladnoy khimii, v. 34, no. 11, 1961, 2487 - 2495

TEXT: The authors set out to study the passivation of zirconium in HCl and H<sub>2</sub>SO<sub>4</sub> solutions of various concentrations and in the same solutions in the presence of an external anode current. The mechanism of this reaction is still disputed and in the introduction previous views are sketched. In the first instance the zirconium potential was measured by a ППТВ-1 (PPTV-1) potentiometer in a special vessel with passage of oxygen or hydrogen. A hydrogen electrode, placed in the same solution, saturated with gaseous hydrogen and connected to the electrode cell by an electric switch served as the electrode of comparison. The e.m.f. of the circuit was the potential difference between the two electrodes.  
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30199

S/050/61/034/011/012/020  
D243/D301

Electrochemical investigation of ...

To measure the zirconium electrode potential in oxygen or air the hydrogen electrode was placed in a separate vessel, through which hydrogen was passed. When an external current was applied an ordinary cell was used with an auxiliary platinum electrode, saturated copper sulphate composing the electrode of comparison. The capacity of the zirconium electrode and the intermediate resistance at the solution boundary were measured on a circuit illustrated. The bridge was fed from a 3Г-10 (3G-10) generator using as zero an EO-7 (EO-7) electron oscillograph connected to a low frequency amplifier. The external polarizing current was fed to the cell from a high voltage rectifier. Two series of experiments were conducted in normal  $H_2SO_4$  for 6-10 hours with continuous polarization at a current density of 40 and 133  $\mu A/cm^2$  with readings at 30 minute intervals. Measurements in 0.1-5 N acid solution were marked by considerable scatter and poor reproducibility, but certain regularities became nonetheless apparent. In  $H_2SO_4$  solution the zirconium potential rose gradually to a constant level in 1-2 hours. In HCl the constant value was usually attained after 2-3 hours but the

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30199

S/080/61/034/011/012/020  
D243/D301

Electrochemical investigation of ...

exact shape of the curve depended on whether oxygen or hydrogen was passing through the cell. With anode polarization in HCl solution the zirconium potential rose rapidly to a constant level independent of current density but varying slightly with acid concentration; in  $H_2SO_4$  solution, studied over the 20 - 266  $\mu A/cm^2$  range, the potential rose continuously, the potentials in this case being dependent not on current density but the quantity of electricity. The passivating film formed was unaffected by  $H_2SO_4$ . Simultaneously, there occurs a fall in zirconium anode capacity and a rise in intermediate resistance. The change in capacity is explained by the linear relationship between the increase in thickness of the  $ZrO_2$  oxide film and time, as given by  $1/C = \text{const} + \beta \cdot t$  (4), where  $\beta$  is the coefficient of proportionality, dependent on the growth rate of the oxide film. There are 8 figures, 2 tables and 14 references: 8 Soviet-bloc and 6 non-Soviet-bloc. The 4 most recent references to the English-language publication read as follows: A. Charlesby, Acta. Met., 1, 340, 1953; M. Maraghini, G.B. Adams, P. Van Rysselberghe, J. Electroch. Soc., 101, 400, 1954;

Card 3/4

80199

S/080/61/034/011/012/020

Electrochemical investigation of ...

D243/D301

N. Hackerman, O. B. Cecil, J. Electroch. Soc. 101, 419, 1954; L. Young, Trans. Faraday Soc., 55, 632, 1959. ✓

SUBMITTED: July 28, 1960

Card 4/4

B/R

ACCESSION NR: AT4010280

S/3053/62/000/000/0280/0282

AUTHOR: Shatalov, A. Ya.; Bondareva, T.P.

TITLE: The electrochemical behavior of zirconium in sulfuric and hydrochloric acids

SOURCE: Trudy\* Vsesoyuznoy mezhvuzovskoy nauchnoy konferentsii po voprosam bor'by\* s korroziyey, Baku, 1962. Moscow, 1962, 280-282

TOPIC TAGS: zirconium, electrochemistry, anode polarization, polarization, oxidation, corrosion

ABSTRACT: The authors measured the electrode potentials of zirconium in solutions of sulfuric and hydrochloride acids in an atmosphere of hydrogen, oxygen, and air. In the HCl solutions with hydrogen passed through, relatively reproducible potential values connected with the process of self-diffusion were obtained. In an atmosphere of oxygen or air, the electrode potentials of zirconium showed a marked tendency toward passivation (inhibition of corrosion). With anode polarization of the zirconium in HCl after an original rapid rise, a constant potential was established which did not vary, despite changes in the current density, but which was a function of the HCl concen-

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ACCESSION NR: AT4010280

tration. With anode polarization of the zirconium in 1 N H<sub>2</sub>SO<sub>4</sub>, studied in an interval of 20 - 270 ma/cm<sup>2</sup>, there was a continuous rise in the potential reaching several tens of volts. The zirconium potential depended on the amount of electricity passed through the solution. With anodic oxidation there was, together with the rise in potential, a regular decrease in the capacity of the zirconium anode and a rise in cross resistance. The temporary change in capacitance can be explained by assuming a linear law for the increase in thickness of the oxide film with time. Orig. art. has: 2 figures.

ASSOCIATION: Voronezhskiy gosudarstvennyy universitet (Voronezh State University)

SUBMITTED: 00

DATE ACQ: 28Jan64

ENCL: 00

SUB CODE: CH, ML

NO REF SOV: 001

OTHER: 001

Card 2/2



S/020/62/142/006/016/019  
B101/B144

18.3300  
AUTHORS:

Shatalov, I. Ya., Marshakov, I. K., and Kaluzhina, S. A.

TITLE:

Thermogalvanic corrosion of metals

PERIODICAL:

akademiya nauk SSSR. Doklady, v. 142, no. 6, 1962, 1339-1341

TEXT: Thermogalvanic corrosion was investigated on a model of thermo-galvanic cells on the basis of polarization curves. To this effect, the electrodes (Armco iron, 18/8 steel, X13 (Kh13) steel, nickel, or zirconium) were inserted in plastic plugs at the ends of a quartz tube at 40 mm from each other. While the lower electrode was dipped into ice, the upper one was heated to 75°C. The advantages of this design are (1) internal resistance less than in H-shaped cells; (2) lower convection, since the hot solution is on top. The electrolyte consisted of 0.1 N H<sub>2</sub>SO<sub>4</sub> + 0.9 N K<sub>2</sub>SO<sub>4</sub>; 1 N K<sub>2</sub>SO<sub>4</sub>; 0.1 N KOH + 1 N K<sub>2</sub>SO<sub>4</sub>; 1 N KOH + 1 N K<sub>2</sub>SO<sub>4</sub>. Conclusions: (a) the polarity of the corrosion pair is normal in acid and neutral solutions: the hot electrode is the anode; (b) "anomalous" polarity takes place in alkaline solution: the cold

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Thermogalvanic corrosion ...

S/O2C/62/142/000/018/019  
3101/B144

Electrode as the anode. This reversal of polarity which does not occur until after a certain time is due to passivation, rising with temperature, of the hot electrode. This was confirmed by passivating additions ( $K_2Cr_2O_7$  or KOH). In Kh13 steel, anomalous polarity is already observed in neutral solution, even without addition of passivating substances. A paper by Ya. M. Kolotyrkin et al. (Sborn. Korroziya reaktornykh materialov (Coll. Corrosion of Reactor Materials) M., 1960, p. 29) is mentioned. There are 3 figures, 1 table, and 4 Soviet references.

