

CHERKASHIN, V. A.

BCD

*Manufacturing Processes
Turning, Separation, Shaping*

1210. A new method for the electrical thawing of clay pits.—V. A. CHERKASHIN (Sov. Avtom. 7, No. 11, 15, 1950). One method of thawing clay pits consists in putting line electrodes on the ground. These are then covered with a layer of sawdust moistened by solns. of NaCl, CaCl₂, CuSO₄ to provide electrical resistance. This method is suitable for surface freezing (up to 18 in. deep). Another method consists in driving rod electrodes into the ground. Since frozen ground is almost a non-conductor of low frequency current, a layer of sawdust moistened with an electrolyte is put on the surface to complete the circuit. Heat first arises in the sawdust layer, which, as the ground gradually thaws, becomes a conductor. Later on the sawdust becomes dry, and ceases to conduct the current, but then acts as a heat insulator. There is also a method of thawing by H.F. current. The main object of the new rod electrode method is to decrease the heat lost to the air. Instead of driving the rods to $\frac{1}{2}$ depth of the frozen ground layer (as was done before), they are driven right through the whole layer and project several inches into the unfrozen layer below. The current then passes through the unfrozen layer, and the thawing thus proceeds from bottom to top. Clearing the surface of the ground from snow and covering it with sawdust is of course dispensed with. (5 figs., 1 table.)

CHERKASHIN, V. A.

CHERKASHIN, V. A. -- "WINTER PRODUCTION OF RAW MATERIAL FOR THE BRICK INDUSTRY." 1952
MAR 52, INST OF MINING, ACAD SCI USSR (DISSERTATION FOR THE DEGREE OF CANDIDATE
IN TECHNICAL SCIENCE)

SO: VECHERNAYA MOSKVA, JANUARY-DECEMBER 1952

1. CHERKASHIN, V.A.
2. USSR (600)
4. Clay Industries
7. Adopting new methods of clay production in winter. Stek. i ker. 9 no. 12. 1952

9. Monthly List of Russian Accessions, Library of Congress, March 1953. Unclassified.

CHERKASHIN, V. A.

"Siphon Spillway in Laying Down Earthwork," Byul. stroi tekhn. 9, No.15, 1952

CHERKASHIN, V. A.

"Re-equipping Excavators for Work at Brick Factory Pits," Byul. stroi. tekhn.,
9, No.18, 1952

CHERKASHIN, V.

"Problem of Introducing New Methods for Clay Production in Winter. Tr.
from the Russian." p. 132,
(MECHANISACE, Vol. 2, No. 4, Apr. 1953, Praha, Czechoslovakia)

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4
No. 5, May 1955, Uncl.

CHERKASHIN, V.A., kandidat tekhnicheskikh nauk; SHNEYDER, V.A., inzhener.

~~CHERKASHIN, V.A., kandidat tekhnicheskikh nauk; SHNEYDER, V.A., inzhener.~~

D-189 scraper with MAZ-E-525 D. truck tractor. Mekh. trud. rab. 7 no.11:
39-40 D '53.

(MIRA 6:12)

(Excavating machinery)

CHERKASHIN, V.A., kandidat tekhnicheskikh nauk; AVERIN, N.D., laureat
Stalinskoy premii [deceased]; POZDNYAK, V.P., inzhener, redaktor;
UDOD, V.Ya., redaktor; VOLKOV, V.S., tekhnicheskiy redaktor.

[Winter mining of sand and clay in open pits] Razrabotka glinia-
nykh i peschanykh kar'erov v zimnee vremia. Moskva, Gos.izd-vo
lit-ry po stroit. i arkhitekture, 1955.87p [Microfilm] (MLRA 9:6)

1. Nachal'nik laboraterii Vsesoyuznogo nauchno-issledovatel'skogo
instituta organizatsii i mekhanizatsii stroitel'stva (for Averin).
2. Vsesoyuznyy nauchno-issledovatel'skiy institut organizatsii i
mekhanizatsii stroitel'stva.

(Clay) (Sand)

CHERKASHIN, V. ^H, kandidat tekhnicheskikh nauk.

New high production machine for working frozen ground. Stroitel' 2
no.10:9 0 '56. (MLRA 10:1)
(Bartwork--Cold weather conditions) (Frozen ground)

CHERKASHIN, V.A., kandidat tekhnicheskikh nauk.

~~Experience with using over-all mechanization and conveyer systems in quarries. Mekh.stroi. 13 no.9:26-28 J1 '56.~~
(Quarries and quarrying) (MLRA 9:11)

Classification

AUTHOR: Muzgin, S.S. (Engineer)

100-4-9/16

TITLE: On the publication by V.A. Cherkashin, Cand. Tech. Sci.,
"The Working of Clay and Sand Pits During the Winter".
(O broshyure Kand. Tekhn. Nauk. V.A. Cherkashina).

PERIODICAL: "Mekhanizatsiya Stroitel'stva" (Mechanisation of
Construction), 1957, Vol. 14, No. 4, pp. 23-24 (USSR).

ABSTRACT: This booklet was published by "Gosudarstvennoye Izdatel'stvo Literaturny Po Stroitel'stvu I Arkhitekture" in 1955. The author discusses the chapter, "The Digging and Breaking Up of Frozen Clay and Sand by Excavators with Specially Adapted Buckets". This experimental bucket is provided with spikes to break up the material by impact which is effected by a pneumatic hammer OMC7-5. Investigations were carried out by A.N. Zelenin who showed that the 2-3 kg/m impact onto the spikes of the bucket is not sufficiently strong for an efficient breaking up process. Diagram No. 1 shows the relation between the effective breaking up and various magnitudes of impact. The excavator was tested on light clay (14% moisture content) at a temperature of -4°C. An impact of 10 kg/m was found to be effective. But for this impact the construction of the bucket had to be strengthened. Diagram 2 illustrates the effect of the impact of

1/2

On the publication by V.A. Cherkashin, Cand. Tech. Sci.,
"The Working of Clay and Sand Pits During the Winter". (Cont.)

100-4-9/16
the spikes on the frozen ground, the spikes being placed
at different distances (c/c). When the spikes are 15 to
20 cm apart a direct impact of 5000 to 7000 (weight behind
the impact) is required to eliminate ridges between the
points of direct impact. This applies to frozen clay with
18-19% of moisture worked with a bucket of 0.5 m³ capacity.

2/2 When the spacing of the spikes lies between 10 to 12 cm no
ridges of frozen clay are left between the impact points.

There are 2 diagrams.

AVAILABLE:

CHERKASHIN, V.A., kand. tekhn. nauk.

Using thermite for warming frozen ground. Nov. tekhn. i pered. op.
v stroi. 19 no.9:17-18 S '57. (MIRA 10:11)
(Earthwork--Cold weather conditions)
(Soil heating)

CHERKASHIN, V.A., kandidat tekhnicheskikh nauk.

New method for rock crushing in quarries. S_troi.prom. 35 no.2:26-
28 F '57. (MLRA 10:3)
(Crushing machinery) (Quarries and quarrying)

CHERKASHIN, V.A.

The E-652 excavator with equipment for breaking frozen soils.

Biul.tekh.-ekon.inform. no.2:32-33 '58.

(MIRA 11:4)

(Excavating machinery)

(Frozen ground)

CHERKASHIN, V.A., kand.tekhn.nauk

Three-wedge ripper for working frozen ground. Nov. tekhn. i
pered. op. v stroi. 20 no.10:13-15 0 '58. (MIRA 11:10)
(Earthmoving machinery--Cold weather operations)

CHERKASHIN, V., kand. tekhn. nauk

Three-wedge rippers for breaking frozen ground. Na stroi. Mosk.
2 no.9:6-6 S '59. (MIRA 13:2)
(Earthwork--Cold weather conditions)

CHERKASHIN, V., kand.tekhn.nauk

Working frozen ground by removing flat soil blocks from
thawed sections. Na stroi.Mosk. 2 no.10:19-20 0 '59.
(MIRA 13:2)

(Frozen ground) (Earthmoving machinery)

CHEKASHIN, V., kand. tekhn. nauk

Using vibration sinkers and boring machines in working frozen ground.
Na stroi. Mosk. 2 no.12:5-7 D '59 (MIRA 13:3)
(Frozen ground) (Vibrators) (Boring machinery)

CHERKASHIN, V., kand.tekhn.nauk

New unit for thawing frozen ground. Stroitel' no.12:22
D '59. (MIRA 13:3)
(Frozen ground) (Thawing)

CHERKASHIN, V.A., kand.tekhn.nauk

New methods and machinery to be used in earthwork and levelling in
winter. Prom.stroi. 37 no.8:55-57 Ag '59. (MIRA 12:11)
(Earthmoving machinery--Cold weather operations)

CHERKASHIN, Y.A. . kand. tekhn. nauk

Some methods for mechanizing earthwork in the Arctic. Prom. stroi.
38 no.9:34-38 '60. (MIRA 13:9)
(Arctic regions--Earthwork) (Frozen ground)

ROGOVSKIY, L.V., inzh.; CHERKASHIN, V.A., kand.tekhn.nauk, starshiy nauchnyy sotrudnik; GORBANEV, V.P.; TRUBIN, V.A., glavnyy red.; SOSHIN, A.V., zam.glavnogo red.; GRINEVICH, G.P., red.; YEPIFANOV, S.P., red.; ONUFRIYEV, I.A., red.; KHOKHLOV, B.A., red.; ZIMIN, P.A., red.; YUDINA, L.A., red.izd-va; RYAZANOV, P.Ye., tekhn.red.; GOL'BERG, T.M., tekhn.red.

