DUBITSKIY, L.G.; GRITSEVICH, G.V., inzh., retsenzent; CHECHEL'NITSKIY, M.I., inzh., retsenzent; KOLETINA, A.V., inzh., red.; GORDEYEVA, L.P., tekhn. red.

[Radio methods of production control] Radiotekhnicheskie metody kontrolia izdelii. Izd.2., perer. i dop. Moskva, Mashgiz, 1963. 350 p. (MIRA 17:3)

CHECHEL'NITSKIY, O. [Chechel'nyts'kyi, O.], inzh.

The sea produces current. Nauka i zhyttia 11 no.12:22-24 D '61. (MIRA15:2)

(Tidal power)

S/114/60/000/007/007/009
E194/E455

AUTHOR: Chechel'nitskiy, Ya.I.

TITLE: Improvements in Turbine Blade Manufacture at the Leningrad Kirov Works

PERIODICAL: Energomashinostroyeniye, 1960, No.7, pp.31-34

TEXT: Steam turbine blades manufactured in the Leningrad Kirov Works are grouped into three classes according to difficulty of manufacture. The first group includes those easiest to make; they are those of constant section and are usually cold-rolled. The second class includes wholly or partially milled blades, with thickened root and constant blade profile in the working section. The manufacture of these blades calls for a great deal of machining and special fixtures, cutters and gauges. The third group, the most difficult to manufacture, includes fully-machined blades with complicated roots, such as skew-milled and screw blades, whose profiles vary over the working length. Manufacture of these blades requires a great deal of machining, again with special and complicated accessories. From the standpoint of improving manufacturing procedure the third class of blades is the most interesting, as it requires the most labour.

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The working part of these blades is formed by profiles of curvolinear surfaces of variable cross-section over the entire length of the blade and there is no plane of symmetry. The cross-sections of the working parts of the blades are at an angle to the radial surfaces of the root. The blade contour is such that they must be machined with reference to certain predetermined reference surfaces and lines. The most accurate reference surface would be the plane of the axial direction of the steam inlet edge and the inner profile of the working part of the blade. However, from the manufacturing point of view, it is preferable to make the reference surfaces not the inner profile of the working part of the blade but the plane of the root from the side of the external profile. When this method is used the tolerances between operations becomes very close and it is necessary to introduce an additional reference basis, such as the skew faces of the working parts of the blades. Blade manufacture is made more difficult and expensive because of the manufacturing

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S/114/60/000/007/007/009
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tolerances between operations with reference to the first edge of the face relative to the root. Instability of the reference base when milling the first skew edge made it necessary to refrain from machining two components simultaneously and to machine each part separately. Difficulties arose because the reference base wandered during machining. This is particularly important in making screw blades. The introduction of an additional manufacturing reference point in the form of a dowel overcame the difficulties and made it possible to use a constant reference point when milling skew edges of the internal and part of the external surface of the working part of the blade. The method of milling that is adopted now that the manufacturing reference point is available is described. It was also possible to simplify the design of the milling fittings. A further important point is to reduce the amount of labour required in manufacturing blades. Analysis of existing methods of machining blades shows that individual machining did not meet the

Improvements in Turbine Blade Manufacture at the Leningrad Kirov Works

requirements. This is particularly true of milling work. Objections can be raised to multiple machining of parts to finished dimensions where it is necessary to maintain strict tolerances and good finish. Such objections, however, cannot be raised to preliminary rough milling and there are many such operations in the manufacture of blading. They include the milling of the inlet edges of skew and screw blades, for which up to 16 blades may be machined at once on a horizontal milling machine and 8 on a vertical milling machine. A similar situation arises when milling the roots of skew and screw blades. Considerations that arise in multiple machining of parts are discussed and it is argued that simultaneous milling of two similar right and left handed blades is better than milling either separately. Improved methods of machining skew blades gave a mean improvement in labour productivity of 36%, whilst the mean labour-content of the blades was reduced by 24%, the corresponding figures for screw blades being 48 and 32% respectively. There are 5 figures and 1 table.

CHECHEL'NITSKIY, Ya.L., insh.

Technological efficiency of the design of steam turbines developed by the Kirov Plant. Energomashinostroenie 7 no.9: 32-35 S '61. (MIRA 14:9)
(Leningrad--Steam turbines)

CHECHEL'NITSKIY, Ya.I.

Selecting an economically expedient technological process for machining the parts of marine engines. Sudostroenie no.8: 46-50 Ag '65. (MIRA 18:9)

CHECHELSKA, B.

Polish Technical Abst.
No. 1 1954
Chemistry and Chemical Technology

2030

663.11 : 577.1

Urbański T., Chechelska B. Preparation on Laboratory Scale of Ergosterol from Mycelium Aspergillus Niger.

„Otrzymywanie ergosterolu z grzybni Aspergillus Niger w skali laboratoryjnej". (Prace Gł. Inst. Przem. Roln. i Spoż. No. 3) Warszawa, 1952. PWT. 4 pp., 1 tab.

The content of ergosterol in Aspergillus Niger taken from a citric acid factory was determined. Two principal methods of extraction of ergosterol were used: 1) extraction of fats and sterols and the hydrolysis of fats, followed by the isolation of ergosterol from the nonhydrolized portion, 2) hydrolysis of the whole material with potassium hydroxide in hydrated alcohol and the extraction of the unhydrolized portion with a suitable solvent. The evaporation of the solvent left the residue of ergosterol. In order to find the most convenient parameters, a number of experiments, in modification of both methods were carried out: the quantity of potassium hydroxide, the time of hydrolysis and extraction, the kind and the quality of solvent. The most suitable method was found to be: hydrolising the fungus with KOH in hydrated alcohol, using 30% of KOH — calculated on the basis of the dry fungus — mixing with water, filtering the precipitate and extracting the solution three times with benzene. Then the fungus was extracted three times with alcohol and the solution was filtered hot. The precipitate from benzene and alcoholic extract was recrystallized several times from the mixture of alcohol and benzene (4 : 1) or dichloroethane. Different kinds of fungi yielded various quantities of ergosterol. It is possible that the yield depends on the conditions of fermentation (medium, aeration) and of the age of fungi. The content of the crude ergosterol was 0.13 — 0.17%. After purification, it decreased to 0.08—0.12%. As the tests were executed on laboratory scale i.e. with small quantities of fungus, the losses were relatively great.

CHECHELSKA, 1957

Chemistry of pyridine. IV. Reactions of amides of picolinic, nicotinic, and isonicotinic acids with formaldehyde and amines. Bozenna Chechelska and Tadeusz Urbański (Inst. Technol., Warsaw). *Roczniki Chem.* 27, [illegible] (1953) (English summary).—[Throughout this abstr. [illegible] nicotinoyl, R′ = picolinoyl, and R″ = isonicotinoyl.] Nicotinic acid amide (24.4 g.) in 90 ml. H_2O, 2.2 g. K_2CO_3, and 10.5 g. 37% CH_2O are heated on a H_2O bath for 1 hr., giving *RNHCH₂OH* (I), m. 141–2°. I *picrate*, m. 140–2°, and I.*HCl*, m. above 120° (decompn.), are also prepd. $(RNH)_2CH_2$ (II), m. 244–6°, is made by slowly adding 2.4 g. of the acid amide to 11.5 ml. 85% H_2SO_4 and 1.9 g. 37% CH_2O at 20–30°, warmed at 40° for 1 hr., and holding at room temp. for 3 hrs.; 1.66 g. product ppts. after treatment with Na_2CO_3. Similarly 1.5 g. I treated with H_2SO_4 above yields 0.68 g. of II. Nicotinic acid nitrile (3.5 g.) is slowly added to 2.1 g. 37% CH_2O and 25 ml. 85% H_2SO_4 at 20°, the mixt. heated at 30° for 2 hrs., poured into ice water, and Na_2CO_3 added to pH 3; the ppted. starting material is filtered off, and addnl. Na_2CO_3 ppts. 1.3 g. II. Also prepd.: II *picrate*, m. 224–6°, and II.*HCl*, m. 267–9°. In the same manner, *R′NHCH₂OH* (III), m. 104–6° (*HCl salt*, m. 202–4°), and $(R'NH)_2CH_2$ (IV), m. 124–6°, are obtained. *R′NHCH₂NMe₂.HCl* (V), m. 159–61°, is prepd. (80%) by refluxing 2.4 g. $R'NH_2$ with 2.1 g. $Me_2NH.HCl$ and 2.0 g. 37% CH_2O in 15 ml. anhyd. EtOH for 3 hrs.; V *picrate* m. 160–2°. III (1.7 g.) and 1.7 g. 2-naphthol are refluxed in 20 ml. EtOH, contg. 1 ml. conc. HCl, for ½ hr., the EtOH is distd., and the residue allowed to stand for several months, giving the 2-$C_{10}H_7OCH_2NHR'$, m. 176–7.5°. By the methods described, *R″NHCH₂OH* (VI), m. 145–7°, $(R''NH)_2CH_2$ (VII), m. 326–8° VI *picrate*, m. 146–8° (decompn.), VII *picrate*, m. 255–7°, *R″NHCH₂NMe₂.HCl* (VIII), m. 156–8°, and VIII *picrate*, m. 188–9°, are prepd. V and VIII show a slight bacteriostatic action *in vitro* against *Mycobacterium smegmatis* and *Mycobacterium* 279.

Chester Placek

Chechelska, Bozenna

Reactions of pyromucic acid amide with formaldehyde and amines. Bozenna Chechelska and Tadeusz Urbański. Roczniki Chem. 27, 410–13 (1953)(English summary).—Pyromucic acid amide (2.2 g.) (I) reacts with 1.75 g. 37% CH_2O in 10 ml. H_2O when heated on a H_2O bath for 2 hrs. at pH 4 to give the *methylenediamide* (II), m. 178–80°. In the presence of concd. H_2SO_4, the reaction gives the *oxymethylenediamide*, m. 270° (decompn.). II, m. 180–2°, is also made by treating 4.4 g. I with 4.3 g. $Me_2NH.HCl$, and 4.5 g. 37% CH_2O in 15 ml. EtOH. *N-(dimethylaminoethyl)-pyromucic acid amide-HCl*, m. 103–4°, is obtained by refluxing 4.4 g. I, 3.5 g. $Me_2NH.HCl$, and 4.3 g. 37% CH_2O in 10 ml. EtOH 2 hrs., stripping the EtOH *in vacuo* and filtering 3.2 g. of the compd. after standing several weeks.

Chester Placek

CHECHELSKA, B

Production of alginic acid from Fucus vesiculosus. Bożenna Checheiska and Radosz Urbański. *Prace Głów. Inst. Przemysłu Rolnego i Spożywczego* 4, No. 2, 39-42 (1951).—*F. vesiculosus* gathered in July and August has an alginic acid content of 12% dry basis. Of a no. of extn. and purification methods investigated, the following was found the most satisfactory. Seaweed is washed with 0.5% HCl, extd. 4 times with 2% Na_2CO_3, the ext. is bleached with ClO_2 or $NaClO_4$, alginic acid is pptd. with HCl and washed with water and alcohol. — Aline S. Szczepanik

URBANSKI, Tadeusz; MALINOWSKI, Stanislaw; SKOWRONSKA-SERAFINOWA, Barbara; CHECHELSKA, Bozenna; DABROWSKA, Halina; FALECKI, Jerzy; GURNE, Daniela; HAISKI, Leszek; SLOPEK, Stefan; KAMINSKA, Irena; VENULET, Jan; JAKIMOWSKA, Krystyna; URBANSKA, Alicja

Search for new antituberculous agents. Gruzlica 22 no.10:681-690 Oct 54.

1. Z Oddzialu Syntezy Lekow Instytutu Gruzlicy; kierownik prof. dr. T.Urbanski, dyrektor: prof. dr. J.Misiewicz.

(CHEMOTHERAPY, in various diseases
tuberc., progr.)
(TUBERCULOSIS, therapy
antituberc. agents, research)

CHECHELSKA, Bozenna

Bozenna Chechelska: "On Reactions of Amides of Nitrobenzoic Acids with Formaldehyde and Amines," Roczniki Chemii, Vol 30, No 1, Warsaw, 1956. Published from the Chair of Organic Technology, II, Warsaw Polytechnic, and the Tuberculosis Institute, Warsaw, 28 Mar 55.

