KRUPKO, I.L., prof.

Humeroscapular periarthritis and its treatment. Vest. khir. no. 6:126-131 '65. (MIRA 18:12)

1. Iz kafedry travmatologii i ortopedii (nachal'nik - prof. I.L. Krupko) Voyenno-meditsinskoy ordena Lenina akademii imeni Kirova.

KRUPKO, I.L., prof.; TKACHENKO, S.S., prof.

Bone homoplasty in treating some bone tumors. Ortop., travm. i protez. 26 no.12:3-7 D '65.

(MIRA 19:1)

1. Iz kafedry travmatologii i ortopedii (nachal'nik - prof.I.L. Krupko) Voyenno-meditsinskoy ordena Lenina akademii imeni S.M.Kirova. Adres avtorov: Leningrad K-9, Botkinskaya ulitsa, d.13, Klinika travmatologii i ortopedii. Submitted March 6, 1965.

KRUPKO, I.L., general-mayor meditsinskoy sluzhby, prof.; BALLYUZEK, F.V.; podpolkovnik meditsinskoy sluzhby, doktor med. nauk; FARSHATOV, M.N., podpolkovnik meditsinskoy sluzhby, kand. med. nauk; GLEBOV, Yu. I., mayor meditsinskoy sluzhby, kand. med. nauk

Regional perfusion in the extremities. Voen.-med. zhur. no. 1: 17-21 Ja '66 (MIRA 19:2)

SHAPOSHNIKOV, O.K., doktor med. nauk; KRUPKO, M.I.

Hypertensive ulcers of the skin (Martorell's syndrome). Vest. derm. i ven. 37 no.5:28-30 My '63. (MIRA 17:5)

1. Klinika kozhno-venericheskikh bolezney (nachal'nik - chlen-korrespondent AMN SSSR prof. S.T. Pavlov) Voyenno-meditsinskoy ordena Lenina akademii imeni Kirova, Leningrad.

KRUPKO, M.I. (Leningrad)

Some characteristics of the mechanism of the anti-inflammatory effect of topically applied corticosteroids. Vest. derm. i ven. 38 no.3:31-34 Mr '64. (MIRA 18:4) [illegible], N.A., mashinist-operator

Improved performance of a machine. Put' i put.khoz. 9 no.6:26-27 '65. (MIRA 18:6)

1. Stantsiya Krasnyy Liman, Donetskoy dorogi.

KRUPKO, N.A., slesar'-naladchik

Our technology of repairing welding machines. Put' i put.khoz. 7 no.2: 15 '63.
(MIRA 16:2)

1. Stantsiya Krasnyy Liman, Donetskoy dorogi.
(Railroads—Rails—Welding)

KRUPKO, P. M.

TAZHIEV, I. T. AND P. M. KRUPKO.
Kazakhskaia SSR. Moskva, Gosplanizdat, 1947. 98 p. DLC: KD861.K3T3
DA

SO: LC, Soviet Geography, Part I, 1951, Uncl.

Kazakhskaya SSR (by) I. T. Tazhiyev I P.N. Krupko. Izd. 2., Perer, 1 dop.
Alma-Ata, Kazakhskoye Gos. Izd.-vo, 1956.
285. P. Illus.

AVS

KRUPKO, S.

Macrosporogenesis and embryo sac development in Chondropetalum Hookerianum (Mast.) Pillans (Restionaceae). Acta soc botan Pol 32 no.1:171-190 '63.

1. Department of General Botany, Adam Mickiewicz University, Poznan.

LUR'YE, Aleksandr Yudimovich, prof., vrach (1897-1958); MAKARCHENKO, A.F., prof., otv. red.; YEVDOKIMOV, A.I., kand. med. nauk, red.; KALINICHENKO, T.Ya., kand. med. nauk, red.; KRUPKO, Yu.A., kand. med. nauk, red.; LOGUNOVA, A.G., kand. med. nauk, red.; PAP, A.G., kand. med. nauk, spets. red.; PANCHENKO, N.I., kand. med. nauk, red.; SAVITSKIY, V.N., doktor med. nauk, prof., red.; SVESHNIKOVA, N.V., kand. med. nauk, red.; TEL'NOVA, R.I., kand. med. nauk, red.; TIMOSHENKO, L.V., kand. med. nauk, spets. red.; YANKELEVICH, Ye.Ya., prof., red.; YANKOVSKAYA, Z.B., red. izd-va; MATVEYCHUK, A.A., tekhn. red.

[Selected works] Izbrannye trudy. Kiev, Izd-vo Akad. nauk USSR. 1960. 425 p. (MIRA 14:7)

1. Chlen-korrespondent Akademii nauk USSR (for Lur'ye, Makarchenko) (GYNECOLOGY)

KRUPKO-BOL'SHOVA, Yu. A.

"Morphological Changes in the Ovaries and Sex Hormone Contents in Patients With Cancer of the Cervix." Cand Med Sci, Chair of Obstetrics and Gynecology, Kiev Order of Labor Red Banner Medical Inst imeni Academician A. A. Bogomolets, Kiev, 1953. (KL, No 10, Mar 55)

SO: Sum. No. 670, 29 Sep 55--Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (15)

USSR/Pharmacology and Toxicology - Analeptics. V-4

Abs Jour : Ref Zhur - Biol., No 21, 1958, 98494

Author : Krupko-Bol'shova, Yu.O.
Inst : -
Title : Influence of Phenamine on Lactation.

Orig Pub : Pediatriya, akusherstvo i ginekologiya, 1956, No 3, 52-54

Abstract : In 46 women with hypogalactia, Phenamine (I) was introduced twice a day in a dosage of 1 mg every other day during 4-5 days 1 hour before nursing. In the majority of cases, the amount of milk increased. I was not discovered in maternal milk. It is considered that the effect of I on lactation has a central mechanism. -- R.Il'yuchenok

Card 1/1

SVECHNIKOVA, N.V. [Sviechnikova, N.V.], kand.med.nauk; KRUPKO-BOL'SHOVA, Yu.O., kand.med.nauk

Skin test using progresterone and folliculin. Ped., akush. i gin. 20 no.2:37-39 '58. (MIRA 13:1)

1. Kafedra akusherstva i ginekologii No.1 (zav. - prof. O.Yu. Lur'ye) Kiyevskogo ordena Trudovogo Krasnogo Znameni meditsinskogo instituta im. akad. A.A. Bogomol'tsa (direktor - dots. I.P. Alekseyenko).
(HORMONES, SEX) (MENSTRUATION)

KRUPKO-BOL'SHOVA, Yu.O., kand.med.nauk

Changes in the sex organs in influenza. Ped., akush. i gin. 22 no.6: 59-62 '60. (MIRA 14:10)

1. Kafedra akusherstva i ginekologii No.1 (zaveduyushchiy - prof. M.S.Baksheyev [Baksheiev, M.S.]) Kiyevskogo ordena Trudovogo Krasnogo Znameni meditsinskogo instituta (direktor - dotsent V.D.Bratus') i laboratoriya virusologii (zaveduyushchiy - kand.med.nauk M.F.Smirnova) Kiyevskogo instituta epidemiologii i mikrobiologii (direktor - kand. med.nauk S.M.Terekhov).

(GENERATIVE ORGANS, FEMALE--DISEASES) (INFLUENZA)

KESYANIK, R.V. [Kesianyk, R.V.], glav. red.; FAI, O.G. [Fai, O.H.], red. TIMOSHENKO, L.V. [Tymoshenko, L.V.], red.: KRUPKO-BOL'SHOVA, Yu.O., red.

[Problems of hygiene and physical development of girls (pediatric gynecology); transactions] Pytannia gigieny i fizychnoho rozvytku divchatok (dytiacha ginekologiia); pratsi. Kyiv, Derzhmedvydav URSR, 1960. 169 p. (MIRA 17:7)

1. Respublikans'ka naukovo-praktychna konferentsiya, prysvyachena pytannyam dytyachoy ginekologii. 1st, 1959.

KELNAR, O., inz. CSc.; PLECHANOVA, M., inz. CSc.; KRUPKOVA, B.

Use of silicone coatings for improving the breakdown strength of surface insulators of high voltage and extra high voltage lines and switch plants in surroundings polluted with dust and chemically aggressive substances. Energetika Cz 14 no.10:483-485 O '64.

