

BELILOVSKIY, Yefim Solomonovich; BOGUSLAVSKIY, Eduard Yelizarovich;  
BINUS, Mark Semenovich; VOLODIN, Aleksey Pavlovich; KUSHIN,  
Iziaslav Kopelovich, SELEKTOR, Spartak Mikhailovich; CHUB,  
Vasiliy Fedoseyevich; YAMKOVY, Grigoriy Tikhonovich; DMITRIYEV,  
A.P., otv. red.; KOVAL', I.V., red. izd-va; MAKSIMOVA, V.V., tekhn. red.

[Improvement of underground mining methods and equipment in the  
Krivoy Rog Basin] Sovershenstvovanie tekhniki i tekhnologii pod-  
zemnoi dobychi rudy v Krivorozhskom basseine. [Dy] E.S. Belilov-  
skii i dr. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po gornomu  
delu, 1961. 238 p. (MIRA 15:3)

(Krivoy Rog Basin--Iron mines and mining)  
(Automatic control)

KUGIN, I.K.; SIMFOROV, G.Ye.; GAVRILENKO, N.L.; SOLOMASHENKO, Yu.A.;  
GORBATOV, V.S.

Chamber mining system. Biul. TSIICHM no.3:46 '61. (MIRA 14:12)  
(Mining engineering--Patents)

BERESLAVETS, F.G., inzh.; ZINENKO, A.G., inzh.; KUNIN, I.K., inzh.;  
GRIBANOV, I.P., inzh.; PRILIPENKO, Ye.D., inzh.

Iron ore haulage out of the stope by vibrating conveyers. Met.  
i gornourd. prom. no.3:83-85 My-Je '62. (MIRA 15:9)  
(Conveying machinery)

SUPRUNOV, N.N.; BESPAL'CHIK, L.M.; TIMOFEYEV, V.M.; BEZLYUD'KO,  
A.I., otv. red.; YEROKHIN, G.M., ved. red.; NESTERENKO,  
V.I., red.; KUNIN, I.K., red.;

[Jet boring; studies] Termicheskoe burenie; sbornik tru-  
dov. Moskva, Nedra, 1965. 182 p. (MIRA 18:12)

1. Krivoy Rog. Institut "Giprorudmash."

VASHCHENKO, V.S., gornyy inzhener; KUNIN, I.N., gornyy inzhener;  
LINNIK, G.F., gornyy inzhener.

Increasing the productivity of electric haulage at the  
"Gigant" mine. Gor. zhur. no.7:26-28 J1 '56. (MLRA 9:9)

1. Shakhta Gigant, rudoupravleniye imeni Dzerzhinskogo.  
(Mine haulage)

VASHCHENKO, V.S., gornyy inzhener; KURIN, I.N., gornyy inzhener; LITNIK, G.F.,  
gornyy inzhener.

Improving work organization at the "Gigant" mine. Gos.zhur. no.6:3-7  
Je '57. (MLRA 10:8)

(Mine management)

S/080/62/035/012/002/012  
D444/D307

AUTHORS: Platkov, M.A., Illarionov, V.I., Kononov, V.A.,  
Kunin, K.V. and Evenchik, S.D.

TITLE: Separation of sulfur and selenium in packed and  
plate columns and the efficiencies

PERIODICAL: Zhurnal prikladnoy khimii, v. 35, no. 12, 1962,  
2620-2624

TEXT: The object of this work was to fill the lack of  
information on plate efficiency or the proportionality coefficient  
between a theoretical plate and unit height of packing. This infor-  
mation is needed for sulfur-selenium separation column design. The  
material used was sulfur containing 0.4% As, 0.03% Se, 0.02% Te,  
bitumen and ash; a Se-enriched variety (0.044% Se) was also used.  
It was found that one theoretical plate corresponds to 27 cm of  
packed column with a reflux number of 2.6 and 5 x 4.3 x 0.3 and  
7.8 x 8.5 x 0.3 mm packing. The efficiency of columns with 'sieve'  
and 'bubble-cap' plates was 6.5 and 0.31, respectively. With the

Card 1/2

S/080/62/035/012/002/012  
D444/D307

Separation of sulfur ...

degrees of separation of sulfur and selenium obtained the tellurium goes into the distillate proportionately to the selenium, while arsenic goes into the residue. There are 2 figures and 4 tables.

SUBMITTED: September 7, 1961

Card 2/2



KUNIN, Leonid Aleksandrovich; ROTSHEYN, Leonid Isaakovich; ANTONENKO, Ye.A.,  
red.; GOSTISHCHEVA, Ye.M., tekhn. red.

[Installation and repair of radio receivers, record players, and  
radio-phonograph combinations] radiopriemniki, radioly, proigryvateli;  
ustroistvo i remont. Novosibirsk , Novosibirskoe knizhnoe izd-vo, 1960.  
68 p. (Radio) (Phonograph) (MIRA 14:11)

KUNIN, L.B.

Control of epidermophytosis under industrial conditions. Vest.derm.  
i ven. 31 no.4:55-56 J1-Ag '57. (MIRA 10:11)

1. Iz polikliniki No.82 Moskvu.  
(RINGWORM)

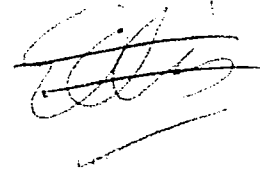
KUNIN, L.B.

Prevention of epidermophytosis in industry. Gig.i san. 23 no.8:77  
Ag '58 (MIRA 11:9)

1. Iz gorodskoy bol'nitsy No.55 Moskvoret'skogo rayona Moskvyy.  
(DERMATOMYCOSIS)



KUNIN, L.L.



70

B. T. R.  
Vol. 3 No. 5  
May 1954  
Metals--Foundry Practice

6838 Device for Determining the Fluidity and Rate of Flow of a Stream of Liquid Metal. L. L. Kunin. Henry Brucher, Alhadena, Cal., Translation no. 2318, 4 p. (From Zavodskaya Laboratoriya, v. 15, no. 7, 1949, p. 870-872.) Determination of fluidity of molten metals not only by length of spiral cast but by rate of flow during filling the mold as well. Diagram, graph, photographs. 2 ref.

PROCESSES AND PROPERTIES

69

8

**The Flowability of a Metal and Methods for Its Determination.** In. A. Rlyachko and L. L. Kunin. (Zavolokaya Laboratoriya, 1948, vol. 15, Oct., pp. 1198-1206). [In Russian]. The influence of flowability on the extent to which moulds are filled by a given metal is discussed, and the equations proposed by various authors for the calculation of flowability from experimental data are critically compared. The more fundamental aspects of flowability are also examined, and the relation between the flowability of a metal or alloy in its liquid state and its physical properties when solid is considered together with the influence of alloying elements, on the basis of data taken from the literature. Though most emphasis is on ferrous materials, some non-ferrous metals and alloys are also dealt with.—s. z.

AS & SLA METALLOGICAL LITERATURE CLASSIFICATION

EZ

CA

9

Colloidal phenomena in metals. XII. Explanation of the formation of a sinter layer on cast metals on the basis of the electrochemical theory of slags. Yu. A. Klyachko and L. L. Kuzn. *Zhur. Priklad. Khim.* (J. Applied Chem.) 22, 707-15 (1949); cf. *C.A.* 45, 4514a.—The formation of the "sinter layer" of metal oxides and silicates, often contg. veins of metal, that occurs on iron and steel castings was studied by expt. and theoretically. Three mold-material plates were used; pure graphite and pressed powders of  $\text{SiO}_2$  and of  $\text{Al}_2\text{O}_3$ . From 1 to 1.5-g. cylinders of cast iron were melted on horizontal surfaces of these plates, and the processes of melting and drop formation were followed by a photographic app. Wetting of the plate by the liquid metal was the criterion of mutual adhesion. Actual measurements of wetting angle were made on solidified drops. New phases arose at the metal-plate boundary for  $\text{SiO}_2$  and  $\text{Al}_2\text{O}_3$ . The phase on  $\text{SiO}_2$  was strongly attached to the  $\text{SiO}_2$  and weakly attached to the metal. The new phase on  $\text{Al}_2\text{O}_3$  was more strongly attached to the metal. In all cases the cast iron

cylinder began to melt at the edges and sometimes boiled up while a white burning "cloud" formed around it. When the burning out of these components ended, the cylinder formed a drop, which was covered with a slag layer. The angle made by the edge of the drop on the graphite was in the range 114-125°; on the new phase on  $\text{SiO}_2$ , 94-108°; on the new phase on  $\text{Al}_2\text{O}_3$ , 68-83°. Thus, the new phase on  $\text{Al}_2\text{O}_3$  was wet better by the cast iron. Two different cast irons were used and gave similar results. The analyses were (1) 3.32 C, 2.05 Si, 0.30 P, 0.81 Mn; (2) 2.98 C, 4.76 Si, 0.30 P, 0.51 Mn. The Mn contents after melting were (1) 0.52 and (2) 0.32. The surface slag on the  $\text{SiO}_2$  plate was (1) 73.35 FeO, 11.82 MnO, 12.83  $\text{SiO}_2$ , 0  $\text{Al}_2\text{O}_3$ ; and (2) 79.05, 9.74, 20.21, 0, resp., for the two cast irons. The contents of the same comps. in the new phase on  $\text{SiO}_2$  were (1) 70.12, 0, 29.88, 0; and (2) 69.42, 0, 30.58, 0. The slag on the  $\text{Al}_2\text{O}_3$  plate was (1) 73.24, 10.15, 12.22, 4.39 and (2) 69.82, 8.65, 18.48, 3.05. The new phase on  $\text{Al}_2\text{O}_3$  was (1) 42.63, 6.05, 6.89, 44.43, and (2) 49.04, 5.17, 12.15, 35.04. Calculs. of the structures based on the ionic theory of slags agreed with the results of x-ray examn. of the test products. The new phase on  $\text{SiO}_2$  is fayalite. Both slags contain fayalite and iron oxide. The new phase on  $\text{Al}_2\text{O}_3$  is similar to the slags. A theory of sinter-layer formation was based on these results. The degree of adhesion of an intermediate (new) phase to the mold material and to the metal is proportional to the closeness of matching of the corresponding ionic lattices. This theory accounts for the fact that the thickness of sinter layer increases with increase in clay content of molding sand and decreases when a thin layer of  $\text{SiO}_2$  is placed on the mold surface. Besides its use in eliminating sinter layer, this theory can be used in producing protective layers on castings.