URBANSK, Tadeusz; BELZECKI, Czeslaw; CHECHELSKA, Bozena; CHYLINSKA, Barbara; DABROWSKA, Halina; FALECKI, Jerzy; GUREK, Daniela; HALSKI, Leszek; MALINOWSKI, Stanislaw; SERAFINOWA, Barbara; ZYLOWSKI, Jerzy; SLOPEK, Stefan; KAMIENSKA, Irena; VENULET, Jan; JANOWIEC, Mieczyslaw; JAKIMOWSKA, Krystyna; URBANSKA, Alicja; KUZNIEWICOW, Anatol

Searching for new anti-tuberculosis drugs. Gruzlica 26 no.11:889-917 Nov 58.

1. Z Zakladu Syntezy Lekow Instytutu Gruzlicy Kierownik Zakladu: prof. dr T. Urbanski Dyrektor Instytutu: prof. dr J. Misiewicz Pracownia Synt. Lekow Przeciwgruzlicych, Warszawa, ul. Koszykowa 75.
(TUBERCULOSIS, therapy,
investigation of 300 cpds. for anti-tuberc. eff. (Pol))

KUZNETSOV, A.I., insh.; CHECHELYUK, Ya.Z., insh.

Machine for manipulating large-size pieces. Izobr. v SSSR 3 no.2:16 F '58. (MIRA 11:3)
(Machine-shop practice)

AFANAS'YEV, O.O. [Afanas'iev, O.O.]; GORVITS, S.M. [Horvits, S.M.]; IGNATOVA, L.P. [Ihnatova, L.P.]; KOTOV, M.P.; NOVIK, G.B. [Novyk, H.B.]; ORLOV, I.V.; PEYSAKHZON, L.B.; ROZENMAN, G.S. [Rozenman, H.S.]; SKATERNOY, V.A.; TSITRIN, L.I.; CHECHENEV, M.I. [Chechenlev, M.I.]; SHOSTAK, S.I.; NAZARENKO, N., red.; GORKAVENKO, L. [Horkavenko, L.], tekhn.red.

[Light industry of the Ukraine] Lehka promyslovist' Ukrainy. Kyiv, Derzh.vyd-vo tekhn.lit-ry URSR, 1960. 197 p. (MIRA 14:4)

(Ukraine--Industries)

CHECHENEV, N. I.

CHECHENEV, N. I. -- "CHANGE OF THE PROPERTIES OF THE SURFACE OF FROST GELATIN AFTER TANNING." SUB 1 JUL 52, MOSCOW TECHNOLOGICAL INST OF LIGHT INDUSTRY IMENI L. M. KAGANOVICH (DISSERTATION FOR THE DEGREE OF CANDIDATE IN TECHNICAL SCIENCE)

SO: VECHERNAYA MOSKVA, JANUARY-DECEMBER 1952

SHKARANDA, I.T., kand.tekhn.nauk; KOTOV, M.P., prof.; CHECHENEV, N.I., kand.tekhn.nauk; MIKHANOSHA, Ye.S., inzh.

Making high-viscous gelatins of chrome-tanned shavings. Izv. vys. ucheb. zav.; tekh.leg. prom. no.2:40-46 '58. (MIRA 11:6)

1.Kiyevskiy tekhnologicheskiy institut legkoy promyshlennosti.
(Gelatin)

CHECHENIN, A.

Overcoming the difficulties of the Arctic. Zhil.-kom. khoz. 8 no. 8:5-8 '58. (MIRA 11:8)

1. Predsedatel' ispolkoma Murmanskogo gorodskogo Soveta deputatov trudyashchikhsya.
(Murmansk--Municipal services)

CHECHENIN, M. G., Cand Med Sci -- (diss) "Healing of skin-muscle wounds of the tibia and reactivity changes in the sciatic nerve after application on a limb of torniquet stanching of blood-flow." Rostov-na-Don, 1960. 15 pp; (Ministry of Public Health RSFSR, Rostov-na-Don State Medical Inst); 300 copies; price not given; (KL, 17-60, 173)

CHECHENIN, M.G.

RUSAKOV, V. I., kand. med. nauk; CYECHENIN, M. G.

Rare form of anomaly causing asphyxia in a newborn infant. Akush. i gin. no.2:97-98 '62. (MIRA 15:6)

1. Is kliniki fakul'tetskoy khirurgii (zav. - prof. B. Z. Gutnikov) Rostovskogo-na-Donu meditsinskogo instituta (dir. - prof. P. P. Kovalenko)

(ASPHYXIA)
(RESPIRATORY ORGANS—ABNORMITIES AND DEFORMITIES)

SHISHKIN, K. Ye., (Engr)

"Investigation of the Strength of Lime-Sandy Building Materials Hardened in an Autoclave." Cand Tech Sci, Sci Res Inst of Construction Engineering, Academy of Architecture USSR, 5 Mar 54. Dissertation (Vechernyaya Moskva Moscow, 24 Feb 54)

SO: SUM 136, 19 Aug 1954

CHECHENIN, M.Ye., kand. tekhn. nauk

Using asbestos-cement pipes for pipelines in Czechoslovakia and Hungary. Stroi. mat. 5 no.6:39-40 Je '59. (MIRA 12:8)
(Czechoslovakia—Pipe, Asbestos-cement)

CHECHENIN, M.Ye., kand.tekhn.nauk

Basic requirements concerning quality indexes of asbestos-cement pipes. Stroi.mat. 5 no.11:13-16 N '59. (MIRA 13:3)

(Pipe, Asbestos-cement--Testing)

CHECHENIN, M.Ye., kand.tekhn.nauk

Basic properties of asbestos-cement pipes for gas pipelines. Stroi. truboprov. 5 no.3:12-15 Mr '60. (MIRA 13:9)
(Gas, Natural--Pipelines) (Pipe, Asbestos-cement)

CHECHENIN, M.Ye., kand.tekhn.nauk

Making and using asbestos-cement gas pipes. Stroi. mat. 6 no.7: 7-10 Jl '60. (MIRA 13:7)
(Gas pipes) (Pipe, Asbestos-cement)

ALIFERENKOV, A.D., inzh.; CHECHENIN, M.Ye., kand. tekhn. nauk

Study of the deformability of asbestos-cement pipes under repeated loads. Trudy NIIAsbesttsementa no.18:20-27 '64.

(MIRA 17:11)

LOMANKIN, P.I.; CHECHENIN, M.Ye.

Problem of the study of gas flow through the walls of asbestos-cement pipes. Trudy NIIAsbesttsementa no.19:56-61 '65. (MIRA 18:9)

L 4962-66 EWA(k)/FBD/EWT(1)/EEC(k)-2/T/EWP(k)/EWA(m)-2/EWA(h) SCTB/IJP(c) WG

ACC NR: AP5027352 SOURCE CODE: UR/0250/65/009/010/0659/0663

AUTHOR: Chekalinskaya, Yu. I.; Chechenina, Ye. P.

ORG: Physics Institute, AN BSSR (Institut fiziki AN BSSR)

TITLE: Amplification of a flux in an inhomogeneous layer when nonlinearity is taken into account

SOURCE: AN BSSR. Doklady, v. 9, no. 10, 1965, 659-663

TOPIC TAGS: laser, solid state laser, laser optics, light reflection, light reflection coefficient, light transmission, solid state amplifier

ABSTRACT: The properties of an amplifying inhomogeneous plane-parallel layer with arbitrary reflection coefficients on the end faces were investigated. Harmful losses in the active substance were taken into account, and the dependence of the amplification coefficient on the radiation density was considered in the calculations. It was shown that the use of an active layer with the reflection coefficients r_1 and r_2 on the end faces as an amplifier is limited by the oscillation threshold. The condition $X < 1/\sqrt{r_1 r_2}$ must be fulfilled if the system is to operate in the amplification mode (X is the single pass gain). The maximum possible value for X for extremely small fluxes ($\alpha S_0 \to 0$) is $X_{lim} = e^{(k_0-\rho)\ell}$ (k_0 is the initial gain of the active substance, ρ is the loss coefficient inside the active layer, and ℓ is the thickness of the layer). Because of nonlinear effects, there is a limiting flux $S_0 \geq S_0^*$ (S_0 is

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a perpendicularly incident flux on the layer surface) at which $X = 1$. When $S_0 < S_0^*$, the incident flux is amplified; when $S_0 > S_0^*$, it is attenuated, i.e., part of the incident flux is lost inside the layer. The limiting value for flux at which the amplification changes into attenuation does not depend on the length of the amplifying layer. The value of X obtained at very large incident fluxes ($\alpha S_0 \to \infty$) is equal to $e^{-\rho\ell}$. In this case the coefficient of external losses $\ln X/\ell$ is negative and equals $-\rho$, i.e., the incident flux is attenuated by losses. To investigate the effect of the layer parameters (k_0, ρ, ℓ, r_1, r_2), calculations were performed for the output emission, gain, and the yield of useful energy by a volume unit of the amplifying layer at incident radiation smaller that the limiting radiation. Due to the nonlinear effects, gains η and η_T($\eta = \eta_T + \eta_R$) (where η_T and η_R are transmission and reflection gains, respectively) essentially depend on the magnitude of the incident flux S_0. Even small incident fluxes cause a decrease in η and η_T in comparison with the maximum possible gains η^0 and η_T^0. When S_0 decreases, η and η_T increase (the closer k_0 is to k_0^{thresh}, the greater the increase). At large light fluxes, i.e., ten to a hundred times smaller than the limiting one, total gains are close to unity and are independent of k_0. The dependence of η and η_T on the reflection coefficient r_1 of the input end-face of the amplifying layer for $r_1 r_2$ = constant shows that η_T reaches a maximum in the region where r_1 is approximately equal to r_2. When r_1 increases, η and η_R decrease to a value equal to r_1. Orig. art. has: 11 formulas, 2 figures, and 2 tables. [JA]

SUB CODE: OP,EC/SUBM DATE: 07Jul65/ ORIG REF: 009/ OTH REF: 001/ ATD PRESS: 4/3

ACC NR: AP7003279 SOURCE CODE: UR/0250/66/010/012/0929/0932

AUTHOR: Chechenina, Ye. P.; Katseva, I. R.