[Earthwork operations under winter conditions] Proizvodstvo zemli-nykh rabot v zimnikh usloviakh; spravochnoe posobie. Moskva, Gos. izd-vo lit-ry po stroit., arkhitekt. i stroit.materialam, 1961. 149 p. (MIRA 14:4)

1. Akademiya stroitel'stva i arkhitektury SSSR. Institut organizatsii, mekhanizatsii i tekhnicheskoy pomoshchi stroitel'stvu. 2. Rukovoditel' laboratorii zemlyanykh rabot Nauchno-issledovatel'skogo instituta organizatsii, mekhanizatsii i tekhnicheskoy pomoshchi stroitel'stvu (for Rogovskiy). 3. Laboratoriya zemlyanykh rabot Nauchno-issledovatel'skogo instituta organizatsii, mekhanizatsii i tekhnicheskoy pomoshchi stroitel'stvu (for Cherkashin). 4. Starshiy tekhnik laboratorii zemlyanykh rabot Nauchno-issledovatel'skogo instituta organizatsii, mekhanizatsii i tekhnicheskoy pomoshchi stroitel'stvu (for Gorbanev).

(Earthwork--Cold weather conditions)

CHERKASHIN, V.A.

Controlling the bulging of lightly loaded foundations in a region
of widespread perpetually frozen soils. Osn., fund. i makh. gr. 3
no. 2:11-12 '61. (MIRA 14:5)

(Foundations) (Frozen ground)

CHERKASHIN, V.A., kand.tekhn.nauk

Three-prong ripper of frozen soil. Stroi. i dor. mash. 10 no.2:15-16
F '65. (MIRA 18:3)

CHERKASHIN, V.A., kand. tekhn. nauk

Basic regularities in various methods of working frozen grounds.
Stroi. i dor. mash. 10 no.4:14-16 Ap '65.

(MIRA 18:5)

MEKHANIKOVA, V.G.; CHERKASHIN, V.I.; FEDOROV, Yu.V.

New beaker as a homogenizer for pulverizing tissues under sterile conditions. Lab. delo 8 no.4:51-52 Ap '62. (MIRA 15:5)

1. Tomskiy nauchno-issledovatel'skiy institut vaktsin i syvorotok.
(TISSUE EXTRACTS--EQUIPMENT AND SUPPLIES)

TSITOVICH, I.K.; CHERKASHIN, V.I.

Sorption of chlorophenoxyacetic acids, their salts, and phenol
by ion exchangers. Zhur. prikl. khim. 36 no.5:973-977 My '63.
(MIRA 16:8)

1. Kubanskiy sel'skokhozyaystvennyy institut.
(Acetic acid) (Ion exchange)

CHERKASHIN, V. I.

"Leading Methods of Gaging" (Slesar'-lekal'shchik. Peredovye metody lekal'nykh rabot), Sverdlovsk, Mashgiz, 1951. 112 pages.

CHERKASHIN, V.I.

Moi sovety molodym lekhal'shchikam (My advice to young gage makers). Moskva, Mashgiz, 1953. 24 p.

SO: Monthly List of Russian Accessions, Vol 7, No 9, Dec 1954

Черкашин В.И.

CHERKASHIN, V.I.

New techniques in templet grinding. Mashinostroitel' no.10:35-36
0 '57. (MIRA 10:11)

(Grinding machines)

CHERKASHIN, Vasilii Ivanovich; LAVRUKHIN, Anatolii Mikhaylovich;
KUZNETSOV, N.S., inzh., red.; LISITSYN, S.V., inzh., red.;
SOMOVA, T.M., inzh., red.vypuska; DUGINA, N.A., tekhn.red.

[Advanced laying-out methods in metal cutting] *Persdovye*
metody razmetki v instrumental'nom dele. Moskva, Gos.nauchno-
tekhn.izd-vo mashinostroit.lit-ry, 1960. 53 p. (Biblioteka
razmetchikn, no.10). (MIRA 14:2)
(Laying out (Machine-shop practice))

CHERKASHIN, Vasilii Ivanovich; PIONTEK, Ye.I., inzh., red.; DUGINA,
N.A., tekhn. red.

[Advanced methods for machining with the use of gauges]Pere-
dovye metody lekal'nykh robot. Izd.3., ispr. i dop. Moskva,
Mashgiz, 1962. 183 p. (MIRA 15:10)
(Metal cutting)

TSITOVICH, I.K.; CHERKASHIN, V.I.

Use of ion exchangers for the separation of chlorophenoxyacetic acids, their salts, and phenol. Zhur.anal.khim. 18 no.10: 1255-1261 0 '63. (MIRA 16:12)

1. Kuban Agricultural Institute, Krasnodar.

CHERKASHIN, V.K., inzh. (Stalino)

Laying underground gas pipelines in mining areas. Stroi.truboprov.
4 no.12:13-15 D '59. (MIRA 13:5)
(Gas, Natural--Pipelines)

CHERKASHIN, V.K., starshiy inzh.

A more precise calculation of fuses. Avtom., telem.i sviaz' 6
no.2:43 F '62. (MIRA 15:3)

1. Klyukvenskaya distantsiya signalizatsii i svazi Vostochno-
Sibirskoy dorogi.
(Railroads--Electric equipment)

CHERKASHIN, V. N., inzh.; RABINOVICH, N. I., inzh.

Attachment with a magnetic clamp for milling and grinding
machines. Mashinostroenie no. 3:60 My-Je '65. (MIRA 18:6)

S/068/62/000/003/003/003
E071/E435

AUTHORS: Gromov, Ye.I., Cherkashin, V.N.

TITLE: Corrosion resistance of materials in technological media involved in the production of indine-coumarone resins

PERIODICAL: Koks i khimiya, no.3, 1962, 47-48

TEXT: The results are given of an investigation of resistance to corrosion of various steels and corrosion resistant materials in the media of the plant for washing and neutralization of polymerized indine-coumarone resins ($AlCl_3$ used as a catalyst) in the evaporator and condenser. Specimens investigated were placed in a special cage made of a fluoride plastic which was fitted in to the appropriate plant equipment. Data on the velocity of corrosion were expressed in loss of weight (g/m^2 of surface per hour). It is concluded that the body of the washing apparatus should be made from mild steel, protected by diabase plate lining, the joints of which should be filled with a paste Armasite-2 (resistant to acid and alkali); the protection of the cover and manholes can be achieved with ATM-1 plates, faolite or bakelite lacquer. The evaporator can be made from steel ~~X18N12M3T~~ (Kh18N12M3T), tubes
Card 1/2

Corrosion resistance ...

S/068/62/000/003/003/003
E071/E435

of the condenser from steel X18H12M2T (Kh18N12M2T) or ATM-1.
At the side of entry of aggressive vapours, the condenser tube can
be protected by coating with bakelite lacquer and subsequent
thermal polymerization of the latter. There are 3 tables.

ASSOCIATION: UKhIN

Card 2/2

GROMOV, Ye.I.; CHERKASHIN, V.N.

Methods for protecting cross tie rods in coke ovens. Koks i khim.
no.11:35-37 '61. (MIRA 15:1)

1. Ukrainskiy uglekhimicheskiy institut.
(Coke ovens)

L 23073-65 EWG(j)/EWP(e)/EWT(m)/EPF(c)/EPR/EWP(j)/T/EWP(v)/EWP(b)/EWP(1) Pc-Li/
Fr-L/PS-L RM/WH/WW

ACCESSION NR: AR4048186 S/0081/64/000/009/S100/S100

SOURCE: Ref. zh. Khimiya, Abs. 93671

AUTHOR: Gronov, Ye. I.; Cherkashin, V. N.

TITLE: Determining the adhesive capacity of paints and varnishes

CITED SOURCE: Sb. nauchn. tr. Ukr, n.-i. uglekhim. in-t, vy*p. 14(36), 1963, 111-112

TOPIC TAGS: paint film, varnish film, film adhesive strength, adhesive power, asbovinyl film, bakelite varnish, ethynol varnish, undercoat

TRANSLATION: The authors report the following values for the adhesion (in kg/cm² of various films to metal: film based on asbovinyl composition, 24.6; asbovinyl plus 10% powdered diabase, 28; asbovinyl plus 10% graphite, 24.9; KhSL varnish, 14.2; bakelite varnish, 57.6; ethynol varnish (50% film forming), 95.3; BF-2 glue, 120; epoxide undercoat E-4021, 133; and undercoat E-4022, 108. The measurement was based on a determination of the pull directed perpendicularly to the surface, and was carried out on a tensile testing machine of the RMP-500 type, using specimens shaped like small cylinders with an area of 2 cm². A layer of varnish

Cord 1/2

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ACCESSION NR: AR4048186

was applied to the sand-blasted and defatted end surfaces of the cylinders and allowed to dry into a film, after which another layer of varnish was applied and the cylinders were carefully aligned end to end. When the adhesion is determined by such a method, without intermediate layers and glues, the results pertain only to the film under investigation. G. Tseytin

ASSOCIATION: None

SUB CODE: MT

ENCL: 00

Card 2/2

ACCESSION NR: AP4038930

B/0068/64/000/005/0042/0044

AUTHOR: Gromov, Ye. I.; Cherkashin, V. N.; Tselik, V. Ye.

