

L 24575-66

ACC NR: AP6009671

the obtained plots of the ultrasound absorption against the loading it is concluded that securing of dislocations during the earlier stages of the programmed loading is possible. At large degrees of deformation, a maximum of ultrasound absorption is observed. The results are interpreted from the point of view of the dislocation theory of absorption developed by A. Granat and K. Lucke (J. Appl. Phys. v. 28, 583, 1956). Orig. art. has: 3 figures, 5 formulas, and 1 table. 0

SUB CODE: 20/ SUEM DATE: 28Jul65/ ORIG REF: 006/ OTH REF: 001

Card

3/3 BK

40307-16  
ACC NR: AP6017310 (N) SOURCE CODE: UR/0126/66/021/005/0774/0778

AUTHORS: Gindin, I. A.; Neklyudov, I. M.; Finkel', V. A.; Shubin, Yu. V.

ORG: Physico-technical Institute, AN UkrSSR (Fiziko-tekhnicheskiy institute AN UkrSSR)

TITLE: Effects of programmed loading on the plasticity of beryllium monocrystals

SOURCE: Fizika metallov i metallovedeniye, v. 21, no. 5, 1966, 774-778

TOPIC TAGS: beryllium, metal property, metal crystal, crystal property, plasticity

ABSTRACT: The effects of preliminary programmed loading at 400C on the subsequent mechanical properties of beryllium monocrystals at room temperature were investigated. One set of specimens (99.6% pure, with base plane oriented at 45° to the loading axis) was loaded (0, 5, 6, and 10 kg/mm<sup>2</sup>) and tested in compression. Another set (99.9% pure, base plane and <1010> direction coincided with loading axis) was loaded (0, 4.3, and 5 kg/mm<sup>2</sup>) and tested in tension. It was found that the room temperature yield stress  $\sigma_s$  and relative compressibility  $\epsilon$  were 9.6, 11.3, 11.0, and 9.8 kg/mm<sup>2</sup> and 10.7, 17.7, 24.7 and 11.2% respectively for the preloading conditions of the first set of specimens and 14.5, 16.1, and 12.4 kg/mm<sup>2</sup> and 29, 36, and 39.5% respectively for the second set. Elongation was 54, 53, and 64% respectively for the second set. X-ray diagrams of the preloaded monocrystals are also presented. Orig. art. has: 5 figures.

SUB CODE: 11, 13/ SUBM DATE: 31May65/ ORIG REF: 006/ OTH REF: 006

Card 1/1 MLP

UDC: 539.37:546.45

EWI(m)/EWP(w)/EWP(t)/ETI/EWP(k) IJP(c) JD/HW  
ACC NR: AP6033052 SOURCE CODE: UR/0126/66/022/002/0254/0261

AUTHOR: Gindin, I. A.; Starodubov, Ya. D.; Zakharov, V. I. 43

ORG: Physicotechnical Institute, AN UkrSSR (Fiziko-tehnicheskii institut AN UkrSSR) 8

TITLE: Investigation of the effect of low-temperature deformation on the creep resistance of nickel and copper at high temperatures 18

SOURCE: Fizika i metallov i metallovedeniye, v. 22, no. 2, 1966, 254-261 21 21

TOPIC TAGS: nickel, creep, ~~resistance~~, copper, ~~creep resistance~~, ~~nickel~~, ~~mechanothermal treatment~~, ~~copper~~, ~~mechanothermal treatment~~ mechanical heat treatment, rupture strength

ABSTRACT: Specimens of oxygen-free copper (99.98%-pure) and vacuum-melted nickel (99.95%-pure), vacuum-annealed at 1050C (nickel) and 900C (copper) for 4 hr, were subjected to low temperature mechanothermal treatment (LMTT) stretched by 3.7% (nickel) or 8% (copper) at 4.2 and 300K, and "annealed" at room temperature for about 100 hr. The specimens were then tested for creep resistance at temperatures ranging from 500C to 1000C. It was found that LMTT improved considerably the rupture life of both metals. For instance (see Fig. 1), the rupture life of untreated nickel specimens at 800C under a stress of 1.3 kg/mm<sup>2</sup>

Card 1/2

UDC: 548.0:539

L 08716-67

ACC NR: AP6033052

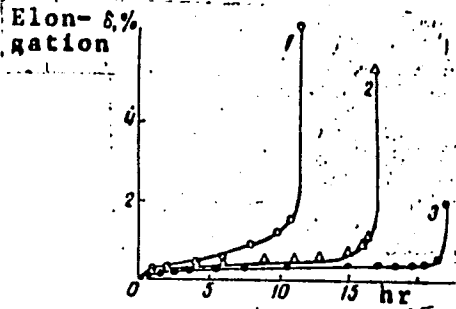


Fig. 1. Primary creep curves of nickel at 800C under a stress of 1.3 kg/mm<sup>2</sup>

1 - Untreated specimen; 2 and 3 - specimens stretched at 300 and 4.2K, respectively.

was 11.3 hr, the elongation was 6.5%; the rupture life of specimens deformed at 300 and 4.2K was 17 and 22 hr, and the elongation was 5.8 and 2.0%, respectively. The creep resistance of copper specimens was similarly affected by LMTT. The effect of LMTT on creep behavior is preserved at temperatures up to 1000C for nickel and up to 700—750C for copper. Orig. art. has: 3 figures and 3 tables.

SUB CODE: 13, 11/ SUBM DATE: 10Aug65/ ORIG REF: 011/ OTH REF: 001

Card 2/2 nst

ACC NR: AP7004567 SOURCE CODE: UR/0126/66/021/004/0600/0607  
AUTHOR: Gindin, I. A.; Godzhayov, V. M.; Lazarova, H. B.; Starodubov, Ya. D.  
ORG: Physicotechnical Institute, AN UkrSSR (Fiziko-tokhnichosky institut AN UkrSSR)  
TITLE: Low-temperature creep of lithium in the region of polymorphous transformation  
SOURCE: Fizika metallov i metallovodeniye, v. 21, no. 4, 1966, 600-607  
TOPIC TAGS: creep, metal deformation

ABSTRACT: A study was made of creep in Li at 300, 180 and 77 K., encompassing the polymorphous transformation range. The electrical resistance of specimens during the creep process was measured. It is shown that for long-term low-temperature creep of Li, the creep curves show three stages, instantaneous deformation, a transitional stage and a stage of steady flow. At 77 K. the logarithmic rule of the transitional stage of creep is valid up to those values of stress at which polymorphous transition is absent or weakly defined. Creep curves of single-phase specimens at 300 K. even in the case of low stresses, do not comply with the logarithmic rule. A maximum of electrical resistance during creep at 77 K. was found which decreases in a steady pattern in specimens previously strained at 77 K. Orig. art. has: 8 figures.  
[JPRS: 36,774]

SUB CODE: 20 / SUBM DATE: 09Mar65 / ORIG REF: 005 / OTH REF: 009

Card 1/1

UDC: 539.292:539.376  
0926 1425

ACC NR: AP6022042

(A)

SOURCE CODE: UR/0120/66/000/003/0225/0226

AUTHOR: Gindin, I. A.; Starodubov, Ya. D.; Kravchenko, S. F.; Lazareva, M. B.

ORG: Physico-Technical Institute, AN UkrSSR, Khar'kov (Fiziko-tekhnicheskiy institut AN UkrSSR)

TITLE: A device for rolling metals at temperatures of 4.2-300°K

SOURCE: Pribory i tekhnika eksperimenta, no. 3, 1966, 225-226

TOPIC TAGS: low temperature physics, low temperature metal, low temperature research, metal rolling

ABSTRACT: The device is used to measure the electrical resistance of deformed samples and for carrying out heat treatment in the temperature range from 4.2 to 1000°K. The basic characteristics of the setup are as follows: roller diameter--30 mm; operating length of the rollers--20 mm; rolling speed--1 and 10 mm/min; initial cross section of samples--from 3 to 5 mm<sup>2</sup> (depending on the material). The thickness of the foil obtained is on the order of ten microns. For example, for copper at 20°K, the thickness is 20-30 microns. Orig. art. has: 1 figure.

SUB CODE: 11,20,13/

SUBM DATE: 24Apr65/

ORIG REF: 002/

OTH REF: 002

UDC: 621.59:621.771

Card 1/1

ACC NR: AP7001543

SOURCE CODE: UR/0020/66/171/003/0552/0554

AUTHOR: Gindin, I. A.; Starodubov, Ya. D.; Lazareva, M. B.; Lazarev, B. G.  
(Academician AN UkrSSR)

ORG: Physicotechnical Institute Academy of Sciences UkrSSR (Fiziko-tekhnicheskiy institut Akademii Nauk UkrSSR)

TITLE: Low-temperature recrystallization of copper rolled at 77 and 20K

SOURCE: AN SSSR. Doklady, v. 171, no. 3, 1966, 552-554

TOPIC TAGS: copper, low temperature deformation, ~~copper~~<sup>metal</sup> deformation, ~~copper~~<sup>metal</sup> recrystallization, recrystallization temperature, recrystallization activation energy, *metal rolling, grain size, metal physical property*

ABSTRACT: Specimens of 99.98%-pure copper with an initial grain size of 100 μ were rolled at 293, 77, and 20K with a 10% reduction per pass and a total reduction of 90%. The specimens were rolled at a speed of 10 mm/min and immediately annealed at 293-468K. X-ray diffraction pattern examination showed that low-temperature deformation decreased the grain size, produced noticeable microdistortion in the lattice, and significantly reduced the temperature of the beginning of recrystallization. Copper deformed with a 90% reduction recrystallized even at room temperature. The lower the deformation temperature, the sooner the recrystallization begins. For instance, in copper rolled at 20K the recrystallization begins after 19 hr, while in copper rolled at 77K-after 2.5 month. With decreasing deformation tempera-

Card 1/2

UDC: 539.2

ACC NR: AP7001543

ture from 293 to 20K, the activation energy was found to decrease from 33 to 18 kcal/g-atom. This fact, and also the lowering of the recrystallization temperature, is caused by an increase in the latent deformation energy and by a higher metastability of the crystalline body. The low-temperature recrystallization makes it possible to investigate the metal recrystallization, taking into account the temperature conditions of the activation work straining, and to develop metal structures with special physical properties. V. V. Kozinets and M. P. Starolat are thanked for their assistance in the experiments. Orig. art. has: 2 figures.

SUB CODE:11,2913/SUBM DATE: 15Jul66/ ORIG REF: 008

Card 2/2



ACC NR: AF7005206

SOURCE CODE: UR/0185/66/011/011/1243/1246

AUTHOR: Hindin, Y. A.--Gindin, I. A.; Malik, H. M.--Malik, G. N.; Nechvolod, M. K.--Nechvolod, N. K; Starodubov, Ya. D.

ORG: Physicotechnical Institute AN UkrSSR (Fiziko-tekhnicheskij institut AN UkrSSR); Pedagogical Institute, Khar'kov (Pedagogicheskij institut)

TITLE: Effect of ultrasonic irradiation on the creep of LiF single crystals, II.

SOURCE: Ukrayins'ky fizychnyy zhurnal, v. 11, no. 11, 1966, 1243-1246

TOPIC TAGS: lithium fluoride, creep, ultrasonic irradiation, crystal dislocation phenomenon, plastic deformation, crystal defect

ABSTRACT: Part I is published in the same issue as part II, which reports an investigation of the influence of prior low-intensity ultrasonic irradiation on the creep of single crystals of LiF to which the load was applied in steps, and the influence on the change in the dislocation structure. The investigations were made on single crystals measuring  $1.5 \times 2 \times 5$  mm having a dislocation density  $6 \times 10^4 - 1 \times 10^5$   $\text{cm}^{-2}$ . The method of preparing the samples and their etching are described in part I. The creep tests were made under uniaxial compression and under identical conditions. The results show that prior irradiation weakens the samples, leading to an increase in the plastic deformation and to an increase in the creep rate. Prior ultrasonic irradiation also contributes to the lowering of the stress required for the transition from the deformation damping stage to the stage where the deformation increases

Cord 1/2

ACC NR: AP7005206

rapidly under stepwise creep conditions. The results are interpreted from the point of view that the ultrasound lowers the potential barrier for the motion of the dislocations in the crystal and facilitates their motion. It is also possible that point defects are produced under the influence of the ultrasound. Orig. art. has: 5 figures.

SUB CODE: 20, 11/

SUBM DATE: 31Jan66/

ORIG REF: 004/

OTH REF: 008

Card 2/2

KUPERMAN, Yakov Mironovich, kand.ekon.nauk; YAKUSHEV, Pavel Mikheylovich. Prinsipal uchastiye: GINDIN, I.P., kand.ekon.nauk;  
BIRMAN, A.M., kand.ekon.nauk, red.; KUTSENOVA, A.A., red.izd-va;  
ML'KINA, E.M., tekhn.red.; GILENSON, P.G., tekhn.red.

[Working capital of construction organizations] Oborotnye sredstva stroitel'nykh organizatsii. Moskva, Gos.izd-vo lit-ry po stroit., arkhitekt. i stroit.materialam, 1959. 159 p.

(MIRA 12:8)

(Construction industry--Finance)

GINDLIN, I.M., inzh.

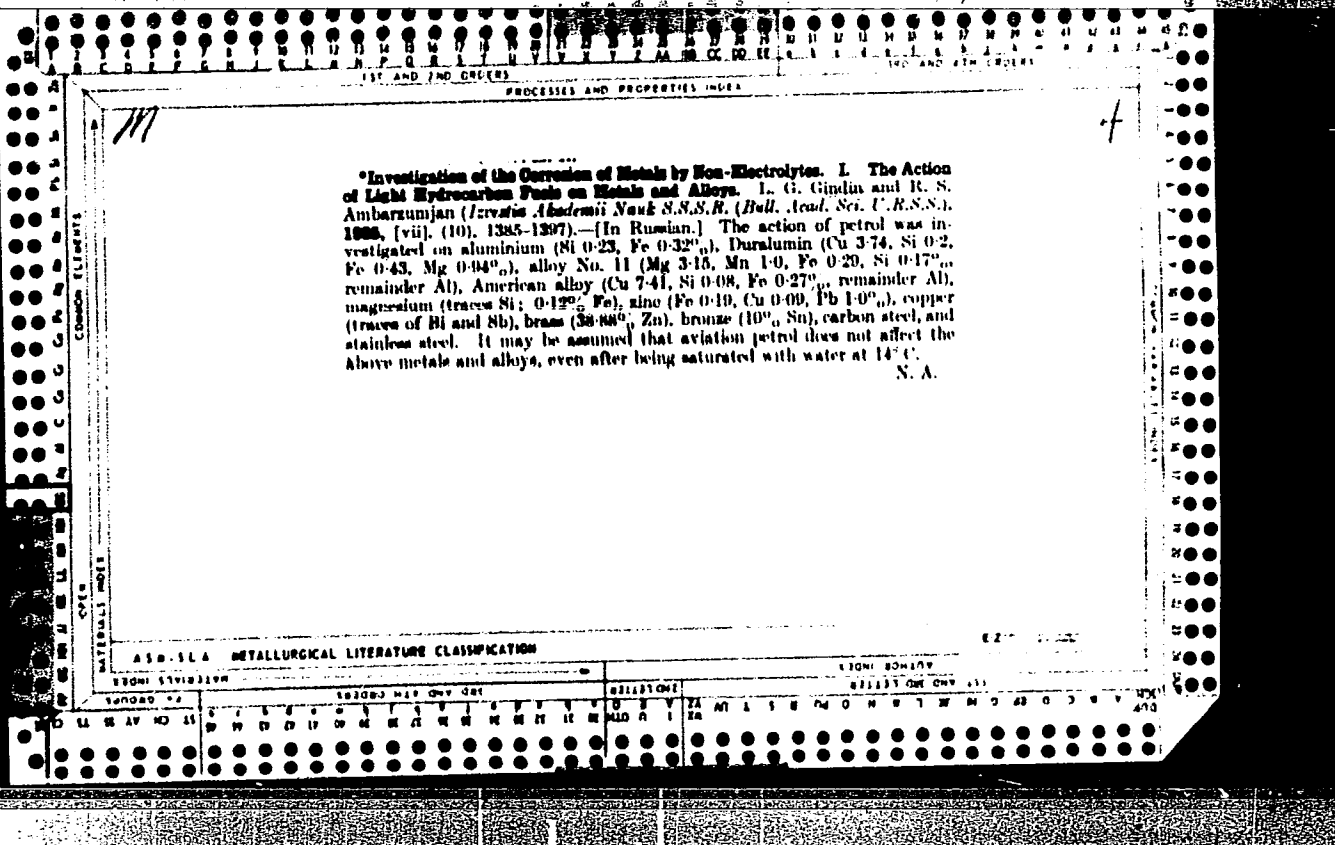
New cold storage distribution warehouses of the Kazakhstan S.S.R.  
Khol.tekh. 40 no.5:4-7 8-0 '63. (MIRA 16:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut kholodil'noy  
promyshlennosti.