ORG: Institute of Physics, AN BSSR (Institut fiziki AN BSSR)

TITLE: Emission from a generator-amplifier system

SOURCE: AN BSSR. Doklady, v. 10, no. 12, 1966, 929-932

TOPIC TAGS: laser emission, molecular amplifier, feedback amplifier, laser optic material, laser cavity

ABSTRACT: Making use of a procedure developed in an earlier paper (DAN BSSR v. 9, 10, 1965), the authors calculate the emission produced by a generator-amplifier system with allowance for their mutual influence (i.e., the feedback between the generator and the amplifier), for different parameters of the active medium and of the resonator. The properties of such a system are compared with those of a system in which the quantum generator and the quantum amplifier are considered separately, so as to determine the region of parameters in which the feedback must be taken into account. The calculation is based on energy relations with allowance for the dependence of the gain of the active medium on the radiation density. A computer (Minsk-1) was used for the calculations. The results are presented in the form of plots of the emission flux against the relative reflection coefficients and of the emitted energy on the relative reflection coefficient. The investigation shows that the mutual influence of the generator and the amplifier in such a compound system must

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ACC NR: AP7003279

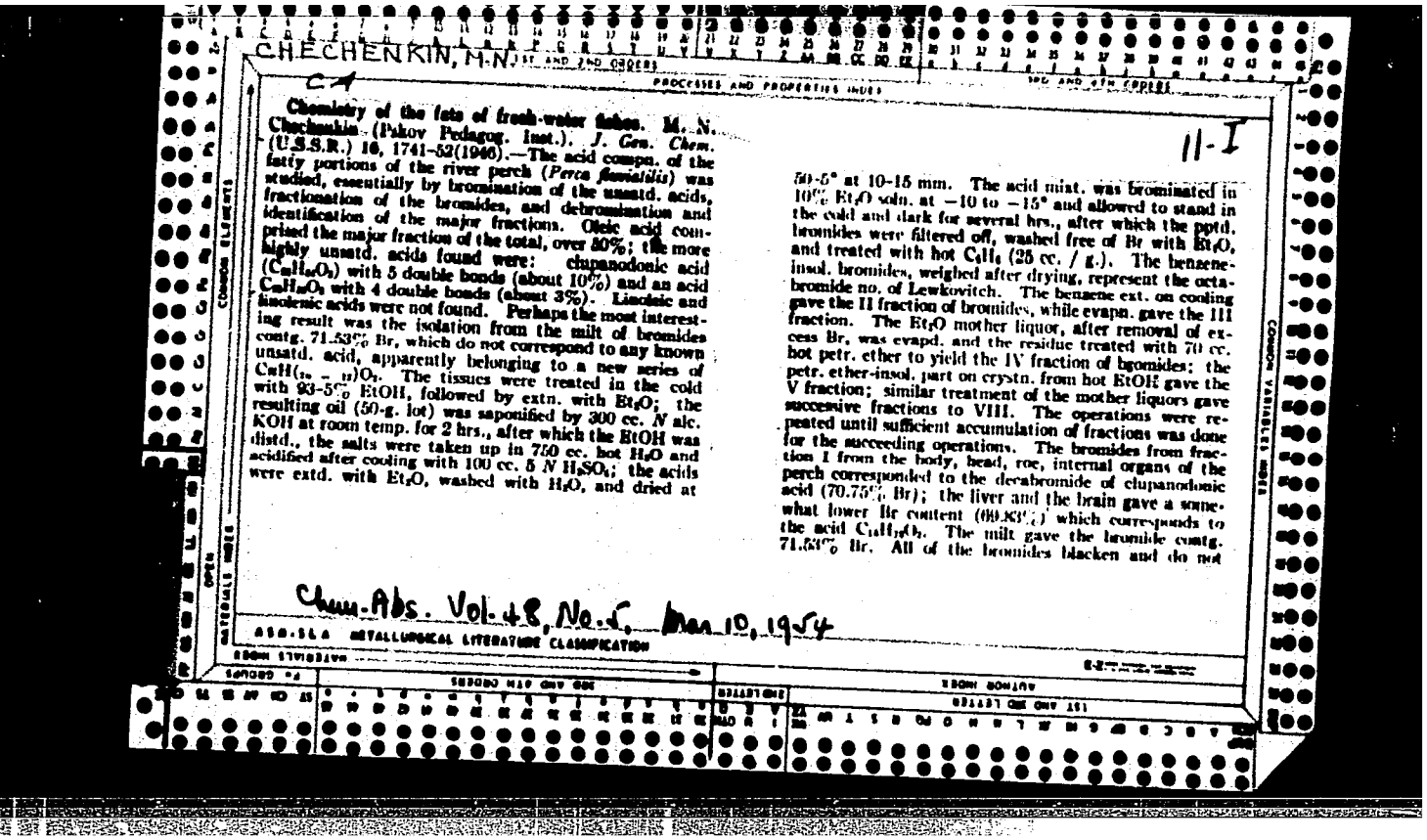
be taken into account if the amplifier length is shorter than or equal to the length of the driver generator, or when the amplifying section is long but the reflection coefficients are close to the threshold values. This report was presented by Academician AN BSSR B. I. Stepanov. Orig. art. has: 2 figures.

SUB CODE: 20/ SUBM DATE: 10Jun66/ ORIG REF: 003/ OTH REF: 006

Card 2/2

CHECHEL'NITSKIY, Ya.I., inzh.

Economic basis for using special equipment in the machining of components in turbine manufacture. Energomashinostroenie 11 no.7:34-39 Jl '65. (MIRA 18:7)



CHECHENKIN, M.N.

C-4

11-I

Chemistry of the fats of fresh-water fishes. M. N. Chechenkin. (Pskov Pedagog. Inst.). *J. Gen. Chem.* (U.S.S.R.) 16, 1741–52(1946).—The acid compn. of the fatty portions of the river perch (*Perca fluviatilis*) was studied, essentially by bromination of the unsatd. acids, fractionation of the bromides, and debromination and identification of the major fractions. Oleic acid comprised the major fraction of the total, over 50%; the more highly unsatd. acids found were: clupanodonic acid ($C_{20}H_{32}O_2$) with 5 double bonds (about 10%) and an acid $C_{18}H_{28}O_2$ with 4 double bonds (about 3%). Linolenic and linolenic acids were not found. Perhaps the most interesting result was the isolation from the milt of bromides contg. 71.53% Br, which do not correspond to any known unsatd. acid, apparently belonging to a new series of $C_nH_{(n-11)}O_2$. The tissues were treated in the cold with 93–5% EtOH, followed by extn. with Et_2O; the resulting oil (50-g. lot) was saponified by 300 cc. *N* alc. KOH at room temp. for 2 hrs., after which the EtOH was distd., the salts were taken up in 750 cc. hot H_2O and acidified after cooling with 100 cc. 5 *N* H_2SO_4; the acids were extd. with Et_2O, washed with H_2O, and dried at 50–5° at 10–15 mm. The acid mixt. was brominated in 10% Et_2O soln. at −10 to −15° and allowed to stand in the cold and dark for several hrs., after which the pptd. bromides were filtered off, washed free of Br with Et_2O, and treated with hot C_6H_6 (25 cc. / g.). The benzene-insol. bromides, weighed after drying, represent the octabromide no. of Lewkovitch. The benzene ext. on cooling gave the II fraction of bromides, while evapn. gave the III fraction. The Et_2O mother liquor, after removal of excess Br, was evapd. and the residue treated with 70 cc. hot petr. ether to yield the IV fraction of bromides; the petr. ether-insol. part on crystn. from hot EtOH gave the V fraction; similar treatment of the mother liquors gave successive fractions to VIII. The operations were repeated until sufficient accumulation of fractions was done for the succeeding operations. The bromides from fraction I from the body, head, roe, internal organs of the perch corresponded to the decabromide of clupanodonic acid (70.75% Br); the liver and the brain gave a somewhat lower Br content (69.83%) which corresponds to the acid $C_{18}H_{28}O_2$. The milt gave the bromide contg. 71.53% Br. All of the bromides blacken and do not

Chem. Abs. Vol. 48, No. 5, Mar 10, 1954

A50-5L4 METALLURGICAL LITERATURE CLASSIFICATION

CHECHENKIN, M.N.

CA

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Composition of oils from various fresh-water fish. M. N. Chechenkin (Pedagog. Inst., Pskov, U.S.S.R.). *Biokhimiya* **16**, 193-8 (1951).—The presence of highly unsatd. acids is typical of oils from fresh-water fish. The chem compns. of oils of 2 closely phylogenetically related fish are almost the same in some cases and entirely different in others. H. Priestley

CHECHENKIN, M. N.

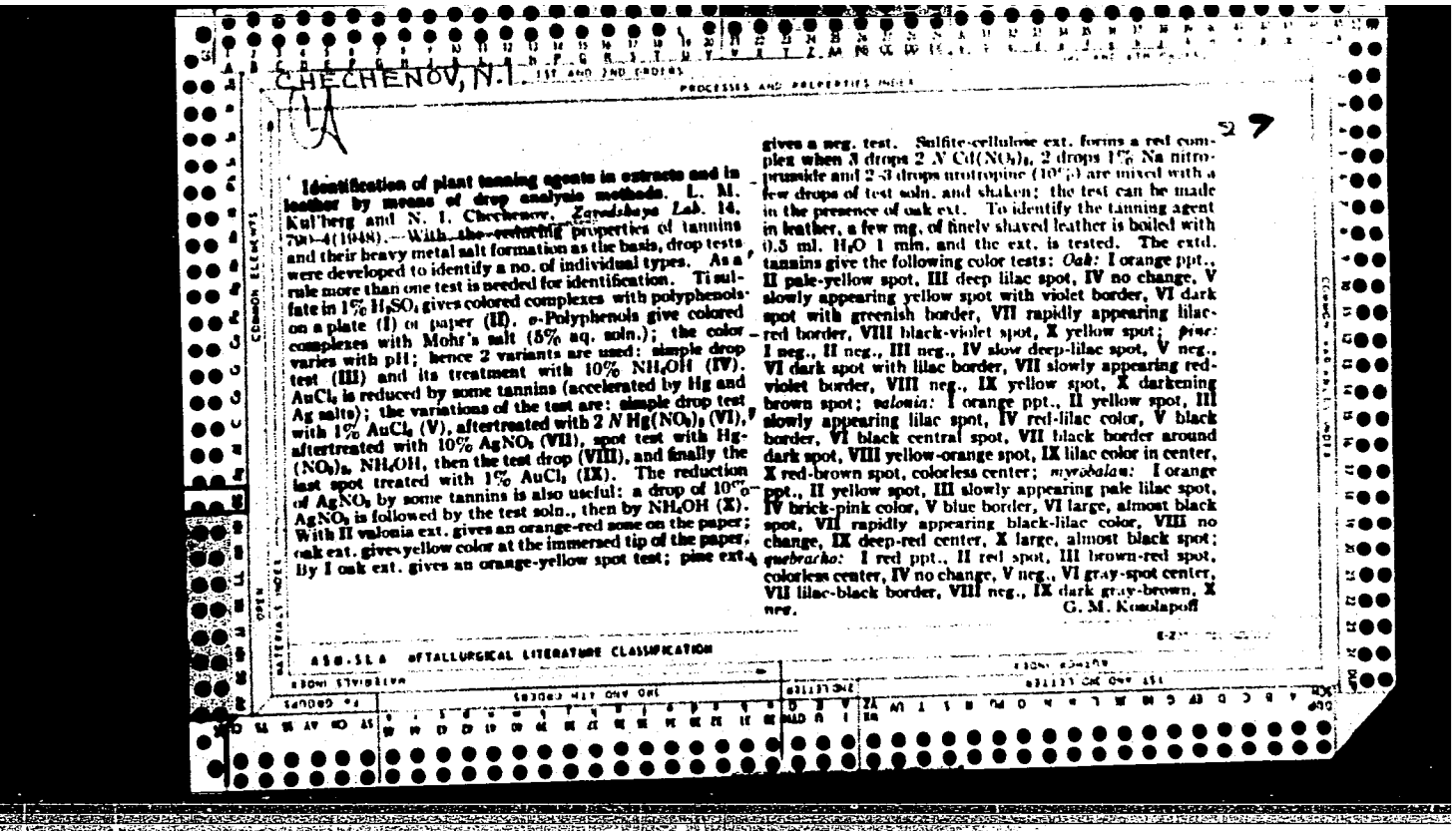
USSR.

The distribution of high saturated fatty acids in the fats of fresh-water plants. M. N. Chechenkin (State Pedagog. Inst., Pskov). *Biokhimiya* 20, 249-50(1955).—Higher fresh-water plants such as duckweed (*Lemna minor*) and water thyme (*Elodea*) have no high satd. fatty acids in their oils, and linoleic acid was the most unsatd. of the fatty acids present. The oils of fresh water *Spirogyra* contain more generally high satd. fatty acids and one fatty acid still more unsatd. than linoleic acid. B. S. Levine

PROKOP'YEVA, M.S.; PILYUSHENOK, S.V.; NIKOLAYEVA, R.I.; CHECHENKOVA, M.V.; MIKHAYLOVA, A.A.; STRELKOVA, A.V.; LOPUKHA, N.Ye; KOZLOV, F.N., red.; VOINOV, K.F., red.; BABESHKINA, N., tekhn. red.