TITLE: Corrosion activity of ammonium and sodium rhodanates

SOURCE: Koks i khimiya, no. 5, 1964, 42-44

TOPIC TAGS: sodium rhodanate, ammonium rhodanate, steel corrosion, rhodanates steel corrosion, thiocyanate steel corrosion, synthetic fiber

ABSTRACT: This work was prompted by the planned increase of synthetic fiber production requiring increasing amounts of sodium and ammonium rhodanates. Their preparation from isocyanates involves steel equipment, namely, dissociators and evaporators. Therefore, a study was made to ascertain the corrosion of different types of steel in this equipment. As a result of their tests, the authors found the corrosion rate of steels St3, 1Kh13, Kh17T, 1Kh18N9T, EI530, Kh18N12M3T and EI629, depending on temperature and ammonium rhodanate concentration. With increasing temperature and salt concentration, steel corrosion rises markedly for types St3, 1Kh13, Kh17T, 1Kh18N9T. The authors have found the corrosion of steels St3, 25KhGSA, 1Kh13, 1Kh18N9T, Kh18N12M3T and EI629 versus the pH of sodium

Card 1/2

ACCESSION NR: AP4038930

rhodanate running from 1.8 to 8.65. Along with decreasing pH of the solution, the corrosion rate of St3, 25KhGSA and 1Kh13 abruptly increases. ATM (-antifric-tion thermoconductive material: a combination of graphite and phenolformaldehyde resin) can be used as material for the dissociator in the production of ammonium rhodanate. The best material for pure salt separation equipment is the Kh1&N12M3T stainless steel, while for the absorption equipment steels Kh27 and 1Kh1&N1T are recommended, likewise steel Okh13. Orig. art. has: 2 figures and 3 tables.

ASSOCIATION: None

SUBMITTED: 00

DATE ACQ: 05Jun64

ENCL: 00

SUB CODE: MT, MM

NO REF SOV: 002

OTHER: 000

Card

2/2

CHERKASHIN, V. S., KIRENSKIY, L. V. and a DROKIN, A. I.

"The results of the Influence of Ultrasonic Waves on the Magnetic Properties of Ferromagnetics at Various Temperatures."

paper presented at the All-Union meeting on Magnetic Structure of Ferromagnetics June 1958, in Krasnoyarsk. Meeting sponsored by Inst. of Physics, Acad. Sci. USSR, and Comm. for Magnetism, Dept Phys-Math Sci, AS USSR,

CHERKASHIN, V. S.

KERENSKIY, A. V., CHERKASHIN, V. S. and DROKIN, A. I.

"Investigation of Phenomena Accompanying the Propagation of Ultrasound and Methods to be used in Work in this Field: The Effect of Ultrasound on the Ferromagnetic Properties of Matter."

report presented at the 6th Sci. Conference on the Application of Ultrasound in the investigation of Matter, 3-7 Feb 1958, organized by Min. of Education RSFSR and Moscow Oblast Pedagogic Inst. im N. K. Krupskaya.

85755

24,7900 (1035,1144,1160)

S/112/60/000/018/003/005
A005/A001

Translation from: Referativnyy zhurnal, Elektrotehnika, 1960. No. 18, p. 30,
5.9839

AUTHORS: Kirenskiy, L.V., Drokin, A.I., Cherkashin, V.S.

TITLE: On the Effect of Ultrasound on the Magnetic Properties of Ferro-
magnetics

PERIODICAL: V sb.: Primeneniye ul'traakust. k issled. veshchestva, No. 9,
Moscow, 1959, pp. 131-137

TEXT: Results are presented from an investigation of the ultrasound effect on the hysteresis loop of a nickel specimen in weak magnetic fields and at various temperatures. The measurement of the intensity of magnetization of the specimen was carried out on the vertical astatic magnetometer. A considerable increase in the intensity of magnetization was detected owing to the sonic irradiation of the specimen; the growth decreased with increasing temperature (vanishing at about

Card 1/2

85755

S/112/60/000/018/003/005
A005/A001

On the Effect of Ultrasound on the Magnetic Properties of Ferromagnetics

300°C) and was retained after finishing the sonic irradiation process. The magnetic permeability of the specimen increased, too. The results obtained are expounded. - There are 12 references. ✓

ASSOCIATION: Krasnoyarsk. ped. inst, in-t fiziki AN SSSR (Krasnoyarsk Pedagogic Institute, Institute of Physics of the Academy of Sciences USSR)

M.G.S.

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

Card 2/2

24.0200

S/058/62/000/004/128/160
A061/A101

AUTHOR: Cherkashin, V. S.

TITLE: Effect of ultrasonics on the magnetization of ferromagnetics at different temperatures

PERIODICAL: Referativnyy zhurnal, Fizika, no. 4, 1962, 76, abstract 4E633
(V sb. "Primeneniye ul'traakust. k issled. veshchestva", no. 12, Moscow, 1960, 135 - 139)

TEXT: The effect of ultrasonics on the magnetization of ferromagnetics (65% permalloy, Ni-Cu alloys with 10 and 20% Cu content) with both positive and negative magnetostriction was investigated. The ultrasonic generator employed for the measurements consisted of a master oscillator and a power amplifier (300 w). A pile of Ni plates served as the ultrasonic pickup. Constant bias magnetization was not applied to the pickup; as a consequence, the excited ultrasonic vibrations had a frequency of 19.5 kc/sec which was twice as high as that of electric oscillations. An oscilloscope was used to observe the qualitative change in the hysteresis loop under the effect of ultrasonics. Quanti-

Card 1/2

Effect of ultrasonics on the...

S/058/62/000/004/128/160
A061/A101

tative results were obtained with the vertical-type astatic magnetometer. The effect of ultrasonics on the ferromagnetic was found to be independent of the position of the specimen with respect to different wave sections. The relation between growth of magnetization due to ultrasonics and magnetization in the same field in the absence of ultrasonics was determined. The independence of the effect on the sign of magnetostriction was established and explained qualitatively.

V. Ivanovskiy

[Abstracter's note: Complete translation]

Card 2/2

32916

S/194/61/000/011/045/070
D271/D302

24,2200(1137,1158,1164)

AUTHORS: Kirenskiy, L.V., Drokin, A.I. and Cherkashin, V.S.

TITLE: The influence of ultrasonics on the magnetic properties of ferromagnetic materials at various temperatures

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 11, 1961, 8, abstract 11 E52 (V sb. Magnitn. struktura ferromagnetikov, Novosibirsk, Sib. otd. AN SSSR, 1960, 165-173)

TEXT: The influence of ultrasonics is studied on the magnetization curve and hysteresis loop of nickel, permalloy and steel samples at various temperatures. Magnetization was measured on an astatic magnetometer. A copper rod was soldered to a nickel vibrator driven by a coil; the sample was bonded to the end of the rod using silicone cement. Cylindrical nickel sample (diameter 2.5 mm, length 67 mm) driven by 20.5 kc/s was used in measuring the hystere-

Card 1/3

32916

S/194/61/000/011/045/070
D271/D302

The influence of ultrasonics...

sis loop. Before each measurement the sample was demagnetized by repeated switching over and by a.c. with amplitude decreasing to zero; the sample was then magnetized by a field of 12 oersted and cycled in this field. Other samples (nickel, permalloy, silicon steel) were in the form of plates; by the intermediary of a copper rod they were attached to a vibrator formed by an assembly of nickel plates excited at 19 kc/s. The amplitude of alternating ultrasonic pressure was 1.8 kG/mm². Cylindrical nickel samples were measured in fields up to 12 oersted, at temperatures of -183°, 20°, 100°, 200°, 300° and 340°C. Magnetization increases considerably (23%) under the influence of ultrasonics at low temperatures; this effect is gradually reduced as temperature rises, and vanishes at ~ 300°C. Permeability was increased under the influence of ultrasonics at low temperatures. It was found that ultrasonics cause permanent changes. Results which were obtained are explained on the basis of the dynamic theory of domain structures: superposition of stresses causes greater displacement of interdomain boundaries, for the same external field strength, and thus greater magnetization values are

4

Card 2/5

3291b

S/194/61/000/011/045/070
D271/D302

The influence of ultrasonics...

obtained. With constant amplitude of the alternating sonic pressure, the variation of magnetization depends solely on the magnitude of magnetostriction, so that increase of magnetization, when ultrasonic field is superimposed, must be linear. Measurements on nickel samples, in the temperature range between -180 and $+340^{\circ}\text{C}$, confirm this dependence. 6 figures. 12 references. [Abstracter's note: Complete translation]

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Card 3/3

S/194/61/000/011/046/070
D271/D302

24.2200

AUTHOR: Cherkashin, V.S.