1. Laboratory of Extra High Voltage of the Institute of Power Engineering, Bechovice.

KRUPKOVA, Milena

Qualifications required from the graduates of industrial schools for telecommunication engineering. Cs spoje 9 no.1:30-31 F'64.

1. Prumyslova skola spojove techniky, Praha.

Krupkovskiy, A.

POLAND/Physical Chemistry. Thermodynamics. Thermochemistry. Equilibria. Physico-Chemical Analysis. Phase Transition. B-8

Abs Jour : Ref Zhur - Khimiya, No 8, 1957, 26066

Author : A. Krupkovskiy

Title : Substitutive Pressure at Isothermic Processes.

Orig Pub : Byul. Pol'skoy AN, 1956, Otd. 4, 4, No 1, 55 - 59

Abstract : The following concepts are introduced: 1) standard work of change in volume of one gram-molecule of substance in an isothermic process $A^{o}(P,T) = \int_{1\ atm}^{P} V\, dP$ at T = const., P and T showing that $A^{o}(P,T)$ depends on the pressure T at the end of the isothermic process and on the temperature T; 2) substitutive pressure $\Phi(T,P)$ determined by the equation RT ln $\Phi(T,P) = A^{o}(P,T)$. Difference between $\Phi(T,P)$ and volatility (according to Lewis): a) $\Phi(P,T)$ refers to any uniform body in any state, not only to real gases; b) the lower limit is not P = 0, but P + 1 atm. The methods of computing $\Phi(P,T)$

Card : 1/2

POLAND/Physical Chemistry. Thermodynamics. Thermochemistry. B-8
Equilibria. Physico-Chemical Analysis. Phase Transition

Abs Jour : Ref Zhur - Khimiya, No 8, 1957, 26066

Abstract : for real gases and condensed phases are given. The methods of computation of the entropy, the enthalpy and the chemical with Φ (T,P) are explained.

Card : 2/2

S/137/61/000/012/132/149
A006/A101

AUTHORS: Krupkovskiy, A., Kayekh, V.

TITLE: Investigating high-strength zinc alloys

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 12, 1961, 28, abstract 12I227 (V sb. "26-y Mezhdunarodn. kongress liteyshchikov, 1959", Moscow, Mashgiz, 1961, 141 - 160)

TEXT: The authors studied alloys of the Zn-Cu-Mn system whose mechanical properties are not below those of brass which is widely used in the industry. Optimum properties are offered by alloy Zn+19% Mn+15% Cu with σ_b 65 kg/mm^2, δ 9% and alloy Zn+24% Mn + 14% Cu with σ_b 57 kg/mm^2, δ 19%. Zn-Mn-Cu alloys are highly wear resistant, in particular under friction conditions without greasing, and their hardness is very high ($H_B > 60$). Their corrosion resistance is somewhat higher than of Zn alloys containing Al. The authors studied the effect of C, Si, Fe on the mechanical properties of alloys of the Zn-Cu-Mn system. C reduces sharply δ; therefore its content must be below 0.03%. The Si content must not exceed 0.5% so that the casting properties of the alloys be not impaired.

Card 1/2

Investigating high-strength zinc alloys

S/137/61/000/012/132/149
A006/A101

The casting properties of Zn-Cu-Mn alloys are similar to those of various types of brass; they are not prone to hot cracks and can therefore be pressure-cast into a chill mold.

N. Sladkova

[Abstracter's note: Complete translation]

Card 2/2

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000826810003-3"

KRUPKOWA, D.

Removal of arsenic and antimony from zinc sulfate solutions during electrolysis. Zaklady Cynkowe "Szopienice"-Przeds. Państw. (by Mieczysław Kapczyński, An'or Król, Danuta Krupkowa, Henryk Łukomski, Jan. No , Jerzy Adamiczka, and Zygmunt Bielawski). Pol. 41, Sept. 10, 1958. Elimination of As and Sb in the $ZnSO_4$ soln. is simplified by filling the filter press with powd. charcoal 75, Zn powder 10, $ZnSO_4$ 2, and H_2O 13%. This method increases the degree of elimination of As and Sb by 0.4-0.5 and 0.5-0.7 mg./l., resp. B. Hulanicka

9 AEZ 1 SD CFK

KRUPKOWA, Danuta, dr inz.

Review of plants for zinc electrolysis. Rudy i metale 9 no.2:54-55 F '64.

CHRAPOWICKI, T.; KRUPKOWSKA, W.

Influence of war on development of rickets in Poland. Pediat. polska 24 no.12:1074-1084 Dec 50. (CLML 20:5)

1. Of Children's Hospital No.1 in Warsaw (Director--Prof.R.Stankiewicz,M.D.)

KRUPKOWSKA, W.

Brief report on typhoid and paratyphoid B therapy with chloromycetin.
Pediat. polska 26 no.2:154-162 Feb 1951. (CIML 21:1)

1. Of Municipal Pediatric Hospital No. 1 (Director -- Prof. R. Stankiewicz, M.D.), Warsaw.

KRUPKOWSKA, Wanda.

Two cases of tetanus treated with novocain injections. Pediat. polska 30 no.12:1197-1198 Dec 55.

1. Z Miejskiego Szpitala Dzieciecego Nr. 1. w Warszawie. Dyrektor: prof. dr. med. R.Stankiewicz. Warszawa, ul. Kopernika 43.

(TETANUS, ther.
procaine)
(PROCAINE, ther. use
tetanus)

ca

9

The mechanism of the reaction ZnO carbon at high temperatures. A. Krupkowski and C. Takhnski. *Ann acad. sci. tech. Varsovie* 2, 217-36(1936); *Chimie & industrie* 37, 278.—Thermal analysis was used to bring out the reduction phenomena. Tests carried out with pure ZnO and wood charcoal in stoichiometric proportions gave a reduction temp. of 900°, whether the tests were carried out in open earthen crucibles or in closed quartz tubes. When the rate of heating was varied, the reduction temp. rose with the intensity of heating up to a max.; also, the size of the grains. Presence of impurities does not always increase the reduction temp.; more particularly, Zn ferrites are as easily reducible as pure ZnO. On the other hand, the nature of the reducing agent exerts considerable influence; coke requires a higher temp., and native or gas graphite a still higher one. As regards the velocity of the reaction, below 908° it is very slow and can even stop completely. The temp. of the center of reduction appears const. and independent of the rate of heating, but the velocity of the reduction depends on the rate of input of heat and, above 908°, is substantially proportional to the rate of heat input. A. P.-C.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

[redacted]

*The Physical and Mechanical Properties of Cold-Worked Copper. A. Krupkowski and M. Balicki (*Ann. Acad. Sci. Tech. Varsovie*, 1936, 3, 90–122). —(I.—) By experiments on copper wires of uniform diameter subjected to varied amounts of cold-working, it was shown that there is a close analogy between the variation of the physical and the mechanical properties of copper with the degree of cold-working. The curves showing the variation in properties as a function of the degree of cold-working exhibit three characteristic zones with limits at 27 and 65% cold-working. A fourth zone with a limit at 97% appears in the case of certain mechanical properties. Observation of the variation with temperature of the thermal e.m.f. of a couple consisting of annealed copper and copper cold-worked to different extents showed that the e.m.f. increases with increase in temperature up to the recrystallisation point, and then becomes roughly constant at a value depending on the degree of cold-working. The recrystallisation temperature and the thermoelectric power were thus determined as a function of the degree of cold-working. From a comparison between the variations with the degree of cold-working of thermoelectric power and the constants of elasticity, it was concluded that the thermoelectric power is a measure of the internal stress in the rolled metal. This stress has a great influence on the temperature of recrystallisation. (II.—) In the second part of the work certain mechanical properties were studied for copper wires cold-worked to varying extent and then re-annealed at different temperature. Wires corresponding to the fourth zone of cold-working (> 96–97%) showed an intercrystalline weakness, which did not disappear even after annealing at 600° C. Observation of the effect of the duration of the re-anneal on the temperature–e.m.f. curves of couples consisting of annealed and cold-worked copper wires afforded a new physical method for studying the relation between temperature of recrystallisation and time of heating. It is shown that the phenomena of recrystallisation may be explained by a theory of activation.—P. W. R.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