[Economy of Pskov Province; statistical collection] Narodnoe khoziaistvo Pskovskoi oblasti; statisticheskii sbornik. Leningrad, Gosstatizdat, 1960. 175 p. (MIRA 14:6)

1. Pskov (Province) Statisticheskoye upravleniye.2. Rabotniki Statisticheskogo upravleniya Pskovskoy oblasti (for all except Kozlov, Voinov, Babeshkina). 3. Nachal'nik Statisticheskogo upravleniya Pskovskoy oblasti (for Kozlov). 4. Zamestitel' nachal'nika Statisticheskogo upravleniya Pskovskoy oblasti (for Voinov)
(Pskov Province--Statistics)



CHECHENOV, N.I.

Identification of plant tanning agents in extracts and in leather by means of drop analysis methods. L. M. Kul'berg and N. I. Chechenov. *Zavodskaya Lab.* 14, 703–4 (1948).—With the reducing properties of tannins and their heavy metal salt formation as the basis, drop tests were developed to identify a no. of individual types. As a rule more than one test is needed for identification. Ti sulfate in 1% H_2SO_4 gives colored complexes with polyphenols on a plate (I) or paper (II). o-Polyphenols give colored complexes with Mohr's salt (5% aq. soln.); the color varies with pH; hence 2 variants are used: simple drop test (III) and its treatment with 10% NH_4OH (IV). $AuCl_3$ is reduced by some tannins (accelerated by Hg and Ag salts); the variations of the test are: simple drop test with 1% $AuCl_3$ (V), aftertreated with 2 *N* $Hg(NO_3)_2$ (VI), aftertreated with 10% $AgNO_3$ (VII), spot test with $Hg(NO_3)_2$, NH_4OH, then the test drop (VIII), and finally the last spot treated with 1% $AuCl_3$ (IX). The reduction of $AgNO_3$ by some tannins is also useful: a drop of 10% $AgNO_3$ is followed by the test soln., then by NH_4OH (X). With II valonia ext. gives an orange-red zone on the paper; oak ext. gives yellow color at the immersed tip of the paper. By I oak ext. gives an orange-yellow spot test; pine ext. gives a neg. test. Sulfite-cellulose ext. forms a red complex when 3 drops 2 *N* $Cd(NO_3)_2$, 2 drops 1% Na nitroprusside and 2–3 drops nitropine (10%) are mixed with a few drops of test soln. and shaken; the test can be made in the presence of oak ext. To identify the tanning agent in leather, a few mg. of finely shaved leather is boiled with 0.5 ml. H_2O 1 min. and the ext. is tested. The extd. tannins give the following color tests: *Oak:* I orange ppt., II pale-yellow spot, III deep lilac spot, IV no change, V slowly appearing yellow spot with violet border, VI dark spot with greenish border, VII rapidly appearing lilac-red border, VIII black-violet spot, X yellow spot; *pine:* I neg., II neg., III neg., IV slow deep-lilac spot, V neg., VI dark spot with lilac border, VII slowly appearing red-violet border, VIII neg., IX yellow spot, X darkening brown spot; *valonia:* I orange ppt., II yellow spot, III slowly appearing lilac spot, IV red-lilac color, V black border, VI black central spot, VII black border around dark spot, VIII yellow-orange spot, IX lilac color in center, X red-brown spot, colorless center; *myrobalan:* I orange ppt., II yellow spot, III slowly appearing pale lilac spot, IV brick-pink color, V blue border, VI large, almost black spot, VII rapidly appearing black-lilac color, VIII no change, IX deep-red center, X large, almost black spot; *quebracho:* I red ppt., II red spot, III brown-red spot, colorless center, IV no change, V neg., VI gray-spot center, VII lilac-black border, VIII neg., IX dark gray-brown, X neg.

G. M. Kosolapoff

A50-51A METALLURGICAL LITERATURE CLASSIFICATION

CHECHENTSEV, V.N.; FIRSANOVA, L.A.; FEDORCHUK, O.K.

Thermodynamic investigation of the reaction $Si + SiCl_4 \rightleftarrows 2SiCl_2$. Izv. vys. ucheb. zav.; tsvet. met. 8 no.4:97-102 '65. (MIRA 18:9)

1. Kafedra proizvodstva chistykh metallov i poluprovodnikovykh materialov Moskovskogo instituta stali i splavov.

L 13532-66 EWT(m)/EWP(t)/EWP(b) IJP(c) JD/JW

ACC NR: AP5028979 SOURCE CODE: UR/0149/65/000/004/0097/0102

AUTHOR: Chechentsev, V. N.; Firsanova, L. A.; Fedorchuk, O. K.

ORG: Moscow Institute of Steel and Alloys, Production of Pure Metals and Semiconducting Materials Dept (Moskovskiy institut stali i splavov, Kafedra proizvodstva chistykh metallov i poluprovodnikovykh materialov

TITLE: Thermodynamic study of the reaction $Si + SiCl_4 \rightleftarrows 2\ SiCl_2$

SOURCE: IVUZ. Tsvetnaya metallurgiya, no. 4, 1965, 97-102

TOPIC TAGS: silicon, chlorine compound, equilibrium constant, thermodynamic calculation, chemical kinetics

ABSTRACT: In view of discrepancies in the findings of Schaefer and Nickl (Z. anorg. und allgem. Chem., B. 274, 250, 1953) on the equilibrium of the reaction

$$Si + SiCl_4 \rightleftarrows 2\,SiCl_2$$

Card 1/3 UDC: 669.782

L 13532-66
ACC NR: AP5028979

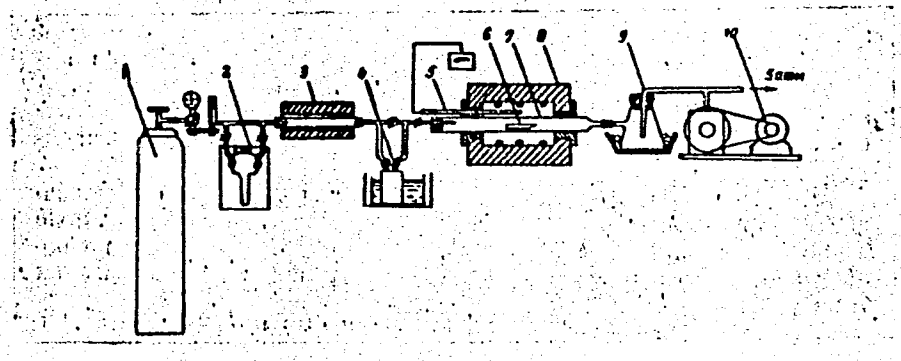


Fig. 1. Diagram of setup for determining the equilibrium constant of reaction (1) by the "current" method:

1 - cylinder with Ar; 2 - flow meter; 3 - furnace for purification of Ar; 4 - evaporator with $SiCl_4$; 5 - thermocouple; 6 - quartz boat with Si; 7 - reaction vessel; 8 - furnace with silit heaters; 9 - condenser; 10 - VN-2 pump

Card 2/3

L 13532-66

ACC NR: AP5028979

and considering that reliable knowledge of the values of thermodynamic functions will facilitate the selection of the optimal conditions for refining Si by the transport reaction method, the authors investigated this equilibrium in the temperature range of 1200-1300°C on employing the "current" method (Fig. 1) where a current of $SiCl_4$ is passed (by means of argon) over a Si-containing boat at a given temperature. Extrapolation of the obtained values of α (mole fraction of $SiCl_4$ converted to $SiCl_2$) to zero flow rate of $SiCl_4$ gives the equilibrium position. On this basis the temperature dependence of the equilibrium constant C_e was determined and hence also the values of the isobaric-isothermal potential ΔZ° of the reaction were calculated: ΔZ° varies linearly from +6790 cal/mole $SiCl_4$ at 1200°C to -1395 cal/mole $SiCl_4$ at 1300°C. The temperature at which the reaction components, taken in standard states, are in an equilibrium, was found to be 1283°C by graphic means for log C_e = 0. The kinetics of the formation of $SiCl_2$ is found to be such that the rate of formation of $SiCl_2$ increases with increasing temperature and, to a lesser extent, with increasing flow rate of $SiCl_4$. The thermal effect of the reaction is calculated at 127,000 cal/mole for the 1200-1300°C temperature range, and hence the reaction is governed by chemical kinetics, i.e. the reaction rate is determined by the rate of chemical interaction. Orig. art. has: 5 figures, 2 tables, 1 formula.

SUB CODE: 07, 11/ SUBM DATE: 10Jul64/ ORIG REF: 001/ OTH REF: 002

Card 3/3

L 46039-66 EWT(m)/EWP(t)/ETI IJP(c) JD

ACC NR: AT6022714 SOURCE CODE: UR/2848/66/000/041/0281/0289

AUTHORS: Chechentsev, V. N.; Firsanova, L. A.; Zaytsev, V. N.; Matviyenko, L. F.

ORG: Moscow Institute for Steel and Alloys, Department for Manufacture of Pure Metals and Semiconductor Materials (Moskovskiy institut stali i splavov, Kafedra proizvodstva chistykh metallov i poluprovodnikovykh materialov)

TITLE: Obtaining high purity silicon by vacuum distillation for the lower chloride

SOURCE: Moscow. Institut stali i splavov. Sbornik, no. 41, 1966. Fizicheskaya khimiya metallurgicheskikh protsessov i sistem (Physical chemistry of metallurgical processes and systems), 281-289

TOPIC TAGS: silicon, silicon compound, vacuum distillation

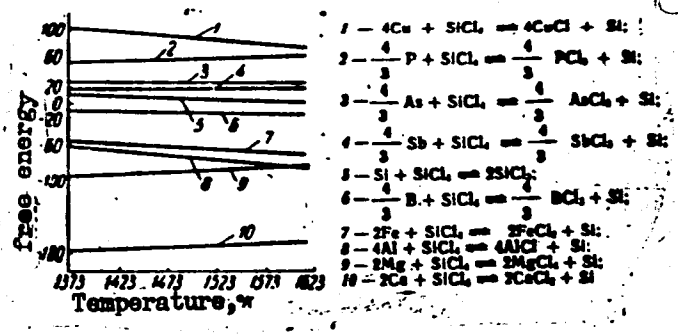
ABSTRACT: The kinetics and thermodynamics of the silicon purification by vacuum distillation from $SiCl_2$ was studied. The standard free energy calculations for a number of reactions of $SiCl_4$ with various elements were carried out by the method of A. N. Krestovnikov i. dr. (Spravochnik po raschetam metallurgicheskikh reaktsiy, Metallurgizdat, 1963). The results of the calculations are presented graphically (see Fig. 1). These calculations showed the feasibility of obtaining high purity silicon according to the reaction

$$Si + SiCl_4 \underset{T_1}{\overset{T_2}{\rightleftarrows}} 2SiCl_2.$$

Card 1/3

L 46039-66
ACC NR: AT6022714

Fig. 1. Dependence of the free energy on the temperature for a number of reactions between $SiCl_4$ and different elements.

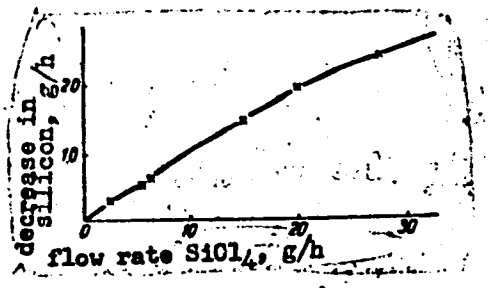


The above reaction was studied in vacuum over the temperature interval of 1150 to 1300C at an average working pressure of $SiCl_4$ of 0.2—0.4 atm. A schematic of the experimental installation is presented, and the experimental results are presented graphically (see Fig. 2). It was found that the optimum conditions for the purification of silicon by the above method are: reaction temperature - 1280C; rate of $SiCl_4$ flow - 20 g/hour; duration of process - 3 hours.

Card 2/3

L 46039-66
ACC NR: AT6022714

Fig. 2. Dependence of the amount of transported silicon on the rate of supply of $SiCl_4$ at 1250C.



Orig. art. has: 1 table, 3 graphs, and 1 equation.