GINDIN, I.S., tehnik-tehnolog; ANDREYEV, V.M., prof., otv.red.;  
POSTERNYAK, Ye.F., inzh., red.; FREGER, D.P., tekhn.red.

[Swivel carriage for cutting screw threads on turret lathes]  
Povorotnyi support dlia narezaniia rez'by na revol'vernykh  
stankakh. Leningrad, 1954. 5 p. (Informatsionno-tehnicheskii  
listok, no.6(579)). (MIRA 14:6)

1. Leningradskiy Dom nauchno-tehnicheskoy propagandy. 2. Lenin-  
gradskiy Dom nauchno-tehnicheskoy propagandy (for Posternyak).  
(Lathes--Attachments)



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

NO. AND SYMBOLS

EXPLANATION AND PREFERRED UNIT

7

ca

INVESTIGATION OF CORROSION OF METALS BY NONELECTROLYTES.  
 II. Action of cracked benzines on zinc. L. G. Gindin,  
 I. I. Torosov and M. S. Amirtsumyan. *Bull. acad. sci. U.S.S.R., Div. chem. sci., Ser. chem.* 1936, 78 (in German 1940); cf. *J. A. C.* 30, 5170. The assumption that the aggressiveness of cracked benzines in causing corrosion of metals is due to their autoxidation is proven experimentally by subjecting weighed specimens of Zn plates to the action of Gromeny and Bakin cracked benzines for varying periods of time (up to 770 days). From the exptl. results it is established that the intensity of corrosion of Zn is a function of the acidity and amt. of tars present in the benzines. Under certain conditions, a "passive" film, probably composed of Zn and org. compds., forms on the Zn surface and protects it from further decompn. Eighteen references. John Livak

ASB-11A METALLURGICAL LITERATURE CLASSIFICATION

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

CA  
GINDIN, L.

7

Authentification of unsaturated hydrocarbons. P. Panyutin, L. Hindin and O. Vasil'eva. *Compt. rend. acad. sci. U. R. S. S. [N. S.]*, 2, 183-6(1936)(in German).—To 2 h ml. of the substance to be tested, e. g., benzene, add exactly 25 ml. of 4% KI in KOH and 0.5 ml. of pure, concd. H<sub>2</sub>SO<sub>4</sub>. Allow the mixt. to stand 4 hrs. in the dark in a stoppered bottle. At the same time start a blank expt. with the same quantities of reagents and 5 ml. of distd. benzene which is known to contain no unsatd. compds. After the specified time has elapsed, titrate the I<sub>2</sub> in the blank test with Na<sub>2</sub>S<sub>2</sub>O<sub>4</sub>. In the main expt. titrate the excess KI after oxidation with ferric alum soln. To accomplish this, ext. the soln. in the main test with two 50-ml. portions of water. Dil. the aq. ext. to exactly 250 ml. and take a 50-ml. aliquot. Transfer this to a 200-ml. round-bottomed flask carrying a glass stopper which is fitted with a glass alum and 2-3 pieces of calcite. Slowly heat the contents of the flask and pass the escaping gas into 100 ml. of 10% KI soln. which is kept cold with ice. Finally titrate the I<sub>2</sub> in the receiver with Na<sub>2</sub>S<sub>2</sub>O<sub>4</sub>. In exactly the same way, treat 25 ml. of the KI soln. with ferric alum and det. the original I content. The peroxide no., expressed in g. I which would be used up by the formula, the substance analyzed, can be obtained by the formula, peroxide no. =  $[a - 5(b - c) - e]T \cdot 100 / s \cdot d$ , where  $a$  = ml. Na<sub>2</sub>S<sub>2</sub>O<sub>4</sub> required for titrating the I<sub>2</sub> originally present in the KI soln.,  $b$  = ml. Na<sub>2</sub>S<sub>2</sub>O<sub>4</sub> required in titrating the distd. I<sub>2</sub>,  $c$  = ml. Na<sub>2</sub>S<sub>2</sub>O<sub>4</sub> required in the blank,  $T$  = titer of the Na<sub>2</sub>S<sub>2</sub>O<sub>4</sub> in terms of I,  $s$  = ml. of sample taken and  $d$ , its d. If it is desired to express the peroxide no. in terms of gram.-equiv. of active O, as is usual, then the titer of the soln. should be in terms of O. W. T. H.

ASS-514 METALLURGICAL LITERATURE



117 AND 119 (1972)      117 AND 119 (1972)

PROCESSES AND PROPERTIES INDEX

B-I-4

Behaviour towards metals of solutions of sulphur and a range of organic sulphur compounds in saturated hydrocarbons. L. (I. GURAN, I. I. TOMUJIV, and V. A. KARAKOVA (Compt. rend. Acad. Sci. U.R.S.S., 1966, 3, 219-223; cf. B., 1936, 694).—The role of S compounds in the corrosion of metals by fuel oils is discussed. Solutions of S in C<sub>6</sub>H<sub>6</sub> (free from S compounds) had no action on steel and Pb during 16 months at room temp., but formed CuS on Cu. R. C. M.

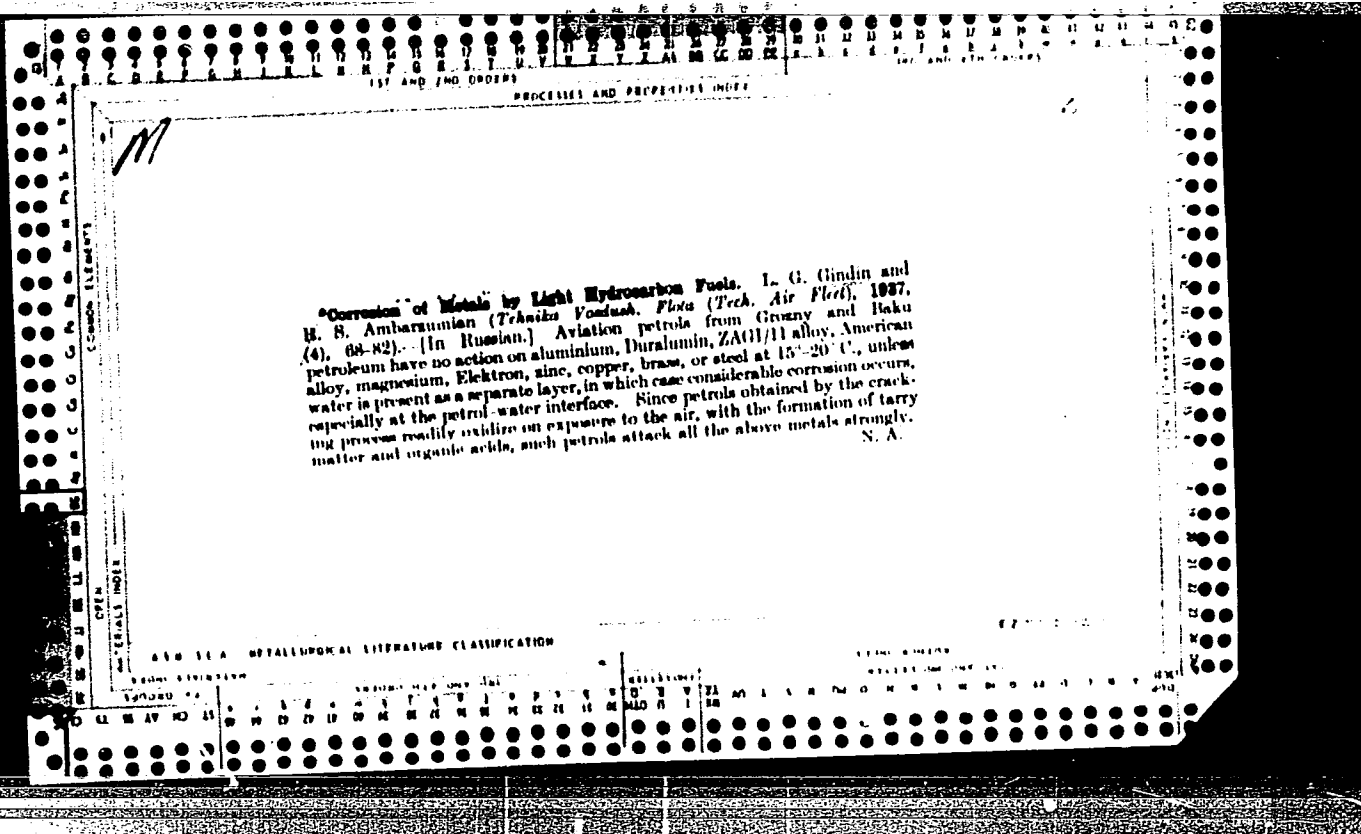
ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