A. G. Guy

1951

KUNIN, L. L.

PA 26/49T79

USSR/Metals  
Alloys  
Surface Tension

Jan 49

"Surface Tension in Eutectic Alloys," Yu. A. Klyachko, L. L. Kunin, All-Union Corr Polytech Inst, 2 pp

"Dok Ak Nauk SSSR" Vol LXIV, No 1

From study of subject tension, following conclusions are drawn: (1) during overheating considerably above crystallization temperature, the eutectic point does not seem to be affected by dependence of surface tension on concentration of alloy, (2) during slight

26/49T79

USSR/Metals (Contd)

Jan 49

overheating, surface tension of eutectic alloys, and of alloys close to them, drops sharply, and (3) surface tension of eutectic alloys in the overheating region up to 1000 above crystallization point has positive temperature coefficient. Submitted 3 Nov 48.

26/49T79



KUNIN, L. L.

PA 163T65

USSR/Metals - Surface Tension  
Steels

Jun 50

"Device for Measuring the Surface Tension of  
Cast Iron and Steel," L. L. Kunin, Yu. A. Kly-  
achko, Cen Sci Res Inst of Tech and Mach Bldg

"Zavod Lab" Vol XVI, No 6, pp 750-753

Describes apparatus for measuring surface tension  
of liquid metals in vacuum. Device permits vari-  
ous controllable changes in conditions of heat-  
ing and cooling, regulation of gaseous medium, thus  
giving possibility of investigating physical prop-  
erties of metals in molten state as to external  
conditions.

163T65

KUNIN, L. L.

USSR/Metals-Steel

Jun 50

"Effect of Boron on the Surface Tension of Kh15N25 Steel," Yu. A. Klyachko, L. L. Kunin, N. S. Kreshchanovskiy, E. S. Ginzburg

"Dok Ak Nauk SSSR" Vol LXXII, No 5, pp 927-928

Chemical composition of samples used: C - 0.04%; Si - 0.26%; Mn-0.04%; S - 0.28%; P - 0.021%; Cr - 15.44%; Ni - 26.09. Boron used was in form of ferroboration containing 18% B. Measurements conducted in vacuum furnace with addition of 0.- 0.8% B. Concludes boron is actually surface-active element in relation to solvent (Kh15N25 steel). Results experimentally confirm applicability here of modification theory, according to which modification effect leads to decrease in linear rate of crystallization as a result of adsorption of surface-active substance at fusion-crystal boundary. Submitted 19 Apr 50 by Acad G. G. Urazov.

PA 163T48

KUNIN, L. L.

USSR/Metals - Steel, Structure

Feb 51

"Effect of Calcium on Crystallization and Surface Tension of Austenitic Nickel-Chromium Steel," L. P. Zapetaeva, N. S. Kreshchanovskiy, Cand Tech Sci, L. L. Kunin, Engr, TSMIIMASH

"Litey Preciz" No 2, pp 26-28

Studied modifying effect of various amounts of Ca, up to 1.5%, on surface tension and primary crystal of steel Kh15N25. Describes apparatus and procedure for measuring surface tension. Established addition of 0.5% Ca as optimum for good macrostructure with finest grain when zone of columnar crystal is entirely eliminated.

185796

CA

Formulas for the calculation of the surface tension  $\sigma$  of metals. L. L. Kuvshin. *Doklady Akad. Nauk S.S.S.R.* 79, 103-6 (1961). - Literature data for the surface tension  $\sigma$  of Na, K, Cu, Ag, Hg, Zn, Cd, Al, Pt, Au, Ga, Sn, Pb, Sb, Bi, A, Ni, Mg, and a new expt. detn. for  $\gamma$ -Fe ( $\sigma = 1200$ ), are compared with values calcd. by the theoretical formulas:  $\sigma = 0.30e^2/a - 0.70e^2/a$  (Samoilovich);  $\sigma = 56400(\gamma/A)^{1/2}$  (Bregier and Zhukovitskii);  $\sigma = 0.0074(Ze)^2/a^2$  [(2e/3)(R/d)^2] (Glauber);  $\sigma = 0.0021(e/a)^2$  [(8e/3\sqrt{2})(R/a\_1)^2] (Shtikovskii);  $\sigma = (8.7 \times 10^4 Z^{1/2} a_1^{1/2}/A^{1/2}) + 4.22 \phi_0^{3/2}$  (Dorfinan);  $\sigma = Q/24.4^{1/2} N^{1/2}$ , where  $e$  = d. of the electron gas,  $Z$  = no. of valence electrons,  $e$  = electron charge,  $d$  = lattice const.,  $a_1$  = base of the hexagonal cell,  $R$  = ion radius,  $\gamma$  = d.,  $A$  = at. wt.,  $A_0$  = at. vol.,  $a$  = at. diamagnetic susceptibility,  $Q$  = heat of evap.,  $\phi_0$  = elec. potential. The best agreement is found with the formula of Samoilovich which rests on the increase of the kinetic energy of the electrons, due to the large electron gas d. gradients in the surface layer. The

calcd. values of  $\sigma$  are, however, too high, owing to an accurate estm. of the no. of free electrons. In e.g.s. units, the formula of Samoilovich becomes  $\sigma = 1.53 \times 10^4 [0.30(0.089/Z/A)^{1/2} - 0.70(0.089/Z/A)^{1/2}]$ . For metals with a normal Hall effect, the Hall const.  $A = (1/0050)(2/3)(A/\gamma Z)$ , and, with this value of  $Z$ ,  $\sigma = 0.01805 [21.517(1/A)^{1/2} - (1/A)^{1/2}]$ . Values calcd. with the aid of this equation are in fair agreement with the exptl. data for Ag, Cu, Au, Pt, Li, Na, but not for Al. More general agreement is found with an empirical formula  $\sigma = (44.5\psi/R^2) - 110$  (erg/cm<sup>2</sup>), where  $\psi$  = min. work function in v.,  $R$  = at. radius in A. This formula is satisfactory for Li, Na, K, Rb, Cs, Zn (polycryst. and monocryst.), Ag, Au, Fe, Ni, W, Cu, Pb, Al, Mo, Pt, but does not apply to Sn and Hg. The deviation in the case of Hg could be due to the presence of less than one free electron per atom.

N. Thon

KUNIN, L. L.

KUNIN, I. L. - "Investigation of the Surface Tension of Metals and of Certain Phenomena at the Solid Body-Liquid Metal Interface."  
Sub 28 May 52, Inst of General and Inorganic Chemistry imeni N. S. Kurnakov,  
Acad Sci USSR. (Dissertation for the Degree of Candidate in  
Chemical Sciences).

SO: Vechernaya Moskva January-December 1952

*KUMIN, L. L.*  
KUNIN, Lev Lazarevich, kandidat khimicheskikh nauk; KLYACHKO, Yu.A.  
professor, doktor khimicheskikh nauk; MIKHAYLOVA, V.V., tekhnicheskiy redaktor.

[Surface phenomena in metals] Poverkhnostnye iavlenia v metallakh.  
Pod red. I.U.A. Kliachko. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry  
po chernoi i tsvetnoi metallurgii, 1955. 304 p. (MLBA 8:11)  
(Metals) (Surfaces)

KUNIN, L.L.

AUTHORS Klyachko, Yu.A., Kunin, L.L., 32-8-5/61  
Chistyakova, Ye.M.

TITLE A Comparative Evaluation of the Methods for Determining  
the Gas Content in Steel.  
(Srvnittel'naya otsenka metodov opredeleniya gazov v stali.)

PERIODICAL Zavodskaya Laboratoriya, 1957, Vol. 23, Nr 8,  
pp. 905-907 (USSR)

ABSTRACT In the paper a comparison between two different apparatus  
for vacuum melting is demonstrated: one of them with  
resistance furnace and volumetric analyzer, and the other  
with high-frequency heating and analysis according to the  
pressure in calibrated volumes. The first apparatus was a  
PWP-2-system (Central Scientific Institute for Ferrous  
Metal Research) that was approved for works laboratories  
in 1955-56. The second apparatus was an improved con-  
struction of the already known apparatus proposed by the  
Institute for Geochemistry and Analytical Chemistry of  
the Academy of Science of the USSR which was equipped  
with a palladium filter and a copperoxide chamber. From  
the here described practical application of both apparatus  
the conclusion may be drawn that both yield good results.

CARD 1/2 1. The second apparatus permits to analyze gas mixtures

32-8-5/61

A Comparison Evaluation of the Methods for Determining the Gas Content in Steel.

up to 0,5 cm<sup>3</sup> and is therefore well applicable for the analysis of metals with a gas content not exceeding 5 cm<sup>3</sup> per 100 g metal.

2. The employment of both apparatus is possible for the analysis of a gas content of 5-25 cm<sup>3</sup> per 100 g metal.

3. For an analysis of gas-saturated metals (more than 25 cm<sup>3</sup> per 100 g metal) the employment of the first apparatus is recommended.

(2 tables)

ASSOCIATION: Central Scientific Research Institute for Ferrous Metals.  
(Tsentralnyy nauchno-issledovatel'skiy institut chernoy metallurgii)

AVAILABLE: Library of Congress.

CARD 2/2



KUNIN, L.L.

AUTHORS: Klyachko, Yu.A., Kunin, L.L., Chistyakova, Ye.M., Larichev, N.S. 32-12-4/71

TITLE: Analysis of Gases in Steel by the Method of Heating in the Vacuum (Analiz gasov v stali metodom vakuum-nagreva).