The reduction of metallic oxides by charcoal and coke: CuO, Cu_2O, NiO, Fe_2O_3. A. Krupkowski. *Ann. acad. sci. tech. Varsovie* 3, 238-63(1936); *Chimie & industrie* 38, 900-900; cf. *C. A.* 30, 8117[6]. —Charcoal reduces CuO and Cu_2O to Cu + CO_2; both reactions are exothermic, the first starting at 680° and the second at 620°. Similarly, charcoal reduces NiO to Ni and CO_2; the reaction is endothermic and offers isothermic characteristics; it occurs at 700°. The higher temp. of isothermic reduction is sharply apparent. There is a close relationship between this temp. and the rules of chem. kinetics. Reduction of pure Fe_2O_3 by charcoal comprises 3 stages: $Fe_2O_3 \rightarrow Fe_3O_4 \rightarrow FeO \rightarrow Fe$. The 1st reaction, which has a very small thermal effect, is carried out between 610 and 820° (CO_2 = 99%); the other 2 are endothermic and their upper isothermic reduction temps. correspond, resp., to 800° (CO_2 = 70%) and 920° (CO_2 = 30%). Coke reduces pure Fe_2O_3 according to the equations: $6Fe_2O_3 + C = 4Fe_3O_4 + CO_2$; $1.79\ Fe_3O_4 + C = 5.37\ FeO + 0.79\ CO_2 + 0.21\ CO$; $1.28\ FeO + C = 1.28\ Fe + 0.28\ CO_2 + 0.72\ CO$. Reduction of Fe ores by coke and by charcoal takes place in the same manner as that of pure Fe_2O_3. Coke reduces the ores at slightly lower temps. than the pure Fe_2O_3, but the difference is insignificant.

A. Papineau-Couture

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

M

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*Study of the Rate of Oxidation of Liquid Bismuth, Based on a New Method. A. Krupkowski and S. Balicki (Ann. Acad. Sci. Tech. Varsovie, 1937, 4, 212 231).—[In French.] In the apparatus described, the crucible containing the metal is suspended in a furnace from the arm of a sensitive balance; the progress of oxidation can thus be followed continuously as the tempera- ture of the furnace is increased, and the rate of oxidation may be determined for any given temperature by drawing a tangent to the temperature total- oxidation curve obtained. There are 3 stages in the oxidation of liquid bismuth, associated with the formation of different types of oxide, viz.: (i) at temperatures up to 700° C., the solid oxide α is the only product; (ii) from 700°–821° C., solid oxide β; (iii) at temperatures above 821° C., the oxide film is liquid. In the temperature ranges (i) and (ii), the rate of oxidation is relatively slow, and conforms to the parabolic law $w^2 = kt$. At temperatures above 821° C., however, the rate is very rapid, owing to the ease with which oxygen diffuses through the liquid oxide film, and the rate of oxidation becomes constant ($w = kt$).—C. E. R.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

3

*New Theory of the Recrystallisation of Work-Hardened Metals, Illustrated by Reference to Copper. A. Krupkowski and M. Balicki (Ann. Acad. Sci. Tech. Varsovie, 1937, 4, 270-288).—[In French.] A general theory of the process of recrystallisation of work-hardened metals is developed. It is assumed that in the first stages of recrystallisation a metal consists of a submicroscopic mixture of two components—hard, deformed metal which has not yet recrystallised, and a soft, freshly-recrystallised constituent. The rate of transformation at a given temperature is $\frac{dx}{dt} = k(1 - x)$, where k is a constant, and x is the fraction of metal already recrystallised. The process is an activated one, and the rate coeff. conforms to the normal Arrhenius equation $\frac{d\ln k}{dT} = \frac{A}{RT^2}$. The rate of recrystallization is therefore given by $\frac{dx}{dt} = c(1 - x)e^{-A/RT}$, where A is the activation energy of the process. The theory is supported by a comprehensive series of mechanical tests on copper wires which had been subjected to controlled working and annealing. For copper reduced 80-81% in cross-sectional area, it was found that $c = 1 \cdot 58 \cdot 10^{11}$/hr., and $A = 33{,}000$ cal./mol. Using these values, K. and B. calculate theoretical curves for the rate of change of thermoelectric and mechanical properties with time and temperature of annealing, which show good agreement with the results obtained experimentally.—C. E. R.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

The isothermal dissociation of chemical compounds in
endothermal reactions. Alexandre Krupkowski. *Ann.*
acad. sci. tech. Varsovie 2, 3-14; *Chem. Zentr.* 1936, II, 7.
—The effect of temp., rate of heating, grain size and pres-
sure on the decompn. of various substances was investi-
gated. E. g., 5-16 g. $NaHCO_3$ in a combustion tube
supplied with a thermoelement was placed in a const.-
temp. furnace and the decompn. at atm. pressure observed.
The evolution of CO_2 and H_2O took place at const. temp.;
only toward the end of the reaction did the temp. in the
tube rise again. The decompn. temp. was independent of
the amt. of material used. With increasing grain size the
temp. increased; it likewise increased with increasing
temp. Decompn. temp. and equil. temp. were different.
They approach each other with increasing external pres-
sure. Approx. decompn. temps. at atm. pressure reported
are: $NaHCO_3$ 124°, $KHCO_3$ 172°, $Ag_2CO_3.nH_2O$ (175° →
Ag_2CO_3, 224° → Ag_2O, and 412° → Ag), $2ZnCO_3.3Zn(OH)_2$ 218°, $ZnCO_3.\frac{1}{2}H_2O$ 351°, and HgO 544°.

M. O. Moore

Properties of Metals

MA

The Problem of the Oxidation of Molten Nickel at High Temperatures. Krupkowski and S. Balicki (*Ann. Acad. sci. tech. Varsovie*, 1938, **5**, 130-15 [illegible] *Chem. Zentr.*, 1939, **110**, (II), 4451).—Cf. *Met. Abs.*, 1937, **4**, 589. The oxid[illegible] [illegible] of molten nickel was studied by making a series of analyses. The proc[illegible] occurs in 2 stages: first, oxygen is dissolved by the fused metal until t[illegible] saturation limit is reached; second, the formation of NiO begins. Th[illegible] solubility of oxygen increases with the temperature; it is 0.067%, at 145[illegible] and 1.18%, at 1720° C. The NiO does not form as a uniform layer, bu[illegible] penetrates the melt in branching filaments. The velocity of oxidation follo[illegible] the law [illegible] $w_0)^2 = Kt$, where w is the amount of oxygen taken up [illegible] unit surface, w_0 is the amount of oxygen in solid solution, and K is a constant. [illegible] fused nickel covered with a uniform film of NiO is oxidized [illegible] times more [illegible] slowly than with the oxide in the form of branching filaments. The rate [illegible] oxidation of solid nickel is less than that of the molten metal; thus at 143[illegible] [illegible] the above equation it is 1.9 and at 1150° [illegible] [illegible]

1942

PROCESSES AND PROPERTIES INDEX

18

Influence of the Gauge-Length and Shape of Test-Pieces upon the Elongation at Fracture. A. Krupkowski and J. Wantuchowski. (Annales de l'Académie Polonaise des Sciences Techniques, 1939-1945, vol. 7, pp. 10-40). A detailed study is made of the deformation of specimens in the tensile test and a formula is developed for the elongation of standard specimens. A nomograph is presented which simplifies the conversion of the elongation and reduction in area of a specimen of the standardized dimensions of one country to those standardized in another.

ASA-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

*The Deformation of Plastic Metals by Strain (Copper and Nickel). A. ~~Krupkowski~~ (Ann. Acad. Polonaise Sci. Tech., 1939-45, 7, 113-120). [In English]. Tensile stress-strain measurements were made with a 15-ton Amsler machine on annealed electrolytic copper, and on sintered nickel in both the annealed and cold-drawn conditions. Results could be expressed by the formula $\sigma = k a_r^m$, where σ denotes the unit tension, and a_r the cold work by strain, k and m being constants for a given metal. The formula is applicable only over the straight portion of the stress-strain curve. M. A. V.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

M

1

THE OXIDATION OF MOLTEN TIN AND 10% -Tin Bronze. A. Krupkowski and A. Piotrowski (Ann. Acad. Polonaise Sci. Tech., 1939-45, 7, 121-128) (In French) The rate of oxidation of molten tin in air at const. temp. was determined by noting the progressive increase in weight. There weretwo distinct stages; over the firest stage, the increase in weight was proportional to the sq uare root of the time, and a thin film, identified by electron-diffraction methods as SnO, formed on the surface. When this reached a given thickness, the rate of oxy en absorption suddenly incr as d, and during this second stage of an acicular structure. The time at which the second stage commenced was a function of the temp. Different samplesof tin, tested under the same conditions, sometimes show d markedly differnnt oxidation rates durint the second st ge. Tesys on 10%- tin bronze yielde similar results, except that during th first stage theprotective film was composed of Cu_2O at temp. below 1000°C. Above 1000°C., the proportion of tin in the film increases with tmp. Molten bronze oxidises at the same rate in oxygen as in air.