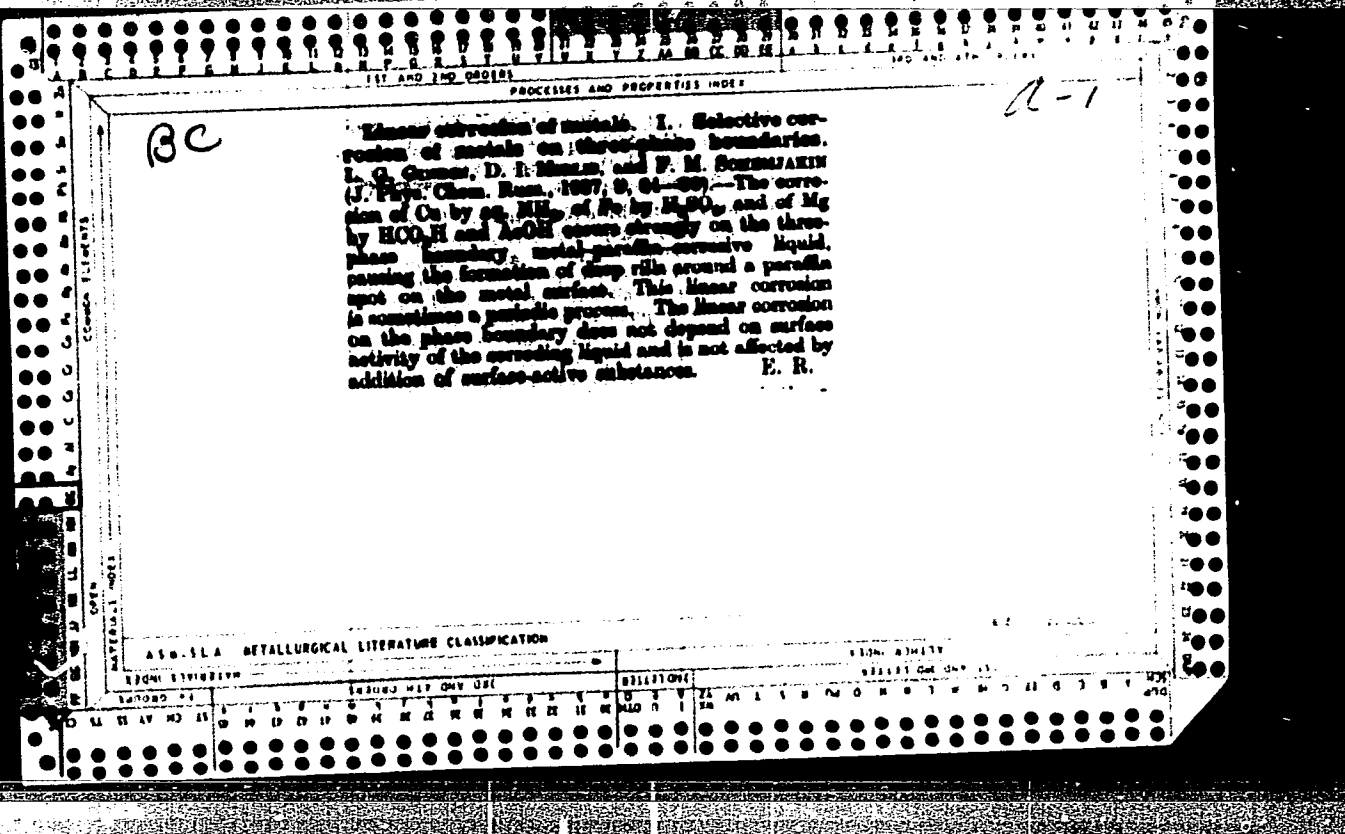
MATERIALS INDEX

CROSS REFERENCE

SERIALS INDEX

SERIALS INDEX



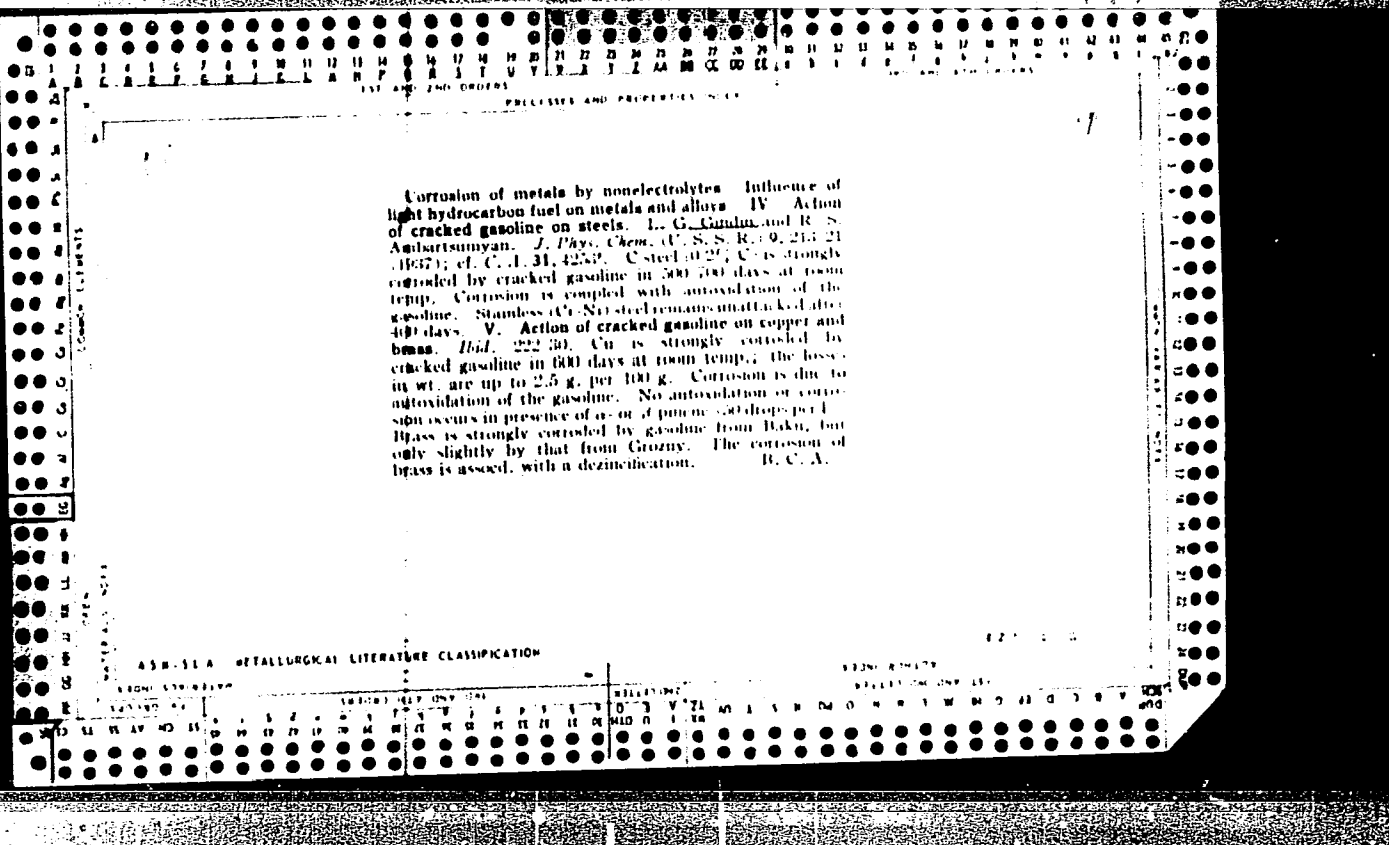


B-1-4

Corrosion of metals by non-electrolytes. In-  
fluence of light hydrogen peroxide on metals and  
alloys. III-V. Action of cracked petrol on  
(III) magnesium, aluminum, and titanium  
alloys (IV) steel and (V) copper and brass.  
L.I. GILBERT and R. G. ANTONOVICH (U. S. Phys.  
Chem. Div., 1957; 61-20, 213-211, 223-230;  
of. R. 1958, 623; 1959, 164).-III: The corrosion of  
Mg, Al, and Al alloys in 60% petrol made by  
cracking. Corrosion has been investigated. Mg is  
strongly affected, but Al and its alloys are stable.  
The corrosion of Mg is due to autoxidation of the  
petrol. The rate of autoxidation is high.  
IV. Corrosion of (VI) Cu is strongly corroded by cracked  
petrol in 60-70 days at room temp. Corrosion is  
coupled with autoxidation of the petrol. Stainless  
(Cr-Ni) steel remains uncorroded after 600 days.  
V. Cu is strongly corroded by cracked petrol in  
60 days at room temp. The losses in wt. are up to  
20%. The corrosion is due to autoxidation of  
the petrol. The mechanism of corrosion occurs in  
presence of a. or b. phases (20 drops per liter). Brine is  
strongly corroded by petrol from 1948, but only  
slightly by this year's oil. The corrosion of brass  
is increased with a. autoxidation. E. R. R.

ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION

CORROSION												CORROSION											
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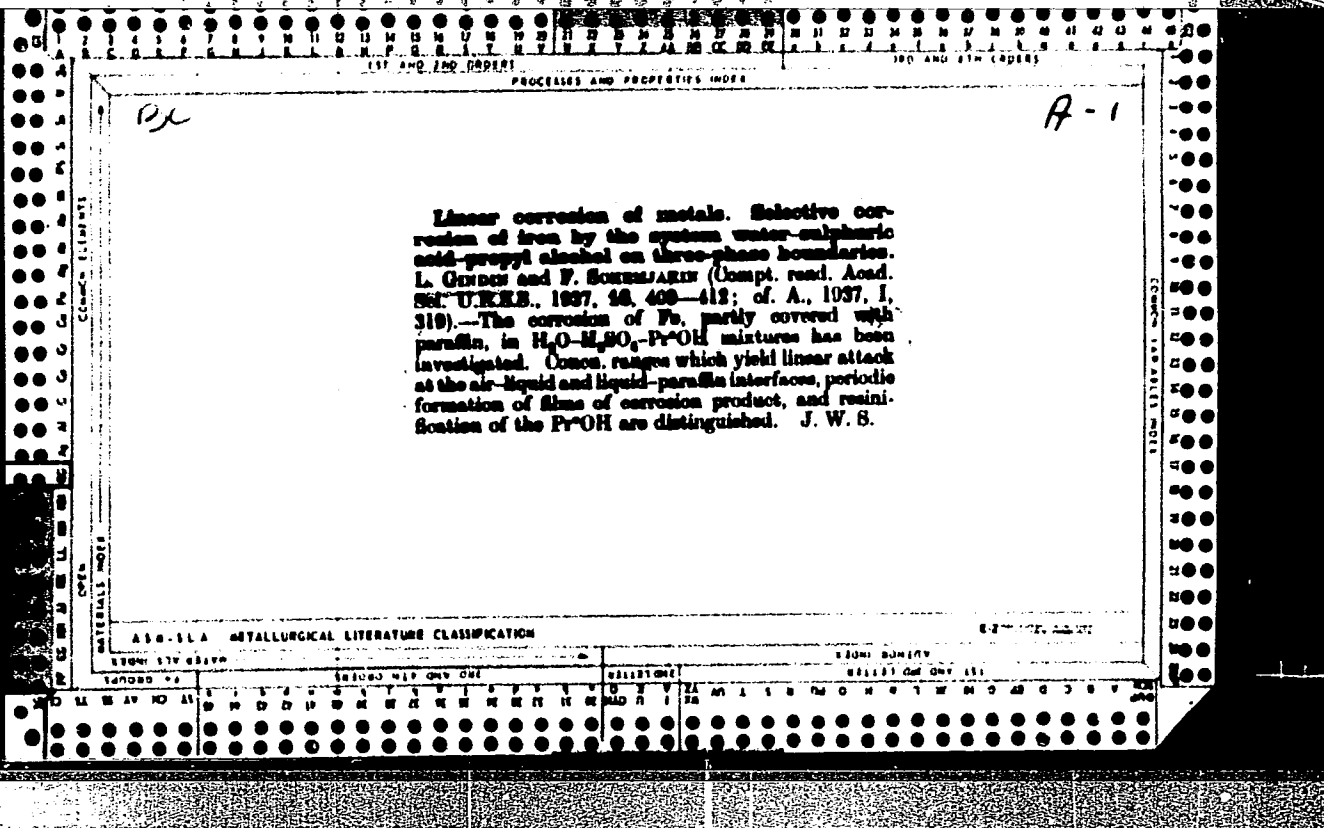


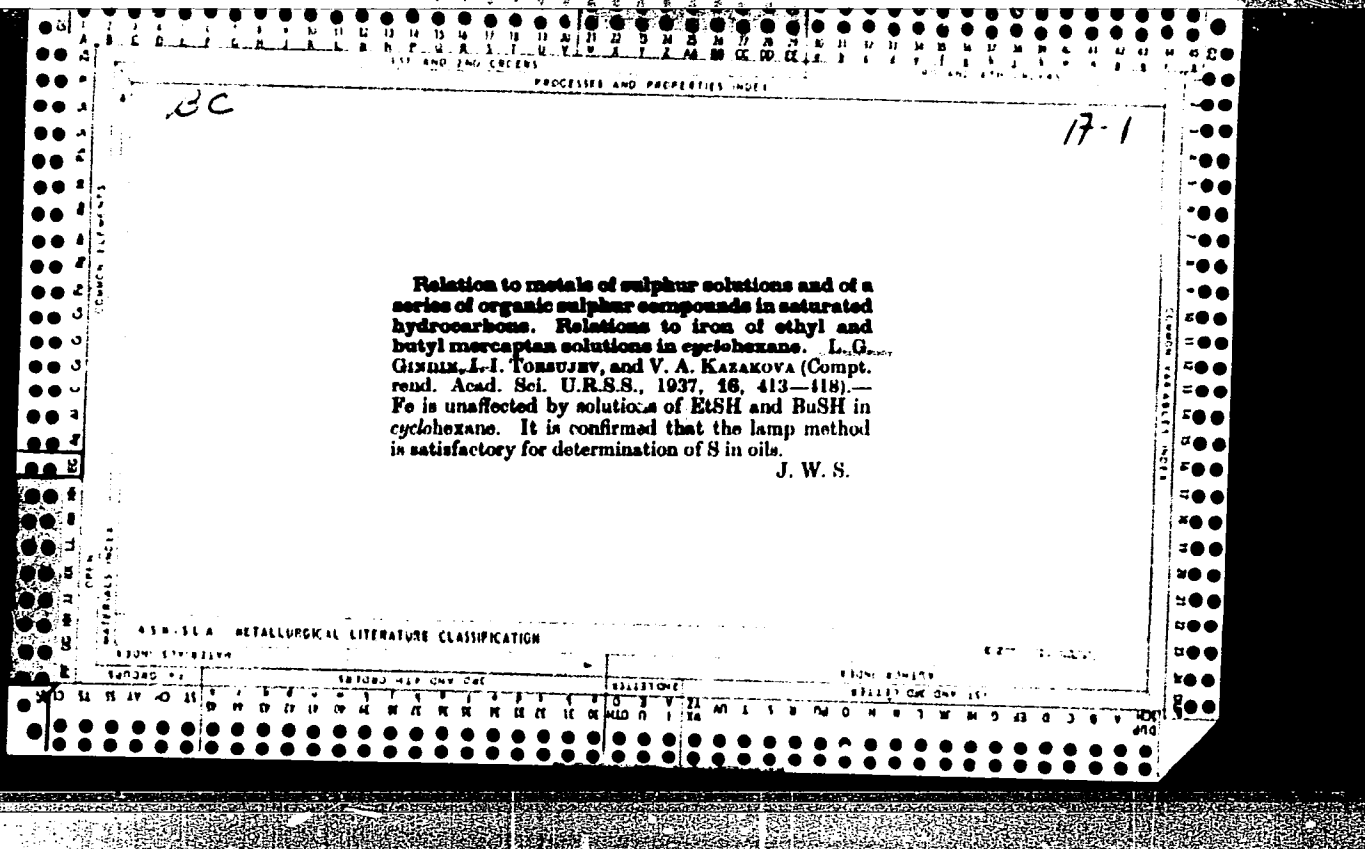
PROCESSES AND PROPERTIES INDEX

**\*Metal Corrosion by Non-Electrolytes. Influence of Light Hydrocarbon Fuels on Metals and Alloys. V.—Action of Cracked Petrols on Copper and Brass. I. G. Girelly and R. B. Ambarzumian (Zhur. Fizich. Khimii (J. Phys. Chem.), 1937, 9, (2), 229-230).—[In Russian.]** Copper is strongly attacked by oxidized cracked petrol, and the action is controlled by the rate of autoxidation of the petrol and by the corrosion products. The actual loss in weight of the metal depends on the changes which occur in the composition of the oil; the results obtained with petrol derived from Baku oil differ from those obtained with petrol from Grozny oil. Both petrols attack  $\beta$  and  $\alpha + \beta$  brass, producing deincification.—N. A.

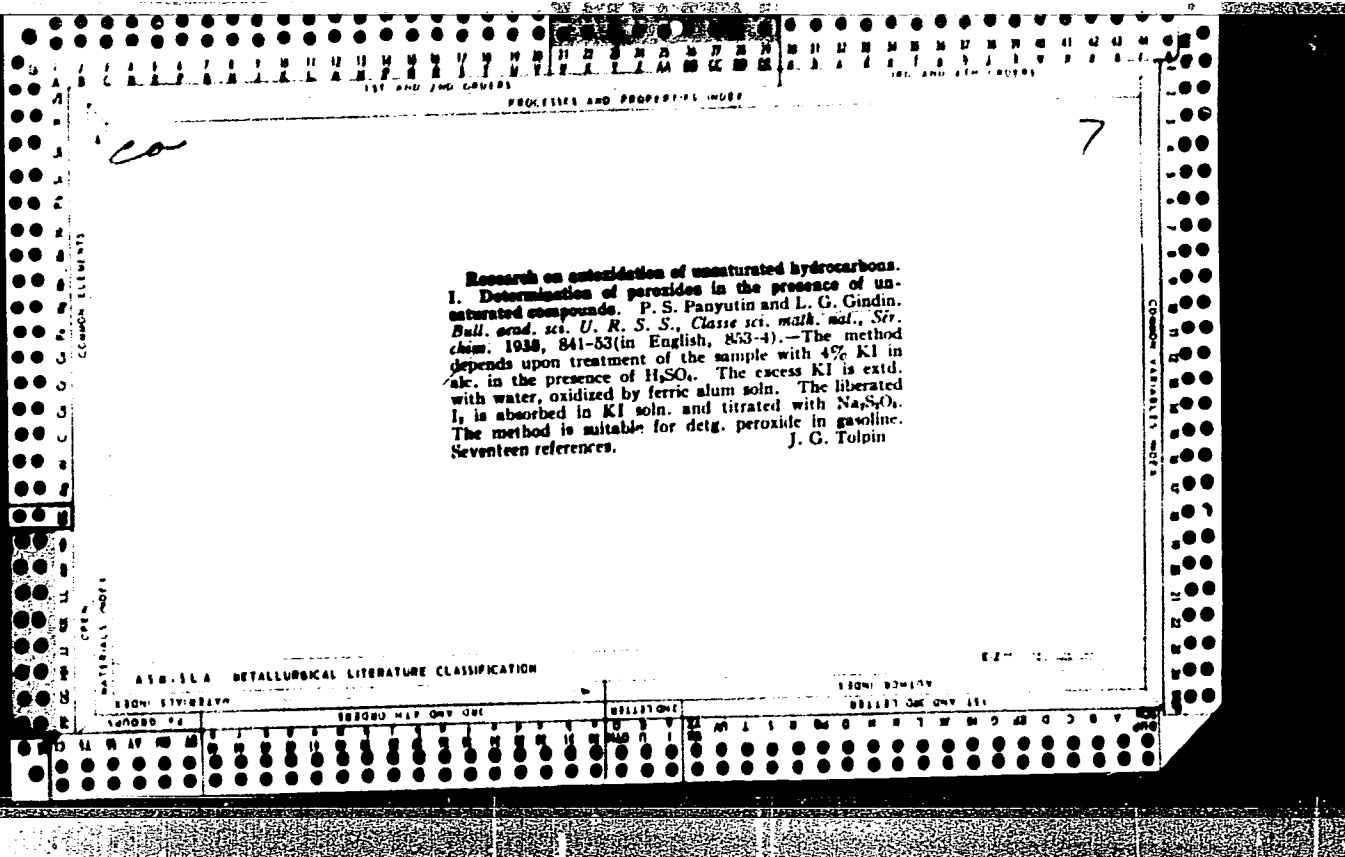
A S M - S L A METALLURGICAL LITERATURE CLASSIFICATION

147000	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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PROCESSED AND TRANSMITTED BY

10

CA

**Oxidation of alkyl anthracenes, alkyl anthraquinones and their derivatives. I. Oxidation with chromic anhydride of  $\beta$ -methylanthraquinone to anthraquinone- $\beta$ -carboxylic acid.** M. A. Il'inskiĭ, E. G. Gidlin and V. A. Karakova. *Compt. rend. acad. sci. U. R. S. S.* **20**, 555-8 (1938) (in English).—A method of oxidation of  $\beta$ -methylanthraquinone (I), giving 90% of anthraquinone- $\beta$ -carboxylic acid (II), has been developed by the following procedure: To 1 g. I in 50 ml. warm glacial AcOH was added gradually 3 g. finely ground anhyd. CrO<sub>3</sub> with vigorous stirring; the mixt. was warmed to 70° and held there for 8 hrs.; the contents were cooled, dil. with 400 ml. H<sub>2</sub>O, and the ppt. filtered, washed with H<sub>2</sub>O, boiled with dil. NH<sub>3</sub> soln. till the filtrate no longer gave a ppt. upon acidification; the soln. of the NH<sub>4</sub> salt of II was filtered and the filtrate acidified with HCl, giving II, m. 201–2°. The highest yields were obtained with anhyd. AcOH and CrO<sub>3</sub>. II. **Oxidation of  $\beta$ -methylanthraquinone with chromic anhydride to anthraquinone- $\beta$ -carboxylic acid as influenced by water.** *Ibid.* 559-60. Using the above oxidation conditions, the inhibiting action of H<sub>2</sub>O was detd. The yield of anthraquinone- $\beta$ -carboxylic acid was decreased with increase in the amt. of H<sub>2</sub>O added. The results are tabulated. I F I.