PERIODICAL: Zavodskaya Laboratoriya, 1957, Vol. 23, Nr 12, pp. 1410-1412 (USSR)

ABSTRACT: The existing sources of errors of the rapid methods as well as the apparatus belonging to them consist, according to the opinion of the authors, in the fact, that the gas which was eliminated during the course of experiments carried out, was supposed only to be hydrogen, but, in reality, also CO<sub>2</sub> water vapor and CO were existant. A new apparatus is suggested in this paper which, first of all, permits the elimination and capture of vapor and highly volatile gases from the sample. The vapor is condensed and the water obtained is frozen-in and weighed; the captured gases are determined in the same manner. Next, the products are determined which are eliminated within the course of time. In this way the content of H<sub>2</sub>, H<sub>2</sub>O and CO<sub>2</sub> can be determined separately in the sample. The apparatus consists of a system of quartz tubes, to one end of which a tubular furnace containing the sample is fitted. The vacuum pump with the correspond-

Card 1/2

Analysis of Gases in Steel by the Method of Heating  
in the Vacuum

32-12-4/71

ing measuring devices is located at the other end of the system. In the system itself the interception chambers (extensions) for the capture of vapors and gases including the corresponding measuring devices are located, as well as a connection with the spectrograph. When carrying out the experiment the fact that part of the condensed vapor goes over to hydrogen, has to be taken into account, which can be determined spectrographically. Here it was determined that, if the eliminated vapors and gases are not eliminated from the part in which the heated sample is located, a decrease of vapor elimination with a simultaneous increase of forming of hydrogen takes place. There are 1 figure, 2 tables, and 4 Slavic references.

ASSOCIATION: Central Scientific Research Institute for Ferrous Metallurgy  
(Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii).

AVAILABLE: Library of Congress

Card 2/2 1. Steel-Gas analysis 2. Instrumentation

KLYACHKO, YU. A., KUNIN, L. L.

"Results of Measurements of the Surface Tension of Metals."

Hydrodynamics of Molten Metals (Gidrodinamika rasplavlennykh metalov; trudy pervogo soveshchaniia po teorii liteinykh protsessov. Moskva, Izd-vo Akad. nauk SSSR, 1958, 257 pp.

(Proceedings of the First Conference on the Theory of Casting Processes)

Central Research Institute of Ferrous Metallurgy

KUNIN, L.L.

KLYACHKO, Yu.A.; IZMANOVA, T.A.; KUNIN, L.L.

Electrochemical properties of hydrogen in iron alloys. *Khim. nauka*  
i prom. 3 no.1:127 '58. (MIRA 11:3)

1. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii.  
(Hydrogen) (Iron alloys)

KUNIN, L.L.

AUTHOR: Turovtseva, Z. M., Candidate of Physical and Mathematical Sciences SOV/30-58-9-43/51

TITLE: Analysis of Gases in Metals (Analiz gazov v metallakh) Conference in Moscow (Soveshchaniye v Moskve)

PERIODICAL: Vestnik Akademii nauk SSSR, 1958, Nr 9, pp. 114 - 115 (USSR)

ABSTRACT: The conference took place in Moscow from June 24 to June 27. It was organized by: The Institut geokhimii i analiticheskoy khimii im.V.I.Vernadskogo i Komissiya po analiticheskoy khimii Akademii nauk SSSR (Institute of Geochemistry and Analytic Chemistry imeni V.I.Vernadskiy and the Committee for Analytic Chemistry of the AS USSR). 34 reports were heard and discussed. Yu.A.Klyachko reported on different forms of the state of gases in metals and the selection of corresponding methods of analysis. I.I.Kornilov spoke about the results of investigations of the phase diagram of the systems of the IV. column of elements containing oxygen and their importance for analytic chemistry. L.L.Kunin, Ye.M.Chistyakova dealt with physico-chemical bases of gas determination in metals by means of melting

Card 1/2

Anaiysis of Gases in Metals. Conference in Moscow

SOV/30-5B-9-43/51

in a vacuum.

A.N.Zaydel' and his collaborators reported on the further development of the isotopic equilibrium method for the determination of hydrogen in metals.

Ye.D.Malikova's report dealt with problems of oxygen analysis in alkaline and alkali earth metals.

The members of the conference stated that it is the most important task in the field of analysis of gases in metals to increase the sensitivity and exactness. The development of spectrum methods of gas analysis in metals has to be promoted. The industrial production of devices has to be organized.

Card 2/2

KUNIN, L.L.

PHASE I BOOK EXPLOITATION SOV/3584

Turovtseva, Zinaida Mikhaylovna, and Lev Lazarevich Kunin

Analiz gazov v metallakh (Analysis of Gases in Metals) Moscow,  
Izd-vo AN SSSR, 1959. 390 p. 2,500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut geokhimi i  
analiticheskoy khimii.

Ed.: A.P. Vinogradova, Academician; Ed. of Publishing House:  
N.V. Travin; Tech. Ed.: R.Ye. Zendel'.

PURPOSE: This book is intended for scientists and metallurgical  
engineers concerned with the gaseous impurities in metals.

COVERAGE: The book presents theoretical principles of determining  
gases in metals, describes the equipment and methods used in de-  
termining the hydrogen, oxygen and nitrogen content in metals,  
and makes recommendations for selecting methods and conditions  
suitable for analyses. Data from investigations done by Yu.A.  
Klachko and V.A. Zhabina on conditions for the extraction of

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Analysis of Gases in Metals

SOV/3584

oxygen from metals by the vacuum-fusion method and from research carried out at the Institut geokhimi i analiticheskoy khimii imeni Vernadskogo (Institute of Geochemistry and Analytical Chemistry imeni Vernadskiy) on the use of the vacuum-fusion method are used. Instruments for vacuum-fusion analysis were designed mainly at Institut metallurgii AN SSSR (Institute of Metallurgy of the Academy of Sciences USSR), Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii (Central Scientific Research Institute for Ferrous Metallurgy), and the Institute of Geochemistry and Analytical Chemistry. The research done by S.A. Mandel'shtam and O.B. Fal'kova on the spectrographic determination of oxygen and nitrogen in steel and the work of N.S. Sventitskiy on the spectrographic determination of hydrogen in metals was reviewed in collecting material for this book. The spectral analysis of gases based on the cathode tube discharge method of B. Rosen [American] is also covered along with the use of stable isotopes to determine gases in metals using mass spectrometric and spectral methods, the sulfur method [A.K. Babko], and the bromine-carbon method for determination of the presence of oxygen. According to the authors, the vacuum-fusion method, while adequate for

Card 2/11



Analysis of Gases in Metals

SOV/3584

determining hydrogen and oxygen, is inadequate for nitrogen determination. Chapter X is devoted to a chemical method developed by B.A. Generozov (Deceased), for determination of nitrogen content. There are 195 references: 33 Soviet, 116 English, 28 German, 9 Japanese, 7 French, 1 Italian, and 1 Dutch.

TABLE OF CONTENTS:

Introduction:

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PART I. THEORETICAL PRINCIPLES OF DETERMINING GASES IN METALS

Introductory remarks

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Ch. I. "Hydrogen - Metal" Systems

1. Thermal stability of the "hydrogen-metal" systems

10

2. Hydrogen diffusion in metals

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3. Degassing time and the amount of separated hydrogen

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4. Brief characteristics of methods for determining hydrogen in metals

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Card 3/11

KUNIN L.L.

BOOK I BOOK EXPLANATIONS

807/5015

Particulary well-instituted laboratory po... (Quality of Materials for...)

Supporting Agencies: USSR, Soviet Ministry... (This book is intended for technical personnel engaged in the manufacture...)

CONTRIBUTORS: This book treats methods of obtaining quality semiconductor materials... (List of authors and their affiliations follows)

Table with 2 columns: Page Number and Title. Entries include: 13. Methods for the determination of...; 19. Methods for the determination of...; 21. Methods for the determination of...; 60. Methods for the determination of...; 72. Methods for the determination of...; 95. Methods for the determination of...; 104. Methods for the determination of...; 108. Methods for the determination of...; 116. Methods for the determination of...

KURIN, L.L.

PHASE I BOOK EXPLOITATION

SOV/4617

Akademiya nauk SSSR. Komissiya po analiticheskoy khimii

Analiz gazov v metallakh (Analysis of Gases in Metals) Moscow, 1960. 304 p.  
(Series: Its: Trudy, tom. 10) Errata slip inserted. 4,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut geokhimii i analiticheskoy khimii imeni V.I. Vernadskogo. Komissiya po analiticheskoy khimii.

Resp. Ed.: A.P. Vinogradov, Academician; Ed. of Publishing House: A.L. Bankvitser;  
Tech. Ed.: V.V. Bruzgul'.

PURPOSE: This book is intended for laboratory personnel concerned with gas analysis in metals.

COVERAGE: This collection of articles is based on materials of the Commission on Analytical Chemistry AS USSR on problems dealing with gas analysis in metals. The articles present data on: 1) The vacuum-fusion method, developed by European scientists and the Soviet scientists N.P. Chizhevskiy and Yu.A. Klyachko, for the analysis of gases in steel and aluminum, and now applicable to analysis of gases in other metals. 2) The research of Z.M. Turovtseva and coworkers at

<Card 1/9

## Analysis of Gases in Metals

SOV/4617

the Institute of Geochemistry and Analytical Chemistry imeni V.I. Vernadskiy AS USSR, Moscow, making it possible to evaluate the practicability and fields of application of the different analytical methods. 3) The contributions of Yu.A. Klyachko and coworkers in their study of thermodynamic methods for the evaluation of suitable conditions for carrying out analysis. 4) The determination of gases in metals by the sulfurous method as developed by A.K. Babko. 5) The spectrum isotope method for the determination of hydrogen as developed by A.N. Zaydel' and coworkers. The authors of these articles systematize and review critically the various analytical methods, describe the apparatus used in analysis, and indicate the basic trends of research. References accompany most of the articles.