TITLE: The influence of ultrasonic stresses on magnetic properties of ferrites

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 11, 1961, 8-9, abstract 11 E53 (V sb. Magnitn. struktura ferromagnetikov, Novosibirsk, Sib. otd. AN SSSR, 1960, 175-176)

TEXT: The influence of mechanical stresses of ultrasonic frequency on magnetic properties of ferrites was investigated. Magnetostrictive vibrator was excited by 19.5 kc/s, with a current of 15 a flowing through a winding of 50 turns. The amplitude of ultrasonic pressure was 1.8 kG/mm². The investigated sample was bonded to a copper rod soldered to the vibrator. Samples were studied in the form of cylindrical rods. Magnetization was measured by a vertical astatic magnetometer. Samples were demagnetized before mea-

Card 1/2

The influence of ultrasonic...

S/194/61/000/011/046/070
D271/D302

surements and then magnetization curves were plotted for each sample, before and after subjecting it to vibrations. It is shown that magnetization increases under the influence of ultrasonic vibrations, i.e. the permeability increases. Ultrasonic vibrations cause permanent changes. 1 figure. 3 references. [Abstracter's note].
Complete translation]

B

Card 2/2

18.1141

31602
S/048/61/025/012/006/022
B125/B112

AUTHORS: Laptey, D. A., and Cherkashin, V. S.

TITLE: Effect of ultrasonics and of a variable alternating field on the domain structure of silicon steel during magnetization

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 25. no. 12, 1961, 1461-1464

TEXT: The domain structure of silicon steel (3% Si) was studied by the method basing on the meridional magneto-optic Kerr effect. Simultaneously the resulting magnetization of the specimen was measured with an astatic magnetometer. The plate and disk-shaped monocrystalline steel specimens, cut in parallel to the (110) plane, were mechanically polished and electro-brightened, annealed in vacuum at 1100°C and subsequently exposed to ultrasonic radiation at 20 kc by means of a magnetostriction vibrator. The alternating fields applied had the usual industrial frequency. After the specimen had been demagnetized, the behavior of the domain structure evolving with a reincreasing magnetic field, was studied. Magnetization was repeated after another demagnetization and the domain structure was observed by exposing the specimen either to ultrasonic radiation at fixed

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Effect of ultrasonics and ...

³¹⁶⁰²
S/048/61/025/012/006/022
B125/B112

values of the field strength or by applying a gradually vanishing magnetic alternating field to the specimen. Exposure, of the specimens to ultrasonic radiation at the two end points of the hysteresis curve and on the curve of initial magnetization increases the total number of domains by splitting the initial domains. The structure resulting either without or with a field being applied (along each of the three crystal axes) will always be the same, independent of the initial state. Magnetization along the [100] axis after preceding demagnetization causes the 180°-boundaries to be displaced in the usual way. The initial structure of the specimen "shaken" in both states by a magnetic alternating field was not altered essentially, but due to the homogeneity of the crystal, the domains were only displaced without changing their total number. The initial structure of a specimen exposed to ultrasonic radiation was split which resulted in its total number being about doubled. By applying a field of > 32 oe, the structure vanishes and cannot be brought to reappear even by ultrasonic radiation. The magnetizations in the [110] and [111] directions were investigated in an analogous way. In the first case a displacement of the 180°-boundaries has not been observed with increasing H. Exposure to ultrasonic radiation led to a new formation of the structure. A double

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Effect of ultrasonics and ...

31602
S/048/61/025/012/006/022
B125/B112

change in the structure could be observed in the second case: (1) displacement of the 180° -boundaries (2) formation of a new structure. Exposure to ultrasonic radiation leads to splitting of the domains. There are 5 figures and 6 Soviet references.

ASSOCIATION: Institut fiziki Sibirskogo otdeleniya Akademii nauk SSSR
(Institute of Physics of the Siberian Branch of the Academy
of Sciences USSR)

X

Card 3/3

S/137/62/000/003/104/191
A060/A101

AUTHORS: Drokin, A. I., Cherkashin, V. S., Smolin, R. P.

TITLE: Influence of ultrasound upon the irreversible processes of magnetization in single-crystalline nickel

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 3, 1962,5, abstract 3I28
(V sb. "Primeneniye ul'traakust. k issled. veshchestva". no. 13, Moscow, 1961, 181-187)

TEXT:1 The thermomagnetic hysteresis was investigated upon samples of single-crystalline Ni in various orientations with respect to the rolling. Specimens were fabricated by a multiple rolling with reduction by 90%. Rods with rectangular cross-section were cut out of the rolled strip along the direction of rolling, at an angle of 45° , and transversely to the direction of rolling, and then annealed in vacuum at $1,150^{\circ}$ and soaked at that temperature for 5 hours and thereupon cooled together with the furnace. By using this method it was not arrived at a total recrystallization of the specimens. A "cubic texture" was manifested in the specimens after the annealing. The specimens were irradiated by ultrasonic waves with a frequency of 20 kc/s. The thermomagnetic hysteresis

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Influence of ultrasound ...

S/137/62/000/003/104/191
AO60/A101

of the specimens was measured by an astatic magnetometer using the cycle heating - cooling in the temperature range from room temperature to the Curie point. It was established that the increase of magnetization for specimens cut out at various angles to the direction of rolling increases as the field increases. It attains a maximum at a field intensity close to the coercive force, then decreases smoothly, becoming slight at a field intensity of 20 oersteds for specimens cut out across and along the direction of rolling; for specimens cut out at an angle of 45° to the direction of rolling the increment of magnetization decreases somewhat more slowly. Under the action of ultrasonic vibration and cyclic heating and cooling there occurs an irreversible increase in the magnetization proceeding in fields at which the magnetization is realized on account of irreversible displacements of the interdomain boundaries. However, the values of this increase differ for one and the same field intensity. At higher field intensities the ultrasound yields a greater increase of magnetization.

A. Rusakov

[Abstracter's note: Complete translation]

Card 2/2

30472

24,2200 (1137, 1147, 1164)

S/139/61/000/005/009/014
E194/E135

AUTHORS: Kiranskiy, L.V., Drekin, A.I., Cherkashin, V.S., and Smolin, R.P.

TITLE: Ideal magnetisation curves of ferro-magnetics

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, no.5, 1961, 78-83

TEXT: The concept of an ideal hysteresis-less magnetisation curve of ferromagnetics has existed for a long time. Various methods of producing the ideal curves have been used, such as application to the specimen of d.c. and a.c. with amplitude decreasing to zero, application of successive heating and cooling, and also magnetic shock. It was considered that these various kinds of treatment would suffice to establish a condition of parallel magnetisation in neighbouring ferromagnetic domains. The problem of whether or not ideal curves produced in different ways coincide has still not been resolved and this was the object of the present investigation. The ideal curves were obtained by applying to the specimen direct and alternating fields of amplitude diminishing to zero by ultrasonic mechanical shaking
Card 1/6 ✓

4

10472

S/139/61/000/005/009/014
E194/E135

Ideal magnetisation curves of

and rapping and by temperature variation, heating the sample to temperatures both below and above the Curie point followed by cooling to the initial temperatures. For temperatures below the Curie point the process was repeated four times. The tests were made with the materials listed in Table 1. Sample 4 was highly work hardened. These compositions were chosen because they had a fairly wide hysteresis loop and comparatively low Curie points. No special heat treatment was applied because this would narrow the hysteresis loops and reduce the differences between materials. Measurements were made in a vertical astatic magnetometer. Kondorskiy's indication that the method of demagnetisation could affect the shape of the magnetisation curves was found to be true in practice. Accordingly, before every measurement the samples were demagnetised by heating to the Curie point followed by cooling in the absence of a magnetic field. Fig.2 shows graphs of the relation between the magnetisation and field for the nickel specimen No.1. The initial curve No.1 lies below all the others and only at high fields does it intersect curve 2, which was produced by ultrasonic mechanical treatment: curve 2' was

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f

4473

Ideal magnetisation curves of

S/139/61/000/005/009/014
E194/E135

obtained by mechanical treatment whilst reducing the magnetic field. The hysteresisless curve could not be obtained by ultrasonic treatment because when the treatment was made more intensive the specimen failed. Curve 3 was obtained by temperature cycling, heating from 20 to 250 °C and recooling to 20 °C. Curve 4 was obtained by applying to the specimen an alternating field diminishing to zero. Very similar curves were obtained for samples Nos. 2 and 3. It was confirmed on sample No. 4 that hysteresisless curves obtained in different ways approach one another and coincide if uniform mechanical stresses, within the elastic limit, are applied to the sample during the measurements. Within the elastic limit, compression of the specimen extends the hysteresis loop and it is possible that under these conditions the hysteresisless curves might differ. However, this would be difficult to check because of bending of the sample. The investigations showed that mechanical treatments (impact and ultrasonic oscillation) generally do not give hysteresisless curves. Evidently, such treatment may not be sufficient to overcome the potential energy barrier and to establish parallel

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Ideal magnetisation curves of ...

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E194/E135

+

magnetisation in neighbouring domains. Temperature variations with simultaneous application of a direct magnetic field can give hysteresisless magnetisation curves; however, usually these do not coincide with one another. When uniform mechanical stress is applied, the hysteresis curves obtained by different methods coincide in the limit.

There are 5 figures, 1 table and 22 references: 12 Soviet-bloc, 1 Russian translation from non-Soviet publication, and 9 non-Soviet-bloc. The English language references read as follows:
Ref. 2: J. Ewing, Trans. Roy. Soc., Vol. 1, 564, 1885.
Ref. 9: J.R. Ashworth, Ferromagnetism, London, 1938

ASSOCIATION: Institut fiziki SO AN SSSR
(Institute of Physics, SO AS USSR)
Krasnoyarskiy pedinstitut
(Krasnoyarsk Pedagogical Institute)

SUBMITTED: August 1, 1960

Card 4/64

40328
S/194/62/000/006/113/232
D256/D308

24, 1900
24, 2200

AUTHOR:

Cherkashin, V.S.