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

EQUINOCTIAL

RELATIVE

Investigations of the corrosion of metals by nonelectrolytes. The action of light hydrocarbon fuel on metals and alloys. VI. The action of cracked gasoline on lead. I. G. Gindin. *Compt. rend. acad. sci. U. R. S. S.* 20, 501-4(1938)(in English); cf. *C. A.* 33, 2044. When autoxidation occurs in Baku and Grozny cracked gasolines, contg. metallic Pb, the Pb is strongly corroded. With the Baku material, 13.2 g. of Pb is attacked after 710 days in 100 cc. of the gasoline. Analysis shows that about 60% of the corrosion product is  $PbCO_3$ . It is suggested that org. acids formed on autoxidation first attack the Pb, then  $CO_2$  displaces part of the org. acid in the Pb salt. George Avery

ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION

IRON STEELS

STEELS

CAST IRON

NON-FERROUS METALS

ALUMINUM

COPPER

NICKEL

TITANIUM

ZINC

MAGNESIUM

OTHER METALS

WELDING

OTHER

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PROCESSES AND PROPERTIES INDEX

20

**Corrosion of Metals by Non-Aqueous Solutions. The Action of Ethyl Alcohol on Metals.** L. G. Gindin, R. S. Ambarzumian and E. P. Belchikova. (Comptes Rendus (Doklady) de l'Académie des Sciences de l'U.R.S.S., 1940, vol. 20, Oct. 10, pp. 44-47). This is the introductory paper to a projected series on the corrosion of metals in non-aqueous electrolytes, mainly alcohols and alcoholic solutions. The authors review the literature on the effect of ethyl alcohol on metals, and they describe the procedure they adopted for the purification of the ethyl alcohol used for their investigation. In the series of experiments described in the present paper, the tests were carried out in sealed glass tubes in an apparatus which is illustrated, and tables are given of the results obtained after keeping samples of magnesium, aluminium, zinc and steel (carbon 0.28%, manganese 0.51% and silicon 0.22%) for 210 days under absolute alcohol and for 150 days under 90-7% alcohol. Only magnesium proved to be slightly corroded by ethyl alcohol under the experimental conditions described, whereas the three other materials examined were not affected at all.

METALLURGICAL LITERATURE CLASSIFICATION

E-2

1ST AND 2ND GRADERS      PROCESS AND PROPERTIES INDEX      3RD AND 4TH GRADERS

20

**Corrosion of Metals by Non-Aqueous Solutions.** R. S. Ambarzumian, L. G. Gindin and E. P. Balchikova. (Comptes Rendus (Doklady) de l'Académie des Sciences de l'U.R.S.S., 1940, vol. 20, Oct. 20, pp. 91-94). The authors studied the influence of carbon dioxide on the action of ethyl alcohol on magnesium, aluminium and steel. They used alcohol saturated with carbon dioxide, and the experimental procedure was as described in the first paper of the series (see preceding abstract). They found that in the presence of carbon dioxide, steel and aluminium are also not corroded by ethyl alcohol, whereas the corrosion of magnesium is considerably enhanced.

ASACSLA METALLURGICAL LITERATURE CLASSIFICATION

FROM	TO	CLASSIFICATION	INDEX
11	12	671.73	1
13	14	671.73	1
15	16	671.73	1
17	18	671.73	1
19	20	671.73	1
21	22	671.73	1
23	24	671.73	1
25	26	671.73	1
27	28	671.73	1
29	30	671.73	1
31	32	671.73	1
33	34	671.73	1
35	36	671.73	1
37	38	671.73	1
39	40	671.73	1
41	42	671.73	1
43	44	671.73	1
45	46	671.73	1
47	48	671.73	1
49	50	671.73	1
51	52	671.73	1
53	54	671.73	1
55	56	671.73	1
57	58	671.73	1
59	60	671.73	1
61	62	671.73	1
63	64	671.73	1
65	66	671.73	1
67	68	671.73	1
69	70	671.73	1
71	72	671.73	1
73	74	671.73	1
75	76	671.73	1
77	78	671.73	1
79	80	671.73	1
81	82	671.73	1
83	84	671.73	1
85	86	671.73	1
87	88	671.73	1
89	90	671.73	1
91	92	671.73	1
93	94	671.73	1
95	96	671.73	1
97	98	671.73	1
99	100	671.73	1

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

9

Corrosion of metals by nonaqueous solutions. I. G. Gindin, R. S. Ambarsumyan and E. P. Bel'chikova. *Compt. Rend. Acad. Sci. U. R. S. S.* 29, 208 (1950) (in English). — The inactivity of Fe(OH) on metals was examined with respect to the possible presence of "antoinhibitors," such as aldehydes or fusel oils. Two metals Mg and Elov-tron metal (I) were tested as described in previous experiments for a period of 180 days at 20° in 99.4% alc. free from aldehydes and fusel oil, and in the same alc. to which was added separately, 0.1% of formaldehyde, acetaldehyde, paraldehyde and benzaldehyde. The addn. of formaldehyde and acetaldehyde produced no inhibition. Paraldehyde inhibited completely the corrosion of Mg and greatly decreased that of I. Benzaldehyde decreased the corrosion of I by a factor of 3. Expt. showed, however, that in alc. with CO<sub>2</sub>, none of the above aldehydes was effective in reducing the corrosion. I K

COMMON ELEMENTS

OPEN

MATERIALS INDEX

ASM. S. A. METALLURGICAL LITERATURE CLASSIFICATION

130th ANNUAL MEETING

1958

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

The mechanism of the simultaneous polymerization of butadiene with vinyl cyanide and 1-methylvinyl cyanide under the action of benzoyl peroxide. L. Gaisin, A. Abkin, and S. Medvedev (Karpov Inst. Phys. Chem., Moscow), *J. Phys. Chem. (U.S.S.R.)* 21, 1299-87 (1947) (in Russian).--Mixts. of butadiene (I) (x wt. %) with CH<sub>2</sub>:CHCN (II) (100 - x %) or CH<sub>2</sub>:CMcCN (III) (100 - x %) and (BrO)<sub>2</sub> (y%) were prepd. in N<sub>2</sub>, heated (100 - x) hrs. and distd. at room temp. in a high vacuum 2) hrs. The distn. residue (= polymer) was analyzed for N (i.e. nitrile) and active O (i.e. BrO<sub>2</sub>). For the detn. of active nitrile and active O (i.e. BrO<sub>2</sub>), not in acetone. (1) The polymer must be dissolved in CHCl<sub>3</sub>, not in acetone. The rate  $\nu$  of formation of polymer decreases when x increases; e.g. at 60° for the system I + II (y being 0.8%) the initial rate is 0.26% per hr. at x = 80% and 8.2% per hr. at x = 20%. During one expt.  $\nu$  is almost const. at small x and increases with time at large x. The  $\nu$  increases with temp.; e.g. 42% polymer is attained at 60° within 63 hrs. and at 70° within 11 hrs. The  $\nu$  is proportional to  $\sqrt{y}$  between y = 0.3 and y = 10 wt.%. These results are discussed from the viewpoint of Abkin and Medvedev, *C.A.* 24, 7709. The polymerization ceases when one of the components is used up. The highest yield of polymer

(over 80%) is observed at x = 50% for the I + II and near x = 70% for the I + III system. The compn. of the polymer depends little on the time of polymerization and temp., but varies according to x. In the I + II system, the polymer contains more I than the original mixt. at x < 53% and less than the original mixt. at x > 53%. In the I + III system, the "azeotropic" mixt. has x = 50%. The concn. of (BrO)<sub>2</sub> in the polymer decreases when t increases. However, polymerization continues also after the concn. becomes zero. Monomer, distd. from the polymer and again mixed with it, polymerizes at the same  $\nu$  as if no distn. occurred, but soln. and reppn. of polymer remove its catalytic activity. The compn. of a copolymer depends on the consts.  $\alpha$  and  $\beta$  expressing the relative rates of reaction of 2 free radicals with the 2 components of the monomeric mixt. A simple method for computing  $\alpha$  and  $\beta$  from exptl. data is shown. From the values for  $\alpha$  and  $\beta$  the distribution of monomer groups within the copolymer can be calcd. (cf. *C.A.* 42, 8046). In the copolymer I + II, 67% II is present as one nitrile group between 2 butadiene groups; and in I + III 80% III is in this alternate pattern. The cessation of polymerization when 1 of the components is used up shows that both components are needed for the branching of the reaction chain.

J. J. Bikerman

ASH-15A METALLURGICAL LITERATURE CLASSIFICATION



GINDIN, L. G.

PA 35/49167

USSR/Metals  
Copper  
Corrosion

Dec 48

"Anthraquinone Protection of Copper From Corrosion by Sulfur Solutions," L. G. Gindin, R. Kh. Sil'is, All-Union Inst Avn Materials, 4 pp

"Dok Ak Nauk SSSR" Vol LXIII, No 6

Shows that anthraquinone lengthens period of "incubation," which precedes beginning of corrosion, by 500,000 times. Table shows effect of anthraquinone on corrosion of copper by sulfur solutions. Decides that anthraquinone cannot properly be called an inhibitor, or its effect be called inhibition since it

35/49167

USSR/Metals (Contd)

Dec 48

does not slow the reaction but rather moves back its beginning, or "immunizes" the metal. Submitted by Acad A. N. Frankin, 3 Nov 48.

35/49167

Polymerization of allyl acrylate. I. Determination of the structure and molecular weight of the soluble forms of polyallyl acrylate. L. Gindin, S. Medvedev, and E. Fleisher. *Zhur. Obshchei Khim.* (J. Gen. Chem.) 19, 1091-1701 (1949). -- Polymerization of allyl acrylate, bp 119.5-121.5°,  $n_D^{20}$  1.4330,  $d_4^{20}$  0.899 (?), in 2.5 and 5.7% solns. in  $CCl_4$  with 1%  $BaO_2$  catalyst at 60° gives low mol. prod-ucts, sol. in org. solvents, with the main chain linkage formed substantially from the "acrylic" double bond. The process, followed dilatometrically to 80% polymerization, gave 45.0% total unsatn. of the product, which was almost identical with the "allyl" unsatn. (by the bromide-bromate method in  $CCl_4$ -AcOH); the total unsatn. was detd. by the bromide-bromate method in the presence of  $HgSO_4$ ; the procedures were successfully tested on the monomer. G. M. Koslanoff

GINDIN, L. G.

PA 26/49T80

USSR/Metals

Jan 49

Copper

Corrosion - Prevention

"The Mechanism for Protecting Copper by Anthraquinone From Corrosion in Sulfur Solutions,"  
Ya. I. Frenkel', Corr Mem, Acad Sci USSR, L. G. Gindin, All-Union Inst of Adv Materials, 3 pp

"Dok Ak Nauk SSSR" Vol LXIV, No 1

Attempts to determine exactly why a certain quantity of sulfur molecules cannot penetrate an impregnated, monomolecular film of anthraquinone on a copper surface. Submitted 3 Nov 48.

26/49T80

11-11-1949 L. G.

A

The Corrosion of Metals by Solutions of Iodine in Hydrocarbons. L. V. Gurina and M. V. Pavlova (*Doklady Akad. Nauk S.S.S.R.*, 1949, 82: 33, 377-380).—(in Russian). The corrosion of Cu, Pb, and Fe by soln. of I in benzene and iso-octane was studied. The required weight of I, many times recondensed, was put into a glass vessel, and the hydrocarbon was distilled, dried with Na, and added to the I. The strength of the I soln. was determined by titration. A strip of the metal of dimensions  $2 \times 20 \times 60$  mm. was left in contact with the soln. and the I and metal losses were determined. The nature of the corrosion products was also investigated. The rate of corrosion of Cu by a benzene soln. of I was up to 1 g./cm.<sup>2</sup>/hr., the corrosion product being CuI. In all experiments the actual loss of I from the soln. was less than it would have been if all the Cu lost from the strip had been converted into CuI; the same discrepancy was observed in the case of Pb. It was concluded that some of the Cu had combined with O. The corrosion products took the form of thin layers on the specimen, which separated and deformed when dried. Soln. of I in iso-octane acted similarly on Cu, but as the solubility of I in iso-octane is small, only dil. soln. could be used. The corrosion product of the benzene soln. on Pb was PbI<sub>2</sub>; the iso-octane soln. acted more vigorously, giving the same corrosion product. The results for Fe were explained by assuming that the primary corrosion product decomposed with time into I and Fe<sub>2</sub>O<sub>3</sub>. Analytical and X-ray methods showed that only 3-4% of the corrosion product was FeI<sub>2</sub>. When Fe was sealed in a tube contg. de-oxygenated I soln. under an inert-gas atmosphere, the corrosion product after 10 months was pure FeI<sub>2</sub>. Only in the presence of soln. contg. O did the corrosion product on Fe form a layer structure; this indicated that the layer structure was connected with the process FeI<sub>2</sub> → Fe<sub>2</sub>O<sub>3</sub>.—Z. S. B.

B

PROCESSES AND PROPERTIES INDEX

B 64  
h

621.315.61 : 621.3.015.51 : 537.528  
 1767. Formation of "bridges" in suspension of conductors or semi-conductors in dielectrics. I. Conducting-bridge formation of aluminum in vaseline oil. L. G. GIDENY, YA. I. FARMELL AND O. A. SHPANKAYA. *J. Tech. Phys., USSR*, 20, 937-43 (Aug., 1950) In Russian.