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[Vinogradov, A.P.] Foreword

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## I. THEORETICAL PRINCIPLES OF GAS ANALYSIS IN METALS

Klyachko, Yu.A. [Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii - Central Scientific Research Institute of Ferrous Metallurgy, Moscow]. State of Gases in Metals and Methods of Determining Them

5

Card 2/9

## Analysis of Gases in Metals

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- Klyachko, Yu.A., L.L. Kunin, and Ye.M. Chistyakova [Central Scientific Research Institute of Ferrous Metallurgy, Moscow]. Physicochemical Principles of Gas Determination in Metals by the Vacuum-Fusion Method 10
- Kornilov, I.I. [Institut metallurgii imeni A.A. Baykova AN SSSR - Institute of Metallurgy imeni A.A. Baykov AS USSR, Moscow]. State Diagrams of the System of IVth Group Elements-Oxygen 17
- Gel'd, P.V., and R.A. Ryabov [Ural'skiy politekhnicheskiy institut imeni S.M. Kirova - Ural Polytechnic Institute imeni S.M. Kirov, Sverdlovsk]. Effect of Alloying Elements on the Hydrogen Diffusion Rate in Steel at High Temperatures 27
- Ryabov, R.A., and P.V. Gel'd [Ural Polytechnic Institute imeni S.M. Kirov, Sverdlovsk]. Effect of Phase Conversions on the Hydrogen Diffusion Rate in Steel 37
- Fedorov, S.N., L.L. Kunin, and L.M. Sachkova [Central Scientific Research Institute of Ferrous Metallurgy, Moscow]. Effect of the Structural Factor on Hydrogen Diffusion in the Fe - Ni - Mn Alloy 46

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Analysis of Gases in Metals

SOV/4617

Klyachko, Yu.A., <sup>\*</sup>L.L. Kunin, S.P. Fedorov, and I.N. Larionov [Central Scientific Research Institute of Ferrous Metallurgy, Moscow]. Study of the Interaction of Gases With Metals 49

Fistul', V.I. Mass Spectrum Method of Determining the Concentration and Diffusion Coefficients of Gases in Metals 71

II. METHODS OF GAS ANALYSIS IN METALS

Turovtseva, Z.M. [Institut geokhimi i analiticheskoy khimii imeni V.I. Vernadskogo AN SSSR - Institute of Geochemistry and Analytical Chemistry imeni V.I. Vernadskiy AS USSR, Moscow]. Evaluation of the Possibility of Determining Gases in Metals by the Groups of the Periodic System of Elements 82

Malikova, Ye.D., and Z.M. Turovtseva [Institute of Geochemistry and Analytical Chemistry imeni V.I. Vernadskiy AN USSR, Moscow]. Determination of Oxygen in Alkali Metals and in Their Alloys by the Mercury Extraction Method 91

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PHASE I BOOK EXPLOITATION SST/AAA

Academiya nauk SSSR. Komissiya po analiticheskoj khimii.

Metody opredeleniya priremy v chistykh metallakh (Methods of Determining Admixtures in Pure Metals) Moscow, 1960. 311 p. (Series: Its: Trudy, 12) 3,500 copies printed.

Resp. Eds.: A.F. Vinogradov, Academician, and D.I. Ryabchikov, Doctor of Chemical Sciences; Ed. of Publishing House: M.F. Volynski; Tech. Ed.: T.V. Polynova.

NOTE: This collection of articles is intended for chemists, metallurgists, and engineers.

COVER: The articles describe methods for detecting and determining various admixtures and their traces in pure metals. Also discussed are many chemical, physicochemical, spectrochemical, spectrochemical and luminescence methods of analyzing admixtures of high purity. The editors state that these methods have been being employed for the last five or six years by various Soviet scientific institutions and are being used in research and factory laboratories of the Soviet Union. No personalities are mentioned. References, mostly Soviet, accompany each article.

Melamed, Sh.S., and S.M. Solodovnik. Analysis of Bismuth for Determining Admixtures 172

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Pillimonov, L.F., M.A. Makhov, and S.A. Babayeva. Spectroanalytic Determination of Admixtures in Tungsten Compounds 227

Korotkiy, E.Ye, Yu.I. Zhigoviy, and M.A. Abramova. Methods of Spectral Determination of Calcium, Antimony, Bismuth, Lead, and Tin in Tungsten and in Molybdenum 236

Karabash, A.G., T.M. Guseynova, M.I. Shadrina-Averina, and Sh.I. Poryvalov. Determination of Admixtures in Molybdenum and Its Compounds 235

Ryabchikov, D.I., Ye.P. Gokhalev, and I.Y. Porizova. Method of Direct Determination of Lead, Cadmium, Bismuth, Antimony, and Tin in Molybdenum with the Aid of Oscillographic Polarography 255

Kravtsov, Yu., Ye.M. Chibrikova, and L.G. Melnik. Determination of Oxygen and Nitrogen in Molybdenum and its Chromium by the Vacuum-Fusion Method 251

Russian, L.L

SOV/137-59-4-7486

Translation from: Referativnyy zhurnal, Metallurgiya, 1959, Nr 4, p 23 (USSR)

AUTHORS: Klyachko, Yu.A., Kunin, L.L.

TITLE: Results of Surface Tension Measurements in Metals

PERIODICAL: V sb.: Gidrodinamika rasplavl. metallov, Moscow, AS USSR, 1958, pp 83 - 86

ABSTRACT: The authors stress that in the case of low Reynold's numbers the presence of a surface tension gradient  $\sigma$  causes movement of the liquid.  $\sigma$  -values are given for 17 metals of a "not very high degree of purity", in particular  $\sigma$  of Fe is equal to 1,210 erg/cm<sup>2</sup>. Methods of measuring  $\sigma$  are analyzed including a lying and suspended drop, capillary rise, maximum pressure in a bubble. The authors believe that the first two methods are applicable for approximate determinations. They stress the necessity of developing and completing the method of maximum pressure in a bubble for  $\sigma$  measurements of cast iron and steel.

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S.P.



FEDOROV, S.N.; KUNIN, L.L.; SACHKOVA, L.M.

Effect of the structural factor on the diffusion of hydrogen in the alloy Fe - Ni - Mn. Trudy kom.anal.khim. 10:46-48 '60.

(MIRA 13:8)

1. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii, Moskva.

(Iron-nickel-manganese alloys)

(Diffusion)

(Hydrogen)

KLYACHKO, Yu.A.; KUNIN, L.L.; FEDOROV, S.P.; LARIONOV, I.N.

Study of the interaction between gases and metals. Trud. kon. anal.  
khim. 10:49-70 '60. (MIRA 13:8)

1. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy  
metallurgii, Moskva.  
(Metals) (Hydrogen) (Diffusion)

KLYACHKO, Yu.A.; CHISTYAKOVA, Ye.M.; KUNIN, L.L.

Determination of oxygen and nitrogen in molybdenum and chromium by  
means of vacuum smelting. Trudy Kom. anal. khim. 12:281-287 '60.

(MIRA 13:8)

(Molybdenum--Analysis) (Chromium--Analysis)

(Vacuum metallurgy)

S/081/61/000/020/028/089  
B117/B147

AUTHORS: Klyachko, Yu. A., Kunin, L. L.

TITLE: Physicochemical principles of gas determination in metals by the method of vacuum melting

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 20, 1961, 104, abstract 20D30 (Sb. tr. Tsentr. n.-i. in-t ocheroy metallurgii, no. 19, 1960, 94-109)

TEXT: The authors studied the factors affecting the accuracy of gas determination in metals and developed methods for further investigations on the development of efficient analysis conditions. [Abstracter's note: Complete translation.]

Card 1/1

S/081/61/000/020/029/089  
B117/B147

AUTHORS: Klyachko, Yu. A., Kunin, L. L., Chistyakova, Ye. M.  
TITLE: Effect of an empty bath on the completeness of extraction  
in gas analysis in metals by the method of vacuum melting  
PERIODICAL: Referativnyy zhurnal. Khimiya, no. 20, 1961, 104-105,  
abstract 20D31 (Sb. tr. Tsentr. n.-i. in-t chernoy  
metallurgii, no. 19, 1960, 123-126)

TEXT: It was found that not all processes of reduction of oxides took place with formation of carbides under conditions of vacuum melting in a graphite crucible. No carbide phase was established by phase or X-ray structural analysis in alloy reguli obtained after extraction of gases from an Cr.3 (St. 3) steel sample. In steel regulus from St. 3 with 10% Ti, both methods showed the existence of carbide and carbonitride phases. Thus, the reduction mechanism of oxides depends on the metal nature, and must be studied individually for each case. It was also shown that there was a large quantity of suspended graphite particles, "graphite foam", in the upper part of a bar kept at higher temperature (~2000°C).

Card 1/2

Effect of an empty bath on ...

S/081/61/000/020/029/089  
B117/B147

This "foam" thickens the upper part of the Fe bath, thus impeding the removal of gas bubbles escaping from the metal. Since it is possible that the gas is not removed completely due to the thickening of the bath during long thermal retardation, it is convenient to use the metal of the bath with the lowest gas content in order to shorten the degasification process. The amount of poorly melting metal samples to be filled in must be limited by the total duration of extraction  $\leq 1.5$  hr at  $\leq 1750^{\circ}\text{C}$ .  
[Abstracter's note: Complete translation.]

Card 2/2

S/133/62/000/005/001/008  
A054/A127

AUTHOR: Kunin, L.L., Candidate of Technical Sciences

TITLE: At the Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii im. I.P. Bardina (Central Scientific Research Institute of Ferrous Metallurgy im. I.P. Bardin) The reaction of hydrogen with binary and multicomponent alloys

PERIODICAL: Stal', no. 5, 1962, 418.