ASSOCIATION: Voronezhskiy gosudarstvennyy universitet (Voronezh State University)

PRESENTED: November 4, 1961, by A. N. Frumkin, Academician

SUBMITTED: November 10, 1961

X

Card 3/3

S/020/62/147/005/028/032  
B101/B186

AUTHORS: Shatalov, A. Ya., Bondareva, T. P.

TITLE: Kinetics of anodic niobium oxidation

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 147, no. 5, 1962, 1137-1140.

TEXT: The change in time of the potential during niobium oxidation at a constant current density was measured in 1 N  $H_2SO_4$ ,  $H_3PO_4$ ,  $HNO_3$ , and HCl. The linear function  $d\Delta\phi/dt = (r/\sigma B_+)i \ln(i/\sigma I_0)$ , where  $i$  is the current intensity, and  $r$  is the volume of oxide forming when one unit of a quantity of electricity passes through, is based on the equation  $I = \sigma \cdot I_0 \exp(B_+ \cdot F)$  (1), of A. Güntherschulze and H. Betz (Zs. Phys., 92, 367 (1934)), where  $\sigma$  is the coefficient of roughness,  $I_0$  and  $B_+$  are constants depending on the type of electrolyte, and  $F$  is the field strength in the growing oxide film. The more precise equation  $I = \sigma I_0 \exp[(B_+ + \alpha F)F]$  (4), based on experimental data, is suggested to

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Kinetics of anodic niobium oxidation

S/020/62/147/005/028/032  
B101/B186

replace Eq. 1. The constants of Eq. 4 are the following:

	$I_0, \mu\text{a}/\text{cm}^2$	$B_+ \cdot 10^6, \text{cm}/\text{v}$ ,	$\alpha \cdot 10^{14}, (\text{cm} \cdot \text{v})^2$
in $\text{H}_2\text{SO}_4$	0.572	1.63	-9.74
in HCl	0.357	1.23	-5.20
in $\text{HNO}_3$	$8.0 \cdot 10^{-4}$	4.78	-37.7
in $\text{H}_3\text{PO}_4$	$7.53 \cdot 10^{-7}$	7.40	-54.0

It is assumed that the oxide layer is non-homogeneous, and that its looser parts dissolve again. A constant potential is reached when an equilibrium is established between dissolution and formation of the oxide layer. This potential, however, increases with the density of the anode current. Observations over 60 - 120 hrs showed that the potential of Nb in 1 N  $\text{H}_2\text{SO}_4$  increases to almost 6v at  $2.6 \mu\text{a}/\text{cm}^2$  and to almost 2 v at

Card 2/3

Kinetics of anodic niobium oxidation

S/020/62/147/005/028/032  
B101/B186

0.5  $\mu\text{a}/\text{cm}^2$ . Short-time potentiostatic measurements (6 hrs) of the dissolution rate yield too high values. The formation of oxide layers on insulated Nb electrodes was studied under the effect of self-dissolution. In HCl and  $\text{H}_2\text{SO}_4$ , a change of the gas medium ( $\text{H}_2$ ,  $\text{O}_2$ , or air) did not affect the oxidation rate. The local current decreased immediately to a fraction of a microampere. Conclusion: Nb oxidation in electrolyte solutions is mainly based on the reaction of Nb with  $\text{H}_2\text{O}$ . The electrolyte itself affects only the structure of the resulting oxide layer and the rate of its dissolution. There are 4 figures and 1 table.

ASSOCIATION: Voronezhskiy gosudarstvennyy universitet  
(Voronezh State University)

PRESENTED: July 5, 1962, by A. N. Frumkin, Academician

SUBMITTED: June 15, 1962

Card 3/3

SHATALOV, A.Ya.; BONDAREVA, T.P.; TSYGANKOVA, L.Ye.

Anodic oxidation of vanadium and niobium. *Izv.vys.ucheb.zav.;khim.i  
khim.tekh.* 6 no.4:631-636 '63. (MIRA 17:2)

1. Voronezhskiy gosudarstvennyy universitet. Kafedra fizicheskoy khimii.

L 12680-63

ACCESSION NR: AP3000648

EWP(q)/EWI(m)/BDS

AFFTC/ASD

JD/JG

8/0080/63/036/003/0588/0594

AUTHOR: Shatalov, A. Ya.; Bondareva, T. P.; Tsy\*gankova, L. Ye.

56

TITLE: Electrochemical research on the passivation of niobium and vanadium

SOURCE: Zhurnal prikladnoy khimii, v. 36, no. 3, 1963, 588-594

TOPIC TAGS: passivation, anodizing oxides, polarization, repassivation, niobium, vanadium

ABSTRACT: The behavior of the electrode potentials of niobium and vanadium during anodic polarization in acid and caustic solutions was investigated. The potential of Nb, with constant current density, increased with time of polarization and reached a voltage of several tenths of a hundred. In the beginning sections of the polarization curves, there is a proportionality between the potential reached and the quantity of electricity, independent of the current strength applied to the electrode. The potentials of the Nb anode in hydrochloric, nitric, sulfuric, phosphoric acid solutions cannot be reduced to one but to the ohmic drop in voltage as a result of the anodizing layer of oxide. The electrode potentials of the V anode on the part of the polarization curve where ionization occurs, depend on current strength but not on the composition of the solution. Polarization tends toward negative values in proportion to the increase in the pH of the solution. Vanadium

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L 12680-63

ACCESSION NR: AP3000648

is most easily passivated in moderately caustic solutions, with the formation of an insulating layer of vanadites. With higher potentials of over 0.6 v, repassivation occurs in caustic media, which is explained by the formation of vanadate ions. Orig. art. has: 3 tables, 6 figures.

ASSOCIATION: none

SUBMITTED: 24Oct61

DATE ACQ: 12Jun63

ENCL: 00

SUB CODE: CH

NO REF SOV: 001

OTHER: 010

Card 2/2



L 16915-63

EWP(q)/EWT(m)/BDS AFFTC/ASD JD/JG S/076/63/037/004/016/029

57

56

AUTHOR: Shatalov, A. Ya., Bondareva, T. P.

TITLE: Kinetics of the anode oxidation of niobium in some electrolytes

PERIODICAL: Zhurnal fizicheskoy khimii, V. 37, No. 4, 1963, 868-874

TEXT: An investigation was made of the anode oxidation of niobium in solutions of mineral acids in order to determine the kinetic patterns of this process. Potential-time curves were obtained from the anode oxidation of pure niobium in 1N sulfuric, hydrochloric, phosphoric, and nitric acid solutions employing an external current with a density of 0.5-250  $\mu\text{A}/\text{cm}^2$ . The anode oxidation rate in the initial stages has a constant value in conformity with the linear portion of the potential-time curves. The latter then bend toward the abscissa axis; in the stationary state a balance is established between the formation and dissolving of the oxide film. After the stationary state is reached, the higher is the anode current density, the higher will be the niobium potential. Based on an analysis of the time-potential curves during the anode oxidation of niobium in the above solutions, the equation  $i = \sigma A \exp \{ (E_+ + \alpha F) F \}$  is obtained for the kinetics of the process. The constants  $A_+$ ,  $B_+$ , and  $\alpha$  have different values for solutions of different composition;  $\sigma$  is the factor of roughness; and  $F$  is the voltage of the

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16915-63

S/076/63/037/004/016/029

Kinetics of the anode oxidation of ...

electrical field. Assuming that the time dependence of the electrode potentials of niobium in the absence of external current is due to local corrosion currents resulting from the interaction of niobium and water and using the corresponding values for  $A_+$  and  $B_+$ , the values of the self-diffusion rate of niobium for solutions of 1N  $H_2SO_4$  and HCl are found to be on the order of  $10^{-7}$  a/cm<sup>2</sup>. There are 7 figures and 3 tables. The most important English-language reference reads as follows: H. A. Johanssen, G. A. Adams, P. V. Rysselberghe, J. Electrochem. Soc., 104, 339, 1957.