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 001/ OTH REF: 005

Card 3/3

VOLOBUYEV, V.I.; FILIPPOV, I.N.; RYZHENKO, D.M.; CHECHERINDA, S.S.; SAMURA, I.N.; GRUDSKIY, Ye.B., red.; ANDREYEV, S.P., tekhn. red.

[Work experience of innovators in a wire rod mill] Opyt raboty novatorov provolochnogo stana. Khar'kov, Metallurgizdat, 1954. 89 p. (MIRA 16:8)
(Rolling mills—Technological innovations)

SOV/124-58-2-1759

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 2, p 38 (USSR)

AUTHORS: Ruzin, I. I., Faynshteyn, A. M., Checherinda, Ye. T.

TITLE: Design Calculation of Burners According to the UKhIN (Khar'kov Coal-chemical Scientific Research Institute)method [Raschet gorelok po metodu UKhIN]

PERIODICAL: Soobshch. Gos. soyuzn. in-ta po proyektir. predpriyatiy koksokhim. prom-sti, 1955, Nr 15, pp 1 and 88-95.

ABSTRACT: Bibliographic entry

Card 1/1

CHECHERNIKOV, V.I.

FD-798

USSR/Physics - Magnetostriction

Card 1/1 Pub. 146-11/21

Author : Volkov, D. I. and Chechernikov, V. I.

Title : Temperature dependence of magnetostriction of ferromagnetic alloys

Periodical : Zhur. eksp. i teor. fiz., 27, 208-214, Aug 1954

Abstract : Study the temperature dependence of magnetostriction of saturated ferromagnetic alloys on nickel basis (Ni-Cu, Ni-Ma, Ni-Fe). The results of measurements were in satisfactory agreement with theory. Fourteen references including 5 foreign.

Institution : Moscow State University

Submitted : October 26, 1953

CHECHERNIKOV, V. I.

CHECHERNIKOV, V. I.: "The temperature dependence of paramagnetic susceptibility of nickel alloys." Moscow state U imeni M. V. Lomonosov. Moscow, 1956 (DISSERTATION For the Degree of Candidate in PHYSICOMATHEMATICAL SCIENCE.)

So: Knixhaya letopis', No. 24, 1956

Chechernikov, V. I.

USSR / Magnetism. Ferromagnetism F - 4

Abs Jour : Ref Zhur - Fizika, No 4, 1957, No 9525

Author : Volkov, D.I., Chechernikov, V.I., Tseytlin, V.B.
Inst : Not given
Title : Temperature Dependence of Magnetostriction of Ferromagnetic Alloys.

Orig Pub : Vestn. Mosk. un-ta, 1956, No 2, 21-28

Abstract : An experimental study was made of the temperature dependence of the magnetostriction of saturation λ_s of ferromagnetic alloys with a nickel base (Ni-Cu, Ni-Co, Ni-Mn and a Ni-Fe alloy with 45% nickel) in the temperature region close to the Curie point. It was established that in this temperature region the variation of λ_s with T is linear in character, and this is in accordance with the theory of the temperature dependence of even Akulov effects. For Ni-Co al-

Card : 1/3

USSR / Magnetism..Ferromagnetism F - 4

Abs Jour : Ref Zhur - Fizika, No 4, 1957, No 9525

Abstract : loys (2.4 and 6% Co) and the Ni-Fe alloy (45% Ni) this linear dependence of λ_s on T is observed in a greater range of temperatures than for Ni-Cu and Ni-Mn. It is noted that on the λ_s (T) curves of the Ni-Cu and Ni-Mn alloys (3.7 and 8.5 atomic percent of manganese), in the direct vicinity of the Curie point (θ), there appear clearly pronounced asymptotic "tails" which vanish at $T_k > \theta$. For the case of Ni-Cu alloys, the authors establish the dependence of T_k on the composition of the alloy. The authors propose that such "tails" on the λ_s (T) curves are due to micro-irregularities in the composition and to the appearance of magnetic ordering at close distance. A study of the temperature dependence of λ_s for Ni-Co alloys (29 and 30.5% Ni) which have an allotropic transformation, has shown that at the transfor-

Card : 2/3

USSR / Magnetism . Ferromagnetism F - 4

Abs Jour : Ref Zhur - Fizika, No 4, 1957, No 9525

Abstract : mation temperature jumps appear in saturation magnetostriction, the λ_s (T) curves have considerable hysteresis, and the hysteresis loop remains unclosed at room temperatures.

Card : 3/3

CHECHERNIKOV, V.I.

137-58-1-1550

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 1, p 207 (USSR)

AUTHORS: Chechernikov, V.I.

TITLE: Paramagnetic Susceptibility of Nickel-base Ferromagnetic Alloys (Paramagnitnaya vospriimchivost' ferromagnitnykh splavov na osnove nikelya)

PERIODICAL: Vestn. Mosk. un-ta Ser. matem., mekhan., astron., fiz., khimii, 1957, Nr 1, pp 47-52

ABSTRACT: The Faraday-Sucksmith method (the elastic ring method) was used to investigate the paramagnetic susceptibility (PS) of ferromagnetic alloys (Ni-Cu, Ni-Al, Ni-Si, Ni-Sn, Ni-Cr, Ni-Mn) at temperatures above the Curie point ($1200 > T \geqslant \theta_k$) in a vacuum of appx. 10^{-3}mm Hg. The samples investigated, prepared in the form of balls of 2 mm diameter, were subjected to annealing for 8 hours before measurement. The measurements were made in a nonuniform magnetic field produced by means of shaped conical electromagnetic pole shoes. It is shown that for the Ni-Al and Ni-Si alloys the negative PS is inversely proportional to the temperature over a broad interval of temperatures, the magnitude of the interval being dependent upon

Card 1/2

137-58-1-1550

Paramagnetic Susceptibility of (cont.)

the non-ferromagnetic element contents. The PS of Ni alloys in the high temperature range may be represented in the form of the expression $\chi = \chi_k + \chi_T$ where χ_k is the PS that is independent of the temperature, and χ_t is the PS varying in accordance with the Curie-Weiss law. In the case of Ni-Cu alloys, χ_k undergoes virtually linear diminution as the Cu content rises, while in the case of other alloys, χ_k increases with the proportion of the non-ferromagnetic component and is highly dependent upon the valence of the latter. The magnetic moments and the Curie-Weiss constant diminish as the non-ferromagnetic element increases. Obviously, a portion of the s-electrons of the non-ferromagnetic element participates in the paramagnetism described by the Curie-Weiss law, while another part is involved in a paramagnetism analogous to that of Pauli. The results obtained are in good agreement with the literature data and the theory of s-d exchange interaction.

V. R.

1. Ferromagnetic materials---Annealing 2. Ferromagnetic materials---Paramagnetic susceptibility

Card 2/2

Chechernikov, V. I.

AUTHORS: Volkov, D. I. and Chechernikov, V. I. 126-1-27/40

TITLE: On the temperature dependence of the paramagnetic susceptibility of ferromagnetic alloys. (O temperaturnoy zavisimosti paramagnitnoy vospriimchivosti ferromagnitnykh splavov).

PERIODICAL: Fizika Metallov i Metallovedeniye, 1957, Vol.5, No.1, pp. 168-169 (USSR)

ABSTRACT: The temperature dependence of the paramagnetic susceptibility of ferromagnetic alloys was investigated in the temperature range from the ferromagnetic Curie point to 1200°C in vacuum by means of the Faraday-Sacksmith method for the binary alloys Ni-Cu, Ni-Al, Ni-Si, Ni-Sn, Ni-Cr and Ni-Mo in which the concentration of the non-ferromagnetic component was varied within wide limits. The investigations have shown that in the high temperature range the paramagnetic susceptibility of the studied alloys can be satisfactorily described by the relation:

$$\chi = \chi_k + \chi_T \qquad (1)$$

The results are graphed in Fig.1 and discussed in the text. There are 1 figure and 1 Slavic reference.

Card 1/2

126-1-27/40

On the temperature dependence of the paramagnetic susceptibility of ferromagnetic alloys.

SUBMITTED: September 29, 1956.

ASSOCIATION: Moscow State University imeni M. V. Lomonosov. (Moskovskiy Gosudarstvennyy Universitet imeni M. V. Lomonosova).

AVAILABLE: Library of Congress.

Card 2/2

Chechernikov, V.

18

1-42c2

Investigation of ferromagnetic alloys in the transition region. V. I. Chechernikov. *Vestnik Moskov. Univ., Ser. Mat., Mekh., Astron., Fiz. i Khim.* 12, No. 1, 53-6(1957).—The alloys Ni-Cu do not obey the Curie-Weiss law in the transition area at temp. ca 60-170° $\geq \theta_f$. Only at high temps. do these alloys follow the law. The equation $H = \alpha\sigma + \beta\sigma^3 + \gamma\sigma^5$ satisfactorily expresses the dependence of σ (magnetization) on H in the interval 900 to 10,000 oersteds, where α, β, and γ are coeffs. depending on the temp. and concn. of nonmagnetic metals (I) (as expts. showed). Near the Curie point, σ at const. H decreases with increasing temp. Dependence of λ on H is marked at temps. near θ_f but with increasing temp. this dependence diminishes and at high temp. practically disappears. The regime of thermal treatment of alloys have no effect on the temp. interval corresponding to the transition area and on the character of change of magnetic properties in this area. The paramagnetic Curie point, like the ferromagnetic point, depends on the concn. and valency of I in alloys. This dependence at small amt. may be expressed very well by the following simple linear law: $(\theta_p)_{alloy} = (\theta_p)_{Ni}(1 - a\nu c)$ where c is at. % of I, ν is no. of valence electrons of I, and a is a const. for different alloys. M. Charmandarian

Moskovskiy universitet,
Kafedra magnetizma.

CHECHETKIN V.I.

KONOVALOV, V.V.; CHECHETKIN, V.I.; ZALIZNYAK, D.V.; FIRER, M.Ya.

Preliminary heat treatment of glass batches. Stek.i ker. 14 no.7:1-6 Jl '57. (MLRA 10:8)

(Glass manufacture)

CHECHERNIKOV V.I.

AUTHORS: Volkov, D. I., Chechernikov, V. I. 48-8-10/25

TITLE: Temperature Dependence of the Paramagnetic Susceptibility of Alloys on a Nickel-basis (Temperaturnaya zavisimost' paramagnitnoy vospriimchivosti splavov na osnove nikelya).

PERIODICAL: Izvestiya AN SSSR Seriya Fizicheskaya, 1957, Vol. 21, Nr 8, pp. 1111-1115 (USSR)

ABSTRACT: As an introductory remark it is maintained here that this field of research has not been fully explored. From a theoretical point of view it is generally assumed, that the paramagnetic susceptibility of ferromagnetic metals in the range of temperatures above the ferromagnetic Curie-point $T > \Theta_f$ is caused by the inner electrons. Whereas the role of the outer electrone is not touched at all. Under certain circumstances, however, the consideration of the effect of s-electrons might be of great importance in the range of temperatures above the Curie-point, because here the peculiarities of the temperature dependence of the paramagnetic susceptibility of alloys containing non-ferromagnetic

CARD 1/3

Temperature Dependence of the Paramagnetic Susceptibility of Alloys on a Nickelbasis 48-8-10/25

elements with differing valence must be taken into consideration. This problem was investigated in this paper. Experimental research was executed on pure nickel and its alloys with non-ferromagnetic components: Ni-Cu, Ni-Zn, Ni-Al, Ni-Si, Ni-Mo and Ni-Cr in the temperature range from the Curiepoint up to 1200°C. The method by Faraday-Sucksmith was employed for the measurement of the paramagnetic susceptibility, the investigations being conducted in vacuum up to 1200°C. The conclusions drawn here are such, that the paramagnetic susceptibility of ferromagnetic alloys does not follow the law by Curie-Weiss, at high temperatures, but the generall law $X = X_k + \frac{C}{T-\theta_p}$, C denoting the Curie-Weiss constant, θ_p the parametric Curie point, X_k a X independent of temperature. Further research furnished, that the paramagnetic susceptibility is largely dependent on the

CARD 2/3

strength of the magnetic field at temperatures near the Curie point, and that with an increase of the concentration of the non-ferromagnetic components in the nickel alloy the values of the coefficients dependent upon temperature and the composition of the alloy decrease. Near the Curie point the parameter varies with a linear relation and drops to zero at the Curie point. There are 8 figures and 7 references, 1 of which is Slavic.