TEXT: Using the Gibbs-Dugan equation for binary and multicomponent alloys and the data on the solubility of hydrogen, it is possible to assess the free excess energy of an alloy and corresponding partial values, which characterize the processes taking place in alloys. An apparatus for the saturation of alloys with hydrogen and its removal from the metal into the gas-phase has been developed. Pressure and temperature are recorded continuously by means of an SHH-09-M1 (EPP-09-M1) type three-position electronic potentiometer. Pressure in the extraction part and analytical part of the apparatus is registered by means of JT-2 (LT-2) pressure tubes, graduated for hydrogen. The effect of thermal extraction was established in the tests: the separation rate of hydrogen from the alloy in the

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At the Tsentral'nyy.....

S/133/62/000/005/001/008  
A054/A127

vacuum at alternating temperatures changes suddenly at points, which correspond to the structural changes in the alloy. Based on this effect in several alloys, phenomena could be observed related to the separation and dissolution of carbides; moreover, the interval of phase-transformations in pearlitic steel (critical points  $A_{c1}$ ,  $A_{c3}$ ) was established.

Card 2/2



KUNIN, L.L.; SMIRNOVA, G.P.

Investigating the interconnection of the electron state with  
hydrogen solubility in alloys. Sbor. trud. TSNIICHM no.24:  
14-19 '62. (MIRA 15:6)  
(Alloys—Hydrogen content) (Electrons)

KUNIN, L.L.; TULEPOVA, I.V.

Removal of tungsten trioxide from an electrolytic deposit by  
sublimation in vacuum. Sbor. trud. TSNIICHM no.24:39-41 '62.  
(MIRA 15:6)  
(Vacuum metallurgy) (Tungsten oxide)

KLYACHKO, Yu.A.; KUNIN, L.L.; CHISTYAKOVA, Ye.M.

Determination of hydrogen in aluminum. Sbor. trud. TSNIICHM  
no.24:42-44 '62. (MIRA 15:6)

(Aluminum—Hydrogen content)

KUNIN, L.L.

Electron state of metals, their interaction with hydrogen and method  
of its extraction by heat. Sbor.trud. TSNIICHM no.31:89-106 '63.

(MIRA 16:7)

(Metals--Hydrogen content) (Electrons)

KUNIN, L.L.; IZMANOVA, T.A.; LARICHES, N.S.

Apparatus for determining the amount of hydrogen separated during  
the conservation of specimens. Sbor. trud. TSNIICHM no.31:110-113  
'63. (MIRA 16:7)

(Metallurgical analysis--Equipment and supplies)  
(Gases in metals--Analysis)

LEVI, L.I., doktor tekhn. nauk; KUNIN, L.L., kand. khim. nauk,  
retsenzent; CHERNYAK, O.V., inzh., red.; UVAROVA, A.F.,  
tekhn. red.; DEMKINA, N.F., tekhn. red.

[Nitrogen in cast iron for castings] Azot v chugune dlia  
otlivok. Moskva, Izd-vo "Mashinostroenie," 1964. 229 p.  
(MIRA 17:4)

KUNIN, L. L.

27 F. P.  
14 S. 11  
113

I. 1/595-65 EWT(d)/EWT(m)/EWP(c)/EWA(d)/EWP(v)/I-2/EWP(t)/EWP(k)/EWP(b)/EWP(1)  
ACCESSION NR AM4046730 BOOK EXPLOITATION Pf-4 MJW/JD/ S/  
MLK

Samarin, A. M., ed. (Corresponding member, Academy of Sciences, U.S.S.R.)<sup>B+</sup>

Steel production; handbook (Staleplavil'noye proizvodstvo; spravochnik),  
t. 2., Moscow, Izd-vo "Metallurgiya", 1964, 1039 p. illus., biblio.,  
tables. Errata slip inserted. 5,850 copies printed.

TOPIC TAGS: steel, open-hearth furnace, quality control, refractory

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Card 2/3



KORSHIKOVA, N.G.; KUNIN, L.L.

High-temperature method for measuring the oxygen activity in oxide systems. Zav. lab. 31 no.9:1104-1106 '65. (MIRA 18:10)

1. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metal-lurgii imeni Bardina.

KUGIN, L.I.

Thermodynamic principles of the determination of gases in  
metals by the method of vacuum fusion. Zhur. anal. khim. 20  
no.7:822-831 '65. (MIRA 18:9)

L. Kugin Central Scientific-Research Metallurgical Institute,  
Moscow.

L 13064-66 EWT(1)/EWT(m)/EPF(n)-2/T/EWP(t)/EWP(k)/EWP(b)/EWA(h)/ETC(m) JD/WW/JG/GG

ACC NR: AT5028956 SOURCE CODE: UR/2776/65/000/040/0091/0104

AUTHOR: Baydov, V. V.; Kunin, L. L.

66  
B+1

ORG: Central Scientific-Research Institute of Ferrous Metallurgy, Moscow (Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii)

TITLE: Use of ultrasonic methods to investigate metallurgical systems in the liquid state

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii. Sbornik trudov, no. 40, 1965. Teoriya metallurgicheskikh protsessov (Theo. y of metallurgical processes), 91-104

TOPIC TAGS: metallurgic research, liquid metal, ultrasonics

ABSTRACT: This article is a survey of foreign and Soviet works pertaining to the application of ultrasonics to investigations of metallurgical systems in the liquid state. The author examines methods of measuring the velocity of sound in liquid metals, the methods being divided into two basic groups: direct methods, which include the pulsing method, and indirect methods which require measuring the length of the sonic waves either at a given frequency or at a given segment of the signal's path. The author gives data on the velocity of sound in the 15 liquid metals for which it has so far been measured and the compressibility and heat capacity of 13 metals calculated from the results of measuring the velocity of sound. The author sums up his survey by stating that investigations of metals, alloys, and slags in the liquid state by the ultrasonic method hold promise for eliciting their structure and for finding the parameters needed when analyzing the behavior of metallurgical systems. Orig. art. Cord 1/2

L 13064-66

ACC NR: AT5028956

has: 3 tables and 41 formulas.

SUB CODE: 11, 20/ SUBM DATE: none/ ORIG REF: 008/ OTH REF: 013

Card 2/2

HW

KUNIN, L.L.; RUTES, V.S.; CHIGRINOV, M.G.; BAKALOVA, L.M.

Interaction between protective atmospheres and liquid metal in  
ingot molds for continuous casting. Stal' 25 no.12:1088-1089  
D '65. (MIRA 18:12)

1. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy  
metallurgii imeni I.P. Bardina.

L 30707-66 EPF(n)-2/EWT(1)/EWT(m)/EWP(b)/EWP(b)/EWA(m)-2/EWF(t) IJP(c)

ACC NR: AT5028955  
AT/WW/JD/JG

SOURCE CODE: UR/2776/65/000/040/0067/0077

20  
19  
3-1

AUTHOR: Kunin, L. L.

ORG: Central Scientific-Research Institute of Ferrous Metallurgy, Moscow (Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii)

TITLE: Current state of the theory of surface tension of metals

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii. Sbornik trudov, no. 40, 1965. Teoriya metallurgicheskikh protsessov (Theory of metallurgical processes), 67-77

TOPIC TAGS: metallurgic research, surface tension, electron, work function

ABSTRACT: This is a survey of the world literature concerning the relation of surface tension with the position of the various elements in the periodic system and electron work function. A formula which relates surface tension with the electron work function is discussed. The author points out that, whereas the direct measurement of surface tension of solids is still an unsolved problem, the electron work function has been measured for almost all metals in the solid state. The author also cites the investigators who proposed that the surface tension of metal is most intimately associated with the heat of sublimation. Calculations of surface tension in this case showed that satisfactory result can be obtained if one assumes  $\sigma$  to be proportional to the ratio of the volume expansion coefficient  $\alpha$  to the isothermal compressibility factor  $\beta$ . The author sums up his survey by stating that the

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L 30707-66

ACC NR: AT5028955

relatively good agreement of the calculated and experimental values of surface tension achieved so far can create a false notion about the degree of accomplishment in this area. Orig. art. has: 1 table, 2 figures, and 28 formulas.

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 032/ OTH REF: 017

Liquid Metal<sup>18</sup>

Card 2/2 LS

ACC NR: AR7000859

SOURCE CODE: UR/0058/66/000/009/E011/E011

AUTHOR: Baydov, V. V.; Kunin, L. L.

TITLE: Correlation between the speed of sound and the surface tension of metals

SOURCE: Ref. zh. Fizika, Abs. 9E93

REF SOURCE: Sb. Poverkhnostn. yavleniya v rasplavakh i voznykayushchikh iz nikh tverd. fazakh. Nal'chik, 1965, 89-93

TOPIC TAGS: surface tension, metal's <sup>physical property,</sup> ~~surface tension~~, ~~compressibility~~, volume expansion, *acoustic speed*

ABSTRACT: The presence was noted of a correlation between surface tension ( $\sigma$ ), isothermic compressibility ( $\beta_{\tau}$ ), and the coefficient of volume

expansion ( $\alpha$ ):  $\sigma \quad \alpha/\beta_{\tau}$ . [Translation of abstract] [GC]

SUB CODE: 11, 20/

Card 1/1



KUNEN, H. Ya.

Evaluation of the density of sedimentary cover in the middle Syr Darya  
Depression based on the materials of seismic prospecting. Razved. geo-  
fiz. no. 2:67-71 '64. (MIRA 18:5)

KUMEN, N. Ya.

Density of rocks in southern Kazakhstan. Prikl. geofiz. no. 4:  
177-184 '65. (MIRA 18:9)

LYAKHOV, P.A.; GENERALOV, G.S.; KLOCHKOVA, N.D.; KUNIN, L.Ye.; KUSHNEROV, V.A.;  
ROVENSKIY, I.I.

Addition of pyrite cinder to the agglomeration charge. (MIRA 12:1)  
Obeg. rud. 3 no.3:24-25 '58.  
(Sintering) (Pyrites)

SOV/133-59-9-3/31

AUTHORS: Lyakhov, P.A. and Kunin, L.Ye.