ASSOCIATION: Voronezhskiy gosudarstvennyy universitet (Voronezh State University),  
Voronezh

SUBMITTED: June 14, 1962

Card 2/2

L 12873-63

EWP(q)/EWT(m)/SDS AFFTC/ASD JD/JG

ACCESSION NR: AP3002934

S/0076/63/037/006/1321/1327 56

AUTHOR: Shatalov, A. Ya.; Bondareva, T. P. 55

TITLE: Kinetics of the anodic oxidation of zirconium in some electrolytes. 1. 27

SOURCE: Zhurnal fizicheskoy khimii, v. 37, no. 6, 1963, 1321-1327

TOPIC TAGS: kinetics, anodic oxidation, electrolyte, zirconium

ABSTRACT: Equations for the ionic-current strength in the anodic oxidation of zirconium in  $1N H_2SO_4$ ,  $H_3PO_4$ , and KOH solutions have been derived for steady state rates of potential growth with time, assuming that the only anodic process is the formation of a  $ZrO_2$  film. In the case of  $H_2SO_4$  and  $H_3PO_4$  calculation of the anodic current is carried out according to equation (1) shown in the enclosure. The corresponding expression for the KOH solution is of the form represented by equation (2) shown in the enclosure. On prolonged anodic oxidation of zirconium with constant density current a maximum potential value is obtained that remains constant, unless there is a break-through of the oxide film, which leads to an abrupt fall in potential. It has been suggested that under the influence of internal stresses a new formation of the oxide film in the steady state occurs at the same rate as its breakdown so that the effective thickness of the film remains constant. Orig.

Card 1/1

Voronezh St. Un.

SHATALOV, A.Ya.; MARSHAKOV, I.K.; KALUZHINA, S.A.

Thermogalvanic corrosion of metals. Part 1. Zhur. fiz. khim.  
37 no.12:2721-2727 D '63. (MIRA 17:1)

1. Voronezhskiy gosudarstvennyy universitet.

SHATALOV, A.Ya.; GLADKIKH, Yu.P.; MALYGIN, V.V.

Current drop curves in the anode oxidation of zirconium  
under potentiostatic conditions. Dokl. AN SSSR 153 no.3:  
657-660 N '63. (MIRA 17:1)

1. Predstavleno akademikom A.N. Frumkinym.

KRAVCHENKO, T.A.; SHATALOV, Ya.; YANCHUK, Ye.K.

Corrosion of aluminum in alkaline solutions with additions  
of oxidizers. Pt.1. Izv. vys. ucheb. zav.; khim. i khim. tekhn.  
7 no. 1:56-60 '64. (MIRA 17:5)

1. Veronezhskiy gosudarstvennyy universitet, kafedra fizicheskoy  
khimii.

L 9052-65 EMT(m)/EPP(n)-2/EWP(b) Pad/Pu-4 RAEM(t) MJW/JD/WV/EM/JG/HB/MLK  
ACCESSION NR: AT4043072 S/0000/64/000/000/0175/0182

AUTHOR: Shatalov, A. Ya.; Marshakov, I. K.; Kaluzhina, S. A. 29  
B

TITLE: Effect of temperature on the anodic behavior of metals in the case of corrosion by macroscopic pairs

SOURCE: <sup>18</sup>Mezhvuzovskaya konferentsiya po anodnoy zashchite metallov ot korrozii. 1st, Kazan, 1961. Anodnaya zashchita metallov (Anodic protection of metals); doklady\* konferentsii. Moscow, Izd-vo Mashinostroyeniye, 1964, 175-182

TOPIC TAGS: thermogalvanic <sup>19</sup>passivation, metal passivation, Armco iron passivation, stainless steel passivation, nickel passivation, zirconium passivation, anodic dissolution, thermogalvanic pair formation, anodic behavior

ABSTRACT: The corrosion behavior of Armco iron, <sup>18</sup>Kh13 and <sup>18</sup>Kh18N9T [AISI 321] stainless steels, <sup>18</sup>nickel, <sup>27</sup>and <sup>18</sup>zirconium under conditions of a 75C temperature gradient in acid, neutral, and alkaline electrolytes, some of which contained an additional oxidizer, has been investigated. Results of experiments showed that the current of thermo-

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ACCESSION NR: AT4043072

galvanic elements depends on the nature of the metal and the electrolyte composition; in the majority of experiments, the current density did not exceed  $10 \text{ mka/cm}^2$ . Normal thermogalvanic elements with a hot anode were formed in acid and neutral solutions. The work of these elements is controlled by the speed of the cathodic process. With increasing alkalinity of the solution the share of the anodic control increases and, in a  $\text{ln KOH} + \text{ln K}_2\text{SO}_4$  solution, reaches 69%. In this solution, the anode is the cold electrode. A similar abnormal polarity of a thermogalvanic element is also observed in neutral solutions when a strongly passivating agent (potassium bichromate) is added. Metals more susceptible to passivation (e.g., Kh13 steel) form thermogalvanic elements with an abnormal polarity (a cold anode) in neutral solutions without passivating agents. Anodic dissolution of Kh13 steel and Armco iron decelerates as the alkaline solutions are substituted for the acid ones. Analogous though somewhat more complex behavior was observed in other investigated metals. In general, normal thermogalvanic pairs with a hot anode are formed when deceleration of the anodic process is small and the thermogalvanic corrosion is controlled by the cathodic process. With a greater share of anodic control, abnormal thermogalvanic elements with a cold anode are usually

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L 9052-65

ACCESSION NR: AT4043072

formed on metals and alloys more susceptible to passivation, or in solutions containing passivating agents (bichromate ions, hydroxyl ions). Formation of the abnormal thermogalvanic elements is ascribed to a more intense passivation of the hot electrode as compared with the cold one. Orig. art. has: 6 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 13Mar64

ATD PRESS: 3105

ENCL: 00

SUB CODE: MM, IE

NO REF SOV: 007

OTHER: 003

Card 3/3

SHATALOV, A.Ya.; KRAVCHENKO, T.A.; MASLOVA, V.V.

Part 2: Iron corrosion in an uneven concentration of inhibitors  
and oxidizers in neutral solutions. Izv.vys.ucheb.zav.; khim. i  
khim.tekh. 7 no.2:227-231 '64. (MIRA 18:4)

1. Voronezhskiy gosudarstvennyy universitet, kafedra fizicheskoy  
khimii.

L 8691-65 EPA(s)-2/EWT(m)/EPF(n)-2/T/EWP(b) Pt-10/Pu-4 RAEM(c)/ASD(m)-3/ASD(r)/

AFMDC RWH/JD/JG/MLK

S/0000/64/000/000/0447/0460

ACCESSION NR: AT4043088

AUTHOR: Shatalov, A. Ya.; Bondareva, T. P.; Teygankova, L. Ye.; Khitrov, A. B. B

TITLE: Anodic behavior of zirconium, niobium, and vanadium

SOURCE: Mezhvuzovskaya konferentsiya po anodnoy zashchite metallov ot korrozii. 1st, Kazan, 1961. Anodnaya zashchita metallov. (Anodic protection of metals), doklady\* konferentsii. Moscow, Izd-vo Mashinostroyeniya, 1964, 447-460

TOPIC TAGS: zirconium, niobium, vanadium, zirconium anodic behavior, niobium anodic behavior, vanadium anodic behavior, anodic polarization, electrode potential, zirconium passivation, niobium passivation, vanadium passivation, zirconium anodic polarization, niobium anodic polarization, vanadium anodic polarization, zirconium electrode potential, niobium electrode potential, vanadium electrode potential

ABSTRACT: In an attempt to determine passivation conditions of zirconium, niobium, and vanadium, their anodic behavior has been determined. Experiments carried out with 99.99% pure zirconium.