TITLE:

Dependence of intensity of magnetization of ferromagnetic materials upon ultrasonic action at various temperatures

PERIODICAL:

Referativnyy zhurnal. Avtomatika i radioelektronika, no. 6, 1962, abstract 6-5-34 v (V sb Primeneniye ul'traakust. k issled. veshchestva., no. 12, M., 1960, 135-139)

TEXT: The effect of ultrasound on the intensity of magnetization was investigated at various temperatures for ferromagnetic materials with both positive and negative magnetostriction effect. The experimental arrangement is described: The magnetostrictive radiator of a frequency of 19.5 kc/s was excited using a master generator type ЗГ-10 (ZG-10) and a 300 W power amplifier. A set-up with an oscilloscope was used for qualitative observation of the hysteresis loops. Specimens of rods made of the following materials were used: nickel, permalloy-65, copper-nickel alloys containing 10 to
Card 1/2

Dependence of intensity of ...

S/194/62/000/006/113/232
D256/D308

20 % of copper. It was shown that the effect of ultrasound on the ferromagnetic materials does not depend upon the position of the specimen relative to the zones of the standing wave. The author obtains a linear dependence of $\log \Delta I/I$ upon I , where I is the magnetization of the specimen prior to the irradiation with ultrasound, ΔI is the increase of the magnetization due to the action of ultrasound. It was shown that the ultrasonic effect does not depend upon the sign of the magnetostriction effect. A discussion of the obtained results is given, 5 figures, 3 references. [Abstracter's note: Complete translation.] 4.

Card 2/2

S/194/62/000/006/119/232
D256/D308

24.1800

AUTHORS: Chernenko, I.V., and Cherkashin, V.S.

TITLE: Effect of ultrasound on mechanical properties of copper

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 6, 1962, abstract 6-5-39 ch (V sb. Primeneniye ul'traakust. k issled. veshchestva, no. 12, M., 1960, 141-145)

TEXT: It is established that the mechanical properties of copper rods, used as sound guides, change considerably in the places exposed to the action of ultrasonic oscillations and high temperature. Specimen of copper wire were soldered to a magnetostrictive vibrator working at 19.5 kc/s, and they were heated up to 700°C during the 20 min. period of vibrating. It was found that red copper passes from plastic to a brittle state as a result of the action of the ultrasound and temperature of about 700°C. Increase of temperature and the time of the exposure to the ultrasound, the strength and the plasticity of copper decreases and its micro-hard-
Card 1/2

JB

Effect of ultrasound on mechanical ...

S/194/62/000/006/119/232
D256/D308

ness is reduced. The exposure to the ultrasound of copper at temp. not exceeding 300°C produces a decrease of the strength without reducing the plasticity; no changes in the structure of copper were observed at temp. below 100°C. 4 figures. [Abstracter's note: Complete translation.]

JB

Card 2/2

S/137/62/000/003/134/191
A052/A101

12820
AUTHORS: Chernenko, I. V., Cherkashin, V. S.

TITLE: The effect of ultrasound on mechanical properties of copper

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 3, 1962, 55. abstract 31350
(V sb. "Primeneniye ul'traakust. k issled. veshchestva". Moscow, no. 12, 1960, 141-145)

TEXT: The effect of ultrasonic oscillations of 19.5 kc frequency on mechanical properties of M1 copper within the 20 - 700°C range was studied. For the sound generation a special ultrasonic oscillator with a magnetostriction pickup was used. The tensile tests have shown that beginning from 400°C the strength drops sharply and the elongation reduces since Cu from the plastic state passes over into the brittle one. A longer exposure to ultrasound at the same temperature has a similar effect. A decrease of strength and ductility of Cu is accompanied by the reduction of its microhardness which can be ascribed to the intensified oscillations of the lattice caused by ultrasonic high-frequency oscillations. A study of the microstructure has shown that with the samples exposed to ultrasound at the temperature of < 500°C an increased etchability of

Card 1/2

The effect of ultrasound ...

S/137/62/000/003/134/191
A052/A101

grain boundaries and a considerable heterogeneity of grain sizes are observed. An exposure to ultrasound at 600 and 700°C has caused cracks at the grain boundaries. Apparently the oscillations of ultrasonic frequency at higher temperatures affect the change in the structure of grain boundaries and adjacent regions. It is probable that initially at the boundaries vacancies form which in the course of time group into micropores and afterwards overgrow into cracks. The measurement results have shown that the electrical resistance increases with the temperature and the time of ultrasonic exposure. These data confirm the viewpoint on the origin of cracks due to the ultrasonic exposure, since the X-ray analysis has not shown the emergence of any additional stresses in the ultrasound treated samples.

N. Sladkova

[Abstracter's note: Complete translation]

Card 2/2

38762

S/194/62/000/005/074/157
D222/D308

24.2200

AUTHORS: Drokin, A.I., Cherkashin, V.S., and Smolin, R.P.

TITLE: The influence of ultrasound on the irreversible processes of magnetization in monocrystalline nickel

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 5, 1962, abstract 5-5-32 c (V. sb. Primeneniye al'traakust. k issled. veshchestva, no. 13, M., 1961, 181-187)

TEXT: The influence of ultrasounds on ferromagnetics was studied with monocrystalline nickel specimens obtained by N.A. Bryukhatov and G.P. D'yakov (Primeneniye ul'traakust. k issled. veshchestva, no. VII, izd. MOPI, M., 1958) by the method of cold rolling with 90 % reduction and subsequent heating at a temperature of 1150°C for 5 hours. Specimens in the form of bars of rectangular cross-section were cut longitudinally, transversally and at an angle of 45° to the direction of rolling. It was observed that the irreversible growth of magnetization under the influence of ultrasound, and due to thermal vibration, occurs in the region of maximal magne-
Card 1/2

34176

S/O48/62/026/002/025/032
B117/B138

24.2260 (1147, 1164, 1482)

AUTHORS: Drokin, A. I., Cherkashin, V. S., Smolin, R. P., and
Yershov, R. Ye.

TITLE: Anhyseretic magnetization curves of ferromagnetic metals
and alloys

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya,
v. 26, no. 2, 1962, 291-295

TEXT: This paper was presented at a conference on magnetism and antiferro-
magnetism. The authors studied anhyseretic magnetization curves
obtained by different methods, and examined the possibility of obtaining
an ideal curve with the aid of a circulating variable field. 2 groups of
specimens were used (1st group: 99.91 % Ni; 96.92 % Ni; 3 % Cr; 90 % Ni,
10 % Cu, 99.32 % Ni. 2nd group: nickel, alloy steel 37XC (37KhS) and
iron with 0.07 % C). The authors chose specimens with quite wide
hysteresis loops and fairly low Curie points. The measurements (maximum
error 5 %) were made with a vertical astatic magnetometer. In the first
group anhyseretic curves were studied which had been obtained by

Card 1/3

34176

S/O48/62/026/002/025/032
B117/B138

Anhyseretic magnetization curves...

mechanical (sonic irradiation at 20.5 Kcps) and thermal "shaking", and with a longitudinal variable field with vanishing amplitude. Mechanical shaking at low frequencies (50 cps) and periodic tapping in a magnetic field produced no anhyseretic curves. The second group was used to study magnetization of longitudinal and circulating variable fields. The curves obtained for a specimen heated above the Curie point and then cooled to the original temperature are very close to the theoretically ideal one. It was found experimentally that the anhyseretic curves will converge under uniform and increasing load not exceeding the elastic limit. At 24 kg/mm² (max. load) they coincide. The almost complete coincidence of all curves at the beginning indicates that, with regard to the circulation field, the remanence becomes more stable as the H_c of the specimen rises. Up to H_{am} = H_c, I_r changes linearly with field. If a circulating variable field with an amplitude of 2-3 H_c is applied the original remanence is reduced to some per cent of its former value. Thus, such a field may prevent hysteresis. The anhyseretic curves obtained by applying a circulating a longitudinal variable field with vanishing amplitude agree satisfactorily. M. A. Grabovskiy, R. I. Yanus are mentioned. There are 5 figures, 1 table

Card 2/3

S/058/63/000/002/058/070
A160/A101

AUTHORS: Laptey, D. L., Cherkashin, V. S., Drokin, A. I.

TITLE: The effect of the ultrasonic action on the domain structure of iron silicide

PERIODICAL: Referativnyy zhurnal, Fizika, no. 2, 1963, 115, abstract 2E781
(In collection: "Primeneniye ul'traakust. k issled. veshchestva".
no. 15. M., 1961, 189 - 194)

TEXT: An investigation was carried out of the effect of the ultrasound and of the alternating magnetic field h on the domain structure of iron silicide in the presence of various magnetizing fields H . The observation of the domain structure was carried out by the method of Kerr's meridional magneto-optical effect. It was established that the ultrasound leads to a fractionation of the main domain structure both in the absence of the field H and in its presence. The total number of domains increases 2 - 3 times. This circumstance is explained by the fact that the magnetic energy of the sample decreases during the fractionation of the domains. The ultrasonic shaking and the "shaking" by the

Card 1/2

The effect of the ultrasonic action on...