ASSOCIATION: Deptment of Physics of the Moscow State University imeni M. N. Lomonosow (Fizicheskiy fakul'tet Moskovskogo gos. universiteta im. M. V. Lomonosova)

AVAILABLE: Library of Congress

CHECHERNIKOV, V. I.

VOLKOV, D. I., KONDORSKIY, E. I., KRINCHIK, G. S., MIRYASOV, N. A., PARSANOV, A. P., RODE, V. E., CHECHERNIKOV, V. I., and GOFMAN, U. (Moscow) (Univ.)

"Results of Studies of Certain Magnetic and Magneto-Optical Properties of Ferro-Magnetics:"

I "Saturation Magnetization of CuNi Alloys at Low Temperatures."
II "Magnetic PRoperties of MnB System."
III "Temperature Dependence of Paramagnetic Susceptibility of Ferrites."
IV "Magneto-Optical Resonance in Ferromagnetics." k (Krinchik)

report presented at Colloquim on Magnetism, Grenoble, France, 2-5 Jul 58.

Eval: B - 3,111,755 3 Sep 58.

24(3) SOV/155-58-2-44/47

AUTHORS: Volkov, D.I., and Chechernikov, V.I.

TITLE: The Temperature Dependence of the Paramagnetic Receptivity of Some Ferrites (Temperaturnaya zavisimost' paramagnitnoy vospriimchivosti nekotorykh ferritov)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Fiziko-matematicheskiye nauki, 1958, Nr 2, pp 208-213 (USSR)

ABSTRACT: The present paper is a report on the experimental investigation of the temperature dependence of the paramagnetic receptivity of several ferrites (nickel-, cobalt-, manganese-, magnesium-, lithium ferrites). It was stated: in the immediate neighborhood of the ferromagnetic Curie-point the receptivity is a function of the temperature and the field. For higher temperatures the depedence on the field suspends, but not always it follows the law of Neel [Ref 1]; e.g. the behavior of the manganese ferrite in the interval from 673°K to 900°K deviates essentially from Neel without depending on the field. For 1360°K the receptivity of the lithium ferrite changes desultorily.
There are 5 figures, and 4 references, 2 of which are Soviet, and 2 American.

Card 1/2

The Temperature Dependence of the Paramagnetic Receptivity of Some Ferrites SOV/155-58-2-44/47

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova (Moscow State University imeni M.V.Lomonosov)

SUBMITTED: January 17, 1958

Card 2/2

24(3)

AUTHOR: Chechernikov, V.I.

SOV/55-58-4-16/31

TITLE: On Paramagnetic Susceptibility of the Alloys Ni-Ag and Ni-W (O paramagnitnoy vospriimchivosti splavov Ni-Ag i Ni-W)

PERIODICAL: Vestnik Moskovskogo universiteta, Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1958, Nr 4, pp 145-146 (USSR)

ABSTRACT: The author investigated the temperature dependence of the paramagnetic susceptibility from the Curie-point to 1200° C for 10^{-3} mm Hg. It was stated that $1/\chi$ is no straight line but a curve concave with respect to the T-axis. The author confirmed the formula

$$(1) \qquad \chi = k + \frac{c}{T - T_p},$$

where T_p is the paramagnetic Curie-point, c is the Curie-Weiß constant. k is the magnetic susceptibility; (1) is valid for $T > T_f$, T_f is the ferromagnetic Curie-point for Ni-Cu, Ni-Zn, Ni-Al, Ni-Si, Ni-Sn, Ni-Cr, Ni-Mo.

There are 2 figures, 1 table, and 2 Soviet references.

ASSOCIATION: Kafedra magnetizma (Chair of Magnetism)

SUBMITTED: October 14, 1957

Card 1/1

24(3)
AUTHORS: Chechernikov, V. I., Volkov, Yu. D. SOV/56-35-4-6/52

TITLE: The Temperature Dependence of Paramagnetic Susceptibility in Nickel-Zinc Ferrites (Temperaturnaya zavisimost' paramagnitnoy vospriimchivosti nikel'-tsinkovykh ferritov)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 4, pp 875-879 (USSR)

ABSTRACT: Whereas for ferromagnetic metals and alloys the paramagnetic susceptibility χ obeys the Curie-Weiss (Kyuri-Veyss) law at high temperatures ($T > \theta_{Curie}$), this is not the case with the temperature dependence of χ in ferrites. The first theoretical investigation of these regularities was carried out by Neel (Ref 1); the results he obtained are described in short. They agree well with experimental results. In the case of alloys a considerable degree of dependence of C- and θ-values on composition (C - Curie-Weiss constant, θ - Curie point) was found. Already in a previous paper the authors carried out an experimental investigation of the temperature dependence of χ; the experimental system is described by reference 4.

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The Temperature Dependence of Paramagnetic Susceptibility in Nickel-Zinc Ferrites

SOV/56-35-4-6/52

The present paper gives the results obtained by numerous measurements. Figure 1 shows the dependence of $1/\chi$ on T within the range of 300-1500°K for 10 different ferrites. Whereas for Fe_2O_3.ZnO $1/\chi$ increases practically linearly with T, the other curves are more or less curved towards the T-axis, especially that for Fe_2O_3.NiO. Figures 2 and 3 show the dependence of the constants θ, C_H, σ and $1/\chi_0$ on the percentage of the ZnO content in ferrite. Figure 4, on the other hand, shows the dependence of $1/\chi$ on T, viz. experimental curves together with those calculated according to Neel's law. It is shown that, within the range of about 850-1500°K, the theoretical and experimental curves coincide. The authors further investigated the magnetization curves for Fe_2O_3•0.5 NiO•0.5 ZnO (Fig 6) at 5 different temperatures (range 537-556°K). It was found that with increasing T the specific magnetization σ decreases; the course of the curves $\sigma(H)$(range 0-5000 Oe) more and more develops into a straight line. For $H(\sigma)$ near θ_{Curie} the

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The Temperature Dependence of Paramagnetic Susceptibility in Nickel-Zinc Ferrites

SOV/56-35-4-6/52

formula $H = a\sigma + b\sigma^3$ is given. The authors thank Professor Ye. I. Kondorskiy and D. I. Volkov for discussing the results. There are 6 figures and 5 references, 2 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: May 5, 1958

Card 3/3

CHECHERNIKOV, V.I.; VOLKOV, Yu.D.

Study of nickel zinc ferates in the transitional region. Vest Mosk. un. Ser. mat., mekh., astron., fiz., khim. 14 no.2:101-105 '59
(MIRA 13:3)

1. Kafedra magnetizma Moskovskogo gosuniversiteta.
(Nickel zinc ferrates)

24.2200
~~24 (3), 18 (6)~~

68044
SOV/55-59-3-12/32

AUTHOR: Chechernikov, V. I.

TITLE: The Temperature-dependence of the Paramagnetic Susceptibility of Nickel - Magnesium and Nickel - Manganese Ferrites

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1959, Nr 3, pp 93 - 96 (USSR)

ABSTRACT: In the present paper nickel-magnesium and nickel-manganese ferrites of the composition $Fe_2O_3NiO_{1-z}MO_2$ are investigated within the wide temperature interval ranging from the ferromagnetic Curie point Θ_f to ~ 1500°K. In the above formula M denotes the bivalent metal manganese or magnesium. The five samples investigated of the nickel-manganese ferrite system corresponded to the following values of z: 0, 0.2, 0.4, 0.6, and 1. From the system of nickel-magnesium ferrites 6 samples with the following values of z were investigated: 0, 0.2, 0.3, 0.5, 0.75, and 1. Moreover, nickel-manganese samples with z = 0, 0.2, 0.4, 0.6, and 1 were investigated. No phase transformations occur in the samples used in this case within the temperature interval under investigation.

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The Temperature-dependence of the Paramagnetic Susceptibility of Nickel - Magnesium and Nickel - Manganese Ferrites

Two diagrams show the temperature dependence of the inverse molar susceptibility for all ferrites investigated within the temperature interval of from 650 to ~ 1500°K. Two other diagrams show the coefficients C, σ, $1/\chi_0$, and Θ, which are contained in Neel's law $\frac{1}{\chi} = \frac{1}{\chi_0} + \frac{T}{C} - \frac{\sigma}{T-\Theta}$, as functions of the percentage of MgO and MnO in the ferrite. These constants decrease for nickel manganese ferrites with an increase in the MnO-content. In nickel-magnesium ferrites this decrease is less distinctly marked, and $1/\chi_0$ even increases slightly with an increase in the MgO-content in the ferrite. The decrease of C (which apparently characterizes the paramagnetic moment), is due to the fact that the manganese- and magnesium atoms lose electrons, thus reducing the non-compensated electron spins of the nickel- or iron ions. The variation of the parameter $1/\chi_0$ is essentially correlated with the variation of the constant n of the molecular field. The decrease of σ with increasing z may be explained by the fact that n decreases with an increase of the

number of magnesium- and manganese ions. The decrease of Θ with increasing z is explained mainly by the decrease of n and C and the exchange interaction of the ions in the various sublattices. The theoretical curves for C, σ, $1/\chi_0$, and Θ are in practical agreement with experimental curves. Neel's law applies to all ferrites in a wide temperature interval of about 850 - 1500°K. It would be of interest to investigate these ferrites in the immediate vicinity of the ferromagnetic Curie point in order to study the range of ferromagnetic transition. The author thanks D. I. Volkov for some useful advice. There are 4 figures and 5 references, 2 of which are Soviet.

ASSOCIATION: Kafedra magnetizma (Chair for Magnetism)

SUBMITTED: December 29, 1958

Card 3/3

S/188/60/000/03/05/008
B019/B056

AUTHORS: Chechernikov, V. I., Uchaykina, R. F.

TITLE: The Temperature Dependence of the Magnetic Susceptibility of Ferrite-garnets of Yttrium and Gadolinium

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya 3, fizika, astronomiya, 1960, No. 3, pp. 37 - 41

TEXT: The garnets investigated here have the formulas $5Fe_2O_3 \cdot 3Y_2O_3$ and $5Fe_2O_3 \cdot 3Gd_2O_3$, the samples were of spherical shape and had a diameter of 1 - 1.5 mm. The measurements were carried out at field strengths of from 1,500 to 20,000 oersteds and at temperatures of from 500 to 1350°K. From the temperature dependence of the reciprocal of molar susceptibility near Curie point it may be seen that susceptibility changes slowly with temperature. Within this range, susceptibility is a function of field strength, whereas at higher temperatures it depends only on temperature. Formula (1) is given, which describes the dependence of the intensity of magnetization σ on the magnetic field in the neighborhood of the Curie temperature:

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The Temperature Dependence of the Magnetic Susceptibility of Ferrite-garnets of Yttrium and Gadolinium

S/188/60/000/03/05/008
B019/B056

$H = \alpha\sigma + \beta\sigma^3$ (α and β are temperature-dependent coefficients). Fig. 2 shows that with rising temperature and fixed magnetic field strength, magnetization rapidly decreases. This diagram further shows that the isothermal lines of magnetization are nonlinear only in the ferromagnetic region, while in the paramagnetic region they may be approximated by a straight line; in this case, susceptibility depends only on H. In Fig. 5 experimental results concerning the dependence of reciprocal molar susceptibility on absolute temperature within the range of from 640 to 1350°K are compared with the theoretical results calculated according to Neel (Ref. 6). There are 5 figures, 1 table, and 7 references: 2 Soviet, 4 French, and 1 German.

ASSOCIATION: Kafedra magnetizma (Chair of Magnetism)

SUBMITTED: October 14, 1959

Card 2/2

82328

S/139/60/000/03/006/045

E032/E314

24.2200

AUTHORS: Chechernikov, V.I. and Uchaykina, R.F.