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L 8691-65

ACCESSION NR: AT4043088

18

2

investigated. Experiments carried out with 99.996% pure zirconium, 98.7% pure niobium, and 99.7% pure vanadium in solutions of  $\text{HNO}_3$ ,  $\text{H}_3\text{PO}_4$ ,  $\text{KOH}$ , and  $\text{H}_2\text{SO}_4$  showed that the potentials of zirconium and niobium in all the electrolytes tested continuously grow with the period of application of current with a constant density, and they may reach a considerable magnitude, up to 160 v for zirconium in 1N sulfuric acid. When the current is turned off the potential drops to the original value, but with current turned on again it returns rapidly to the value it previously reached. The high potential of zirconium and niobium anodes cannot be explained solely by an ohmic voltage drop in the growing oxide film. Potentials of vanadium anode in the section of the polarization curve corresponding to the active process of ionization depend upon the current density. With the increasing pH of the electrolyte, the polarization curves shift towards negative values. Vanadium can be easily passivated in a moderately alkaline solution. In 0.01 N sulfuric acid, vanadium passivates at a current density as high as 80 ma/cm<sup>2</sup>. The introduction of substances forming insoluble compounds in the

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L 8691-65  
ACCESSION NR: AT4043088

presence of vanadite ions contributes to vanadium passivation. It is assumed that the vanadium passivation is due to the formation of a protective layer of vanadites. With potentials exceeding 0.6 v in an alkaline solution the formation of vanadate ions takes place, leading to overpassivation. Orig. art has: 7 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 13Mar64

SUB CODE: MM, GC

ATD PRESS: 3107

ENCL: 00

NO REF SOV: 004

OTHER: 016

Card 3/3

ACCESSION NR: AP4010484

S/0080/64/037/001/0103/0109

AUTHOR: Shatalov, A. Ya.; Kravchenko, T. A.

TITLE: Corrosion of aluminum and duralumin by nonuniform concentration of hydrogen peroxide

SOURCE: Zhurnal prikladnoy khimii, v. 37, no. 1, 1964, 103-109

TOPIC TAGS: aluminum, duralumin, corrosion, hydrogen peroxide

ABSTRACT: In studying the corrosion behavior of 99.99% aluminum and technical duralumin in solutions containing chloride and nitrate mixtures, with the general anion concentration maintained constant and  $H_2O_2$  added, it was shown that the  $H_2O_2$ , depending on the purity of the aluminum, anionic composition of the solution and pH, can promote as well as inhibit corrosion. Corrosive vapors develop when the  $H_2O_2$  concentration is uneven in the solution in contact with aluminum or duralumin; their effectiveness in solutions of a given composition is determined by the proportion of the oxidant concentration to the cathode and

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ACCESSION NR: AP4010484

and anode surface. The largest current strengths, measured in the corroded element on addition of 0.1N  $H_2O_2$  to the cathodic compartment, were reduced to several microamps/sq. cm. in neutral KCl and  $KNO_3$  solutions. The action of corrosive vapors with unevenly distributed  $H_2O_2$  (due to the appearance of a negatively shielded aluminum cathode established in neutral and alkaline solutions) may be the cause of localized corrosion developing not only on the anode but also on the cathode of the corroded element when the relative surface areas of these electrodes are decreased and current density is correspondingly increased. Orig. art. has: 3 tables and 5 figures.

ASSOCIATION: None

SUBMITTED: 04Jun62

DATE ACQ: 14Feb64

ENCL: 00

SUB CODE: CH, ML

NO REF SOV: 008

OTHER: 005

Card 2/2

SHATALOV, A.Ya., KRAVCHENKO, T.A.

Effect of the magnitude of the pH on the operation of corrosion  
couples arising in aluminum during uneven concentrations of  $H_2O_2$ .  
Zhur. prikl. khim. 37 no.2:326-330 F '64.

(MIRA 1989)



SHATALOV, A.Ya.;KRAVCHENKO, T.A.

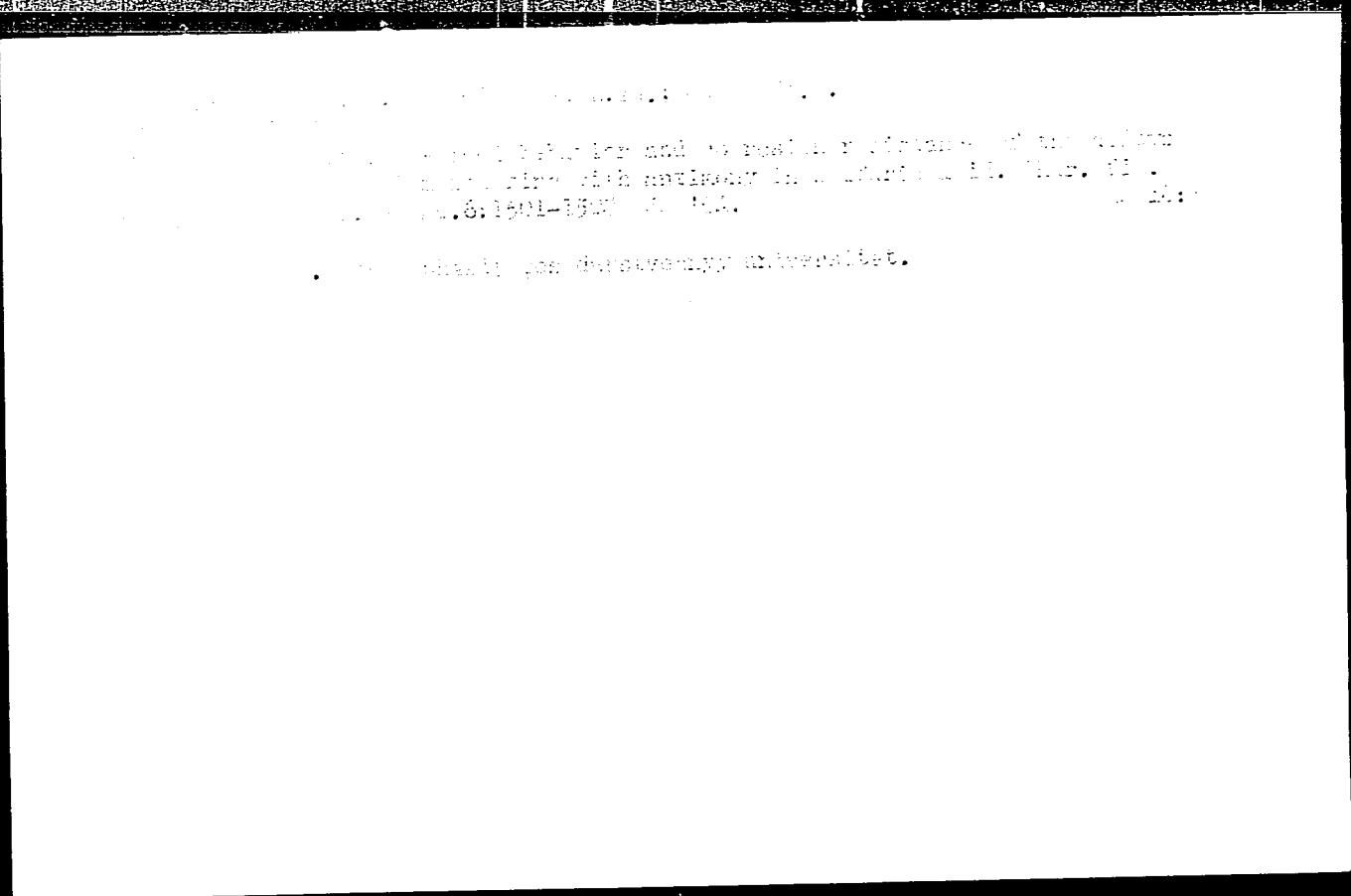
Corrosion of copper in the case of uneven distribution of  
oxidizing agents in solution. Zhur.prikl.khim. 37 no. 5:  
1057-1063 My '64. (MIRA 17:7)

1. Voronezhskiy gosudarstvennyy universitet.

SHATALOV, A.Ya.; MARSHAKOV, I.K.; KALUZHINA, S.A.