TITLE: Operation of the Second Sinter Plant in its Starting Stage on the Southern Mining and Ore Dressing Combine (KYUGOK)

PERIODICAL: Stal', 1959, Nr 9, pp 776-782 (USSR)

ABSTRACT: The flow of materials (Fig 1) and operating conditions of the new sinter plant during the initial period of its operation are described. The plant was designed for sintering of concentrates (no data given) with some addition of Krivoy Rog ore fines 0 - 10 mm (about 20%) at a rate of 0.86 ton/m<sup>2</sup> hour. Characteristic feature of the plant is the hydraulic removal of dust from multicyclones which considerably improved working conditions in this part of the plant. In the older plant operating in the works, the removal of dust from the multicyclones was done through a double seal by a conveyor belt. The concentration of dust in air in this part of the plant sometimes reached 2000 to 3000 mg/m<sup>3</sup>. The hydraulic removal of dust on the new plant consists of a hydraulic seal (Fig 3) connected to a constant level water tank. Dust falling from the multicyclone

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SOV/133-59-9-3/31

Operation of the Second Sinter Plant in its Starting Stage on the Southern Mining and Ore Dressing Combine (KYUGOK)

settles on the surface of the water and sinks. A continuous stream of water carries the dust into a collecting sump from which the pulp is pumped into a classifier. The amount of dust collected amounted to about 0.7 ton/hr per strand. The coarser particles separated in the classifier are returned to the sinter mix and the remaining dust is lost with water (85% of the total). The chemical composition and size distribution and magnetic properties of the dust are given in Table 2. It is expected that the magnetic recovery of the dust will be introduced. The other feature of the plant is the ventilation scheme of the conveyor belts housing (Fig 4) and partial covering of the sinter strand. The above measures improved the working conditions (measured by the concentration of dust in various parts of the plant) in comparison to those on the older plant. Some experiments on the effect of the height of the sinter bed (for concentrates alone and concentrates mixed with 20% of ore fines) and the effect of preheating the mix by hot return fines on the output of

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Operation of the Second Sinter Plant in its Starting Stage on the Southern Mining and Ore Dressing Combine (KYUGOK)

sinter were carried out. It was found that preheating of the mix with hot return fines from 28 to 53°C increased the output by 21%. The basicity of sinter was maintained at 0.4 due to the lack of limestone crushing capacity. It is concluded that the output of sinter already exceeded the design figure (0.94 to 0.95 ton/m<sup>2</sup>hr, design output 0.86 ton/m<sup>2</sup>hr) and can be further increased by the addition of 1 to 3% of lime. For further improvement of working conditions conveying of return fines in closed vibrational conveyors should be introduced. There are 4 figures and 2 tables.

ASSOCIATION: Mekhanobr

Card 3/3

LYAKHOV, P.A.; KUNIN, L.Ye.; Prinimali uchastiye: KUSHNIROV, V.A.; KLOCHKOVA,  
N.D.; SEREBRYANNIK, G.I.

Hydraulic dust removal from cyclone banks in the sintering plants  
of the Southern Ore-Dressing Combine. Obog. rud 5 no.6:49-53 '60.  
(MIRA 14:8)

1. Aglomeratsionnyy tsekh Yuzhnogo gornoobogatitel'nogo kombinata  
(for Kushnirov, Klochkova, Serebryannik).  
(Separators (Machines)) (Dust collectors)

KUNIN, L.Ye.

Making fluxed pellets from Olenogorsk concentrates without firing (by the chemical catalyst method). Obog. rub. 36-38 '61. (1961, 1961)

(Ore dressing)



KUNIN, L. Ye.

Solid fuel for the sintering process. Obog. rud. 7 no.6:16-18  
'62. (MIRA 16:4)

(Sintering) (Coke)

VASIL'YEV, V.A.; ~~KUNIN, M.A.~~; VOLODIN, Ye.I.

Detecting small quantities of gas in the pleural cavity by means of laterography. Vest.rent. i rad. 31 no.5:33-34 S-0 '56. (MLRA 10:1)

1. Iz kafedry tuberkuleza Voyenno-meditainskoy skademii imeni S.M. Kirova (nach. kafedry - prof. V.M.Novodvorskiy)  
(THORAX, radiography  
determ. of gas in pleural cavity, laterography)  
(PLEURA, radiography  
same)

KUNIN, M.A.

Method for sperm examination in childless marriages. Sov. med.  
25 no.2:138-140 F '62. (MIRA 15:3)

1. Iz kliniki akusherstva i ginekologii (zav. kafedroy -  
zasluzhennyy deyatel' nauki prof. V.A. Pokrovskiy) Voronezhskogo  
gosudarstvennogo meditsinskogo instituta.

(STERILITY)  
(SPERMATOZOA)

KUNIN, M.A.

Clinical significance of the determination of fructose in  
the ejaculate. Urologia no.4:25-29 '63. (MIRA 17:10)

1. Iz akushersko-ginekologicheskoy kliniki (zav.- prof.  
V.A. Pokrovskiy) Voronezhskogo meditsinskogo instituta.

SMIRNOVA, N.L.; KUNIN, M.B.; BELOV, N.V.

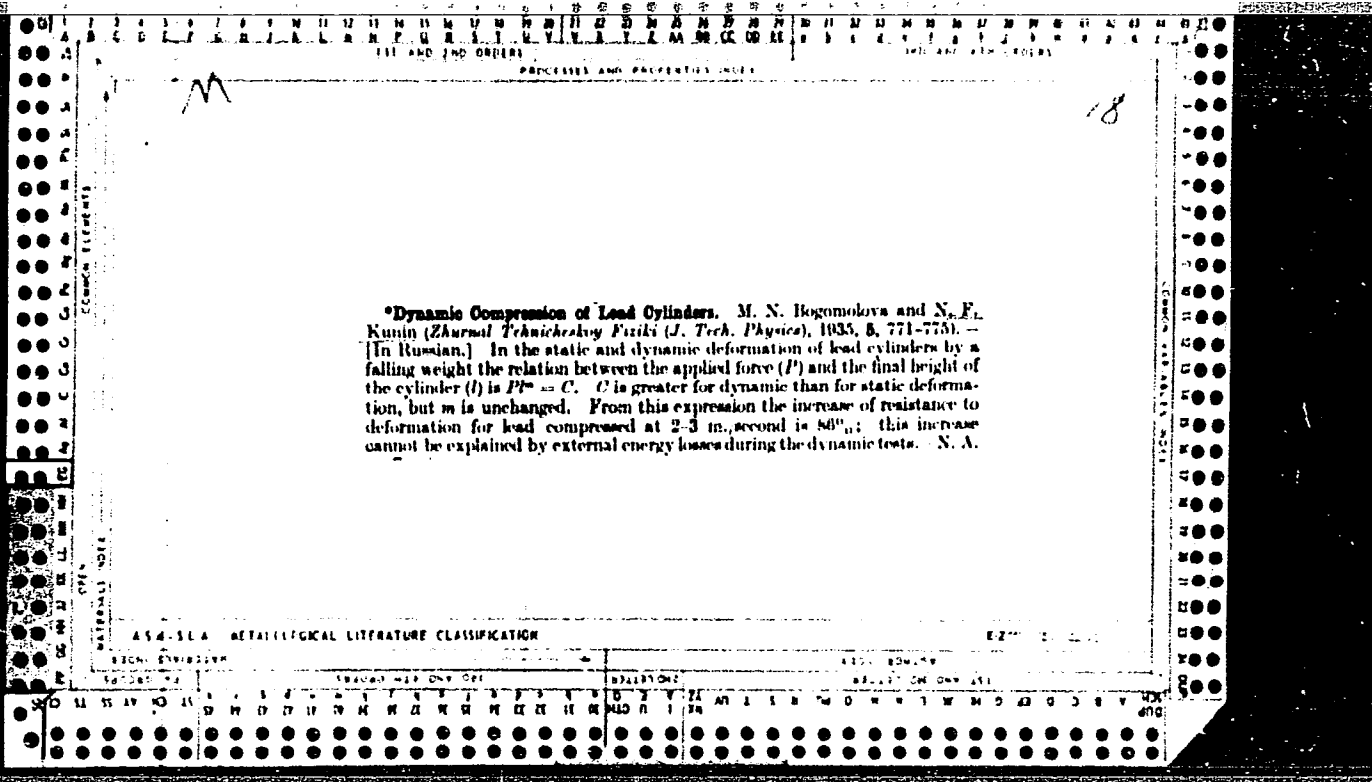
Fedorov group ( $D_{6h}^4$ ) as a generic indicant of the family of  
crystal structures. Zhur. strukt. khim. 5 no.5:719-729 S-0 '64  
(MIRA 18:1)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomenosova.

KUNIN, M.Ye.; DEMBO, N.G., redaktor.

[Leningrad; views of the city] Leningrad; vidy goroda. Moskva,  
Izogiz, 1954. 211 p. (MLRA 8:1)  
(Leningrad--Views)







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

PROCESSES AND PROPERTIES INDEX

11) \*Plastic Compression. N. F. Kunin (*Izvest. Akad. Nauk S.S.S.R. (Bull. Acad. Sci. U.R.S.S.), 1937, (Phys.), (6), 823-829.*)—[In Russian.] Mathe-

matical. Expressions are derived relating load and compression in plastic metal cylinders, under both static and dynamic stress.—N. B. V.

AND S.A. 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

USSR/Physics - Friction of metals

FD-1030

Card 1/1 : Pub. 153 - 1/23

Authors : Kunin, N. F., and Lomakin, G. D.

Title : Silent dry external friction of metals at small speeds

Periodical: Zhur. tekhn. fiz., 24, 1361-1366, Aug 1954

Abstract : Develop mathematical representations of the plastic flow of a metal at individual micro-contacts. Give analytical expression for the dependence of the coefficient of silent friction upon velocity. This expression is in good agreement with earlier experimental data. Give also expressions for the dependence of coefficient of static friction upon time of contact, which are in good agreement with experimental data. Give the connection between coefficients of silent friction at large and small speeds and dynamic coefficient of compression. Ten references (V. D. Kuznetsov 1949; M. N. Bogomolova and N. F. Kunin, 1935; I. V. Kragel'skiy, 1944, 1948).