ASM SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

Ca

9

Low melting point solders containing no tin. A. Krupkowski and W. Truszkowski. *Hutnik* 14, 453-8 (1947).—A large no. of Pb-base solders (contg. Pb 80-85, Cd and Zn 5-10, and Cu, P, Sb, Al, and Mg 0.1-4.0%) were prepd. and tested in an attempt to find a low-cost solder contg. no Sn. The compn. of two solders having good appearance, adhesion, strength, and resistance to corrosion are given as: (I) Pb 86.05, Cd 8, Zn 5, Sb 0.7, and Al 0.25%; and (II) Pb 84.05, Cd 10, Zn 5, Sb 0.7, and Al 0.25%. Frank Gonet

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

15

ON OXIDATION OF METALS. A. Krupkowski. (Hutnicke Listy, 1948, vol. 3, Dec., pp. 356-361). (In Czech). An equation for calculation of the free energy of chemical reactions has been developed by the author from a thermodynamical law. Such free energy values has been calculated for a number of metals at various temperatures. These are given in a talbe. This talbe permits the determination of the affinity of individual metals to oxygen at various temperatures even if the metal and the oxide are both in a gaseous state provided their vapours are in a state of saturation. Classification of metals according to the free energy of the oxidation reactions also indicates that it is easy to remove impurities from molten metals at temperatures above 1000°C by introducing oxygen or H_2O particularly if the oxide layer which covers the metal is in a liquid state. At normal temperatures, and at temperatures up to nearly 1000°C., a solid dense oxide layer is formed in most cases on solid and on liquid metals. The resistance of the metals to oxidation depends mainly on the density of the crystal lattice of these oxides and their resistance to diffusion; affinity for oxygen is only of secondary importance at up to 1000°C. E.G.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

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M

22

Free-Energy Change of the Reversible Reactions. A. Krupkowski (*Hutnik*, 1948, 15, (3), 108–115).—[In Polish]. A new system of denoting the differing thermodynamic values by dashes above the symbols is proposed for theoretical and practical use. Thus, in the theoretical system of the endothermic reactions at 298·1° K., the following designations are proposed: $+\Delta H$, the heat of the reaction, $+\Delta F_r^\circ$ free-energy change of the reaction; the same values in the practical system of these reactions take the form: $-\Delta H_r$, ΔF_r°. The value of the free energy of the reversible reactions at temp. T, if no changes of substances take place, is expressed by the formula: $\Delta F^\circ = \Delta H_r + \Delta a . f_1 + \Delta b . f_2 + \Delta c . f_3 + \Delta d . f_4 + T . \Sigma S_r$, where Δa, Δb, Δc, Δd are coeff. calculated from the equation of the specific molecular heat, according to the formula: $\Delta C_p = \Delta a + \Delta b T + \Delta c T^{-2} + \Delta d T^2$; f_1, f_2, f_3, f_4 are functions depending on temp., the values of which are tabulated; ΣS_r is the algebraic sum of the entropies of the substances taking part in the reversible reactions. Free energy at the temp. T, when the substances are changing, can be calculated according to an approx. formula: $\Delta F^\circ = \Delta H_r \pm \Sigma \lambda_p + \Delta a . f_1 + \Delta b . f_2 + \Delta c . f_3 + \Delta d . f_4 - T . (-\Sigma S_r \pm \Sigma S_p)$, where $\Sigma \lambda_p$ and ΣS_p are the heats and entropies of the transitions and are denoted with the mark + if the left component of the reaction is changing, and with the mark − when the right component changes. The method of free-energy calculation according to the deduced formulæ is shown in many examples illustrating chemical changes in metals and their compounds and the vapour pressure of metals.—A. K.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

5

M

*Sintered Porous Graphite-Bronze Bearings. A. Krupkowski and W. Cegielski (*Prace Badawcze Głównego Inst. Met. i Odlewnictwa*, 1949, 1, (2), 163-179).—[In Polish]. An investigation was made into the effect of compn., sintering, and impregnation conditions on properties such as porosity, hardness, plasticity, compressive strength, and dimensional changes during sintering, using electrolytic Cu powder of 250 mesh, and slightly finer Sn powder. Preheating for 2·5 hr. at 400° C. before sintering at 800° C. increased the porosity and reduced the radial shrinkage, but it also reduced the hardness and compressive strength. The porosity could be increased by adding 3% of talcum, NH_4Cl, or $(NH_4)_2CO_3$, or by sintering in H. The latter method is recommended as giving the best compromise between porosity and dimensional stability, and mech. properties. As reported, oil-porosity varied from 15 to 30%; B.H.N. = 25-45; compressive strength = 30-60 kg./mm.^{2}; radial linear contraction was up to 2·5%. 15 ref.—N. H. P.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

5

4

ENDOTHERMIC REACTHIONS ACCOMPANIED BY GAS EVOLUTION - A Krupkowski and J Zemelka. Jutnicke Listy 1949, vol. 4, Mar., pp 79-83. In Czech. In endothermic reactions between solid bodies which are accompanied by evoluti n of gases, a particular temperature, the upper isolathermic temperature can be distinguished. This temperature is easily determined and is always higher than the equilibrium temperature. The difference between the two temperatures characterises the degree of overheating of the system of solids above equilibrium temperature. In industrial processes endothermic reactions which are accompanied by gas evolution usually occur at tempesatures equal to or lower than the upper isothermic temperature and the reaction is the slower the further the tempera ure is below the upper isothermic one.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

S

Anisotropy of Annealed Metals. A. Krupkowski and R. Kawiński. (Hutnik, 1949, vol. 16, Sept.–Oct., pp. 347–351). [In Polish]. A conception of coefficients of partial uniform elongation a'_A and a'_b has been introduced, the value of which may be easily calculated from the data of elongation on a fractured flat metal test piece.

The relationship of these coefficients of partial uniform elongation,

$$K_a = \frac{a'_A}{a'_b}$$

is the coefficient of anisotropy for polycrystalline metals. It is a constant value for a given annealed metal, provided that the individual layers have undergone annealing before the same degree of cold working.

In the drawn test bars, various layers of which have been submitted to different degrees of cold working, the coefficient K_a varies in a continuous manner from one layer to another. Some annealed metals, such as mild steel, brass, and aluminium, after previous cold working, show a distinct tendency towards anisotropy.—W. J. W.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

M

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On the Relation Between the Hardness Number and Coefficients of the Tensile Test. A. Krupkowski and W. Truszkowski (*Arch. Mech. stos.*, 1950, 2, (3), 235-250; *Appl. Mechanics Rev.*, 1951, 4, 291).—Values of the exponent n in Meyer's law $L = Ad^n$ were measured for ball indentations in several metals cold worked in tension by various amounts (L = load, d = impression dia.). The law is found to hold right up to a hemispherical impression. In the fully annealed state, n = 2·65 for Au, 2·51 for Cu, 2·50 for 70 : 30 brass, 2·46 for Ni, 2·43 for Ag, 2·36 for Al, and 2·31 for Monel metal. After heavy prestraining in tension, n is very nearly 2·0 for all metals; the ratio of load to projected area is then const. during indentation and is found to be approx. 2·9 times the corresponding tensile yield stress. For annealed or moderately worked metals, empirical relations are proposed between certain characteristics of the hardness and tension tests.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

KRUPKOWSKI, A.