Thermogalvanic corrosion of metals. Part 2. Zhur. fiz. khim.  
32 no.2:380-385, 1956. (MIRA 17:6)

1. Voronezhskiy gosudarstvennyy universitet.



ACC NR: AK6024967 (N) SOURCE CODE: UR/0000/65/000/000/G121/G125 35 811

AUTHOR: Shatalov, A. Ya.; Markova, E. Ye.; Chernyshev, V. V.; Lavrova, N. N.

ORG: none

TITLE: Electrochemical removal of chloride ion impurities from etched aluminum capacitor foil in nitrate and borate solutions

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, 121-126

TOPIC TAGS: chloride, aluminum foil, electrolytic capacitor, electrolytic refining

ABSTRACT: An electrochemical purification of aluminum capacitor foil designed to remove adsorbed chloride ions involved cathodic treatment in neutral solutions of KNO3 and borate buffer at current densities of 6.75 x 10^-5 - 1 x 10^-4 A/cm^2. It was found that in this range the current density has practically no effect on the degree of purification of the foil, but as the duration of the cathodic treatment (cathodic polarization) is increased, the process of desorption of chloride ions becomes more complete. A batch of electrolytic capacitors prepared from foil which had undergone the

ACC No: A10024967

cathodic treatment showed that their leakage current was much smaller than in untreated capacitors, and the aging period required was also substantially reduced. Orig. art. has: 4 figures and 1 table.

SUB CODE: 11, 07, 09/ SUBM DATE: 27Nov63/ ORIG REF: 005/ OTH REF: 003

Card 2/2

blg

L 2621-66 ENT(m)/EPF(c)/EWP(t)/EWP(b) IJP(c) JD/WB  
ACCESSION NR: AP5011367 UR/0365/65/001/002/0233/0235  
620.193.01

61  
58  
B

AUTHOR: Shatalov, A. Ya.; Tsygankova, L. Ye.; Ugay, Ya. A.  
*44.55* *44.55* *44.55*

TITLE: Anodic oxidation and corrosion resistance of indium-antimony alloys  
*18* *44.55, 18* *27* *27*

SOURCE: Zashchita metallov, v. 1, no. 2, 1965, 233-235

TOPIC TAGS: anodic oxidation, corrosion resistance, corrosion resistant alloy, antimony alloy, indium containing alloy

ABSTRACT: Anodic oxidation and corrosion resistance of indium-antimony alloys (0-100% Sb) was studied electrochemically. The intermetallic InSb compound was prepared by means of partial melting of n- and p-type single crystals with current carrier concentrations of  $3.5 \times 10^{14}$  and  $2.0 \times 10^{18}$ , respectively. The corrosion resistance experiments were carried out in 1-normal H<sub>2</sub>SO<sub>4</sub> and in hydrogen atmosphere for 4 days. The anodic oxidation process was studied in solutions with pH = 0-14 at current densities of 0.01-1 mA/cm<sup>2</sup> using InSb single crystals. The stationary potentials and rate of corrosion of In-Sb alloys in 1-normal H<sub>2</sub>SO<sub>4</sub> solution are shown in fig. 1 of the Enclosure. The maximum anodizing rate and the formation of

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L 2621-66

ACCESSION NR: AP5011367

3

a tight oxide layer on the anode coincides with an intermetallic InSb compound containing 51.5% Sb. The dependence of the rate of anodic oxidation (I) and of  $\frac{d}{dt}$  (1/C) (II) in 0.1n Na<sub>2</sub>B<sub>4</sub>O<sub>7</sub> solution upon alloy composition is shown in fig. 2

of the Enclosure. The composition of the oxide layer formed on the anode containing 51.5% Sb corresponds to formula: (In<sub>2</sub>O<sub>3</sub>)<sub>7</sub>·(Sb<sub>2</sub>O<sub>3</sub>). The anodizing process is found to be independent of the type of conductivity of the anode material. Orig. art. has: 1 table, 2 figures, 1 formula.

ASSOCIATION: Voronezhskiy gosudarstvennyy universitet (Voronezh State University)

SUBMITTED: 03Sep64

ENCL: 02

SUB CODE: MM, GC

NO REF SOV: 004

OTHER: 001

Card 2/4

L 2621-66

ACCESSION NR: AP5011367

ENCLOSURE: 01

$K, \frac{g}{cm^2 \cdot hr}$

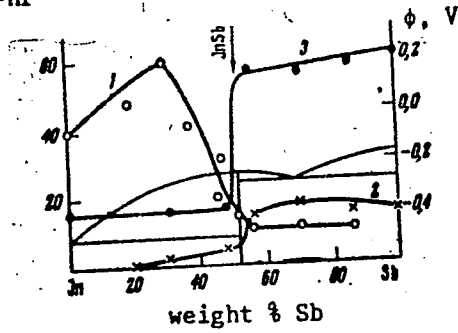


Fig. 1. 1--rate of corrosion based on indium; 2--rate of corrosion based on antimony and 3--stationary potentials in reference to a normal hydrogen electrode.

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L 2621-66

ACCESSION NR: AP5011367

ENCLOSURE: 02

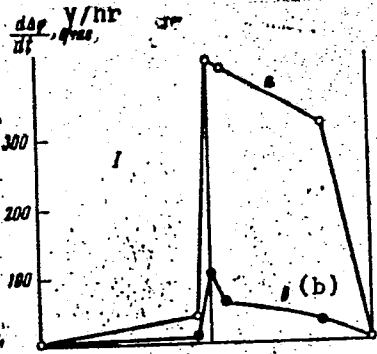
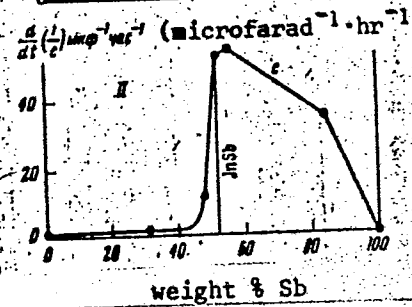


Fig. 2. a and c--0.5 mA/cm<sup>2</sup>;  
b--0.1 mA/cm<sup>2</sup>.



Card 4/4 DP

weight % Sb

L 3784-66

EWT(m)/EPF(c)/EWP(t)/EWP(b) IJP(c) JD/WB

ACCESSION NR: AP5014140

UR/0365/65/001/003/0340/0342

546.3-19'48'86

620.193'

44  
41  
03

AUTHOR: Shatalov, A. Ya.; Tsygankova, L. Ye.; Ugay, Ya. A.