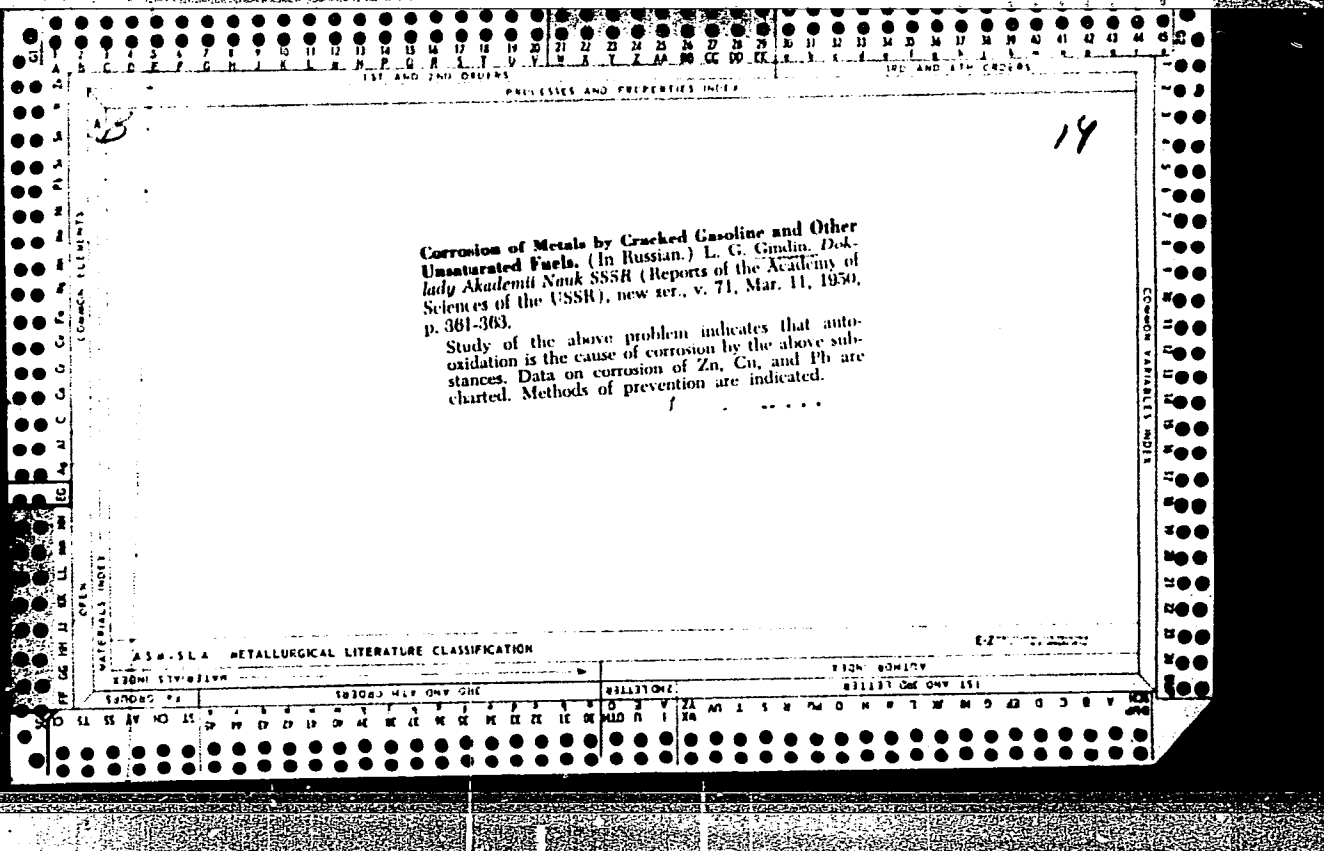
An investigation of the behaviour in strong electric fields of low concentration suspensions of Al in vaseline oil. It was found that above a certain critical value of the field strength the electrical breakdown of the suspension occurs, i.e. conversion from a dielectric to a metallic conductor, owing to formation of bridges of Al particles. The curve of the influence of  $E_{crit}$  on dispersion of Al particles was almost a straight line. If for linear particle dimension  $\lambda$ ,  $E_{crit} = 4000$  V/cm, size reduction to  $\lambda/5$  brings  $E_{crit}$  to 13 000 V/cm. The critical Al concentration in the oil at which bridge formation is possible rises with its dispersion. If for particle size  $\lambda$  the limiting concentration = 0.005%, it is 0.05% for  $\lambda/5$ . It is interesting that for  $E > E_{crit}$  a weak (0.05%) concentration remains a dielectric. This is due to intense turbulence of suspension between electrodes. Variation of electrode distance from 0.5 to 3.5 mm does not alter  $E_{crit}$ . At distance  $> 3.5$  mm bridges were not completed. There is a certain "induction period." Detachment of bridge formation is by fall of  $E$  from  $\sim 4000$  V/cm to  $\sim 1$  V/cm and interruption of particle movement.

B. F. KRAUS (R)

METALLURGICAL LITERATURE CLASSIFICATION

CA

Behavior of soap dispersions in liquid dielectrics in a constant electric field. I. N. Putilova, L. G. Gindin, and L. M. Moroz. *Doklady Akad. Nauk S.S.S.R.* 71, 81-3(1960).—Formation of peculiar ribbon-shaped structures was observed in 0.1% dispersions of Ba or Zn stearate, and of Ba oleate, in aviation gasoline and in paraffin oil, in an elec. field of 7600 v./cm. between 2 Ag electrodes 0.6 mm. apart. The ribbons start at one electrode, then a fragment breaks away and attaches itself to the other electrode; the 2 fragments continue to grow until they become united. At the stage when the ribbons connect the electrodes, the elec. cond. of the dispersion is increased very considerably, which indicates that the soap ribbons possess a very high elec. cond. Structurally, the ribbons appear to be cryst. . . . . N. Thon



GINDIN, L. G.

PA 165T102

USSR/Physics - Dielectrics  
New Techniques

1 Jun 50

"Electric Rupture of Metal Suspensions in Liquid Dielectrics," L. G. Gindin, L. M. Moroz, I. N. Putilova, Ya. I. Frenkel', Corr Mem, Acad Sci USSR, O. A. Shpanskaya

"Dok Ak Nauk SSSR" Vol LXXII, No 4, pp 671-674

Describes apparatus used in actual studies of subject rupture. Gives purely phenomenological (gross macroscopic) description of phenomenon of rupture in metal suspensions. Theoretical analysis will appear later. Suspensions of aluminum powder in gasoline, vaseline, oil, etc., were mainly used, varying in metallic content from 0.005 to 1% (usually 0.1%). Submitted 5 Apr 50  
165T102



C.A.

The electrochemical nature of the corrosion of metals in liquid dielectrics. L. G. Gindin. *Doklady Akad. Nauk S.S.S.R.* 73, 513-18(1950).—In a 1.5 N soln. of AcOH in isooctane, of sp. elec. cond.  $\sigma = 3.3 \times 10^{-10}$  ohm<sup>-1</sup> cm<sup>-1</sup> under 30 kv./cm., a Mg-Fe couple shows acetate spots on the Fe spreading from its middle but stopping at a distance of  $\sim 0.2$  mm. from the Fe/Mg boundary. The Mg is corroded particularly along the boundary with Fe. This corrosion pattern, wherein the periphery of the Fe is protected by the contact with Mg, indicates clearly its electrochem. nature. This is confirmed by the potential distribution, mapped under a microscope, and showing a steep fall from the Mg to the Fe potential within a narrow boundary strip about 0.5 mm. wide. Consequently, in the dielec. soln., Fe and Mg form a cell in which Mg is anodic to Fe. That these electrochem. boundary effects, observed with macro-couples, must be even much more intense with micro-couples, follows from the observation that the zone of strong corrosion of Mg spreads and increases with decreasing dimensions of the electrodes. In a Fe-Mg microcouple of a diam. of  $10^4$  A., with a gap of  $\sim 10$  A. between the 2 metals, the elec. field  $E$  in the gap is  $\sim 10^7$  v./cm., and, on the surface of the microcouple,  $10^{-8}$  to  $10^{-6}$  v./cm. On account of the proportionality between  $\log \sigma$  and  $\sqrt{E}$ , this field gives rise to a sufficiently high elec. cond. around the microcouple to set up a galvanic cell. N. Thon

PA 174T56

GINDIN, L. G.

USSR/Physics - Dielectrics

1 Sep 50

"Mechanism Governing the Electric Rupture of Metal Suspensions in Liquid Dielectrics," Ya. I. Frenkel', Corr Mem, Acad Sci USSR, L. G. Gindin, L. M. Moroz, I. N. Putilova

"Dok Ak Nauk SSSR" Vol LXXIV, No 1, pp 49-52

Expt indicate that crit rupture voltage  $E_c$  is several 1,000 v/cm, e.g., about 4,000 v/cm for Al particles 3-5 microns. Submitted 21 Jun 50.

174T56

131 AND 130, CUBERS

PROCESSES AND PROPERTIES INDEX

21

5

Heat-Treatment of Twinned Iron Crystals. R. I. Garter, I. A. Gindin, M. G. Konstantinowkii, and V. I. Starbsev. (Doklady Akademii Nauk U.S.S.R., 1950, vol. 74, No. 2, pp. 343-344). [In Russian]. The investigation of the influence of heat treatment on disappearance of twinned crystals of iron prepared by non-uniform deformation is described.

COMMON ELEMENTS

MATERIALS INDEX

OPEN

ASB-11A METALLURGICAL LITERATURE CLASSIFICATION

13000	13100	13200	13300	13400	13500	13600	13700	13800	13900	14000	14100	14200	14300	14400	14500	14600	14700	14800	14900	15000	15100	15200	15300	15400	15500	15600	15700	15800	15900	16000	16100	16200	16300	16400	16500	16600	16700	16800	16900	17000	17100	17200	17300	17400	17500	17600	17700	17800	17900	18000	18100	18200	18300	18400	18500	18600	18700	18800	18900	19000	19100	19200	19300	19400	19500	19600	19700	19800	19900	20000
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USSR-156

GINDIN, L. G.      PROPERTIES AND PROPERTIES INDEX

A 53  
0

537.528 : 621.3.015.51 : 621.315.61

6240. Formation of "bridges" in suspensions of conductors or semiconductors in dielectrics. II. L. G. GINDIN, L. M. MOROZ, I. N. PUTILOVA AND YA. I. FRINKIN. *J. Tech. Phys., USSR, 21 (No. 2) 143-8 (1951) In Russian.*

See Abstr. 3550 (1951) for part I. The behaviour of a 0-1% suspension of Al in petrol in strong electric fields was investigated. The process of bridge formation between the electrodes, which determines the final breakdown of the suspension, does not depend on shape, material or surface condition of the electrodes. Viscosity and specific weight of the dispersing medium, whilst not influencing the critical or breakdown voltage of the field,  $E_{crit}$ , determines the duration of the formation time, or rate of formation, of the bridges and also their "life" after removal of the field.  $E_{crit}$  depends on the dielectric constant of the dispersing medium and on the duration of the preliminary application of the field. The length of the obtainable bridges may be 3-4 cm, and even longer in more viscous media like vaseline oil. The measured resistances of 25 bridges varied between 150 and 10 000  $\Omega$ , and the initial resistance value increases during the lifetime of the bridge, and may reach several  $M\Omega$ . Comparative values of  $E_{crit}$ : petrol ( $\epsilon = 1.9$ ), 4250; diethyl ether ( $\epsilon = 4.5$ ), 4000; chlorobenzene ( $\epsilon = 9.4$ ), 2250; nitrobenzene ( $\epsilon = 36.5$ ), 1750 V. B. P. KRAUS

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

GINDIN I. G.

PA 119T102

USSR/Physics - Dielectrics Aug

"Electric Conductivity of Liquid Dielectrics in Strong Fields," I. G. Gindin, Ya. I. Frenkel

"Zhur Tekh Fiz" Vol XXI, No 8, pp 986-993

Examd electric cond of hydrocarbon solns of iodine and acetic acid. It was shown that elec cond of these solns increases exponentially with potential of elec field, according to Frenkel's

eq  $\sigma' = \sigma_0 \exp \sqrt{\frac{eSE}{kT}}$ , which was represented graphically as rectilinear relation between  $\ln \sigma'$  and  $\sqrt{VE}$ . (cf. Ya. I. Frenkel, "Technical Physics of

194T102

USSR/Physics - Dielectrics (Contd) Aug 51

USSR" 1937). Authors thank V. A. Kazakova and O. N. Shpanskaya for exptl research. Submitted 31 Jan 51.

194T102

PA 193T27

USSR/Chemistry - Corrosion of Metals Oct 51

"Corrosion of Metals by Hydrocarbon Solutions of Carboxylic Acids," L. G. Gindin, V. A. Kazakova

"Zhur Prikl Khim" Vol XXIV, No 9, pp 958-969

Subsequent to series of investigations of corrosion processes arising in oxidized cracking gasoline, investigated corrosion of Mg, Fe, and Pb by hydrocarbon (isooctane, benzene, and petrol ether) solutions of acetic, propionic, n-valeric, and n-caproic acids. Discusses variations of corrosion in respect to different hydrocarbons and acids. Character of salts formed in

193T27

USSR/Chemistry - Corrosion of Metals Oct 51  
(Contd)

corrosion processes was found to depend on nature of metal, properties of hydrocarbons, and mol wt and concn of acids.

193T27

GINDIN, L. G.

GINDIN, L.G.

PA 190T36

USSR/Chemisty - Corrosion

Oct 51

"Corrosion of Copper and Lead by Hydrocarbon Solutions of Iodine," L. G. Gindin, M. V. Pavlova

"Zhur Prik Khim" XXIV, No 10, pp 1026-1032

Benzene and iso-octane solns of iodine corrode copper and lead, converting the former to  $Cu_2I_2$ , the latter to  $PbI_2$ . Iso-octane solns of iodine are more corrosive than benzene solns to lead, while both are equally aggressive in regard to copper.

✓

190T36

R

ASM

279-B. Corrosion of Iron by Ben-  
zoic Solutions of Iodine. (in Rus-  
sian.) L. G. Gindin and M. V. Pav-  
lov. Zhurnal Prikladnoi Khimii, v.  
24, Nov. 1951, p. 1151-1153.  
Laboratory tests; apparatus and  
method. It was found that FeI<sub>2</sub> is  
first formed and is then trans-  
formed to Fe<sub>2</sub>O<sub>3</sub>, liberating the io-  
dine for further attack. Data are  
tabulated. (16, Fe)



GINDIN, L. G.

USSR/Chemistry - Corrosion;  
Fuels

21 Sep 51

"Corrosion of Metals by Hydrocarbon Solutions of Fatty Acids," L. G. Gindin, V. A. Kazakov

"Dok Ak Nauk SSSR" Vol LXXX, No 3, pp 389-392

Studies the action of benzene, isooctane, and petroleum ether solns of acetic, propionic, butyric, valeric and caproic acids on magnesium, iron, and lead. The corrosive action of 0.5N solns of acetic to caproic acids in isooctane increases with mol wt but not evenly. The rate of corrosion depends nonlinearly on the concn of the acid, and this dependence varies from one metal to another, as illustrated by curves.