Institution: --

Submitted : 23 November 23, 1953

USSR/Physics - Friction

FD-1031

Card 1/1 : Pub. 153 - 2/23

Author : Kunin, N. F., and Lomakin, G. D.

Title : Connection between static and kinetic friction

Periodical : Zhur. tekhn. fiz., 24, 1367-1370, Aug 1954

Abstract : Study the phenomenon of jump-like discontinuity occurring in the transition from static friction to kinetic. Show that the jumps are due to increase of true surface of tangency at individual contacts, to ordering of micro-fractures, and to processes of hardening and relaxing of the metal. Hence establish subject connection. Confirm experimentally the existence of the ordering effect of micro-fractures during transition from static friction to kinetic. Three references (N. L. Kaydanovskiy and S. E. Khaykin, 1933; A. Yu. Ishlinskiy and I. V. Kragel'skiy, 1944).

Institution: --

Submitted : 23 November 1953

KUNIN, N.F.

124-57-2-2496

Translation from: Referativnyy zhurnal, Mekhanika, 1957, Nr 2, p 138 (USSR)

AUTHORS: Kunin, N.F., Sukhin, L. T.

TITLE: The Plastic Compression of Metals at Various Temperature Levels (Plasticheskoye szhatiye metallov pri razlichnykh temperaturakh)

PERIODICAL: Tr. Chelyabin. in-ta mekhaniz. i elektrifik. s. kh., 1955, Nr 5, pp 134-142

ABSTRACT: Presentation of the results of experimental investigations on the plastic compression of a number of metals at various temperature levels; the purpose of the work was the confirmation that for that type of deformation the stresses are an exponential function of the temperature over a broad interval of temperatures. The investigation comprised copper, silver, aluminum, zinc, lead, tin, lithium, sodium, and cadmium. The paper is preceded by a brief survey of the literature on the subject .

1. Metals--Stresses    2. Metals--  
Temperature factors    G. A. Smirnov-Alyayev

Card 1/1

USSR/Solid State Physics - Phase Transformations in Solids, E-5

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 34713

Author: Kunin, N. F., Shulepov, S. V.

Institution: Chelyabinsk Institute of Mechanization and Electrification of Agriculture USSR

Title: Effect of Temperature on Graphitization of Cokes

Original Periodical: Dokl. AN SSSR, 1955, 104, No 3, 401-414

Abstract: An investigation was made of graphitization of cokes using the method of measuring the thermal emf in specimens roasted at various temperatures. When roasting at 1,000-1,400° the thermal emf diminishes insignificantly, at 1,400-2,100° it rises sharply, and a further increase in temperature causes a sharp drop in the emf. The reduction in the thermal emf at temperatures from 1,000-1,400° is due to the removal of volatile components of the coke; the increase of the thermal emf at 1,400-2,000° is explained by the growth of the graphite layers, and the reduction in the thermal emf at temperatures above 2,100° is due to the formation of a 3-dimensional graphite structure. The soaking time (from one to 7 hours) at temperatures of 2,100-2,600° does not affect the value of the thermal emf.

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- 1 -

*KUNIN, N.F.*

USSR/Electricity - Conductors

G-4

Abs Jour : Referat Zhur - Fizika, No 5, 1957, 12260

Author : Kunin, N.F.

Inst : Institute of Mechanization and Electrification of Agriculture, Chelyabinsk, USSR.

Title : Change in Thermal emf of Metals During Plastic Deformation

Orig Pub : Fiz. metallov i metallovedeniye, 1956, 2, No 2, 237-243

Abstract : An experimental study was made of the thermoelectric properties of a metal (copper), induced during plastic deformation. It is shown that the value of the absolute thermal emf and of the Thomson coefficient are sensitive to a change in the properties of the metal during plastic deformation. In the case of copper, the induced thermal emf increases with the deformation, and its sign and magnitude are independent of the boundary conditions of the

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KUNIN, N.F.

G-4

USSR/Electricity - Conductors

- Abs Jour : Referat Zhur - Fizika, No 5, 1957, 12258
- Author : Kunin, N.F., Melamed, I.Z.
- Inst : Chelyabinsk Institute of Mechanization and Electrification of Agriculture, Chelyabinsk, USSR.
- Title : Measurement of Thermal emf of Metals of the Cooper Subgroup Under the Influence of Plastic Deformation at Various Temperatures.
- Orig Pub : Fiz. metallov i metallovedeniye, 1956, 2, No 3, 423-427
- Abstract : It is shown that within the experimental accuracy, up to deformations on the order of 40 -- 50% for copper, silver, and gold, at each temperature of experiment, the induced thermal emf (C) is proportional to the magnitude of the relative deformation  $\epsilon$ . Other conditions being equal, the values of C diminishes with increasing temperature.

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Ref Zhur - Fizika, No 5, 1957, 12258

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APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000927520017-8

The dependence of the specific induced thermal emf on the temperature at which it is produced, satisfies the equation  $C = B \epsilon \exp(-\alpha T)$ , where B and  $\alpha$  are constants of the substance (a table of their values is given for copper, silver, and gold). It is shown that the induced thermal emfs obey the additivity law with respect to  $\epsilon$  provided the temperature T is constant. The induced thermal emfs satisfy also the rule of additivity in that case, when the second stage of the deformation takes place at a lower temperature than the first stage. Otherwise, the value of the total C turns out to be always smaller than the value expected from additivity considerations. The result is easy to explain, when one takes into account the action of relaxation during the process of deformation. An investigation was made of the temperature course of C in specimens of copper in the temperature range from 0 to 300°. One can assume that within the above interval,

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BIBIKOV, Ye.S., kand.tekhn.nauk; KUNIN, N.F., prof. doktor fiziko-  
matematicheskikh nauk, red.

[First artificial earth satellite] Pervye iskusstvennye sputniki  
zemli. Pod red. N.F.Kunina. Cheliabinsk, Cheliabinskoe obl.  
otd-nie Ob-va po rasprostraneniu polit. i nauchn. znanii RSFSR,  
1957. 27 p. (MIRA 11:4)  
(Artificial satellites)



21640

18-8100 1138, 1160, 1418, 1413

8/137/61/000/003/057/069  
A006/A101

AUTHOR: Kunin, N. F.

TITLE: Induction of thermo emf at deformation of metals

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 3, 1961, 30, abstract 3Zh188  
("Uch. zap. Chelyab. gos. ped. in-t", v. 5, no. 1, 1958, 7-21)

TEXT: The author analyzes induction of thermo emf in metals loaded over  $\sigma_s$ . The induced thermo emf is composed of two components, namely an elastic and a residual one, having opposite signs. Experimental data are given for Fe, Cu and Ag, showing that elastic induced thermo emf  $e$  depends on the stress non-linearly:  $e = \alpha \sigma^n$ ,  $\alpha n = 1.9$  for Cu and 2.10 for Ag. During deformation an elastic-plastic effect is observed in the form of an elastic aftereffect and elastic hysteresis. The author studied the relation between induction of thermo emf and changes of  $\rho$ . It was established by tests made with Ag that the specific residual resistance caused by deformation did not depend on the temperature and obeyed the Matissen-Fleming rule. The resistance induced is directly proportional to the degree of deformation during tension to about 15% deformation. The induced resistance and thermo emf are, at the given deformation, proportional to each other. There are 12 references.

[Abstractor's note: Complete translation.] M. M.  
Card 1/1

Нам, И. Ф.

126-1-30/40

AUTHORS: Kunin, N. F. and Kunin, V. N.

TITLE: Influence of the stresses on the thermal expansion of a deformed metal. (Vliyaniye napryazheniy na teplovoye rasshireniye deformirovannogo metalla).

PERIODICAL: Fizika Metallov i Metallovedeniye, 1957, Vol.5, No.1, pp. 173-174 (USSR)

ABSTRACT: The reversibility of elastic deformation and of thermal expansion permits considering the simultaneous effect of these phenomena on the basis of generally valid thermodynamic relations. Khvol'son, O. D. (Ref.1) derived the following formula inter-relating the coefficient of thermal expansion  $\alpha$  with the applied stress:

$$\left(\frac{\partial \alpha}{\partial \sigma}\right)_T = \frac{1}{E^2} \left(\frac{\partial E}{\partial T}\right)_\sigma \quad (1)$$

where  $E$  is the Young modulus and  $T$  is the temperature of the deformed substance. For a given temperature the right-hand side of this equation is constant and by integration the following linear dependence is obtained between the coefficient of thermal expansion and the

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Influence of the stresses on the thermal expansion of a deformed metal.

stress:

$$\alpha = \alpha_0 + c\sigma,$$

(2)

$\alpha_0$  being the coefficient of linear expansion in absence of stresses. Rosenfield, A.K. and Averbach, B.L.(Ref.2) discovered a jump-like deviation of the coefficient of expansion  $\alpha$  from linearity when passing through the limit of elasticity. The experiments were carried out with three grades of steel and two grades of invar. The change of the coefficient of expansion  $\alpha$ , caused by the plastic deformation, was the residual one. After removing the stress, the coefficient of expansion had another value differing from the original value. These authors did not consider the important problem on whether Eq.(2) is valid for work hardened metal. It is known that the limit of elasticity of a metal which is subjected to plastic deformation increases to a value corresponding to the applied load provided that the temperature of deformation is sufficiently low and that no relaxation effects take place. As a result of that, Card 2/4 repeated deformation of a preliminarily work hardened

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Influence of the stresses on the thermal expansion of a deformed metal.

metal up to loads corresponding to the new limit of elasticity are reversible and Eq.(2) should be fulfilled. Thereby the values of  $\alpha$  and  $c$  should become different to some extent owing to the changes caused by the plastic deformations. Independently of the work of Rosenfield and Averbach and approximately at the same time the authors of this paper measured the coefficient of linear expansion of copper under load. The copper was subjected to considerable preliminary work hardening. Special measuring equipment enabled measurement of the coefficient  $\alpha$  with an accuracy of up to 0.2 to 0.3%; the thermal expansion was effected in the temperature range 14.98 to 41.48°C. The elongation as a result of the load and the thermal expansion was measured by optical means and the results are graphed in Fig.1 ( $10^7 \alpha / ^\circ\text{C}$  vs.  $\sigma, \text{kg/mm}^2$ ). It can be seen that within the limits of the here mentioned accuracy of the experiments, the coefficient of thermal expansion increases linearly with increasing stresses in accordance with Eq.(2). Since during work hardening the Young modulus  $E$  remains practically unchanged, it follows from Eq.(1) that the changes in  $\alpha_0$

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126-1-30/40

Influence of the stresses on the thermal expansion of a deformed metal.

and  $\epsilon$  during work hardening are due to a temperature dependence of the Young modulus. In conclusion it is pointed out that the problem of thermal expansion of loaded metals is of great practical importance, particularly from the point of view of the theory of tolerances and settings.