TITLE: Anodic oxidation and corrosion resistance of cadmium-antimony alloys

SOURCE: Zashchita metallov, v. 1, no. 3, 1965, 340-342

TOPIC TAGS: cadmium alloy, antimony alloy, corrosion resistance, anodic oxidation

ABSTRACT: The authors study the behavior of cadmium-antimony alloys during anodic oxidation in silutions of various composition. The corrosion resistance of this system was studied in detail in a previous paper (*Zh. fiz. khimi*, 1964, 38, 1501). The rate of anodic oxidation for this system is experimentally plotted as a function of alloy composition in buffer solutions with various pH values. The solutions are mixtures of 0.1N Na<sub>2</sub>B<sub>4</sub>O<sub>7</sub> and 0.1N NaOH taken in definite proportions. A direct relationship is found between oxidation rate and corrosion resistance in these alloys. In the Sb-content range from 52 to 92 wt. % the rate of anodic oxidation

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L 3784-66

ACCESSION NR: AP5014140

3

reaches a maximum with a simultaneous sharp reduction in the self-dissolution of these alloys which takes place when the limit of corrosion resistance is passed. This region is reflected on the phase diagram by the stable intermetallic compound CdSb and a heterophase alloy with an excess of antimony. Since the corrosion resistance of antimony-rich Cd-Sb alloys is highest, it is concluded that the capacity for anodic oxidation is directly connected with the protective properties of the oxide film which is formed, and consequently this capacity is determined by the structure of the film and by the composition of the solution in which the process takes place. The alloys have the capacity for anodic oxidation only in those pH regions where the oxide film is stable. Orig. art. has: 2 figures.

ASSOCIATION: Voronezhskiy gosudarstvennyy universitet (Voronezh State University)

SUBMITTED: 01Oct64

ENCL: 00

SUB CODE: MM

NO REF SOV: 005

OTHER: 000

4,55

PC  
Card 2/2

L 00936-66 EWP(e)/EWT(m)/EPF(c)/EWP(i)/EPF(n)-2/EWA(d)/EWP(t)/EWP(b) IJP(c)  
JD/JG/WB

ACCESSION NR: AP5019728

UR/0153/65/008/003/0411/0415

AUTHOR: Shatalov, A. Ya.; Marshakov, I. K.; Kaluzhina, S. A.

38  
22  
B

TITLE: Thermogalvanic corrosion of iron and steel

SOURCE: IVUZ. Khimtya i khimicheskaya tekhnologiya, v. 8, no. 3, 1965, 411-415

TOPIC TAGS: thermogalvanic corrosion, carbon steel, steel corrosion, iron corrosion

ABSTRACT: The cause of thermogalvanic corrosion is the difference in electrochemical potentials assumed by a metal at the boundary with a solution of a different temperature. The thermogalvanic corrosion of armco iron in solutions of various acidities with a constant total content of  $SO_4^{2-}$ ,  $NO_3^-$ ,  $Cl^-$ , and  $Br^-$  ions was studied, and it was shown that the most effective thermogalvanic macrocouples causing a virtually complete concentration of the weight losses on the anodic areas are formed in alkaline media. The introduction of oxidizing admixtures ( $HNO_3$ ) into the solution at pH 1 led to a sharp increase in the overall thermogalvanic effectiveness of the macrocouples. A study of the thermogalvanic corrosion of carbon steels in acid sulfate solutions revealed an increase in the overall thermogalvanic effectiveness with a rise in the carbon content; this corresponded to a decline in the corrosion resistance of the alloys. Other things being equal, the intensity of the thermogal-

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L 00936-66

ACCESSION NR: AP5019728

6  
vanic couples decreased in the case of alloy steels when additional alloying components (titanium, boron, molybdenum) were introduced into the alloy, and the corrosion was substantially concentrated on the hot (80C) electrode. Orig. art. has: 5 figures and 4 tables.

ASSOCIATION: Kafedra fizicheskoy khimii, Voronezhskiy gosudarstvennyy universitet  
(Department of Physical Chemistry, Voronezh State University)

SUBMITTED: 20Mar64

ENCL: 00

<sup>55,44</sup>  
SUB CODE: MM

NO REF SOV: 001

OTHER: 000

Card 2/2 *dy*

KRIVONERKOV, T.A.; SHATALOV, A.Ya.

Metal corrosion by nonuniform concentrations of hydrogen peroxide in solutions with a variable pH value. Zashch. met. 1 no.5:583-585 8-0 '65. (MIRA 18:9)

1. Voronezhskiy gosudarstvennyy universitet i Voronezhskiy tekhnologicheskii institut.

L 65024-65 EWT(m)/EPF(c)/T/EWP(t)/EWP(b)/EWA(c) IJP(c) JD/WB  
ACCESSION NR: AP5022149 UR/0364/65/001/009/1118/1123  
.541.13:621:315.592

AUTHOR: Shatalov, A. Ya.; Tsygankova, L. Ye.; Ugay, Ya. A.  
44 44 38  
36

TITLE: Anodic oxidation of certain intermetallic compounds  
44 14 B

SOURCE: Elektrokimiya, v. 1, no. 9, 1965, 1118-1123

TOPIC TAGS: intermetallic compound, anodic oxidation, indium compound, antimonide,  
arsenide, cadmium compound, zinc compound, semiconductor single crystal, electrode  
potential, compound semiconductor, indium arsenide, indium antimonide, zinc anti-  
monide, cadmium antimonide, anodic oxide film, dielectric film

ABSTRACT: The kinetics of anodic oxidation of intermetallic compounds InAs, InSb, ZnSb, and CdSb, and the dielectric properties of anodic oxide films formed on these compounds have been studied because of the steadily increasing use of the compounds in semiconductor technology. Single crystals of the intermetallic compounds, of p- or n-type conductivity, were grown by Bridgman or zone-melting techniques and were oxidized in 0.1 N borax solution at a constant current density in the 1-1000  $\mu\text{amp}/\text{cm}^2$  range. The growth rate of oxide films,  $d\Delta\phi/dt$ , was evaluated from the increase in electrode potential with time. The constants in the equations for

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L 65024-65

ACCESSION NR: AP5022149

2

anodic oxidation rate, specific rate of oxidation  $R_1 = i^{-1}d\Delta\phi/dt$ , and electrolytic parameters in the kinetic equation of the oxidation process were determined and tabulated for each of the compounds studied. The data indicated that InAs and InSb are oxidized faster than ZnSb and CdSb. Chemical analysis of the oxide films indicated the presence and the relative proportions of the oxides of both components of the binary compounds. The dielectric constant,  $D$ , of the films was determined by measuring the rate of decrease in capacitance  $dC^{-1}/dt$  of the electrode during oxidation and calculating  $D$  from the plot of  $dC^{-1}/dt$  vs anodic current density using the capacitance formula for a plate condenser. Values of  $D$  were found to be 9.1; 19.1; 17.7, and 14.6 for InAs, InSb, ZnSb, and CdSb, respectively. The study of oxidation kinetics of the four compounds at different pH (2-12) confirmed the better anodizing capability of the zinc blend-type structures such as InAs and InSb. [JK]

Orig. art. has: 5 figures, 5 tables, and 4 equations.

ASSOCIATION: Voronezhskiy gosudarstvennyy universitet (Voronezh State University).

SUBMITTED: 24Dec64

ENCL: 00

SUB CODE:SSGC

NO REF SOV: 001

OTHER: 008

ATD PRESS: 4062

Card 2/2 *mlw*



L 1660-66 EWT(1)/EWT(m)/EPF(c)/EWG(m)/EWP(t)/EWP(b) JD/WB

ACCESSION NR: AP5021414

UR/0076/65/039/008/1880/1885  
620.191/.193

AUTHOR: Shatalov, A. Ya.; Marshakov, I. K.; Kaluzhina, S. A.