210T32

QINDIN L G

\*Influence of the Solvent on the Behaviour of Solutions of Acids Towards Metals (Copper and Iron). L. G. Gindin, V. A. Kazakova, and I. M. Pukhova (Doklady Akad. Nauk S.S.S.R., 1951, 80, (6), 777-780).—[In Russian]. Plates ( $2 \times 2$ )  $\times$  60 mm.) of Fe and Cu were tested in 0.5N. soln. of butyric acid in water, benzene, isooctane, and vaseline oil, at room temp. in diffused light. The soln. were contained in thick-walled tubes with ground-in stoppers, but O was not excluded. The mean losses in weight of Fe in these soln. after 20 days were 0.0276, 0.4410, 0.0252, and 0.0223 g., resp. (0.0224 g. in pure distilled water); in 50-day tests, the mean losses for the Cu were 0.0594, 0.5510, 0.0329, and 0.0370 g., resp. These results do not support suggestions in the literature that the corrosion rate depends on the elect. conductivity ( $\sigma$ ) of the soln.: for the aq. soln.  $\sigma = 5.4 \times 10^{-4}$  ohm $^{-1}$  cm $^{-1}$ , but for benzene or iso-octane soln. at  $E = 30$  kV/cm.,  $\sigma < 2.1 \times 10^{-10}$  ohm $^{-1}$  cm $^{-1}$ . This discrepancy cannot be explained by supposing that the corrosion is electrochem. in one soln. and purely chem. in the other (cf. G., Ambastumyan, and Bel'chikova, *Ibid.*, 1940, 29, 45; G., *ibid.*, 1950, 73, 515; 1950, 74, 311); it indicates that the corrosion can be attributed to the homogeneous-electrochem. mechanism suggested by Frumkin (*Trudy 2-i Konf. po Korrozii Metallov*, 1940, 6; Kolotyrkina and E., *Zhur. Fiz. Khim.*, 1941, 15, 346; *M.A.*, 10, 250). Since the corrosion rates in iso-octane and oil are almost the same despite the difference in viscosity, the kinetics of dissolution are not determined by diffusion. In experiments to find inhibitors, 1% chlorinated paraffin reduced the corrosion of Fe in the benzene soln. to 1/4.33 of its original value; 1.5% sulphurized stearic acid reduced the corrosion of Cu in the benzene soln. to 1/1.42 of the original value. In addn. to stimulating corrosion in aq. soln. of acids, nitrophenol and nitrobenzaldehyde cause a 2-2.5 times increase in the rate of corrosion of Fe in the benzene soln.—G. V. E. T.

GINOIN, L. G.

"Electric conductivity of hydrocarbon solutions of iodine." (p. 1762)

SO: Journal of General Chemistry, (Zhurnal Obshchei Khimii), 1952, Vol. 23, No. 10

GINDIN, L. G.

Gindin, L. G., Kazakova, V. A.- "Electric conductivity of hydrocarbon solutions of saturated fatty acids." (p. 1767)

SO: Journal of General Chemistry, (Zhurnal Obshchei Khimii), 1952, Vol. 22, No. 10

GINDIN, L.G.

\*The Electrochemical Character of the Corrosion of Metals in Hydrocarbon Solutions of Iodine. L. G. Gindin (Doklady Akad. Nauk S.S.S.R., 1952, 88, (4), 753-754; [in Russian]. Cf. G. and Pavlova, *ibid.*, 1949, 68, 377; *M.A.*, 29, 1029; *Zhur. Priklad. Khim.*, 1951, 24, 1026, 1151; *M.A.*, 25, 129. G. has investigated the corrosive action of the soln. by the method described previously (Doklady Akad. Nauk S.S.S.R., 1949, 74, 304), namely measurement of the current flowing between the electrodes of two metals. With Zn and Cu electrodes (0.1 x 20 x 0.1 mm, 0.1-0.15 mm. from one another) in a 0.25N soln. of I in benzene, the Zn became the anode and the e.m.f. was 1.0-1.1 V. The current was initially very weak, but increased after 10-20 min.; the internal resistance of the cell was ~100 MΩ at first, falling to ~0.1-0.01 MΩ. When 2-3 C had passed (determined by graphical integration of the current-time graph), the losses of Zn and Cu were 0.0037 and 0.0003 g., resp. (only the surface of the Zn facing the Cu was exposed to the soln.), i.e. the amount of electricity recorded is only 26-3% of that theoretically required for the loss of Zn. The additional loss is attributed to the action of microelements on the surface of the Zn. The Cu/Zn macrocell did not

rapidly in both soln. Fe/Mg cells function in both benzol and iso-octane soln.; in a 0.03N iso-octane soln. the losses in weight were Mg (anode), 0.0531 g. and Fe 0.0010 g. for a flow of 24.8 C. This is only 2.8% of that theoretically required for the loss of Mg. The current from these cells ( $10^{-5}$  to  $10^{-4}$  amp.) was relatively high, even during the elect. conductivity of the soln. ( $10^{-10}$  to  $10^{-11}$  cm<sup>-1</sup>). Because of this, and of the relative inactivity in the first 10-20 min., G. explains the corrosion in terms of the formation between the electrodes of "bridges" of salts (in this case, probably polymeric ones) of mixed conductivity; the metal ions move from one electrode to another across these bridges and not through the poorly conducting soln. The sharp fluctuations in the current-time graphs are probably connected not so much with the polarization of the electrodes as with variations in the salt bridges. Corrosion of metals in these dielectrics, as in hydrocarbon soln. of fatty acids, is thus electrochem. in nature and not purely chem., as supposed by Kahlbaum (*J. Inorg. Chem.*, 1892, 6, 1). G. V. R. T.

GINDIN, L. G.

Oct 52

USSR/Metallurgy - Corrosion, Immunizers

"On the Immunization of Metals Against Corrosion,"  
L. G. Gindin and I. N. Putilova

"Dok Ak Nauk SSSR" Vol 86, No 5, pp 973-975

Defines immunizers as substances capable of delaying beginning of corrosion process on metals in hydrocarbon solutions, increasing, sometimes by thousands of times, induction period preceding evident beginning of corrosion. These substances were detected during search for corrosion inhibitors. Names several immunizers for copper, such as anthraquinone, aniline, triethanolamine, quinoline, benzyl alcohol, phthalimide, and

245T26

others. Discusses application of immunizers for protection of steel in kerosene and analyzes difference in action of inhibitors and immunizers, suggesting coefficient for evaluating protective action of latter. Submitted by Acad P. A. Rebinder 28 Jun 52.

245T26

PA 234T32

GINDIN, L.G.

USSR/Chemistry - Corrosion

21 Oct 52

"The Mechanism of Corrosion of Metals by Hydrocarbon  
Solutions of Sulfur," L. G. Gindin, T. A. Miskinova

"Dok Ak Nauk SSSR" Vol 86, No 6, pp 1145, 1146

Finds that the corrosion of copper by 0.1% benzene  
solns of sulfur is a purely chem process rather than  
electrochem. Presented by Acad P. A. Rebinde  
28 Jun 52.

234T32

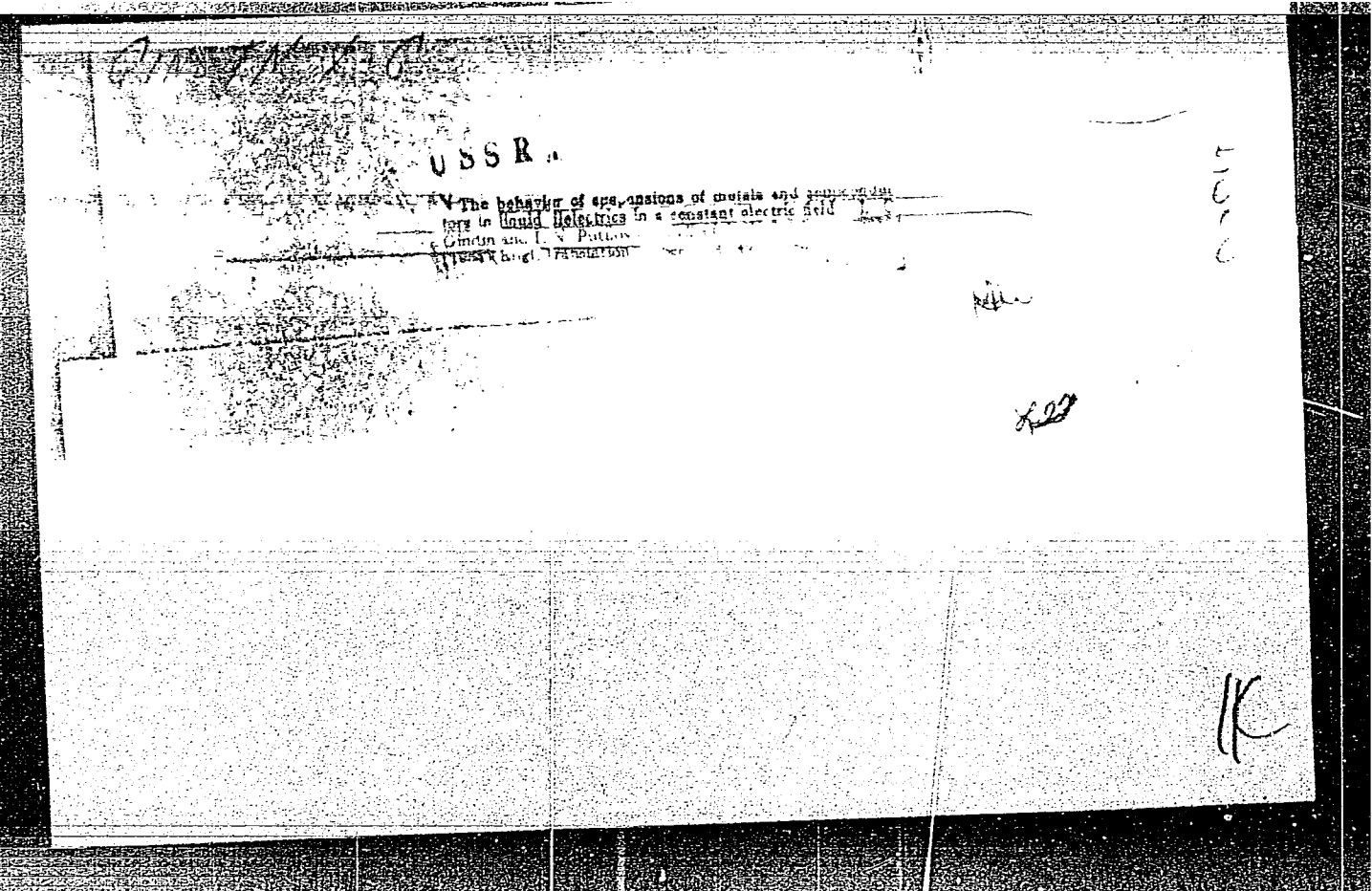
GINDIN, L.G.

Chemical Abst.  
Vol. 48 No. 5  
Mar. 10, 1954  
Metallurgy and Metallography

54

Corrosion of steels by kerosine and methods of its inhibition. L. N. Putilova, L. G. Gindin, E. V. Artamonova, and V. A. Kazakova; *Zhurn. Priklad. Khim.* 26, 148-51 (1953); cf. *C.A.* 36, 5160<sup>a</sup>.—Contrary to conclusions drawn from work on the corrosive action of gasoline and hydrocarbons (*J. C.A.* 31, 4253<sup>a</sup>, 1750<sup>a</sup>; 33, 3740<sup>a</sup>) kerosine was found to be corrosive to steels. The rate of corrosion for kerosines treated in different manners, in diminishing order, are as follows: kerosine (I no. 0.30); satd. with water; redistd.; treated with Na and satd. with H<sub>2</sub>O; and treated with Na. The analysis of the products of corrosion were 80% Fe<sup>+++</sup> salt of org. acids and 10% Fe<sub>2</sub>O<sub>3</sub>. This acid was more than the kerosine contained originally, and it continued to increase to 25 times its original content after the steel had been removed. This suggests induced autocatalytic oxidation of kerosine when in contact with steels, and shows that the rate of oxidation is greater than the rate of combination of acid formed with Fe. The addn. of a H<sub>2</sub>O soln. of Na benzoate prevents corrosion in the water phase, but corrosion continues in the kerosine phase. Org. substances contg. Cl, S, NH<sub>2</sub>, and OH are suggested as inhibitors (cf. *C.A.* 46, 6510b).  
I. Reucowitz





GINDIN, L.G.

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2244. THE ACTION OF A CONSTANT ELECTRIC FIELD ON A SUSPENSION OF METALS AND SEMICONDUCTORS IN LIQUID

*Handwritten initials*

The behaviour of 0.1% by weight suspensions of micro-sized particles in various media. Pt showed high conductivity and the ...

With both Pt and boron particles the ... formed at high fields was stable on removing the applied voltage. The high  $\sigma$  of Pt suspensions was attributed to the absence of ...

Gindin, L. G.

USSR

✓ The corrosion of metals by a saturated fuel. I. N. Putilova, L. G. Gindin, and E. V. Artamonova. *Doklady Akad. Nauk S.S.S.R.* 94, 489-92(1954); cf. *C.A.* 49, 4488h. —  
 The corrosion of the following metals and alloys in kerosine was studied by noting the time for surface discoloration to appear: Steel 1: C 0.19, Mn 0.43, Si 0.30, S 0.045, P 0.045, Ni 0.30, Cr 0.30%. Steel 2: C 0.40, Mn 0.65, Si 0.30, S 0.045, P 0.045, Ni 0.30, Cr 0.30%. Steel 3: C 1.60, Mn 0.90, Si 0.30, Cr 1.10, W 1.62%. Steel 4: C 0.99, Mn 0.30, Si 0.35, S 0.02, P 0.027, Ni 0.37, Cr 1.45%. Steel 5: C 0.30, Mn 0.75, Si 0.36, Ni 0.30, Cr 1.02%. Mg: Fe 0.09%, traces of Si. Mg-1: Al 0.3, Mn 2.2, Zn 0.3, Cu 0.35, Ni 0.01, Si 0.23, Be 0.02, Fe 0.04%. Mg-2: Al 8.3, Mn 0.3, Zn 0.7, Cu 0.05, Ni 0.002, Si 0.2, Be 0.02, Fe 0.04%. The kerosine was characterized by distn. and by the following: d<sub>4</sub><sup>20</sup> 0.819; acidity 0.50 mg-KOH; iodine no. 0.30; S content 0.05%; flash point ac-

62

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OVER  
(T)

I. N. PUTILOVA

according to Martens-Penski 36°. The kerosine was used as received (I); satd. with water (II); distd. (III); purified over Na (IV); purified over Na and then satd. with water (V). The best materials were steel 3 (lasting 70-8 days in I, 07-70 days in II, and 1 year with no corrosion in IV), and Mg and Mg-1 (no appearance of corrosion after 2 years in I, III, and IV). Steel 1 was the poorest (7-10 days in I) while steels 2, 4, 5 were nearly identical and intermediate between 1 and 3. Mg-2 lasted 25 days in I, 100 days in III, and 2 years in IV. Steel 1 and Mg-2 were also studied in two-phase mixts. of kerosine and water with and without Na benzoate (0.5 and 5%) in the water. Na benzoate lengthened the induction period in the aq. soln. and at the interface but only slightly in the kerosine. Thio, chloro- and amino derivs. of aliphatic and aromatic compds. were effective inhibitors for steel. These compds. were considered immunizers since corrosion did not appear for periods as long as one year.

R. D. Misch

Gindin, L.G.

62

Systematics of Inhibitors of the Corrosion of Metals. I. R. Putikova and L. G. Gindin (Zhur. Priklad. Khim., 1956, 29, (12), 1298-1301).—[In Russian]. P and G classify anti-corrosion substances into desactivators (which combine with H ions or dissolved O in aq. soln. and inhibitors (which have some surface effect). There are three types of inhibitor: (1) inhibitors proper, which reduce the corrosion rate but do not prevent the attack proceeding to completion; (2) immunizers, which have little effect on the corrosion rate but which cause there to be an induction period before corrosion begins; and (3) passivators, which set up a passive film, thus preventing any further corrosion. Types (1) and (3) can each be divided into chem. and electrochem. groups, and the electrochem. groups can each be further subdivided into anodic, cathodic-anodic, and cathodic inhibitors.—G. V. E. T.

①

of

GINDIN, L.G.; MISKINOVA, T.A.; PUTILOVA, I.N.