TITLE: Temperature Dependence of the Paramagnetic Susceptibility of Nickel-cadmium Ferrites

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1960, Nr 3, pp 39 - 42 (USSR)

ABSTRACT: The paramagnetic susceptibility was measured by an apparatus based on the Faraday-Sucksmith method. The susceptibility was measured in a vacuum in the temperature interval between 300 and about 1 400 °K. The high temperatures were obtained with the aid of a furnace made of a quartz tube and heated by platinum wire. The temperature of the furnace was measured by a platinum-platinum rhodium thermocouple. 20-40 mg specimens were investigated in fields between 900 and 20 000 Oe. The specimens were mixed Ni-Cd ferrites described by the formula $Fe_2O_3(1 - z)NiO \cdot zCdO$, where z was varied between 0 and 1. The ferrites were obtained from the oxides Fe_2O_3, NiO and CdO, which were mixed and compressed under a pressure of 3 t/cm^2 and then heated at 1 250 °C for three hours.

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82328
S/139/60/000/03/006/045
E032/E314

Temperature Dependence of the Paramagnetic Susceptibility of Nickel-cadmium Ferrites

Figure 1 plots the reciprocal of the molar susceptibility as a function of temperature for the specimens indicated. As the CdO concentration increases, the dependence of $1/\varkappa$ on T gradually becomes linear. According to the Neel theory the reciprocal of the susceptibility as a function of temperature is given by Eq (1). Using experimental values for the constants in this expression, one can calculate the theoretical dependence of the reciprocal susceptibility on temperature. Figure 2 gives this dependence. The dotted curves are theoretical and the continuous curves are experimental. The two curves coincide in a wide temperature interval. The area of agreement increases with increasing cadmium-oxide concentration. The curves do not agree near the ferromagnetic Curie point. Measurements were also carried out of the magnetic susceptibility near the ferromagnetic Curie point. It was found that near Θ_f there is a temperature region where the susceptibility is weakly

Card2/3

S/139/60/000/03/006/045
E032/E314

Temperature Dependence of the Paramagnetic Susceptibility of Nickel-cadmium Ferrites

dependent on T but is a function of the magnetic field H . The dependence of the specific magnetisation σ on H is described by an expression of the form given by Eq (2), which holds between 1 000 and 10 000 Oe. The coefficients α and β depend on temperature and concentration. The coefficient α varies linearly with temperature near Θ_f but vanishes at $T = \Theta_f$.

The coefficient β varies nonlinearly with temperature. These facts were used to determine the ferromagnetic Curie points for ferrites with $z = 0$, 0.1, 0.2, 0.3, 0.4, 0.5 and 0.6, for which the Curie points were 843, 750, 710, 635, 580, 540 and 480 °K, respectively. Thus, the ferromagnetic Curie point is a practically linear function of the cadmium-oxide content of the ferrite.
There are 4 figures and 4 references, 3 of which are French and 1 is Soviet.

ASSOCIATION: Moskovskiy gosuniversitet imeni M.V. Lomonosova
(Moscow State University imeni M.V. Lomonosov)

SUBMITTED: March 9, 1959
Card3/3

CHECHERNIKOV, V.I.; UCHAYKINA, R.G.

Investigating ferrates in ittrium and gadolinium garnets in the vicinity of the ferromagnetic Curie point. Fiz.met.i metalloved. 9 no.3:456-458 Mr '60. (MIRA 13:6)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova. (Ferrates) (Curie point)

85962

24.2200 1144, 1395, 1482, 1162

S/126/60/010/005/006/030
E032/E414

AUTHOR: Chechernikov, V.I.

TITLE: Temperature Dependence of the Ferromagnetic Susceptibility of Iron Nickel Alloys

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol.10, No.5, pp.672-675

TEXT: It is known that the paramagnetic susceptibility of nickel alloys at temperatures very much greater than the ferromagnetic Curie temperature may be represented as a sum of two terms, namely

$$\chi = \chi_k + \chi_T \qquad (1)$$

The magnetic susceptibility χ_T follows the Curie - Weiss law

$$\chi_T = C/T - \Theta_p$$

where C is the Curie - Weiss constant and Θ_p is the paramagnetic Curie temperature. The quantity χ_k is not temperature dependent and is, in fact, a susceptibility of the

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85962
S/126/60/010/005/006/030
E032/E414

Temperature Dependence of the Ferromagnetic Susceptibility of Iron Nickel Alloys

Pauli type. It has been shown experimentally by the present author and Volkov (Ref.1) that χ_k strongly depends on the concentration of the non-ferromagnetic component in the alloy. It increases with this concentration, and the rate of increase is greater for greater valencies of the non-ferromagnetic component. In the present paper, the author reports a study of iron-nickel alloys which has not so far been carried out from the above point of view. Alloys containing 89.6, 80.3, 77.6, 75.1, 69.0, 58.8, 48.5 and 38.8 at.% Ni were investigated. The paramagnetic susceptibility was measured using an apparatus described by the present author in Ref.3. This apparatus is based on the Faraday - Sucksmith method. All the measurements were carried out in an argon atmosphere. Fig.1 shows the reciprocal of the paramagnetic susceptibility as a function of temperature in the range 400 to 1200°C. The curve marked 1 refers to pure nickel and the remaining numbers refer to the above eight nickel concentrations respectively. In most cases the dependence is

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Temperature Dependence of the Ferromagnetic Susceptibility of Iron Nickel Alloys

practically linear. Only in the 89.6 and 80.3% alloys can one detect a small departure from linearity. In these two cases the curve bends towards the temperature axis. In the first of these two alloys this departure begins at about 1000°C and in the second at about 1100°C. In other words, the linear parts of the plot of reciprocal susceptibility versus temperature become longer for lower concentrations of nickel, and below 77% Ni all the plots are linear in the above temperature interval, i.e. these alloys obey the Curie - Weiss law. The dotted lines in Fig.1 represent a plot of

$$\frac{1}{\chi - \chi_k} = f(T)$$

for the above two alloys. This relation is linear. Fig.2 shows a plot of χ_k as a function of the atomic concentration of iron in the alloys. As can be seen, the temperature independent

85962

S/126/60/010/005/006/030
E032/E414

Temperature Dependence of the Ferromagnetic Susceptibility of Iron Nickel Alloys

susceptibility χ_k decreases with iron concentration and is practically zero at a nickel concentration of about 75%. Beyond this value χ_k remains unaltered. The results obtained by the present author suggest that χ_k depends not only on the paramagnetism of the conduction electrons and the s - d exchange interaction, but also on the diamagnetic properties of the metal. It follows that in studying ferromagnetic metals and alloys in the paramagnetic region, both paramagnetic and diamagnetic properties of these materials should be taken into account. There are 3 figures and 9 references: 5 Soviet and 4 Non-Soviet (one of which is translated into Russian).

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova (Moscow State University im. M.V.Lomonosov)

SUBMITTED: February 2, 1960

Card 4/4

9.4300 (1147, 1151, 1155)
24.2200 1164, 1160, 1138

21210
S/188/61/000/001/005/009
B108/B209

AUTHORS: Chechernikov, V. I., Kol'chenko, V. G.

TITLE: Temperature dependence of the paramagnetic susceptibility of copper-cadmium ferrites

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya 3, fizika, astronomiya, no. 1, 1961, 36-39

TEXT: In order to check the correctness of Neel's hyperbolic law of the temperature dependence of the paramagnetic susceptibility for high temperature, the authors studied copper-cadmium ferrites containing cadmium ferrite of normal spinel structure. The ferrites were prepared from Fe_2O_3, CuO, and CdO powders which were mixed with ethyl alcohol for 44 hr. Subsequently, the mixture was dried, sifted, and mixed with polyvinyl alcohol. Samples were pressed at 3 tons/cm^2, annealed at 1050°C for 3 hr, and slowly cooled to room temperature. The cylindrical samples (1.5 mm high) were examined between 300 and 1400°K, using the Faraday-Sucksmith method (Ref. 4: Sucksmith W. Proc. Roy. Soc., A170, 551, 1939). Fig. 1 shows the temperature dependence of the reciprocal molar para-

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Temperature dependence of the...

magnetic susceptibility of various copper-cadmium ferrites between their respective ferromagnetic Curie points and 1400°K. It is seen that with rising CdO content in the ferrite, the curves are gradually straightened. On the basis of experimental data, the authors determined the constants in Neel's law. Fig. 2 shows a comparison of the theoretical curves, as calculated with these constants and Neel's law, and the experimental ones. Finally, the authors studied the dependence of the constants ($\sigma, 1/\chi_0, \theta, C$) in Neel's law (Ref. 3: Neel L. Ann. Phys., 3, 137, 1948) on the percentual content of cadmium ferrite ($CdO \cdot Fe_2O_3$) in the composite ferrite. They found that all the constants decrease with increasing content of cadmium oxide. The results show that the paramagnetic susceptibility of the ferrites under discussion follows Neel's law in the range of high temperatures. [Abstracter's note: In the original legends to the figures, the symbol Gd should read Cd]. There are 4 figures and 5 references: 3 Soviet-bloc and 2 non-Soviet-bloc.

ASSOCIATION: Kafedra magnetizma (Department of Magnetism)

SUBMITTED: July 27, 1960

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Temperature dependence of the...

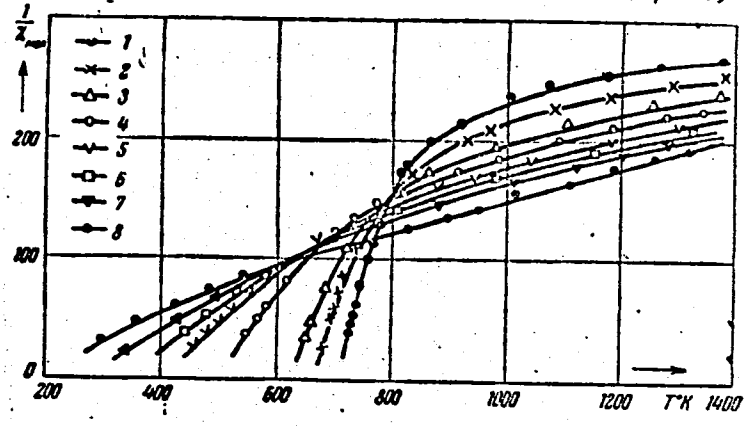

Fig. 1

Legend to Fig. 1: (1) $Fe_2O_3 \cdot CuO$; (2) $Fe_2O_3 \cdot 0.9CuO \cdot 0.1GdO$; (3) $Fe_2O_3 \cdot 0.8CuO \cdot 0.2GdO$; (4) $Fe_2O_3 \cdot 0.6CuO \cdot 0.4GdO$; (5) $Fe_2O_3 \cdot 0.5CuO \cdot 0.5GdO$; (6) $Fe_2O_3 \cdot 0.4CuO \cdot 0.6GdO$; (7) $Fe_2O_3 \cdot 0.3CuO \cdot 0.7GdO$; (8) $Fe_2O_3 \cdot GdO$.

Temperature dependence of the...

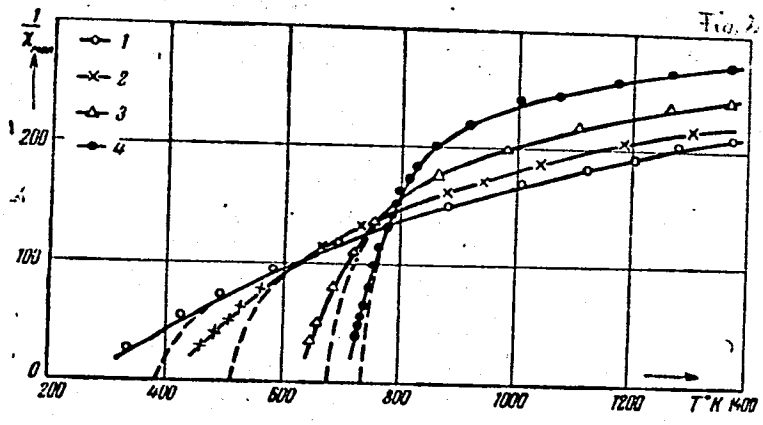

Fig. 2

Legend to Fig. 2: (1) $Fe_2O_3 \cdot 0.7GdO \cdot 0.3CuO$; (2) $Fe_2O_3 \cdot 0.5GdO \cdot 0.5CuO$; (3) $Fe_2O_3 \cdot 0.2GdO \cdot 0.8CuO$; (4) $Fe_2O_3 \cdot CuO$.