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

*Manufacture and Properties of Resistance Wires of Composition Cu 82·5, Mn 12·0, Al 4·0, Fe 1·5%. A. Krupkowski and Z. Misiolek (*Prace Badawcze Glownego Inst. Met. i Odlewnictwa*, 1950, 2, (4), 273-284).—[In Polish]. The charge consisted of Cu (99·98% purity), Al (99·5%), 90 : 10 Cu-Mn and 60 : 40 Fe-Mn alloys. These were melted in a crucible furnace, poured at 1210°-1240° C., and annealed to homogenize them at 900° C. for 14-16 hr. The cast rods were then cold rolled from 13 to 8 mm. dia., and drawn without annealing in 26 passes to 0·09 mm. dia. (total reduction 99·4%), and annealed at different temp. from 100° to 700° C. It is recommended that intermediate anneals be given after each 60% reduction, and the wire annealed at 400°-600° C. for 2 hr. to produce the lowest thermal coeff. of resistivity and min. thermoelect. effect against Cu (−0·40 µV./°C.). Mech. properties agree with those quoted in the literature for this alloy. 6 ref.—N. H. P.

KRUPKOWSKI, L. A.

Sintered contact materials. L. A. Krupkowski, W. Rutkowski, and S. Stolarz. *Prace Glównego Inst. Met.* 3, 140-60(1951).—A treatment of the metallurgy of sintered powders. After a short review of required properties, the authors present their own findings. First, the methods of obtaining pure W, W-Fe, Cu, Ag powders used for subsequent sintering are given, followed by a description of methods used for sintering W-Cu and W-Ag contacts. The effects of compn., particle size, applied pressure, temp., and time of sintering upon properties of the product were examd. These properties were evaluated on the basis of d., hardness, and elec. cond. The authors claim to have obtained the optimum results with 60-70% coarse, 50-300 μ range W powders under a pressure equal to or greater than 15 tons/sq. cm. by employing a sintering temp. of about 1000-1100° over a period of 3-4 hrs. in dry H. The article is illustrated with several graphs and microphotographs. A. J. P.

B.I.R.

Metals - Smelting, Reduction and Refining

3108*. Reactions in the Muffle of a Zinc Furnace. (In Polish.) A. Krupkowski and J. Sowa. *Prace Glownego Instytutu Metalurgii*, v. 3, no. 6, 1951, p. 447-461.

During the reduction of Zn, a number of chemical reactions take place in the muffle of a furnace between carbon and the compounds of Zn, Pb, Fe, Cu, Cd, Sn, etc. The composition of gas evolved from the Zn dust is used as basis for calculation of direction and intensity of above reactions at 1200°K. Conclusions are summarized in English. Data are extensively tabulated and charted.

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000826810003-3"

(3) plots

Polish Technical Abst.
No. 4, 1953
Metallurgy

2390 655.32:669.575.001,5

Krupkowski A., Zalesinski E., Babinski W. Zinc Graphic Plates. Cynkowe plyty graficzne. (Prace Inst. Metalurgii No. 3), Katowice, 1952, PWT, 19 pp., 16 figs., 3 tabs.

With a view to improving the quality of Polish made zinc graphic plates, the authors performed a number of experiments changing the chemical composition of the alloy by an addition of magnesium and also of aluminium. The hardness of manufactured zinc plates, the granularity of the alloy and the grain growth at high temperatures were investigated. The usefulness of such plates for printing purposes was considered. Zinc alloys with the addition of 0.08% to 0.4% of magnesium or of magnesium and aluminium in a quantity of 0.4% Mg and 0.4%. Al produced particularly good results as regards the manufacturing of graphic plates.

addition of small amounts of [illegible]

4

POLON

"Process of Condensation of Zinc and Cadmium Vapours. A. Kr[illegible] (Bull. Acad. Polon. Sci., 1955, Cl. 4, [illegible]).—(In English.) A theoretical study of the condensation of a metal vapour from its mixture with CO and CO_2, the metal being oxidisable by CO_2 and equilibrium being attained in this oxidation. In a typical Zn-retort gas, contg. 51·2% Zn, 46·4% CO, 2·4% CO_2, oxidation of Zn vapour by CO_2 begins when the temp. falls to 1241° K. When the Zn dew-point, 1111° K., is reached, only 0·2% CO_2 is left in the gas, and this reacts with Zn as condensation proceeds.—J. L.

Theoretical study of ...

A at. wt. of the ... During the complex process ... $M-CO-CO_2$ occurring ... mixt. in state 1. ... tion and oxidation of metal in the mixt. ... should be ring under the equil. conditions, an equil. const. ... $= K_p$. Wt. of the taken into consideration ... passes from state 1 oxidized metal ...

KRUPKOWSKI, A.

Journal of the Iron and Steel Institute
Vol. 176
Apr. 1954
Blast Furnace Practice and Production of Pig Iron

Calculation of Thermodynamic Values in Metallurgical Processes (Reactions in Liquid Iron). A. Krupkowski. (*Bull. Academie Polonaise Sciences*, 1953, I, (1-2), 37-59). [In English]. On the basis of thermodynamic data for undercooled substances, the free energy changes for the following processes: $Fe_s \rightleftharpoons Fe_{liq}$, $FeO_{sol} \rightleftharpoons FeO_{liq}$, $Fe_{liq} + \frac{1}{2}O_2 \rightleftharpoons FeO_{liq}$ and $Fe_{liq} + H_2O \rightleftharpoons FeO_{liq} + H_2$, were calculated in the temperature range 1800–2000° K. Calculated activity coefficients, partial heats of solution of the Fe-FeS system at 1800° K. are also given.—V. G.

KRUPKOWSKI, Aleksander

Metallurgical Abst.
Vol. 21 May 1954
Properties of Metals

*Condensation of Zinc and Cadmium Vapours. Aleksander Krupkowski and Karol Rzyman (*Arch. Górn. Hutn.*, 1953, 1, (1), 75-104).—[In Polish, with English summary]. The ternary systems Zn-CO-CO_2 and Cd-CO-CO_2 were studied at 700°-1300° C. in relation to the met. processes of the prodn. of metallic Zn and Cd by reduction of their resp. oxides. Theoretical analysis of the condensation, reduction, and oxidation of the Zn and Cd vapours leads to some conclusions important in met. practice. The importance of maintaining a highly reducing atmosphere in Zn condensers is stressed, and the use of pure N (instead of air) is recommended for purging vertical retorts. Analysis of condensation diagrams brings to light the little-studied problem of the velocity of flow of Zn-CO-CO_2 gas mixture through the condenser. The efficiency of Cd condensation is comparatively insensitive to the presence of CO_2 in the gases.—S. K. L.

KRUPKOWSKI, ALEKSANDER

Calculation of the thermodynamic values in metallurgical processes. Reactions in the liquid phase of iron. Aleksander Krupkowski. *Arch. Gornictwa i Hutnictwa* 1, 107-28(1953)(English summary, 128).—The changes in the free energy were calcd. over the range 1800 to 2000°K. for the following process reactions: (1) $Fe_{\alpha} \rightleftarrows Fe(l)$, $\Delta F^{\circ} = 485 - 3.11T$; (2) $FeO(s) \rightleftarrows FeO(l)$, $\Delta F^{\circ} = 7280 - 1.70T$; (3) $Fe(l) + \frac{1}{2}O_2 \rightleftarrows FeO(l)$, $\Delta F^{\circ} = -58,625 + 12.81T$; (4) $Fe(l) + H_2O \rightleftarrows FeO + H_2$, $\Delta F^{\circ} = 1015 - 1.01T$. All values are in cal. per mol. The auxiliary equations 1 and 2 facilitate the calcn. of the free energy of reversible reactions occurring in liquid iron at high temp. With the aid of the above results a series of values relative to the components Fe and FeS in the soln. of liquid iron over the temp. range 1260-1810°K. was calcd. (5) $\log f_{Fe} = (813/T)N_{FeS}^{2}$, (6) $\log f_{FeS} = (813/T)(N_{Fe}^{2} - 3.778N_{Fe} + 2.778)$, (7) $\bar{H}_{Fe} = 3710.7N_{FeS}^{2}$, (8) $\bar{H}_{FeS} = 3719.7(N_{Fe}^{2} - 3.778N_{Fe} + 2.778)$, and (9) $\Delta H = 10,332.5N_{FeS}(1 - N_{FeS}^{2})$, in which f_{Fe} and f_{FeS} represent coeffs. of activity, $\bar{H}_{Fe}$ and $\bar{H}_{FeS}$ molar partial heats of soly., ΔH molar heat of the formation of a soln. With the aid of the calcd. activity coeffs. the value of the partial heat of soly. of FeO in liquid Fe was established at approx. $\bar{H}_{FeO} = 18,500$ cal./mol.