Kinetics of the reactions of benzene solutions of certain fatty acids with sodium. Dokl.AN SSSR 106 no.4:683-686 P '56.(MIRA 9:6)

1. Predstavleno akademikom A.A. Balandinym.  
(Acids, Fatty) (Sodium compounds)

GINDIN, L. G.

20-6-30/47

AUTHORS: Miskinova, T. A. , Gindin, L. G.

TITLE: The Kinetics of the Reactions of Sodium With Water and With the Systems: Water - Dioxane, Water - Butyric Acid (Kinetika reaktsiy natriya s vodoy i sistemami : voda - dioksan, voda - maslyanaya kislota)

PERIODICAL: Doklady AN SSSR, 1957, Vol. 117, Nr 6, pp. 1027 - 1029 (USSR)

ABSTRACT: Before the investigation of the reaction of sodium with the systems benzene - butyric acid - water it had to be determined how sodium reacts with water alone and with the systems water - butyric acid. The present paper gives the results of such investigations. Water was diluted with dioxane which does not react with sodium at room temperature. In the systems consisting of water and butyric acid the butyric acid serves as "diluting medium" of water. The method of the tests was already described in a preliminary paper by the authors (reference 1). The experiments were made at 20°C. The composition of the systems studied is given. The reaction with pure water was finished after several seconds. The data on the dependence of the reaction velocity on the concentration of water in the systems water - dioxane are illustrated by a diagram. In some such systems the reaction velocity is a linear function of the concentration of water and therefore satisfies a first order

Card 1/3

20-5-30/47

The Kinetics of the Reaction of Sodium With Water and With the Systems: Water -  
- Dioxane , Water - Butyric Acid

equation of reaction:  $dC/dt = kC$  with the constant  $C = 4,7 \cdot 10^{-5}$ . Above a certain concentration of water the reaction velocity rapidly increases. Dioxane with water most probably forms a number of oxone compounds by means of the hydrogen-linkages and thereby inactivates water to the known degree. A further diagram illustrates the dependence of the velocity of the dissolution of sodium in the systems butyric acid-water on the portion of water in them. This dependence has a peculiar steplike nature. These steps are in parallel with the abscissa and correspond to a certain interval of the molecular relations between water and fatty acid within which the dissolution velocity of sodium remains constant. These steps are of different length and height. The reduction of the velocity after the third step and the subsequent rapid acceleration of the reaction also are peculiar. The peculiar nature of this reaction may only be due to the common action of water and butyric acid upon the metal. First of all water is supposed to react with sodium. But the assumption arises that butyric acid because of the hydrogen-linkage forms a number of molecular compounds with water. It is just this fact which might represent the key for the explanation of the kinetic rules found here. There are 3 figures, 1 table, and 3 references, 2 of which are Slavic.

Card 2/3



20-6-30/47

The Kinetics of the Reactions of Sodium With Water and With the System: Water -  
- Dioxane, Water - Butyric Acid

PRESENTED: June 22, 1957, by P. A. Rebiner, Academician

SUBMITTED: June 5, 1957

AVAILABLE: Library of Congress

Card 3/3

S/044/62/000/005/056/072  
C111/C444

AUTHOR: Gindin, L. G.

TITLE: On the controlling of chemical reactions

PERIODICAL: Referativnyy zhurnal, Matematika, no. 5, 1962, 56,  
abstract 5V301. ("Probl. kibernetiki", no. 5, M. Fizmatgiz,  
1961, 97-103)

TEXT: One points to the large dispersion of the results of certain  
chemical experiments and to the processes of divergence and convergence  
in connection with it. The latter ones are also observed in physics,  
biology etc. The phenomena and analogies are considered under the  
kibernetik aspect. ✓

[Abstracter's note: Complete translation.]

Card 1/1

S/194/62/000/007/044/160  
D295/D308

AUTHOR: Gindin, L.G.

TITLE: On the control of chemical reactions

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika  
no. 7, 1962, abstract 7-2-95 yu (In collection: Probl.  
kibernetiki, no. 5; 1961, 97 - 103)

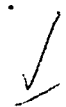
TEXT: The fundamental problem of chemical kinetics is the develop-  
ment of methods for the control of chemical reactions, enabling the  
automation of production. The factors governing the course of a che-  
mical process are divided into two groups: internal, material, and  
external ones (temperature, pressure, radiation, mixing, etc.). Dis-  
persion of experimental results, caused by the nature of the samp-  
les tested, occurs in physical and physico-chemical investigations.  
The methodological consequences of this are pointed out. Results of  
the author's experiments are shown as well as examples from animate  
nature, oecology and geology. The question is discussed of the need  
of differentiating cybernetics into branches, in conformity with  
the material nature of the systems investigated. The distinct featu-  
Card 1/2

SECRET

On the control of chemical reactions

S/194/62/000/007/044/160  
D295/D308

res of chemical cybernetics are discussed. The close connection of  
chemical cybernetics and chemical kinetics is emphasized. [Abstrac-  
tor's note: Complete translation.]



Card 2/2

GINDIN, L. G.; MISKINOVA, T. A.; PUTILOVA, I. N.

Reaction kinetics of sodium with the single-phase systems  
benzene-water-butyric (or lauric) acid. Zhur. fiz. khim. 36  
no.12:2589-2592 D '62. (MIRA 16:1)

1. Moskovskiy elektrotekhnicheskiy institut svyazi.

(Butyric acid) (Benzene) (Sodium)

GINDIN, L.G.; MISKINOVA, T.A.

Kinetics of certain reactions involving metallic sodium. Kin.  
1 kat. 4 no.3:480-483 My-Je '63. (MIRA 16:7)

1. Vsesoyuznyy nauchnyy politekhnicheskiy institut.  
(Sodium) (Chemical reaction, Rate of)

MISKINOVA, T.A.; GINDIN, L.G.

Lead corrosion in dielectric materials. Zashch. met. 1 no.2:  
195-198 Mr-Ap '65. (MIRA 18:6)

1. Vsesoyuznyy zaochnyy politekhnicheskiy institut.

L 58283-65 EWT(1)/EWP(e)/EPA(s)-2/EWT(m)/EPR/EEC(t)/EWP(t)/EWP(k)/EWP(z)/EWP(b)  
Pf-4/Ps-4/Pt-7/P1-4 IJP(c) JD/GG  
ACCESSION NR: AP5015424 UR/0020/65/162/004/0839/0842

AUTHOR: Gindin, L. G.; Vol'p'yan, A. Ye.; Galkin, I. F.; Gul', V. Ye. 54  
0

TITLE: New data on the electrical breakdown of aluminum suspensions in dielectrics 21

SOURCE: AN SSSR. Doklady, v. 162, no. 4, 1965, 839-842 21

TOPIC TAGS: dielectric breakdown, aluminum suspension, aluminum dielectric,  
aluminum oxide

ABSTRACT: To provide a phenomenological description of the process by which aluminum in suspensions is converted from a dielectric (due to its oxidized surface layer) to a conductor, the authors took motion pictures of the principal stages of this process. The pictures were taken continuously at the rate of one frame every 4 sec. The aluminum powder particles, ranging in size from fractions of one micron to several microns (peak of distribution curve at 1  $\mu$ ), were dispersed in B-70 aviation gasoline. Aluminum powders impregnated with B-70 (into which the electrodes were inserted) were also studied. Photographs representative of the principal stages are illustrated and described. In addition, the authors investigated the fundamental problems of the structure of the bridge formed by the aluminum particles and the nature of the forces which form it and hold it together. To this end, oscil-

Card 1/3



L 58283-65

ACCESSION NR: AP5015424

lations of the current and voltage of the bridges were recorded, and the current-voltage characteristics of the bridge were plotted (see Fig. 1 of the Enclosure). The hysteresis loop arises from a structural rearrangement of the bridge. The observed deviations from Ohm's law were attributed to the evolutions of Joule heat. The results confirm an earlier hypothesis that the bonding between the individual links of the bridge is metallic and that when breakdown occurs the aluminum particles are welded to one another. Furthermore, the oscillograms indicate that when the current passes through the bridge, a major part is played by the forces of the electric field which continuously restore the broken contact between the links of the bridge and give it a degree of stability. Orig. art. has: 2 figures, 2 tables, and 3 formulas. [08]

ASSOCIATION: none

SUBMITTED: 18Dec64

ENCL: 01

SUB CODE: IC, EM

NO REF SOV: 003

OTHER: 002

ATD PRESS: 4037

Card 2/3

L 58283-65

ACCESSION NR: AP5015424

ENCLOSURE: 01

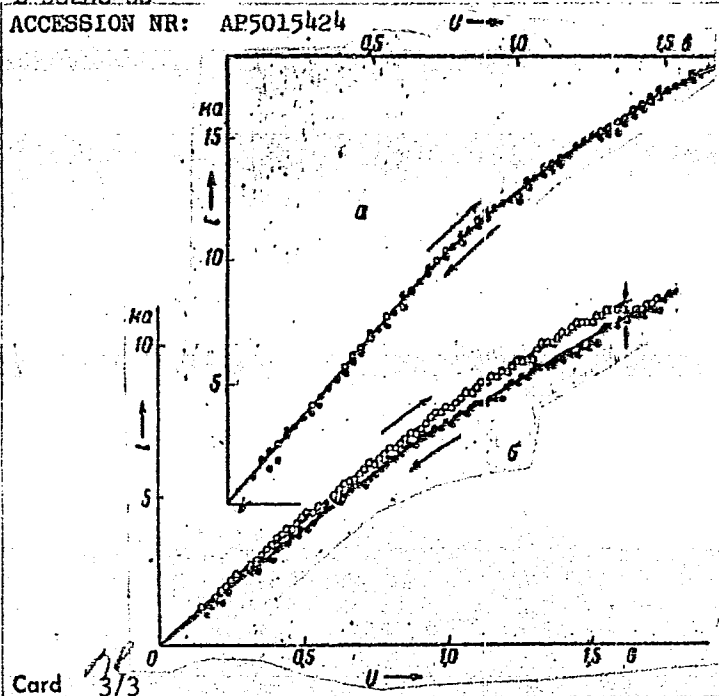


Fig. 1. Current-voltage characteristics of aluminum bridges

a - Without hysteresis loop; b - with hysteresis loop.

ZHIL'TSOVA, V.M.; KRUGLYAKOVA, K.Ye.; ULANOV, B.P.; GINDIN, L.G.

Kinetics of DNA denaturation following ultraviolet irradiation.  
Dokl. AN SSSR 164 no.1:198-200 S '65. (MIRA 18:9)

1. Vsesoyuznyy zaochnyy politekhnicheskii institut i Institut  
khimicheskoy fiziki AN SSSR. Submitted March 25, 1965.

BALANDIN, A.A.; GINDIN, I.G.

Kinetics of antibacterial reactions. Report No.1. Effect of  
some organotin compounds on pathogenic bacteria. Biofizika 10  
no.6:986-992 1965. (MIRA 19:1)

1. Vsesoyuznyy zaochnyy politekhnicheskiiy institut, Moskva.  
Submitted March 23, 1965.

L 21191-66 EWT(1)/EWP(e)/EWT(m)/EWP(t)/EWP(k) IJP(c) JD

ACC NR: AP6008052

SOURCE CODE: UR/0020/66/166/004/0894/0896

AUTHOR: Vol'pian, A. Ye.; Gindin, L. G.; Gul', V. Ye. 62  
E

ORG: All-Union Correspondence Polytechnic Institute (Vsesoyuznyy zaachnyy politekhnicheskiy institut)

TITLE: Behavior of copper suspensions and powders in a constant electric field 21, 44-55

SOURCE: AN SSSR. Doklady, v. 166, no. 4, 1966, 894-896

TOPIC TAGS: copper, electric conductivity, powder metal property, semiconducting film

ABSTRACT: Powdered electrolyte copper particles (2-15  $\mu$ ) oxidized in air and covered with a film of semiconducting  $\text{Cu}_2\text{O}$  were suspended in B-70 airplane gasoline and the conductivity of the suspension in a constant electric field was studied. The volt-ampere characteristic obtained showed that the conductivity of the system increases smoothly with the field strength as is typical of semiconductors in strong electric fields. The conductivity was due to the contact between the individual

UDC: 54.148

Card 1/2 2

L 21191-66

ACC NR: AP6008052

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copper particles coated with  $Cu_2O$ . The critical voltage (value at which breakdown occurs) was found to be directly proportional to the thickness of the oxide film. This relationship can be used in rapid methods for determining the degree of oxidation of metal powders. In order to show that the conducting structures in powders do not differ from those observed in suspensions, the conductivity of copper powder immersed in gasoline was studied as a function of the depth of immersion of the electrodes; the volume of powder between the electrodes was proportional to the depth. It was found that the conductivity of the oxidized copper powder before breakdown and that of deoxidized copper powder is approximately proportional to the immersion depth whereas the conductivity of oxidized powder after breakdown is independent of the volume of powder between the electrodes. Hence, in the first and second case three-dimensional conducting structures are formed, but in the third case, a bridge is produced. The paper was presented by Academician A. A. Balandin on 6 July 1965. Orig. art. has: 3 figures.

SUB CODE: 11/      SUBM DATE: 05Jul65/      ORIG REF: 006/      OTH REF: 000

Card 2/2 *ddr*

L 05130-07 EWP(K)/EWT(M)/EWP(C)/EWP(W)/EWP(L)/ETI IJP(c) WE/DS/WW/JD/IW/JG

ACC NR: AP6027736 SOURCE CODE: UR/0020/66/169/004/0865/0867

AUTHOR: Gindin, L. G.; Vol'p'yan, A. Yo.; Galkin, I. F.

91  
89  
B

ORG: All-Union Correspondence Polytechnic Institute (Vsesoyuznyy zaochnyy politekni-  
cheskiy institut)

TITLE: Structuralization of suspensions and powders of certain metals in a constant electric field

SOURCE: AN SSSR. Doklady, v. 169, no. 4, 1966, 865-867

TOPIC TAGS: powder metal, dielectric breakdown, *ELECTRIC FIELD, ELECTRIC CONDUCTIVITY*

ABSTRACT: Suspensions in gasoline (B-70) and gasoline-immersed powders of Fe, Ni, Co, Cr, Mo, W, Sb, Bi, Sn, Pb and Ag were studied in a constant electric field. All the metal particles were oxidized as a result of prolonged contact with air. On the basis of the behavior of their disperse systems, the metals studied are divided into four groups: (1) Pb, Bi; (2) Fe, Co, Ni, Cr, W, Mo; (3) Sn, Zn; (4) Ag, Sb. The differences between the first three groups are shown in Fig. 1, where the first group is represented by lead. The conductivity of lead up to the breakdown was too low to be measured, and became high only after the breakdown (indicated by a broken line). The second group is represented by Fe and Co, whose structures in relatively weak fields (up to the breakdown) display a conductivity obeying Ohm's law, and as the field increases, a conductivity characteristic of thin semiconducting films in strong fields.