S/058/63/000/002/058/070
A160/A101

field h lead to a development of various structures. The structure obtained by the action of the ultrasound may be eliminated by a superposition of the field h, and vice versa. During an increase of the ultrasound intensity, a displacement of some boundaries takes place in the beginning - and also a simultaneous shifting of the domains on the whole. Individual domains begin to fractionate. Subsequently, this appearance intensifies and leads to the fact that the visible picture on the surface of the sample becomes washed-out.

N. Smol'kov

[Abstracter's note: Complete translation]

Card 2/2

S/275/63/000/001/026/035
D413/D308

AUTHORS: Iaptey, D. L., Cherkashin, V. S. and Drokin, A. I.

TITLE: The effect of ultrasonic action on the domain structure of silicon iron

PERIODICAL: Referativnyy zhurnal, Elektronika i yeye primeneniye, no. 1, 1963, 10-11, abstract 1V 78 (In collection: Primeniye ul'traakust. k issled. veshchestva, no. 15, M., 1961, 189-194)

TEXT: The authors have investigated the effect of ultrasonic vibration and an alternating magnetic field on the domain structure of silicon iron subjected to various magnetizing fields. The ultrasonic vibration was applied to the specimen by a 20 kc/s ultrasonic oscillator and a magnetostriction vibrator. The domain structure was observed by a technique using the meridional magneto-optical Carr effect. The variation in domain structure was observed visually, photography being taken after the vibration was switched off. Photographs are given of the change in domain structures after and

Card 1/2

The effect of ...

S/275/63/000/001/026/035
D413/D308

before ultrasonic treatment (at various magnetic fields, under various initial magnetic conditions etc.). Their work lead the authors to the following results: (1) Ultrasonic action leads to disintegration of the basic structure both in the absence and in the presence of a magnetizing field. (2) Ultrasonic shaking and 'shaking' of the specimen by an alternating magnetic field lead to different structures. The structure obtained by ultrasonic action can be removed by applying an alternating magnetic field and vice versa. (3) Independent of the initial state, other conditions being the same, ultrasonic action always leads to the same structure. (4) Visual observations during the ultrasonic treatment have shown that as the sound intensity is gradually increased the first effect is the displacement of some boundaries and the simultaneous shift of domains as a whole, while individual domains start to disintegrate. Then these effects intensify up to the point where at maximum sound intensity the picture visible on the surface of the specimen appears washed-out. As the sound intensity is decreased, a definite structure gradually establishes itself. The structures are shown in photographs. 5 figures, 7 references. /Abstracter's note: Complete translation. /

Card 2/2

CHERKASHIN, V.V. (Vladivostok 5, Ivanovskaya, ul., d.4)

Replacement of metacarpal defects by the end section of the
metatarsus. Ortop., travm. i protez. 25 no.4:50-51 Ap '64
(MIRA 18:1)

PROCESSES AND PROPERTIES IN ALLOYS

Physicochemical analysis of the system of lead-cadmium alloys. B. G. Petrenko and B. R. Cherkashin. *Ukrain. Khim. Zhurn.* 12, 385-90(1937). The system Pb-Cd was investigated by thermal analysis and by elec. cond. and potential measurements. A bend was noticed on the liquidus curve of the primary crystn. of Cd but no thermal effects were observed that could account for chem. reasons for the bend. Elec. cond. was measured at 25°, 50° and 85°. At 25° the cond. does not vary with time. At 50°, the resistance of alloys contg. 2 and 3% Cd decreases gradually, but rises sharply at 85°, and rapidly reaches a const. Resistance of alloys contg. 6 and 8% Cd rises weakly and reaches rapidly a const. at both 50° and 85°.

The soln. of Cd in solid Pb as obtained by potential measurements is less than 2% at 50°, and at 200° it is over 3 but less than 6% by wt. B. Z. Kamich

ANALYTICAL 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

1ST AND 2ND ORDER

PROCESSES AND PROPERTIES INDEX

CA 2

Potential of lead-cadmium alloys. B. G. Petrenko, E. E. Cherkashin and E. V. Ermolaeva. *Trans. Inst. Chem. Khar'kov Univ.* 4, No. 13, 57-63(1938); cf. C. A. 32, 2071^o.—The solid soly. of Cd in Pb is 5%, as detd. from the p.d. between Cd-Pb anodes and a Cd cathode in N CdSO₄. Anomalous behavior of alloys contg. 8-15% Cd is ascribed to formation of a protective film of PbSO₄ on the Cd crystals, as a result of which the anode behaves as a homogeneous alloy; this effect is nearly absent in alloys subjected to prolonged heating at 200°, and contg. large Cd crystals. B. C. P. A.

ASS-ILA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDER

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

PROCESSES AND PHENOMENA IN METALS

m

***The Solubility Limits of Metallic Solid Solutions. I. Determination of the Solubility of Antimony in Lead.** E. E. Cherkashin and V. N. Tolmachev (*Trudy Inst. Khim. Khar'kov. Gosudar. Univ.*, 1940, 5, 263-271; *Khim. Referat. Zhur.*, 1941, 4, (9), 35; *C. Abstr.*, 1943, 38, 611) [In Russian] Solid solutions of antimony in lead (0.5, 1.0, and 1.5%), antimony) were studied by constructing tensile strength isotherms. It was proved experimentally that the boundary of the single phase system is characterized by a distinct break on the isotherm. The boundaries of the solid solution determined at various temperatures by this method agree well with those given in the literature. The applicability of the method to the determination of the solidus curve in binary systems was confirmed.

2

ASM-SEA METALLURGICAL LITERATURE CLASSIFICATION

67

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FBI - NEW YORK

PROCESSES AND PROPERTIES INDEX

9

CA

Investigations of phase equilibria in the system aluminum-silver by the method of thermal analysis and electric conductivity. E. E. Cherkashin and G. I. Petrenko. *J. Gen. Chem. (U.S.S.R.)* 10, 1528-30 (1940).—Thermal analyses were made of alloys of the system Al-Ag contg. from 0 to 16% by wt. of Al. Two peritectic reactions were found: $\alpha + \beta \rightleftharpoons \gamma$ (780°) and $\beta + \gamma \rightleftharpoons \delta$ (720°). The soln. limit of the γ -solid soln. is 14.33% of Al. Measurements of the elec. cond. at 500° and 350° showed that the transition $\alpha + \gamma \rightleftharpoons \beta'$ takes place very slowly. A normal change of the elec. cond. is observed only for the γ -phase. Measurements of the tempered and hardened alloys (tempered for 10 days at 600° and slowly cooled to room temp. during 30 days, tempered again for 10 days at 500° and hardened in ice water) contg. 0-14% of Al showed that the max. soly. for the α -phase and the min. soly. for the γ -phase are at 500°. At 400-600° there is a heterogeneous region $\gamma + \alpha$. At 400° there is formed a β' -phase according to the reaction $\alpha + \gamma \rightleftharpoons \beta'$ which is characterized by a max. elec. cond. Each homogeneous and heterogeneous region in the system Al-Ag has its own characteristic branch on the elec.-resistance isotherms. Eleven references. W. R. Henn

Brittle constituent in chromium-nickel-iron alloys. H. Hougardy. *Metal Progress* 37, 64-5, 98 (1940).—Embrittlement is due to the decompn. of the α -phase into Fe-Cr (α -phase) and austenite as a result of prolonged annealing. B. C. P. A.

ASS-SL 3 METALLURGICAL LITERATURE CLASSIFICATION

COMMON ELEMENTS

OPEN MATERIALS INDEX

ALPHABETIC INDEX

NUMERICAL INDEX

CHEKASHEV, Ye. Ye.

Cherkashin, Ye. Ye. and Glasyshevskiy, Ye. I. - "Chemical activity of aluminum-magnesium alloys, " Uchen. zapiski (L'vovsk. gos. un-t im. Franko), Vol IX, 1948, p. 81-92, (In Ukrainian, resume in Russian), Bibliog: 14 iters

SO: U-5240, 17, Dec. 53, (Letopis 'Zhurnal 'nykh Statey, No. 25, 1949).

Chair Gen. & Inorganic Chemistry

CHERKASHIN, Ye.Ye. [Cherkashyn, IE.IE.]; GLADYSHEVSKIY, Ye.I. [Hladyshevs'kyi, IE.I.]

Chemical properties of intermetallic phases. Part 3: Chemical reactions in the γ -phase of Al-Mg alloys. Nauk. zap. L'viv. un. 13:63-68 '49. (MIRA 12:10)

1. Kafedra obshchey i neorganicheskoy khimii L'vovskogo gosudarstvennogo universiteta imeni I. Franko.
(Aluminum-magnesium alloys)

CHERKASHIN, Ye.Ye. [Cherkashyn, YE.IE.]; GLADYSHEVSKIY, Ye.I. [Hladyshevs'kyi, IE.I.]; KRYPYAKEVICH, P.I. [Kryp'iakevych, P.I.]