M. O. Holowaty

KRUPKOWSKI, A.

Metallurgical Abst.
Vol. 21 May 1954
Properties of Alloys

*Anisotropy of Gilding-Metal Strips. A. Krupkowski and A. Block-Bolten (Prace Inst. Mech., 1953, 2, (7), 34-41).—[In Polish]. Changes of anisotropy in gilding-metal (95 : 5 Cu-Zn alloy) strips at different stages of cold rolling and annealing have been determined by the Krupkowski-Kawinski method. The highest degree of anisotropy occurs in the direction of rolling; it increases during rolling and decreases during annealing, and is proportional to the % reduction in thickness in rolling. It is suggested that the times of the interstage annealings can be reduced considerably without lowering the deep-drawing properties of the material, as even a 10-min. annealing at 600° C. induces recrystn. and partly eliminates the anisotropy of the strips tested.—S. K. L.

(2)
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KRUPKOWSKI, A.

MG

Krupkowski A. Plastic Properties of Cast Metals in the Hardness and Tensile Test.

„Plastyczne własności metali odlanych w próbie twardości i rozciągania". Archiwum Górnictwa i Hutnictwa (PAN). No. 1, 1953, pp. 27—53, 7 figs., 4 tabs.

The tensile test employed for the valuation of the quality of cast metals fails in many cases on account of premature fracture, caused by casting defects, of the test pieces of cast metal; the specific plastic properties of metals are then not revealed. The method proposed in this paper consists in a series of hardness measurements carried out under increasing load with a ball of constant diameter. Such measurements make it possible to calculate the plastic susceptibility (m) as well as the maximum hardness H_{max} defined by Meyer's ratio. $H = H_{max}\left(\frac{d}{D}\right)^m$ where H determined hardness under load P according to equation $H = 4P/\pi d^2$, d being the diameter of the impression and D the diameter of the ball. Values m and H_{max} obtained in experiments characterise the properties of cast metals almost independently of hidden casting defects. The coefficient of plastic susceptibility of metals used for construction of machines should amount at least to the value $m \geq 0.20$. Analysis of the deformation of a cast metal specimen in the tensile test reveals a characteristic phenomenon — the premature fracture of the test piece. In order to determine, in the tensile test, the degree of this premature fracture the three following coefficients were introduced: 1) tensile strength index; 2) stress index; 3) angle index. The newly proposed method facilitates the determination of cast alloys from the point of view of the quality of the material itself, and enables the technology of refining and casting to be evaluated.

KRUPKOWSKI, A.

POLON

†An Electrochemical Method of Defining the Degree of Microsegregation in Metals. A. Krupkowski and A. Piotrowski (Bull. Acad. Polon. Sci., 1954, Cl. 2, (3), 143–146).—(In English). When two pieces of the same metal corroding in HNO_3 are connected as a cell, there are small voltage oscillations of a pattern that is reproducible for a given sample of metal. Galvanometer traces from duplicate experiments are shown for a C steel and a Zn alloy (4·4% Al). It is assumed that the degree of microsegregation in alloys of a given type ∝ mean amplitude of voltage oscillation × frequency of oscillation.—J. L.

(1)

Zinc rectification. Aleksander Krupkowski and Henryk Pik (Zaklad Met. Inst. Podstawowych Probl. Tech. PAN, Kraków, Poland). *Arch. Górnictwa i Hutnictwa* 2, 243-302 (1954)(English summary, 350-2).—Chem. engineering calcns. are presented for Zn rectification in 2 columns by the method of the New Jersey Zinc Co. The crude Zn is heated to above 600° and introduced into approx. the middle of the 1st column. Fe, Pb, and other impurities and some Zn flow out from the bottom while most of the Zn and Cd distil out from the top of the column. The mixt. of Zn and Cd is reheated and introduced into approx. the middle of the 2nd column from which Cd distils out and pure Zn flows out from the bottom. Each column has 38-48 trays made out of SiC with some addn. of plastic clay. The following rectification formulas were derived:

$$b_2/b_1 = [[1 - P_4/(P_1 + P_6)]^{(M+1)/M}/\{[1 - P_4/(P_1 + P_6)]^{(M+1)/M} + (1 - P_4/P_3)^{(N+1)/N}\{1 - [1 - P_4/(P_1 + P_6)]^{(M+1)/M}\}\}][P_1/(P_1 + P_5 - P_6)],$$

$$b_3/b_1 = [[(1 - P_3/P_4)^{(N+1)/N}\{1 - [1 - P_4/(P_1 + P_6)]^{(M+1)/M}\}/\{[1 - P_4/(P_1 + P_6)]^{(M+1)/M} + (1 - P_3/P_4)^{(N+1)/N}\{1 - [1 - P_4/(P_1 + P_6)]^{(M+1)/M}\}\}][P_1/(P_4 - P_5)]$$

where b_2 = the mole fraction of the metal component in P_2, b_3 = mole fraction of the same component in P_3, b_1 = mole fraction of the same component in P_1, P_1 = the same component in the feed, P_2 = the component condensed in the upper part of the column, P_3 = the component in the liquid residue, P_4 = the component vaporized in the lower part of the column, P_5 = the component in vapors leaving the column, and M and N = consts. which are calcd. from equil. between soln. and vapor. $P_3 = P_1 + P_5 - P_4$; $P_6 = P_4 - P_5$. All values of P are in moles/24 hrs. The above formulas are valid for continuous rectification. However, because of entrainment of liquid droplets in the overhead vapors a correction has to be made. The amt. of entrained metal = approx. $C(P_4 - P_3)(2P_4 - P_5)P_5$, where C is a const. which is calcd. from the material and heat balances.

Frank J. Hendel

Krupkowski, A.

On the conditions of solving the Gibbs-Duhem equation in the case of many-component solutions. In English. p. 147, Vol. 2, no. 3, 1954, BULLETIN, Dep't of Technical Sciences, Polish Academy of Sciences

SO: MONTHLY LIST OF EAST EUROPEAN ACCESSIONS, (EEAL), Vol. 4, No. 9, LC, Sept. 1955, Uncl.

1257* Statistical Analysis of the Shape of Die Cast Test Pieces. Ocena statystyczna kształtu próbek wytrzymałościowych odlewanych pod ciśnieniem. (Polish.) Aleksander Krupkowski, Zbigniew Lech, and Jan Wojnicki. Archiwum Górnictwa i Hutnictwa, v. 3, no. 3, 1955, p. 317-344. H6

A five-fold test piece is proposed for the inspection testing of die cast alloys. A 2.5-fold test piece is recommended when it is possible to increase the thickness and gage length of test pieces. Diagrams, graphs, tables. 18 ref.

2/ 1 9

KRUPKOWSKI, A.

The problem of standardizing samples cast under pressure in the light of statistical data. p. 644

NORMALIZACJA vol. 23, no. 11, Nov. 1955

Poland

So. EAST EUROPEAN ACCESSIONS LIST vol. 5, no. 10 Oct. 1956

Distr: 4E2c

Dilution law for solutions of metals. Aleksander Krupkowski and Władysław Ptak. *Rudy i Metale Nieżelazne* 1, 6-9(1956).—The equation of Krupkowski (*C.A.* 51, 14384*d*) is applied to calcns. of contents and solubilities of impurities in metal refining. As an example, the sepn. of Ag from Pb is given. Z. Kurtyka

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3W

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metals: the first, from the elastic limit to the limit of uniform elongation; the second, corresponding to the formation of the neck

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567. Krupkowski, A., On substitute pressure in the isothermal [illegible]

[illegible]

which denotes the substitute pressure corresponding to the work [illegible]

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KRUPKOWSKI, ALEKSANDER

POLAND/Atomic and Molecular Physics - Statistical Physics. Thermo- D-3
dynamics

Abs Jour : Ref Zhur - Fizika, No 2, 1958, No 3176

Author : Krupkowski Aleksander, Ptak Wladyslaw, Block-Bolten Andrzej.
Inst : Academy for Mining and Smelting, Cracow, Poland
Title : Thermodynamic Functions in Binary Systems.