Card 1/3

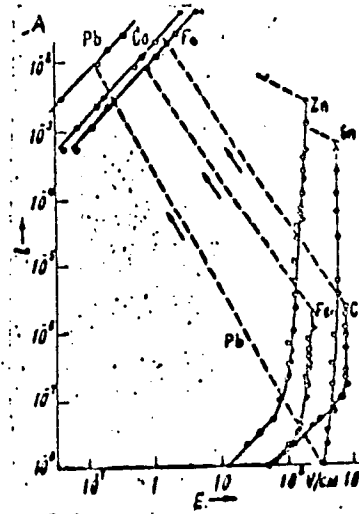
UDC: 54-148

L 05130-67

ACC NR: AP6027736

Breakdown occurs after  $E \geq E_{br}$  is reached. The third group is characterized by a still greater increase of conductivity with rising  $E$ ; whereas in Fe and Co the currents preceding the breakdown are  $10^{-6}$  A, they amount to  $\sim 10^{-3}$  A in Zn and Sn. In general, the behavior of suspensions and powders of the metals studied is determined by the nature and primarily by the conductivity of their oxide films. The formation of structures in the electric field is due to polarization forces of the particles, this polar-

Fig. 1. Volt-ampere characteristics of structures in Fe, Fe, Co, Zn and Sn powders (broken lines indicate breakdown leading to the formation of a bridge).





ACC NR: A16027736

ization in turn being related to the conductivity of the surface oxides. A conductivity low enough to promote the formation of more or less stable structures up to the breakdown is shown by oxides of the metals of the first three groups. The paper was presented by Academician Rebinder, P. A., 11 Dec 65. Authors thank Prof. V. Ye. Gul' for his steady interest in this work and for discussing its results. Orig. art. has 2 figures.

SUB CODE: 07,11,20/ SUBM DATE: 04Oct65/ ORIG REF: 010/ OTH REF: 004

Card 3/3

GINDIN, L. M.

PA 1170

USSR/Chemistry - Polymerization - Apr 1947  
Chemistry - Azeotropes

"Some Problems of Binary Copolymerization." L. M.  
Gindin, A. D. Abkin, S. S. Medvedev, 4 pp

"CR Acad Sci" Vol LVI, No 2

Differential equations and their solutions, describing  
the subject phenomenon. Study of azeotropic  
(extremal boiling point) mixtures and the limits to  
polymerization.

1170

AUTHORS: Gindin, L. M., and Kouba, E. F.

TITLE: Quick Detection of Nickel by the Extraction Method (Ekspressnoye opredeleniye Nikelya ekstraktsionnym metodom)

PERIODICAL: Zavodskaya Laboratoriya, 1957, Vol. 23, No. 1, pp. 19-20 (U.S.S.R.)

ABSTRACT: This process is based on the premise that the detection of nickel in hydroxide, oxide and metallic cobalt can be effected only after the removal of the cobalt. Cobalt is generally precipitated in the form of potassium cobaltinitrite. The final detection is done by the gravimetric or colorimetric method. The experimenters tried the method based on the difference in solubility of nickel dimethylglyoximate and cobalt in chloroform and found that the analysis took about 30 minutes. The analysis was begun by dissolving a batch of hydroxide or oxide of cobalt in a concentrated saline acid (metallic cobalt dissolved in nitric acid 1:1). The further steps of the analysis are stated, a table of results is prepared and it is found that the extraction method gives results close to those of the spectral method.

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Quick Detection of Nickel by the Extraction Method

ASSOCIATION: Noril Mining and Metallurgical Combine

PRESENTED BY:

SUBMITTED:

AVAILABLE:

Card 2/2

Gindin, L.M.

7 27.

2930. Rapid determination of iron in products of the cobalt industry by means of extraction. L. M. Gindin and E. E. Kouba (Nortsk Mining-Metallurgy Comb. In). *Zavod. Lab.*, 1957, 23 (2), 130-131.

The soln. (20 ml) of cobalt salts is mixed with 30 ml of conc. HCl in a separating funnel and shaken for 15 to 20 sec. with 25 ml of isoamyl acetate. The solvent layer containing the Fe is shaken with 25 ml of water, which extracts the Fe. Iron is determined colorimetrically with sulphosalicylic acid against an artificial scale of standards containing FeCl<sub>3</sub>, CoSO<sub>4</sub>, and HCl. With high contents of Co, several extractions may be necessary.

G. S. Saitu

4E2C  
4E4J

PM RB  
ALMG

SOV/20-122-3-34/57

AUTHORS:

Gindin, L. M., Bobikov, P. I., Kouba, E. F., Kopp, I. F., Rozen, A. M., Ter-Oganesov, N. A., Zagarskaya, N. I.

TITLE:

Separation of Metals by the Exchange-Extraction Method  
(Razdeleniye metallov metodom obmennoy ekstraktsii)

PERIODICAL:

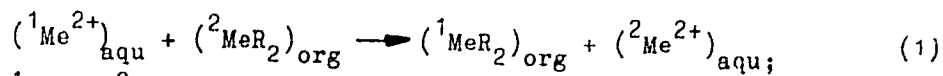
Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 3, pp 443-447  
(USSR)

ABSTRACT:

An extraction in connection with an exchange reaction between metals is a very productive method of separation if these metals are in different phases: in an organic phase as salts and aliphatic acids and in an aqueous phase as salts of mineral acids (Ref 1). For this purpose saturated aliphatic acids with 5 and more carbon atoms were used. They fulfill a double function: a) they take part in the formation of the corresponding metallic salts (soaps), and b) they serve as solvents for these soaps being formed. Aliphatic acids are used most properly as solutions in an inactive solvent with a low specific weight. Directions for the preparation of such solutions are mentioned. The exchange reaction between the metals as mentioned earlier can be expressed by the following equation:

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. Separation of Metals by the Exchange-Extraction Method SOV/20-122-3-34/57



${}^1\text{M}$  and  ${}^2\text{M}$  denote the corresponding metals, R - the organic residue of the aliphatic acid  $\text{C}_n\text{H}_{2n+1}\text{COO}'$ , the indices org and aqu denote the organic and the aqueous phase. The equilibrium constant of the exchange reaction depends on the character of the exchanging metals, as was confirmed by the experiments. Metals with a small pH value ("acid" metals) mainly pass into the organic phase, metals with a high pH value, however, (more alkaline metals) into the aqueous phase. In many cases reaction (1) takes place almost completely (>99%), it may therefore be said that a metal is displaced from the organic phase by another metal. Separation of the metallic salts by means of the reaction mentioned in the title can be carried out from the aqueous as well as from the organic phase. In the first case (Fig 1) the aqueous phase which contains a mixture of salts of two metals is brought into contact with the organic phase in which a salt of an aliphatic acid of a stronger alkaline metal is contained. In the second case the organic phase which contains a mixture of salts of the aliphatic acids is brought into contact with the aqueous phase which contains a salt of a mineral acid of a

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Separation of Metals by the Exchange-Extraction Method SOV/20-122-3-54/51

weaker alkaline metal. Table 1 reveals the results of separation of metallic salts combined with sulfuric acid by means of the discussed method. As organic phase a solvent of industrial aliphatic acids of the fraction C<sub>7</sub> - C<sub>9</sub> (average molecular weight 141) in petroleum (400 g/liter) was used. Data on table 1 characterize a single exchange. By using an extraction column the degree of separation is considerably increased. If metals have similar properties reaction takes place incompletely. There are 2 figures, 1 table, and 1 reference, 1 of which is Soviet.

ASSOCIATION: Noril'skiy gorno-metallurgicheskiy kombinat im. A. P. Zavenyagina (Noril'sk Mining Metallurgy Kombinat imeni A. P. Zavenyagin)

PRESENTED: May 4, 1958, by S. I. Vol'fkovich, Member, Academy of Sciences, USSR

SUBMITTED: April 12, 1958

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5(2,3,4)

SOV/20-128-2-20/59

AUTHORS:

Gindin, L. M., Bobikov, P. I., Rozen, A. M.

TITLE:

Some Physico-chemical Peculiarities of the Exchange Extraction

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 2, pp 295-298  
(USSR)

ABSTRACT:

The exchange extraction is based on reactions proceeding between the salts of fatty acids (soaps), which are mainly dissolved in the organic phase, and the salts of mineral acids dissolved in the aqueous phase (Ref 1). Besides the above-mentioned reaction (1), its equilibrium constant  $K$  (2) as well as the equilibrium conditions for metal soaps (3) are indicated ( $K_1$  and  $K_2$ ). The soaps are not dissociated in the organic phase, but they are dissociated in the aqueous phase. In the exchange reaction, the equilibrium conditions of the equations of both soaps must be satisfied at the same time. A common solution of the two equations (3) gives the value of  $K_1/K_2$  (4). From (2) and (4) it results that  $K = K_1/K_2$ , i.e. the equilibrium constant of the exchange reaction is equal to the ratio of the

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Some Physico-chemical Peculiarities of the Exchange Extraction

distribution constants of the mutually exchanging metals. Thus, the direction of the exchange reactions is conditioned by the distribution character of the corresponding soaps. The metals, the soaps of which are less soluble in water, pass into the organic phase, mainly as soaps. Metals with a higher water solubility of their soaps are concentrated in the aqueous phase as cations. With respect to the rising water solubility of their soaps, the metals constitute the following sequence: Fe<sup>III</sup>, Pb<sup>II</sup>, Cu<sup>II</sup>, Zn, Ni<sup>II</sup>, Co<sup>II</sup>, Mn<sup>II</sup>, Na; the same order is maintained in the exchange reactions: each metal, which is present as a cation in the aqueous phase, dislodges all metals on its right in the sequence out of the soap dissolved in the organic phase. The extraction of the metal by the organic phase can be achieved by the introduction of an alkali into the system. Figure 1 shows the experimental results characterizing the extraction of Cu<sup>II</sup>, Zn, Ni<sup>II</sup>, and Co<sup>II</sup> by a fatty acid (fraction C<sub>7</sub>-C<sub>9</sub> dissolved in petroleum, concentration of the acid 400 g/l) under the influence of NaOH. This shows that the

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equation  $\lg \alpha = K_6 + 2 \text{ pH}$  (11) derived from the above-mentioned equations is satisfied. With an increase in the basic properties of the metals, the value of the constant  $K_6$  decreases, while the above-mentioned sequence of metals is maintained. It is easy to prove that for metals of equal valency the constant (1) is determined by the constants  $K_{\text{Me-H}}$  characterizing the extraction of each metal mutually exchanging under the influence of the base. After further calculations ((12) - (20)), the authors arrive at the conclusion that the solubility of the soap in the aqueous phase is proportional to the cube root of the solubility product of the metal hydroxide. This explains the connection between the behavior of a metal during the extraction by fatty acids, and its basicity. The separation of metals by exchange extraction constitutes a peculiar hydrolytic method of separation: this separation is distinguished from the ordinary hydrolytic method by the absence of precipitation. As is well intelligible, this separation proceeds more perfectly since there is no carrying along by the solid phase. Be-

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sides, a multi-stage separation in counterflow columns is easier to be carried out. Therefore, this kind of extraction makes possible the separation of metals with similar properties (e.g.  $\text{Co}^{\text{II}}$  -  $\text{Ni}^{\text{II}}$ ) which cannot be achieved by means of hydrolytic separation. Figure 2 shows the dependence of the  $\lg(\text{Me}^{+2})_b$  on pH in the distribution of soaps. There are 2 figures and 4 references, 2 of which are Soviet.

ASSOCIATION: Noril'skiy gornometallurgicheskiy kombinat im. A. P. Zavenyagina (Noril'sk Mining Metallurgical Kombinat imeni A. P. Zavenyagin)

PRESENTED: April 6, 1959, by I. I. Chernyayev, Academician

SUBMITTED: March 30, 1959

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GINDIN, L.M.

Extraction of hydrochloric acid and calcium chloride with  
isoamyl alcohol. Zhur.neorg.khim. 5 no.1:139-148 Ja '60.  
(MIRA 13:5)

1. Noril'skiy gorno-metallurgicheskiy kombinat im. A.P.  
Zavenyugina, Opytno-issledovatel'skiy tsokh.  
(Hydrochloric acid) (Calcium chloride)  
(Isopentyl alcohol)

GINDIN, L.M.; KOPP, I.F.; RCZEN, A.M.; BOBIKOV, P.I.; KOUBA, E.F.;  
TER-OGANESOV, N.A.

Extraction equilibria for cobalt, nickel, and certain metals.  
Zhur.neorg.khim. 5 no.1:149-159 Ja '60.

(MIRA 13:5)

1. Noril'skiy gornometallurgicheskiy kombinat im. A.P.  
Zavenyagina, Opytno-issledovatel'skiy tsekh.  
(Extraction (Chemistry)) (Metals)

GINDIN, L.M.; BOBIKOV, P.I.; KOUBA, E.F.; BUGAYEVA, A.V.

Separation of metals by exchange extraction with fatty acids under the influence of alkali. Zhur. neorg. khim. 5 no.8:1868-1875 Ag '60. (MIRA 13:9)

1. Noril'skiy gornometallurgicheskiy kombinat im.A.P.Zavenyagina.  
(Acids, Fatty) (Metals--Analysis) (Extraction (Chemistry))

GINDIN, L.M.; BOBIKOV, P.I.; KOUBA, E.F.; BUGAYEVA, A.V.

Distribution of metal soaps in exchange extraction. Zhur. neorg.  
khim. 5 no.10:2366-2373 O '60. (MIRA 13:10)

1. Noril'skiy gornometallurgicheskiy kombinat im.A.P.Zavenyagina.  
(Soap) (Extraction (Chemistry))



GINDIN, L.M.; BOBIKOV, P.I.; KOUBA, E.F.

Extraction of metals of the platinum group with amines.  
Izv. Sib. otd. AN SSSR no.10:84-91 '61. (MIRA 14:12)

1. Noril'skiy gornometallurgicheskiy kombinat imeni A.P.  
Zavenyagina.

(PLATINUM GROUP)  
(EXTRACTION(CHEMISTRY))  
(AMINES)

18.3100

31739  
S/136/61/000/012/001/006  
E091/E335

AUTHORS: Gindin, L.M., Bobikov, P.I., Patyukov, G.M.,  
Dar'yal'skiy, V.A., Brodnitskiy, K.P. and Kasavin, I.A.

TITLE: Electrolytic-extraction method for the production of  
high-purity cobalt

PERIODICAL: Tsvetnyye metally, no. 12, 1961, 22 - 26

TEXT: The basic method for the production of high-purity  
cobalt is its purification from other metals by double  
extraction and the final electrolytic separation of the metallic  
cobalt. Cobalt is separated from less alkaline metals during  
double extraction and, subsequently, it is separated from more  
alkaline ones, which plate out at the cathode to a certain extent,  
by electrodeposition. In the above technological scheme, an  
ion-exchange separation from Pb and Zn is used, in addition to  
the double-extraction purification of cobalt solutions. However,  
variations of this scheme are possible in which only extraction-  
purification without ion exchange is carried out. This method is  
based on the double reactions between metals in different phases:  
in the organic phase, in the form of fatty acid salts (soap) and  
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Electrolytic-extraction method ...

in the aqueous phase, in the form of mineral acid salts (chlorides or sulphates). Fatty acids of the C<sub>7</sub>-C<sub>9</sub> fraction (monocarbonic acids of the aliphatic series) are used in the organic phase; these participate in the formation of the corresponding metal salts and are also solvents for the soaps formed. The principles underlying this method are discussed and the procedure is outlined. The method has many advantages over the double extraction-electrolytic one. The following are the main advantages: 1) the purification of the Co solution from impurities is completely automated and mechanized; 2) filtration of solid cakes and operations associated with processing and unloading are dispensed with; 3) the extraction of Co is higher and the losses lower; 4) compared with the normal hydrometallurgical process, this method of Co-production results in a higher quality metal; 5) purification is carried out at normal temperature and pressure;

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Electrolytic-extraction method .. E091/E335

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- 6) working conditions are healthier;
- 7) production costs are lower.

There are 1 figure, 1 table and 4 Soviet-bloc references.

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