Chemical properties of intermetallic phases. Part 4: X-ray studies of extraction residues. Nauk zap. L'viv. un. 13:69-76 '49.
(MIRA 12:10)

1. Kafedra obshchey i neorganicheskoy khimii L'vovskogo gosudarstvennogo universiteta imeni I. Franko.
(Phase rule and equilibrium) (Alloys--Metallography)

M

***Chemical Reactions of Intermetallic Phases. I.—Corrosion of the Intermetallic Compounds Ag₃Al₂ and Mg₂Pb.**
 E. E. Cherkashin, F. A. Derkach, and S. M. Prabevskotskaya
 (*Zhur. Obshch. Khim.*, 1949, 19, (5), 798-804; *C. Abs.*, 1949, 43, 8341).—[In Russian]. (1) Ag₃Al₂ (Ag 87, Al 13%), melted under a CaCl₂ + NaCl flux, superheated to 200°-300° C. above the liquidus temp. and slowly cooled, has a porous structure and corrodes in the atmosphere very rapidly to form a dark powder. The same alloy, produced under the same flux, but superheated by only 20°-30° C. and quenched, has a considerably denser structure and corrodes less rapidly. In dry air, neither of the alloys corrodes. Alloys prepared under the same conditions as the first sample, but under a BaCl₂ + NaCl flux or under illuminating gas, do not corrode even in the atmosphere. Corrosion consists in a reaction with H₂O: 2Ag₃Al₂ + 18H₂O → 10Ag + 6Al(OH)₃ + 9H₂, and is strongly accelerated by the hygroscopic flux occluded during the crystn. (2) Among Mg-Pb alloys, in the range 2-70% Mg, Mg₂Pb corrodes most rapidly in the atmosphere. The corrosion/time curve for this alloy shows an inflection at a relative increase of weight close to 0.266, corresponding to the completion of the reaction: Mg₂Pb + 4H₂O → Pb + 2Mg(OH)₂ + 2H₂, which evidently represents the first stage of the process. Beyond that point, the finely divided Pb is no longer protected by the H₂ evolved, and is slowly

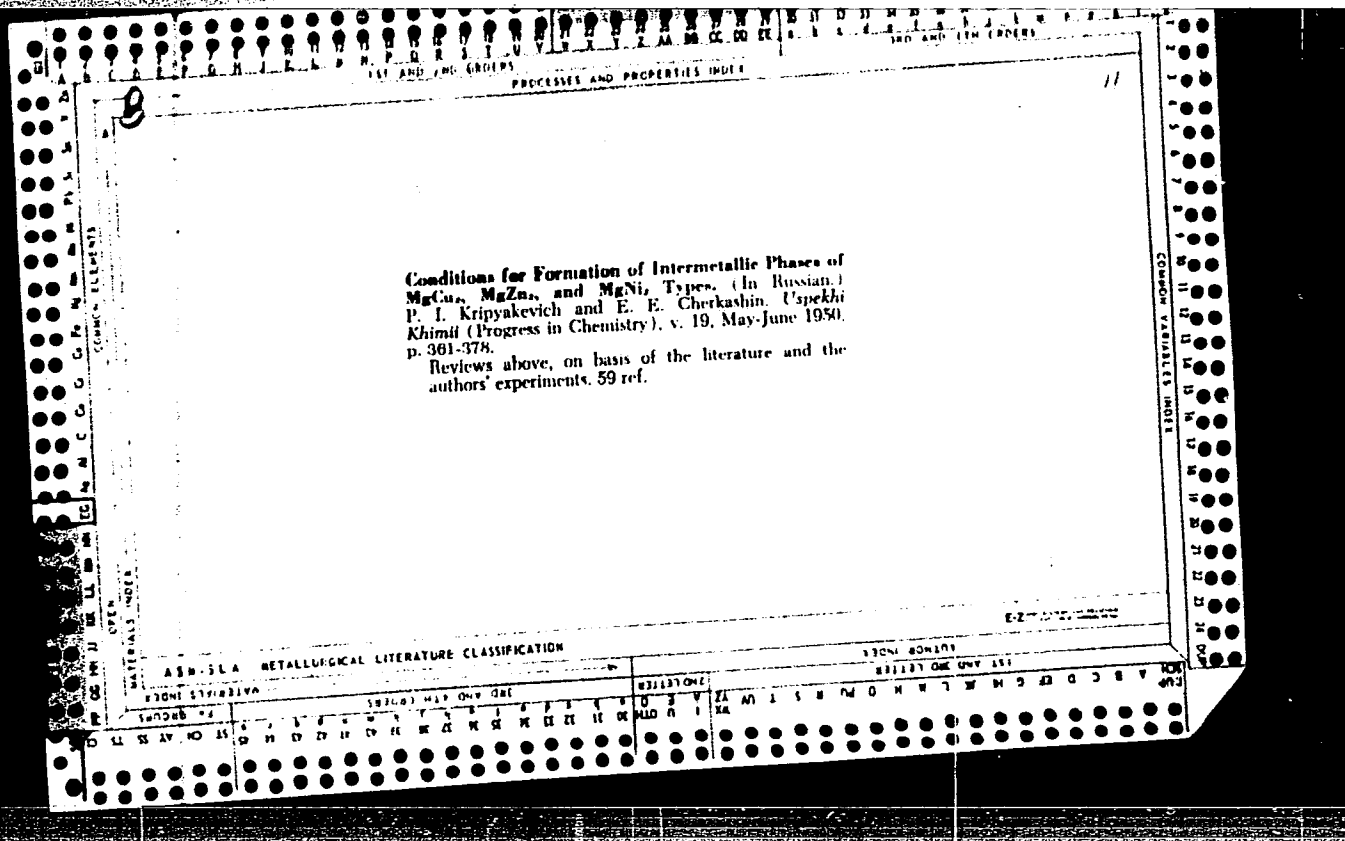
oxidized to the final product PbO.2MgO.3H₂O. The relative gain of weight of the alloy with 15% Mg (excess of Pb) at the inflection point was only 3-18, instead of the theoretical 0-190, possibly owing to inhibition by the eutectic α-phase. On the other hand, the alloy with 21.7% Mg showed, at the inflection point, a relative gain of weight of 0.280, higher than the theoretical value 0.253. This may be linked with the longer time (20 days) necessary for this alloy to reach completion of the first stage of the corrosion process, as contrasted with 12 days for Mg₂Pb (18.8% Mg) and the 15% Mg alloy. (3) The reactivity with H₂O increases in the order Mg₂Si, Mg₂Ge, Mg₂Sn, Mg₂Pb, parallel with the increasing proportion of metallic bond and decreasing proportion of ionic bond. The 4th-group elements in these intermetallic compounds play the role of electron-transferring agents from Mg to H⁺ ions. (4) The rate of corrosion of intermetallic phases can be used for purposes of physicochem. analysis. Thus, the relative increase of wt. at a given moment, e.g. after 120 hr., has a max. at the compn. Mg₂Pb, and thus reveals the existence of a compound.

A 59-51A METALLURGICAL LITERATURE CLASSIFICATION

CA

2

Cryoscopy as a method of physicochemical analysis.
 K. B. Cherkashin and M. F. Cherkashina (L'vov. Gosu-
 darst. Univ. Im. Ivana Franko). *Doklady Akad. Nauk*
 S.S.S.R. **66**, 201-4 (1949). The cryoscopic depression θ
 of a soln. is plotted against the total molal concn m of the
 solutes, and the interaction factor $f = m/a$, where a =
 total activity of the solutes, is detd. from the plots. For
 an ideal soln. exemplified by CCl_4 in C_6H_6 , $a = m$, and the
 empirical dependence of θ on m , of the form $\theta = 5.12 m$
 $- 0.26 m^2$ (from data of Bury and Jenkins, *C.A.* **28**,
 4840), gives the dependence of θ on a . For a system in-
 volving 2 solutes, e.g. $\text{EtOH} + \text{MeOH}$, the expl. curve
 of f , as a function of the molal fraction n of MeOH is obtained
 from the family of expl. curves of θ as a function of m
 at different n . A calcd. curve $f_1(n)$ is obtained by $f_1 =$
 $m/(a' + a'')$, where the partial activities a' and a'' of the
 pure components are read from the expl. curves. Finally,
 an ideal curve $f_0 = f_1/(f_1 - f_0)n + f_0$ is obtained with the
 aid of $f_1 = m(1-n)/a'$ and $f_0 = mn/a''$; it is, in general, a
 hyperbola convex to the axis of compn., and a straight
 line parallel to the axis of compn. In the particular case
 $f_1 = f_0$. Coincidence of all 3 curves indicates both stability
 and absence of interaction between the components.
 Coincidence of only f_0 and f_1 means absence of interaction
 but also nonstability of individual components, e.g. dis-
 sociation. Interaction between components manifests itself
 in a deviation of f_1 from f_0 . Formation of a stable compd.
 is expressed by a singular point on the f_1 curves at all n .
 Analysis of the 3 types of $f_1(n)$ curves for the systems EtOH
 $+ \text{MeOH}$ and $\text{EtOH} + \text{PhMe}$, on the basis of the expl.
 data of Ushovenko and Babak (*C.A.* **43**, 436, **43**, 1232),
 reveals, for the 1st system, at $m = 1$, very slight inter-
 action, for the 2nd system, absence of interaction and dis-
 sociation of assoc. EtOH . In $\text{EtOH} + \text{MeOH}$, dis-
 sociation of the assoc. alics. is fully compensated by their interaction.
 The system $\text{EtOH} + \text{AcOH}$ shows, at high dilns., di-
 merization of AcOH ; at $m = 1$, interaction between com-
 ponents exceeds their dis-
 sociation. An undissoc. compd. is
 indicated by a singular point in the system $\text{MeOH} +$
 CCl_4CHO , but, judging by the coincidence of the expl.
 and calcd. high- n branches of the curves, there is no further
 interaction between the compd. and CCl_4CHO . N. T.