26  
23  
B

TITLE: Study of the thermogalvanic corrosion of metals. Part 3. Electrochemical principles of thermogalvanic corrosion

SOURCE: Zhurnal fizicheskoy khimii, v. 39, no. 8, 1965, 1880-1885

TOPIC TAGS: thermogalvanic corrosion, thermogalvanic cell

ABSTRACT: Thermogalvanic corrosion results from the combined action of a macrocouple arising upon immersion of different areas of a metal surface having different temperatures in an electrolyte, and inherent microcells operating in the hot and cold zone. In the case of couples with reversible electrodes, the rate of transfer of a substance from the anode to the cathode, which is proportional to the current intensity of the thermogalvanic cell, is related directly to the magnitude of the exchange current and may be represented by an equation of the form

$$I_r = \text{const} [Me^{n+}]^b,$$

Card 1/2

L 1660-66

ACCESSION NR: AP5021414

3  
where  $I_T$  is the thermogalvanic current. For thermogalvanic cells with irreversible electrodes operating in acid media, the thermogalvanic current arising therein is a linear function of the product of the spontaneous dissolution rate of the isolated electrode by the shift of its potential from the initial steady-state value, a shift taking place when the couple is closed. The latter rule holds with regard to the effect of the solution composition as well as the effect of the nature of the metal itself - factors which determine the overall rate of spontaneous dissolution of isolated electrodes of a thermogalvanic cell. Orig. art. has: 5 figures and 6 formulas.

ASSOCIATION: Voronezhskiy gosudarstvennyy universitet (Voronezh State University) <sup>U.S.S.R.</sup>

SUBMITTED: 15Jan64

ENCL: 00

SUB CODE: MM

NO REF SOV: 007

OTHER: 002

Card 2/2 DP

SHATALOV, A.Ya.; TSYGANKOVA, L.Ya.; UGAY, Ya.A.

Anodic oxidation of some intermetallic compounds. *Elektrokhimiya*  
1 no.9:1113-1123 3 '65. (MIRA 13:10)

1. Voronezhskiy gosudarstvennyy universitet.

BOGGIN, H.A.; SHATALOV, A.Ya.

Use of polarization curves for determining the inhibition degree of anodic and cathodic partial processes in acid iron corrosion in inhibited solutions with various temperatures. Zhur. fiz. khim. 39 no.4:1025-1027 Ap '65.

(MIRA 19:1)

1. Institut obshchey i neorganicheskoy khimii AN SSSR, Moskva. Submitted Nov. 22, 1963.

SHATALOV, A.Ya.; MARSHAKOV, I.K.; KALUZHLINA, S.A.

Effect of temperature on the effectiveness of thermogalvanic  
couple. Zhur. fiz. khim. 39 no.9:2278-2281 S '65.

(MIRA 1965)

1. Voronezhskiy gosudarstvennyy universitet.

L 30179-66 ENT(m)/EWP(t)/ETI IJP(c) JD/NB

ACC NR: AP6014262

SOURCE CODE: UR/0153/66/009/001/0048/0052

AUTHOR: Gladysheva, V. P.; Shatalov, A. Ya.

ORG: Physical Chemistry Department, Voronezh State University (Kafedra fizicheskoy khimii, Voronezhskiy gosudarstvennyy universitet)

TITLE: Effect of hydrogen ion concentration on the work of differential aeration couples

SOURCE: IVUZ. Khimiya i khimicheskaya tekhnologiya, v. 9, no. 1, 1966, 48-52

TOPIC TAGS: hydrogen ion, concentration, solution kinetics, corrosion rate, zinc, cadmium, molybdenum

ABSTRACT: The effect of solution pH on the behavior of metals in differential aeration was investigated in order to compare the change in the overall rate of spontaneous dissolution of the metal, which is determined by the pH, with corresponding changes of the indices characterizing the work of macrocorrosion couples due to differential aeration. The current intensity  $I$ , degree of localization of weight losses on anodic portions  $\gamma$  of macrocorrosion couples formed on zinc, cadmium, and molybdenum as a result of differential aeration, and fraction of weight loss of the anodic portion due to the work of the macrocouple  $w$  were studied as functions of the pH. The  $I$  - pH curves were identical in form to the curves representing the corresponding

UDC: 620.193

Card 1/2

S/032/62/028/012/020/023  
B104/B186

AUTHORS: Shatalov, B. I., and Levinskiy, M. I.

TITLE: A small centrifugal pump for aggressive media

PERIODICAL: Zavodskaya laboratoriya, v. 28, no. 12, 1962, 1525

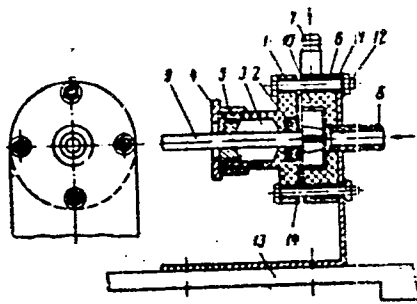
TEXT: A centrifugal pump (Fig. 1) was designed consisting of a plexiglass body (1), a ball bearing (2), a stuffing box (3), a sealing device (4), (5), a cover (6) with the mouthpieces (7), (8). The centrifugal wheel is a four-vaned blade wheel with a textolite shaft (9). The pump is designed for operation by an M-2 (MSh-2) or DM-2 (DShS-2) motor (220 v, 0.5 a, 40 w, 3000 rpm) of the type normally employed to drive sewing machines. The pump has a delivery of 200-250 liters per hour. It has been in use for some time to fill containers and dosing devices with hydrochloric acid and alkali. [Abstracter's note: Complete translation.] There is 1 figure.

Fig. Centrifugal pump for aggressive media. Legend: (10) blade wheel, (11) fastening plate, (12) pin, (13) support, (14) gasket.

Card 1/2

A small centrifugal pump for...

S/032/62/028/012/020/023  
B104/B186



Sheet 2/3



SHATALOV, D.; TOLSTOV, A.

Construction in Lipetsk. Stroitel' no.5:3-8 My '60.  
(MIRA 13:8)

1. Nachal'nik Upravleniya stroitel'stva Lipetskogo sovnarkhoza  
(for Shatalov). 2. Spetsial'nyy korrespondent zhurnala  
"Stroitel'" (for Tolstov).  
(Lipetsk--Building)

SHATALOV, D.A.

Building the Palace of Culture and Science in Warsaw. Mekh. trud. rab.  
7 no.11:35-38 D '53. (MLBA 6:12)

1. Zamestitel' nachal'nika Upravleniya stroitel'stva.  
(Warsaw--Building) (Building--Warsaw)

SHATALOV, D.A., inzhener.

Prestressed reinforced concrete construction elements. Strei.prem.34  
no.7:42-45 JI '56. (MIRA 9'9)  
(Prestressed concrete)

45458

S/892/62/000/001/021/022  
B102/B186

21.6000

AUTHORS: Doroshenko, G. G., Shatalov, G. A.

TITLE: Separation of the pulses from fast neutrons and gamma quanta in a fast-neutron time-of-flight spectrometer

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniya, no. 1, 1962, 137-149

TEXT: If the neutron pulses are separated from the gamma pulses (cf. Izv. AN SSSR, ser.fiz.,25,no.1,152,1961) the construction of a fast-neutron time-of-flight spectrometer can be considerably simplified. Such an instrument is described. It operates with two transmitters which are ФЭУ-33 (FEU-33) photoelectronic multipliers with stilbene crystals (30 · 10 mm and 30 · 30 mm). The first is a usual transmitter (time operation); the second serves for pulse separation. The block diagram of the spectrometer and the circuit diagrams of the transmitters, the pulse-forming unit and the converter are given and discussed in detail. The characteristics of the mixer tube were investigated under various operational conditions. The spectrometer was calibrated using a

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S/892/62/000/001/021/022  
B102/B186

Separation of the pulses from fast ...