Orig Pub : Zesz. nauk. Akad. gorn.-huth., 1957, No 10, 27-71

Abstract : The authors consider the relationships between the form of the diagrams of the thermal systems and the thermodynamic functions that characterize these systems. Methods for calculation of the thermodynamic functions such as enthalpy and entropy, chemical potentials of pure elements, partial heat of solubility, heat of solution, activity of the substances in solution, enthalpy, entropy and chemical potentials of individual metals in solutions are presented. Another group of functions comprises the enthalpy, entropy, and free energies of solutions and mixtures. Four typical thermal systems of metals which do not form into metallic compounds

Card : 1/2

POLAND/Atomic and Molecular Physics - Statistical Physics. Thermo- D-3
dynamics.

Abs Jour : Ref Zhur - Fizika, No 2, 1958, No 3176

are chosen, namely: zinc-cadmium, silver-copper, nickel-copper, and lead-zinc. The thermodynamic functions for these systems were calculated on the basis of experimental data, gathered essentially from Kelley's data (Kelly K.K., U.S. Bureau of Mines Bulletin, Nos. 350, 371, 393, 394, 407, and 434). The indicated systems must be considered as examples. It is possible on their basis to calculate any system of a given type. In contradiction to the qualitative solutions presently available, this work con-iders the problem quantitatively.

Card : 2/2

5634 669.715.782 : 539.567

5

Krupkowski A., Adamski C. On the Problem of the Plasticity of Silumin.

„Zagadnienie plastyczności siluminu". Przegląd Odlewnictwa. No. 12, 1957, pp. 341—347, 23 figs.

Several attempts to improve the technology of casting silumin containing approximately 11% Si, were made with a view to obtaining the maximum value of elongation in the tensile test. It was noted that the pouring temperature, the refining with nitrogen and the modification with metallic sodium have considerable influence. After 15 minutes of refining, the increase in the elongation value amounted to 50% of the value before refining. Silumin was modified by adding the following weight percentages of sodium in relation to the metal charge: 0.05; 0.1; 0.15; 0.25; 0.75; 1.00 and 2.00 per cent. The highest elongation value amounting to approximately 18 per cent was achieved by adding 0.25 per cent of sodium after approximately 35 minutes of modification. At the same time, the inoculant was found to have greater influence on the structure refinement. In the specimen which showed the maximum elongation values, the silicon crystals (of the β solution) were not visible even when enlarged 700 times. On the basis of the theory of A. Krupkowski concerning the latent plasticity of metal, it was found that the silumin tested in the tensile test may be expected to show an elongation still several per cent higher than the maximum elongation obtained in the conditions of the study carried out.

See also: 5637, 5661, 5667.

Krupkowski Aleksander

POLAND/Solid State Physics - Mechanical Properties of Crystals and Polycrystalline Substances E-10

Abs Jour : Ref Zhur - Fizika, No 5, 1958, No 10735

Author : Krupkowski Aleksander
Inst : Institute of Metals of the Institute of Basic Problems of Technology, Krakow, Poland.

Title : Anisotropy of Single-Crystal and Polycrystalline Metal with Structure A_1.

Orig Pub : Arch. hutn., 1957, 2, No 1, 9-46

Abstract : The author considers the problem of the deformation of a specimen, cut out of a single crystal with a structure A_1 (type Cu) in an arbitrary direction. The stretching of such a specimen (with the direction of the tension remaining constant) is possible only in the presence of multiple slippage. The three dimensional model of the plastic limit shows eight maxima, corresponding to the cirections (111). The deformation of the cut of a round specimen (dimensions and form of ellipses) is characterized by an anistropy coefficient in the form $K_a = d\varrho_y/d\varrho_x$, where $d\sigma_y$ and $d\varrho_x$ are the decreases in the

Card : 1/2

POLAND/Solid State Physics - Mechanical Properties of Crystals and Polycrystalline Substances E-10

Abs Jour : Ref Zhur - Fizika, No 5, 1958, No 10735

dimensions of the specimen in the directions of the principal access of the ellipses. A large similarity is observed between the anisotropy of the shape of a monocrystal of type A_1 and the anisotropy of a polycrystalline sheet of nickel with hardening and with a texture (110) [$\bar{1}$12]. In accordance with the calculations, horizontal ellipses should occur in the above polycrystalline specimen with round cross section in the range of angles from 0 to 40°. The conclusions are confirmed by experiments.

Card : 2/2

KRUPENSKIY, A.

POLAND/Solid State Physics - Phase Ballance. Phase Transformation E-5

Abs Jour : Ref Zhur - Fizika, No 1, 1959, No 875

Author : Krupkowski A.
Inst : -
Title : Thermodynamic Principles of the Dissolution of Gases in Metals.

Orig Pub : Bull. Acad. polon. sci., 1957, Cl. 4, 5, No 6, 357-362, XXXII

Abstract : The author considers the thermodynamic principles of the dissolution of gases in metals. In connection with this, the author uses the concept of "substitution pressure," which he introduced, determined by the formula

$$RT \ln \Phi = \int_1^p V\,dP$$

where V is the molar volume of the given substance, and P is the pressure. A general relation is derived, which describes qualitatively the course of the process of dissolution of gases in metals at a constant temperature.

Card : 1/1 Author's resume

Distr: 4E2c

Purification of cadmium. Zakłady Cynkowe "Welnowiec" (by A. Krupkowski, H. Pik, and K. Rzyman). Pol. 41,351, Dec. 3, 1958. Cd of 99.99% purity can be obtained from melted Cd sponge or Zn-Cd alloys. Part of the alloy is vaporized and freed from higher boiling constituents in the distn. app. provided with a suitable filter. Quantity of the circulating metal in the distg. app. is at least 4 times that of the furnace charge. K. Bojanowska

5

AUTHORS: Krupkovskiy, A., Ptak, V., Blek-Bol'ten, A. 78-3-4-19/38

TITLE: Thermodynamic Functions in Binary Systems (Termodinamicheskiye funktsii v binarnykh sistemakh)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 4, pp. 939-944 (USSR)

ABSTRACT: In binary systems different phases exist at various temperatures. For explaining the phase equilibria thermodynamic functions were used. For binary solutions the following function holds:

$$F' = N_1\bar{\mu}_1 + N_2\bar{\mu}_2$$

μ_1, μ_2 = chemical potentials of the substances 1 and 2 in solution,
N_1, N_2 = concentration of substances 1 and 2, given in mol.
For mixtures the following function applies:

$$F' = n_1\mu_1 + n_2\mu_2$$

μ_1, μ_2 = chemical potential of pure substances 1 and 2
n_1, n_2 = concentration of substances 1 and 2, given in mol.
The values for the individual thermodynamic functions in the system Zn-Cd at temperatures of 538°, 600°, 700° and 800°K

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were determined.
Furthermore the values for the free energy for liquid solutions and mixtures in the system Zn-Cd were determined and the connection between these function as well as the composition at 538°, 600°, 700° and 800°K were graphically represented. By using thermodynamic functions also the systems Ag-Cu, Cu-Ni and Zn-Pb were investigated.
There are 5 figures and 10 references, 6 of which are Soviet.

ASSOCIATION: Institut tekhniki Pol'skoy Akademii nauk, otdeleniye metallov (Technical Institute, Department of Metals, Polish AS)

SUBMITTED: June 25, 1957

Distr: 4E2b(v)/4E2c(j)/4E2c(m)/4E3b/4E3c 2 cys/4E3d

5 JAJ(NB) MJC(JO)

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Activities of components in the gaseous solutions of ethylene with argon. A. Krupkowski and T. Drwal (Zakład Metali P.A.N., Kraków, Poland). *Arch. Hutnictwa* 4, 323-33(1959)(English summary).—Excess free enthalpy of mixing at const. temp. and pressure, P, was computed from Masson and Dolley's data (*CA* 17, 2404) and by the expression $\int(V - x_1V_1 - x_2V_2)dP$, where V is the vol. of the mixt.; V_1, V_2, those of pure components; and x the mole fractions; and the limits of integration were 1 and 80, 70, 100, or 125 atm. The activity coeff., f_1, was represented by the equation $\ln f_1 = wx_2^m$, where w and m are adjustable consts., independent of compn. J. Stecki

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KRUPKOWSKI, A.