CHERKASHIN, Ye, Ye.

11 Nov 50

USSR/Metals - Alloys, CuMg Sn
Physics - Crystals, Powderd
X-Ray, Roentgenograms

"Crystalline Structure of the Ternary CuMgSn Phase," I. I. Kripyakevich, Ye. I. Gladyshevskiy, Ye. Ye. Cherkashin, L'vov State U imeni Ivan Franko

"Dok Ak Nauk SSSR" Vol LXXV, No 2, pp 205-207

Roentgenograms of the powder of the CuMgSn phase. Description of the system Cu-Mg-Sn, their compositions and phases. Submitted 17 Sep 50 by Acad S. S. Balyankin.

178T84

~~CHERKASHIN, Y. Y.~~ TESLYUK, M.Yu., student III kursa; MALEYEV, I.I.,
student III kursa.

Cryoscopic analysis of organic systems with aniline. Nauk.zap.
L'viv.un. 21:79-82 '52. (MLRA 10:7)

1. Kafedra obshchey i neorganicheskoy khimii.
(Systems (Chemistry)) (Cryoscopy) (Aniline)

Cherkashin, Ye. Ye.

GLADISHEVS'KIY, Ye.I.; KRIP'YAKOVICH, P.I.; CHERKASHIN, Ye.Ye.

Chemical properties of the intermetallic phases. Part 5: Analysis of the residue after extraction of magnesium, from alloys with copper and nickel. Nauk.zap.L'viv.un. 21:83-88 '52. (MLRA 10:7)

1. Kafedra neorganichnoi khimii.
(Magnesium alloys)

~~AKASHIN, Ye. Ye.~~
CHERKASHIN, Ye. Ye.

U S S R .

~~The crystal structure of the Cu₂Cd phase. P. I. Keln-
vakevich, E. I. Gladyshevskii, and E. E. Cherkashin (Lvov
Franko State Univ., Lvov). Doklady Akad. Nauk S.S.S.R.
63, 253-6 (1952).--The β -phase of the Cu-Cd alloy, having a
compn. Cu₂Cd, was studied by means of x-ray diagrams.
The lattice constants are $a = 4.05$, $c = 7.07$ kX, and the
elementary cell contains 12 atoms. J. Roytar Leach.~~

CHERKASHIN, YE. YE. and KRIPYAKEVICH, P. I.

"Systematics of Double Intermetallic Phases"
Izv. Sektora Fiz. -Khim. Analiza IONKh AN SSSR, 24, 1954, pp 59-123

Classification of all known double intermetallic phases is outlined, based on the structure type and chemical bond. The tabulation contains around 1800 double intermetallic phases as well as their distribution in binary alloys. (RZhFiz, No 11, 1954)

L'vov State U. im. Franko -

SO: W-31187, 8 Mar 55

CHERKASHIN, Ye. Ye.

USSR/ Physical Chemistry - Thermodynamics. Thermochemistry. Equilibrium.
Physicochemical analysis. Phase transitions

B-8

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 11182

Author : Gladyshevskiy Ye.I., Cherkashin Ye.Ye.

Inst : L'vov University

Title : Mutual Solubilities of Nickelarsenide Compounds NiSb and Ni₃Sn₂.

Orig Pub : Nauk. zap. L'vivs'k. un-ta, 1955, 34, 51-55

Abstract : Using the microstructure method, x-ray phase structure analysis and precision measurements of identity periods, the authors have investigated the system NiSb-Ni₃Sn₂, characterized, in contrast to the previously investigated γ -compounds, by different content of transition metal and absence of continuous solid solutions of the metals being substituted (Sb and Sn) in the binary system. Alloys were produced from Ni, Sb and Sn and were then annealed for 40 hours at 600° followed by hardening in cold water. There was ascertained the formation of a continuous series of solid solutions with replacement of all Sb atoms by Sn atoms and additional incorporation of Ni atoms in the NiSb structure.

Card 1/1

CHERKASHIN, YE. YE.

USSR/Physical Chemistry - Thermodynamics. Thermochemistry. Equilibrium. Physico-chemical Analysis. Phase Transitions, B-8

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 349

Author: Cherkashin, Ye. Ye., and Prib, O. A.

Institution: Lvov University

Title: On the Determination of the Molecular Weight of Associated Substances in Solution

Original

Periodical: Nauk. zap. L'vivs'k. un-tu, 1955, Vol 34, 91-97

Abstract: The equation giving the molar depression as a function of the concentration $\theta = \Delta t/m = f(m)$ was used in the determination of the molecular composition of associated substances by cryogenic methods. The authors confirmed that the extrapolation of $\theta = f(m)$ to $m \rightarrow 0$ in the determination of molecular composition is useful only in cases for which a definite association reaction with a sufficiently large constant ($K_m > 10^5$) has been established. In all other cases a shift in equilibrium considerably changes the molecular composition with changing

Card 1/2

USSR/Physical Chemistry - Thermodynamics. Thermochemistry. Equilibrium. Physico-chemical Analysis. Phase Transitions, B-8

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 349

Abstract: concentration and does not permit the elimination of polar interaction by extrapolation to infinite dilution. The experimental data on the systems investigated show that solutions of CCl_4 and o-nitrophenol in benzene represent nearly ideal systems; O- and n-cresol solutions in benzene are not associated; alcohols and formic acid show undetermined association; and CH_3COOH and $\text{C}_2\text{H}_5\text{COOH}$ form dimers.

Card 2/2

CHERKASHIN, V. E.
USSR/Physical Chemistry, Thermodynamics, Thermochemistry,
Equilibriums, Phys-Chem. Anal. Phase-Transitions.

B-8

Abs Jour : Ref Zhur - Khimiya, No 7, 1957, 22314.

Author : E. I. Gladyshevskiy, E. E. Cherkashin.

Inst : Not given

Title : Solid Solutions on the Base of Metallic Compounds.

Orig Pub : Zh. neorgan. khimii, 1956, 1, No 6, 1394-1401.

Abstract : Formation conditions of solid solutions of the 3rd component in binary metallic compounds are examined on the basis of literary material and experimental data furnished by roentgeno-structural and microstructural analyses. Solubility of metals was studied in metallic compounds of the group $MgZn_2$ (structure of $MgZn_2, MgNi_2$ and $MgCu_2$ type), in electronic compounds (structure of α -, β -, and γ -brasses type), in nickel-arsenide compounds (structure of $CdI_2, NiAs$ and Ni_2In), in silicides and in some quadruple alloys. A series of new continuous solid solutions between metallic alloys was found and their structure was studied. Solubility of As, Al, Si, Sn and Sb in $MgCu_2$ is limited by a maximum electronic concentration, which is necessary for filling the first energy zone of $MgCu_2$ struc-

-109-

cont 1/2

Cherkashin Ye. Ye.

USSR Thermodynamics - Thermochemistry. Equilibria.
Physical-Chemical Analysis. Phase Transitions.

B-8

Abs Jour : Referat Zhur - Khimiya, No 6, 1957, 18505

Author : ~~Ye. Ye. Cherkashin~~, Ye.I. Gladyshevskiy, M.Yu. Teslyuk.
Inst : Institute of Organic and Inorganic Chemistry of Academy
of Sciences of USSR.

Title : Study of System Copper - Magnesium - Tin in Range of Cu -
Cu₂Mg - CuMgSn.

Orig Pub : Izv. Sektora fiz.-khim. analiza IONKh AN SSSR, 1956, 27,
212-216

Abstract : The structure of alloys pertaining to the system Cu - Mg -
Sn was studied microscopically and roentgenographically.
Alloys of the cross-section Cu₂Mg - CuMgSn are homoge-
neous in the range of 0 to 15 at.% of Sn; along the
cross-section Cu₂Mg - Sn the maximum solubility is 12 at
.% of Sn. The lattice spacing rises in the first case
from 7.020 to 7.248 kX and to 7.157 kX in the second.

Card 1/2

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USSR/Thermodynamics - Thermochemistry. Equilibria.
Physical-Chemical Analysis. Phase Transitions.

B-8

Abs Jour : Referat Zhur - Khimiya, No 6, 1957, 18505

The compounds Cu_2Mg and Cu_4MgSn do not produce any continuous series of solid solutions. The data of Sn solubility in Cu_2Mg are compared with the data of solubility of Fe, Zn, Cd, Al, Si, Pb and Sb in Cu_2Mg and Cu.

Card 2/2

- 186 -

CHERKASHIN, Ye.Ye.;KRIP'YAKEVICH, P.I.;FRANKEVICH, D.P.

Ternary solid solutions in the system Cu - Mg - Cd. [with summary in English]. Dop. AN URSR no.1:33-37 '57. (MLRA 10:4)

1. L'vivs'kiy derzhavniy universitet im. Iv. Franka. Predstaviv akademik AN URSR O. I. Brods'kiy.
(Copper-manganese-cadmium alloys)