$^{60}\text{Co}$  source placed in the middle between the two transmitters; in  $\gamma$ - $\gamma$  coincidence measurements the time resolution was  $3.14 \cdot 10^{-9}$  sec. For checking the spectrometer the neutron spectrum of a Po-Be source arranged with  $L=1$  m was determined. The neutrons of the Po-Be source were produced in the reaction  $\text{Be}_4^9 + \text{He}_2^4 \rightarrow \text{C}_6^{13} \rightarrow \text{C}_6^{12} + n + (Q - E_1)$  where the reaction energy  $Q=5.75$  Mev, and  $E_1$  is the excitation energy of the  $\text{C}_6^{12}$  nucleus. Since  $E_0=0$ ,  $E_1=4.43$  Mev and  $E_2=7.65$  Mev, three neutron groups could be expected. However, as only the first level de-excites via gamma emission,  $E_2$  in at least 99.97% via  $\alpha$ -emission, only the 4.43-Mev group was recorded. The spectrum recorded was not discrete but continuous, which is attributed to changes of the  $\alpha$  and neutron energies due to ionization losses or differences in the direction of emission. The results are shown in Fig. 8, compared with theoretical calculations and foreign results. There are 9 figures.

Card 2/4

Separation of the pulses from fast ...

S/892/62/000/001/021/022  
B102/B186

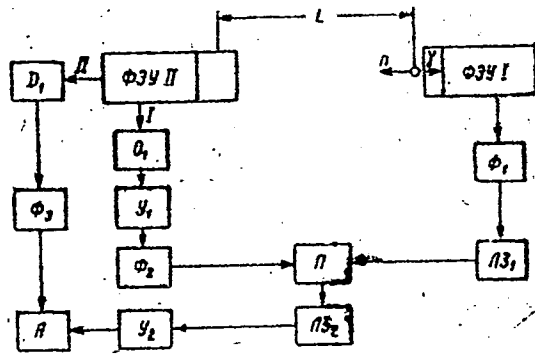


Fig. 1. Block diagram of the spectrometer.

$O_1$  - limiter;  $\Phi_{1,2,3}$  - pulse-forming circuits;  $Y_{1,2}$  - amplifiers;  
 $\Pi_{3,1,2}$  - delay lines;  $D_1$  - discriminator;  $\Pi$  - converter;  $A$  - multi-channel analyzer.

Card 3/4

Separation of the pulses from fast ...

S/892/62/000/001/021/022  
B102/B186

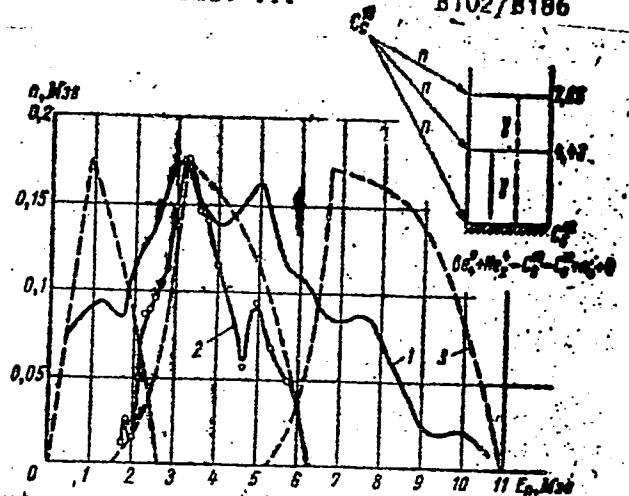


Fig. 8. The Po-Be neutron spectrum (2) compared with the theoretical spectrum (3) obtained in qualitative approximation, and with the spectrum (1) obtained from photoemulsion experiments (Phys. Rev. 78,799,1950).

Card 4/4

NESMEYANOV, A.N.; NOGINA, O.V.; BERLIN, A.M.; GIRSHOVICH, A.S.; SHATALOV, G.V.

Acyl and alkoxy derivatives of bis-(cyclopentadienyl)titanium and  
the refraction increment of the  $-C_5H_5Ti$  group. Izv. AN SSSR  
Otd.khim.nauk no.12:2146-2151 D '61. (MIRA 14:11)

1. Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR.  
(Titanium compounds)



L 91103-62 EWT(e)/EWP(j)/T IJP(c) RM

ACC NR: AR6021268 (A) SOURCE CODE: UR/0081/66/000/004/S030/S030

AUTHOR: Mikhant'yev, B. I.; Shatalov, G. V.TITLE: Polymerization of piperylene. Report 2. Polymerization of trans- and cis-piperylene in the presence of the diisobutylaluminum chloride and alcoholic cobaltous chloride complex catalytic system

SOURCE: Ref zh. Khim, Part II, Abs. 4S188

REF SOURCE: Tr. Labor. khimii vysokomolekul. soyedineniy. Voronozhsk. un-t, vyp. 3, 1964, 83-86

TOPIC TAGS: catalytic polymerization, alkene, polymerization catalyst, tensile strength, elongation, fluid viscosity

ABSTRACT: Pure isomers were separated from the amylene-piperylene fraction. Polymerization was carried out for 8-10 hours at 20° in dry oxygen-free argon in glass ampoules in 20-30% solution in absolute benzene. Catalyst was 3% diisobutylaluminum chloride (I) and 0.01-0.02% CoCl<sub>2</sub> on the weight of the monomer. Percentage of conversion was 75-85%. The polymer consists primarily of 1,4- and 1,2-cis groups. Decreasing the amount of the alcoholic CoCl<sub>2</sub> complex does not cause a change in the polypiperylene structure but reduces  $[\eta]$ . Reducing the amount of I to

Card 1/2

L 41103-66

ACC NR: AR6021268

2

2% and reducing reaction time leads to a decrease in polymer yield and  $[\eta]$ . The latter is also reduced by raising the temperature to  $40^{\circ}$ . A carbon black vulcanizate of the polymer has a tensile strength of 160 and  $101 \text{ kg/cm}^2$  at  $20^{\circ}$  and  $100^{\circ}$  and relative elongation of 760 and 490%, respectively. Report 1, see R. Zh. Khim., 1964, 24S175. I. Gritskova.  
[Translation of abstract].

SUB CODE: 07

Card 2/2 11b

SOBOLEV, V.S., akademik, red.; SHATALOV, G.Y.[translator];  
STARIKOVA, L.N., red.; GRIBOVA, M.P., tekhn.red.

[Problems of theoretical and experimental petrology] Vop-  
rosy teoreticheskoi i eksperimental'noi petrologii; sbor-  
nik statei. Moskva, Izd-vo inostr. lit-ry, 1963. 530 p.  
Translated from the English. (MIRA 16:12)  
(Petrology)

24405

S/024/61/000/002/003/014  
E113/E13526.5100

AUTHORS: Kulik, L.M., and Shatalov, G.Ye. (Moscow)

TITLE: Unsteady heat transfer in composite slabs

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Energetika i avtomatika, 1961, No.2, pp. 72-77

TEXT: This work gives the analytical solution of the unsteady heat conduction equation for a composite plain slab consisting of  $n$  layers with general boundary conditions in case of internal heat sources being present. The system of differential equations describing the heat distribution in the composite slab consisting of  $n$  layers of differing properties is:

$$\frac{\partial t_i}{\partial \tau} = a_i \frac{\partial^2 t_i}{\partial x^2} + P_i(x)W_i(\tau) \quad (1)$$

where the term  $P_i(x)W_i(\tau)$  represents the internal heat sources varying in time and space. The boundary conditions at the free surfaces are given in general form from which, by suitable choice of coefficients, it is possible to obtain an expression for each

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