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30076
S/048/61/025/011/022/031
B117/B102

24.7900 (1055, 1144, 1163)
15.2660

AUTHOR: Chechernikov, V. I.

TITLE: Temperature dependence of the paramagnetic susceptibility of mixed ferrites

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 25, no. 11, 1961, 1399-1402

TEXT: The constants C_N, Θ, $1/\chi_o$, and σ contained in the law $1/\chi = 1/\chi_o + T/C_H - \sigma/(T - \Theta)$, (1), first established by Neel for ferrites were studied between ferromagnetic Curie point and 1500°K as functions of ferrite composition. The following ferrite systems were examined: $Fe_2O_3(1 - z)NiO \cdot zMO$ and $Fe_2O_3(1 - z)CdO \cdot zPO$. M stands for Zn, Cd, Mg, Mn, and P for Cu and Li. The quantity z varied between 0 and 1. The numerical values of the above constants were determined from experimental data. Applying the values thus found, the theoretical $1/\chi = f(T)$ can be calculated from (1). Θ, χ_o, and σ depend on

Temperature dependence of ...

the constants of the molecular field, on the number of magnetically active iron ions, and on their atomic constant C_N. A satisfactory agreement between theoretical and experimental values can be observed only at high temperatures. It was found in all examined cases, although the character of the curves $1/\chi = f(T)$ differs most widely. In all nickel-base ferrites, C_N dropped nonlinearly with rising content of the second component. The same was also observed to hold for the other constants. A particularly strong change of the constants is observed in mixed ferrites. It was shown that mixed ferrites, like simple ferrites and metals, possess a transition region in which χ depends not only on T but also on H. The width of this region, which depends on the divergence between experimental and theoretical results, can be narrowed by 50-60° by heat treatment (10 hr at 1200°K and chilling in water) (Ref. 3: Chechernikov, V. I., Volkov, Yu. D., Vestn. Mosk. un-ta, 2, 101 (1959)), but cannot be eliminated. Systematic studies of a large group of mixed ferrites have shown that the constants C_N, θ, $1/\chi$, and σ depend on the ...mite composition in a specific manner, and that the magnetic structure ...can be determined from $1/\chi = f(T)$ in the paramagnetic region.

30076
S/048/61/025/011/022/031
B117/B102

Temperature dependence of ...

In the case of a linear dependence (Curie - Weiss law) a magnetic structure of normal ferromagnetics is observed if $\theta_p > 0$, while the structure of compensated antiferromagnetics can be observed if $\theta_p < 0$. Ferrimagnetics are subjected to Neel's law in the paramagnetic region. There are 5 figures and 3 references: 2 Soviet and 1 non-Soviet. The reference to the English-language publication reads as follows: Ref. 1: Neel L., Ann. Phys., 3, 137 (1948).

ASSOCIATION: Kafedra magnetizma fizicheskogo fakul'teta Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova (Department of Magnetism of the Physics Division of Moscow State University imeni M. V. Lomonosov)

Card 3/3

22121

S/056/61/040/003/001/031
B111/B202

24.2200

AUTHORS: Chechernikov, V.I., Kol'chenko, V.G.

TITLE: Antiferromagnetic properties of cobaltous oxide

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 3, 1961, 721 - 724

TEXT: The authors studied the magnetic susceptibility of CoO between 100 - 700°K. The temperature dependence showed a sharp peak at 292°K. Furthermore, the authors determined the dependence of susceptibility on the magnetic field in antiferromagnetic state and in the region of the antiferromagnetic Curie point. The authors determined the dependence of the magnetic susceptibility on the magnetic field strength H in CoO because the dependence mentioned in the references (J.Phys. et Radium, 12, 765, 1951; ZhETF, 33, 1119, 1957; J. de Phys., 12, 170, 1951) was different in other substances. This fact has hitherto not been fully explained. Magnetic susceptibility was determined by measuring the force acting upon a sample which has been brought into an inhomogeneous magnetic field. The

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22121
S/056/61/040/003/001/031
B111/B202

Antiferromagnetic properties ...

force was measured by determining the deformation of an elastical circular ring consisting of beryllium bronze. For a mass of 10 - 25 mg of the sample the point of the scale denotes a value of $\sim 10^{-7}$. The low temperatures of about 100°K were produced by evaporating liquid nitrogen. By means of quartz threads the sample was freely suspended in a double-wall glass tube. The individual chambers were filled with nitrogen vapor in order to keep the temperatures as constant as possible. The temperature was measured by means of a copper-constantan thermocouple. The studies were made with magnetic field strengths of up to 18,000 oe. The antiferromagnetic Curie point (292°K) is independent of the external magnetic field. If the curve in Fig. 1 is extrapolated until the absolute zero is attained a magnetic susceptibility of $\sim 55 \cdot 10^{-6}$ is obtained. Above 470°K the curve shown in Fig. 2 obeys the Curie-Weiss law. The authors obtained C = 3.05 for the Curie-Weiss constant, $P_p = 4.97$ for the atomic magnetic moment, and $\Theta_p = -270°K$ for the paramagnetic Curie point. L.D. Landau is mentioned. There are 4 figures and 11 references: 2 Soviet-

Antiferromagnetic properties ...

bloc and 9 non-Soviet-bloc. The 2 most recent references to English language publications read as follows: J. R. Singer, Phys. Rev., 104, 929, 1956; W. Sucksmith, Proc. Roy, Soc., A 170, 551, 1939.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet
(Moscow State University)

SUBMITTED: January 29, 1960 (initially)
October 31, 1960 (after revision)

Card 3/7 3

37418

S/188/62/000/002/003/013
B104/B102

24.2200

AUTHOR: Chechernikov, V. I.

TITLE: A study of nickel-cadmium ferrites in the transition range

PERIODICAL: Moscow. Universitet. Vestnik. Seriya III. Fizika, astronomiya, no. 2, 1962, 20-23

TEXT: The investigation of nickel-cadmium ferrites near the ferromagnetic Curie point was based on an experimental arrangement described previously (V. I. Chechernikov, "Vestn. Mosk. un-ta", ser. matem., mekhan., astron., fiz., khimii, no. 1, 1957). The ferrites were obtained from Fe_2O_3, NiO and CdO powder by pressing and sintering. In the transition range above the ferromagnetic Curie point the magnetic susceptibility varies slowly with the temperature in the beginning and decreases rapidly with increasing temperature afterwards. In the transition range the magnetic susceptibility depends on the magnetic field strength. Only at high temperatures does it depend on the temperature alone and obeys the Neel law. The magnetization curve in the transition range can be described by

A study of nickel-cadmium ...

$\alpha\sigma + \beta\sigma^3 = H$, where α and β are coefficients depending on temperature and concentration. In fields of 1000-1500 oersteds the second term of this equation is of importance at temperatures near the Curie point. At higher temperatures the value of this term decreases and magnetization becomes a linear function of the magnetic field strength. α and β are positive in the temperature range investigated. α is a linear function of temperature and tends toward zero for $T \to \theta_f$. β is no linear function of temperature; at θ_f it possesses a minimum. Most ferrites have similar characteristics. There are 4 figures.

ASSOCIATION: Kafedra magnetizma (Department of Magnetism)

SUBMITTED: May 3, 1961

Card 2/2

38878

S/188/62/000/003/003/012
B111/B112

24 2200

AUTHOR: Chechernikov, V. I.

TITLE: Some magnetic properties of a Europium ferrite garnet

PERIODICAL: Moscow. Universitet. Vestnik. Seriya III. Fizika, astronomiya, no. 3, 1962, 27-29

TEXT: The author studied the ferrite garnet $3Eu_2O_3 \cdot 5Fe_2O_3$ near the ferromagnetic Curie point $\Theta_f = 280^0$ using the ponderomotive method (V. I. Chechernikov, R. F. Uchaykina, "Vestn. Mosk. un-ta", ser. fiz., astronomii, no. 3, 1960). For $T < \Theta_f$ the specific magnetic susceptibility χ changes only slowly with temperature. For $T > \Theta_f$, χ rapidly decreases. Near the Curie point, $\alpha\sigma + \beta\sigma^3 = H$ (1) states the dependence of the specific magnetization σ on the field strength H where α, β are temperature and pressure dependent coefficients. (1) holds only for pure magnetization. The nonlinearity of (1) gradually decreases as the temperature increases and stops at $T = 289^0$. The Θ_f can be exactly evaluated after determining the

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Some magnetic properties of... ,

functions $\alpha(T)$, $\beta(T)$ experimentally; this is of special theoretical importance. Finally, it is established that the region in which (1) holds, where χ depends only on T and not on H, is much narrower (8-10°) for ferrite garnets than for other ferromagnetics. There are 3 figures.

ASSOCIATION: Kafedra magnetizma (Department of Magnetism)

SUBMITTED: June 4, 1961

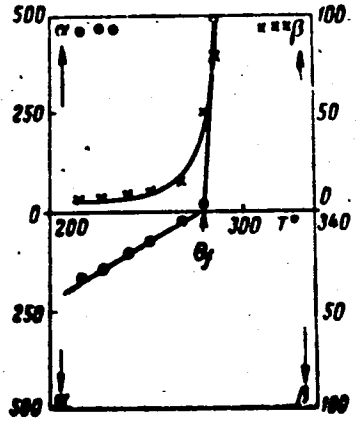

Fig. 3

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S/126/62/013/001/008/018
E032/E314

AUTHORS: Chechernikov, V.I. and Galeyev, G.S.

TITLE: A study of iron-base alloys in the paramagnetic region

PERIODICAL: Fizika metallov i metallovedeniye, v. 13, no. 1, 1962, 93 - 96

TEXT: The authors report a study of ordered Fe-Al and Fe-Mo alloys, whose magnetic properties in the paramagnetic region have not as yet been investigated. The paramagnetic susceptibility was measured in the range 750 - 1 200 °C with the aid of the Sucksmith balance; the particular alloys examined were as follows: 4.06; 5.98; 12.70; 19.57; 21.60; 24.70 and 28.5 at.% Al and 0.95; 2.49; 5.6 and 6.1 at.% Mo. It was found that for the Fe-Al alloys the susceptibility was inversely proportional to the temperature. The paramagnetic Curie point of the Fe-Al alloys was a linear function of the concentration up to 22 at.% Al. Thereafter, even a small change in the concentration of Al gave rise to a more rapid reduction in the paramagnetic

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Curie point and for an alloy with 24.7 at.% Al in an unordered state θ_p = 236 °C. It was found from the relation between the paramagnetic Curie point θ_p and the percentage concentration of Al that the Curie point for pure Fe should be 828 °C and this is in good agreement with published data. In the case of Fe-Mo alloys the law relation between the reciprocal of the susceptibility and the absolute temperature is again linear for 6.1 and 5.6 at.% Mo but at 0.95 at.% Mo and 2.49 at.% Mo there is a discontinuity at 930 °C. This is ascribed to an $\alpha \rightarrow \gamma$ transition. Below this point the Curie-Weiss law is found to hold. The paramagnetic Curie point of Fe-Mo alloys decreases with concentration of Mo less rapidly than in the case of Fe-Al alloys. The general conclusion is that the above alloys follow the linear Curie-Weiss law at high temperatures and the susceptibility due to conduction electrons is zero. The magnetic properties of ordered alloys in the paramagnetic region are very dependent on the degree of order. Thus, for example, the paramagnetic Curie point of an alloy with 24.7 at.%

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Al increases from 256 deg for the unordered state to 364 deg for the ordered state. There is also an appreciable change in the Curie-Weiss constant and the mean number of Bohr magnetons per atom of the alloy.
There are 4 figures and 1 table.

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