There are 1 figure and 2 references, 1 of which is Slavic.

(Note: This is a complete translation).

SUBMITTED: November 20, 1956.

ASSOCIATION: Chelyabinsk Institute of Mechanisation and Electrification of Agriculture. (Chelyabinskiy Institut Mekhanizatsii i Elektrifikatsii S-Khoz).

AVAILABLE: Library of Congress.

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01807

S/137/60/000/04/11/015

1 p. 8/100

Translation from: Referativnyy zhurnal, Metallurgiya, 1960, No. 4, p. 258  
# 8537

AUTHORS: Kunin, N.F., Sukhin, L.T.

TITLE: Thermoelectric Phenomena <sup>21</sup> in Deformation of Metals

PERIODICAL: Tr. Chelyab. in-ta mekhaniz., i elektrifik. s. kh., 1959, No. 7,  
pp. 302 - 308

TEXT: The authors investigated the formation of residual thermo-emf produced between non-deformed metal and metal that was subjected to plastic deformation and the form of arising elastic, elastic-residual and residual effects of thermo-emf produced by deformation in various metals. The tests were performed with wire specimens made of Ag, Cu and commercial Fe. Prior to the test the specimens were annealed during 4 hours at 400°C (Cu), 350°C (Ag) and 750°C (Fe). The initial length of the specimens was 225 mm. They were stretched in horizontal position on a special installation. The load was produced directly by weights. The arising thermo-emf were measured under the load and after removing the load. The same material in unloaded state was used as a standard. The soldered joints of the deformed and non-deformed metal were located near the grippers of the

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Thermoelectric Phenomena in Deformation of Metals

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deforming installation. One of the joints was placed in melting ice, the other one in oil. The magnitude of thermo-emf was measured using a mirror galvanometer. It was shown that the thermo-emf produced by deformation consisted of an elastic and a residual component. The elastic thermo-emf produced, may be determined as the difference of thermo-emf under load and after unloading. The elastic component of the thermo-emf produced increased with higher stress. The stress under which the difference between elastic and non-elastic components arises, is designated as the thermoelectric yield limit. It was established that the thermoelectric yield limit of the investigated metals approached the mechanical yield point. During expansion, the elastic thermo-emf has a sign that is opposite to the residual thermo-emf; this causes an inversion of the sign of full thermo-emf if the stress is sufficiently high. It was shown that for the thermo-emf produced, elastic-residual phenomena were observed in the form of a thermoelectric hysteresis.

L. G.

Card 2/2

K.U.V.L.M., N.F.

FRASE I BOOK EXPLOITATION SOV/5053  
Vsesoyuznaya konferentsiya po treniyu i iznosu v mashinakh. 3d, 1958.  
Iznos i iznosostoykost'. Antifraktsionnyye materialy (Wear and Wear Resistance. Antifriction Materials) Moscow, Izd-vo AN SSSR, 1960. 273 P. Errata slip inserted. 3,500 copies printed. (Series: Its: Trudy, v. 1)

Sponsoring Agency: Akademiya nauk SSSR, Institut mashinovedeniya. Resp. Ed.: M. M. Krushchov, Professor; Eds. of Publishing House: M. Ya. Klebanov, and S. L. Orpik; Tech. Ed.: I. V. Polyakova.

PURPOSE: This collection of articles is intended for practicing engineers and research scientists.

COVERAGE: The collection, published by the Institut mashinovedeniya, AN SSSR (Institute of Science of Machines, Academy of Sciences USSR) contains papers presented at the III Vsesoyuznaya konferentsiya po treniyu i iznosu v mashinakh (Third All-Union Conference on Friction and Wear in Machines) which was held April 9-15, 1958. Problems discussed were in 5 main areas: 1) Hydrodynamic Theory of Lubrication and Friction Bearings (Chairman: Ye. M. Gut'yar, Doctor of Technical Sciences, and A. K. D'yachkov, Doctor of Technical Sciences); 2) Lubrication and Lubricant Materials (Chairman: G. V. Vinogradov, Doctor of Chemical Sciences); 3) Dry and Boundary Friction (Chairman: B. V. Deryagin, Corresponding Member of the Academy of Sciences USSR, and I. V. Kragel'skiy, Doctor of Technical Sciences); 4) Wear and Wear Resistance (Chairman: M. M. Krushchov, Doctor of Technical Sciences); and 5) Friction and Antifriction Materials (Chairman: I. V. Kragel'skiy, Doctor of Technical Sciences, and M. M. Krushchov, Doctor of Technical Sciences). Chairman of the general assembly (on the first and last day of the conference) was Academician A. A. Blagonravov. L. Yu. Pruzhanitskiy, Candidate of Technical Sciences, was scientific secretary. The transactions of the conference were published in 3 volumes, of which the present volume is the first. This volume contains articles concerning the wear and wear resistance of antifriction materials. Among the topics covered are: modern developments in the theory and experimental science of wear resistance of materials, specific data on the wear resistance of various combinations of materials, methods for increasing the wear resistance of certain materials, the effects of friction and wear on the structure of materials, the mechanism of the sealing of seals, the effect of various types of lubricating materials on sealing, abrasive diffusion conditions, modern developments in antifriction materials, and the effects of finish machining on wear resistance. Many personalities are mentioned in the text. References accompany most of the articles.

Boncharenko, V. G. Some Results of an Investigation of the Quality of Piston Rings of Diesel Motors Used in Automotive Tractors	208
Kunin, N. P., and M. M. Sokolova. Isothermal Wear of <del>Metals as a</del> Result of Their Interaction With a Polishing Abrasive	216
Mazukhin, I. I., and A. I. Volodin. Analysis of the Wear of the Flanges of the Crankshaft of a D-50 Diesel Locomotive, and Systematic Methods for Measuring the Wear	221
Puzankov, V. V. Surface Finish of the Flanges of the Crankshaft and Bearing Bushings of the GAZ-51 Automobile	225
Savitskiy, K. V. On the Problem of the Relationship Between the Abrasive Wear of Metals and the Strength Properties of the Lattice	230

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KUNIN, N.F.; AFANAS'YEVA, L.I.; KOZLOVA, S.S.

Dynamic effect of induced thermoelectromotive force at  
various temperatures of deformation. Fiz. met. i metalloved.  
12 no.4:595-599 0 '61. (MIRA 14:11)

1. Chelyabinskiy politekhnicheskiy institut.  
(Thermoelectricity)  
(Metals, Effect of temperature on)  
(Deformations (Mechanics))

KUDRYAVTSEV, Yuriy Georgiyevich; MELAMED, Vladimir Ionovich, kand. tekhn. nauk;  
MEL'NIKOV, Andrey Sergeyeovich; KUTUKOV, V.F., inzh., retsenzent;  
ROZENTSVEYG, V.D., inzh., retsenzent; KUNIN, N.F., doktor fiz.- mat.  
nauk, red.; DUGINA, N.A., tekhn. rod.

[Production and use of ceramic articles in the machinery industry]  
Proizvodstvo i primeneniye mineralokeramicheskikh izdelii v ma-  
shinostroenii. Pod red. N.F.Kunina i V.I.Melameda. Moskva, Mash-  
giz, 1962. 157 p. (MIRA 15:10)  
(Machinery industry) (Ceramics)

S/126/62/013/001/016/018  
E073/E535

1.100

AUTHORS: Kunin, N.E., Melamed, V.I. and Davidyuk, V.I.

TITLE: On the relation between various types of deformation and the process of machining metals

PERIODICAL: Fizika metallov i metallovedeniye, v.13, no.1, 1962, 154-157

TEXT: According to existing views, the process of cutting plastic metals is based on plastic deformation of the metal which is transformed into chip. In establishing quantitative relations between various types of plastic deformation, two means are available, the first is to find a flow curve for the metal which is the same for all types of deformation, the second consists of establishing the equivalent specific deformation work for various methods of deformation. In establishing equivalent flow curves, it is necessary to plot a single flow curve for various types of deformation; thereby, the degree of deformation and the stress state are taken as equivalents. As a criterion of the coincidence of flow curves for various types of deformation, experimental results were used which are based on Card 1/3

On the relation between various ... S/126/62/013/001/016/018  
EO73/E535

purely mechanical tests of measuring the size of the metal before and after deformation. In machining, the dimensions of the deforming metal layer before and after deformation are determined from the deformation of the chip and, therefore, establishment of quantitative relations between various types of deformation in the process of cutting can be related only to this quantity, which is an external feature and does not determine the plastic deformation of the metal itself. In investigating the equivalent specific deformation work for various methods of deformation, the method of induced thermo e.m.f. can be applied. It was found possible to plot a single curve of the change in the induced thermo e.m.f. caused by distortions in the crystal lattice resulting from plastic deformation as a function of the specific deformation work. On the assumption that the nature of internal changes in the metal is the same for all types of plastic deformation, the method of induced thermo e.m.f. can also be applied in studying the process of machining. The results are given of measurements of the induced thermo e.m.f. of chips produced during turning of copper discs on a thread-cutting lathe. The chip was cut at a speed of 8 m/min, whereby the thickness of the chip was varied  
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