TECHNOLOGY

PERIODICAL: MECHANIK, Vol. 32, no. 1, Jan. 1959;

KRUPKOWSKI, A. K. Wesolowski's Metaloznawatwo. Tom 3. Metale niezelazne i ich stopy (Metals Vol. 3. Nonferrous Metals and Their Alloys); a book review. p. 42.

Monthly List of East European Accessions (EEAI) LC Vol. 8, No. 4
April 1959, Unclass.

25624
P/038/60/005/002/001/002
A076/A126

18.8100

AUTHOR: Krupkowski, Aleksander

TITLE: Thermodynamic properties of irregular binary metal solutions and their relation to thermal equilibria: Zn – Sn, Cd – Sn, and Al – Sn systems

PERIODICAL: Archiwum Hutnictwa, v. 5, no. 2, 1960, 143 - 168

TEXT: The author lists a number of scientists and results obtained by them during investigations on the thermodynamic properties of irregular binary metal solutions. Basing the article on works listed in the reference column, the author tries to define proper interpretation of thermodynamic properties of binary metal solutions, regardless whether the solutions are regular or irregular. The basic conception of the author goes back to the formula expressing the relation between the activity coefficient of the component in solution, the temperature and the composition of the solution. This formula for condensed systems takes the following form: $\ln f = \omega(T) X(N)$, (2) where f is the activity coefficient; $\omega(T)$ - the function on temperature; X (N) - the function dependent on the composition of the solution. On the basis of former investigations conducted by the author

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Thermodynamic properties of irregular binary....

(Ref. 5: Extr. Bull. de l'Acad. Sci. et Lettres, Serie A, 1, 1950, 15) the author proves the above equation with the following formula: $\ln f_1 = \omega(T)\, N_2^m$; $\ln f_2 = \omega(T)\left(N_2^m - \frac{m}{m-1} N_2^{m-1} + \frac{1}{m-1}\right)$, (3) where indexes 1 and 2 refer to the given components; N - the mole fraction of a component; m - the coefficient constant for a given system and independent of temperature. The function $\omega(T)$ can be expressed in general by the relation $\omega(T) = \frac{\alpha}{T^k}$, (4). The components should be numbered in such a manner as to maintain the coefficient m in the limits $1 < m < 2$. The interpretation of the experimental curves for H' in relation to the composition, and the change of partial enthalpy $\Delta\bar{H}_1$ and $\Delta\bar{H}_2$ of the components 1 and 2 during their passage into a solution is calculated by the author with the following formula: $\Delta H' = -RT^2 \frac{\partial \omega(T)}{\partial T} \frac{N_2}{m-1}(1 - N_2^{m-1})$, (9). Analyzing the Zn — Sn, Cd — Sn and Al — Sn liquid solutions the author has stated a relation between the activity coefficient of a component and the temperature and composition of the solution. This may be expressed as: $\ln f = \omega(T)\, X(N)$. The deduced formula enables the interpretations of the curves of thermal equilibria and the enthalpy change in binary solutions. There are 12 figures, 10 tables and 20 references: 5 Soviet-bloc and 15 non-Soviet-bloc. The reference to the most recent English-language publication reads as follows: Ref. 19: M. Hansen, Con-

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Thermodynamic properties of irregular binary....

stitution of binary alloys. New York, 1958.

ASSOCIATION: Institute of the Basic Technical Problems, Polish Academy of Sciences, Department of Metallurgy, Kraków

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KRUPKOWSKI, A.

On the partial thermodynamic functions. Bul Ac Pol tech 8 no.4: 199-207 '60. (EEAI 9:10)

1. Department of Metals, Institute of Basic Technical Problems, Polish Academy of Sciences.
(Thermodynamics) (Functions)

KRUPKOWSKI, Aleksander; PTAK, Wladyslaw

Thermodynamic characteristic of liquid iron-oxygen solutions. Przegl hutn 6 no.4:265-285 '61.

1. Instytut Podstawowych Problemow Techniki Polskiej Akademii Nauk Zaklad Metali, Krakow. Redaktor naczelny kwartalnika "Archiwum Hutnictwa" (for Krupkowski)

KRUPKOWSKI, Aleksander

The thermodynamic theory of solutions and its application to metals, salts, and gases. Archiw hutn 7 no.2:137-175 '62.

1. Zaklad Metali, Instytutu Podstawowych Problemow Techniki, Polska Akademia Nauk, Krakow.

S/081/62/000/023/010/120
B149/B186

AUTHORS: Krupkowski, Aleksander, Koperski, Stanisław

TITLE: Reduction of metallic oxides with carbon oxide and carbon

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 23, 1962, 84, abstract 23B607 (Rudy i metale niezel., v. 7, no. 3, 1962, 101 - 106 [Czech.])

TEXT: On the basis of thermochemical data, metal oxides are divided into 3 groups according to the ease of their reduction. The peculiarities of the reduction of each group at different temperatures and pressures are described. [Abstracter's note: Complete translation.]

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KRUPKOWSKI, Aleksander, prof. dr

Professor Albert Portevin (1180-1962). Archiw hutn 7 no.4:277-279 '62.

KRUPKOWSKI, A., prof.

Theory of metallurgic processes and their utilization. Koh lap 96 no.1:26-32 Ja '63.

1. Lengyel Tudomanyos Akademia tagja.

KRUPKOWSKI, A.

Thermodynamic properties of a liquid iron-carbon solution. Bul Ac Pol tech 10 no.8:503-509 '62.

1. Laboratory of Metals, Krakow, Institute of Fundamental Technical Problems, Polish Academy of Sciences.

P/038/63/008/001/001/003
E193/E383

AUTHORS: Krupkowski, Aleksander and Poniewierski, Zdzisław

TITLE: Application of small test pieces in the impact-testing of metals

PERIODICAL: Archiwum hutnictwa, v. 8, no. 1, 1963, 3 - 20

TEXT: The object of the present investigation was to explore the possibility of modifying the standard method of impact-testing with a view to 1) reducing the cost of preparation of test pieces and 2) making the method applicable for testing materials with very low impact strength and for determining the impact strength of fabricated parts from which it is impossible to cut test pieces of the standard size. The experimental work was conducted on cylindrical test pieces with notches of various shapes and sizes, tested on a small Charpy impact-testing machine with a maximum capacity of 40 Kgcm. The results of preliminary experiments indicated that a test piece 44 mm long, 5 mm in diameter, with a U-shaped notch (1.25 mm deep, 0.5 mm root radius) was most likely to meet the requirements. Test pieces of this type were used in the remaining series of experiments conducted on steel,
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duralumin, brass and silumin. As was to be expected, the values of the impact strength obtained differed from those yielded by the standard tests and were 1.6 - 2.8 times lower. Statistical analysis of the results show, however, that the new method is quite suitable for comparative studies of impact strength in cases when the standard method is inconvenient or impossible to use. It gives accurate and reproducible results, not more than four tests being required to obtain reliable data on the impact strength of a given material. There are 11 figures and 11 tables.

SUBMITTED: July 1, 1962

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KRUPKOWSKI, Aleksander, prof. dr inz.; ADAMSKI, Czeslaw, doc. dr inz.

M-54 antifriction brass. Rudy i metale 8 no.7:236-240 Je '63.

KRUPKOWSKI, Aleksander

Development of the science of metallurgy and its basic problems. Nauk polska 11 no.4:35-55 Jl-Ag '63.

1. Czlonek rzeczywisty Polskiej Akademii Nauk, Krakow.

KRUPKOWSKI, A.

Determination of the limits of the reduction range of metal oxides with carbon. Bul Ac Pol tech 11 no.3:143-150 '63.

1. Laboratory of Metals, Institute of Fundamental Technical Problems, Polish Academy of Sciences, Warsaw.

KRUPKOWSKI, A.; GOLONKA, J.

Vapor pressures of liquid copper and silver. Bul Ac Pol tech 12 no. 1: 69-74 '64

1. Department of Metals, Krakow, Institute of Fundamental Technical Problems, Polish Academy of Sciences. Presented by A. Krupkowski.

KRUPKOWSKI, Aleksander; JAZWINSKI, Stanislaw

Present problems of metallurgy. Nauka polska 12 no. 3: 13-22 My-Je '64.

1. Member of the Polish Academy of Sciences (for Krupkowski).