KURKCHI, M.F.; MEL'NICHENKO, Ye.D. [Mel'nychenko, IE.D.]

Extracurricular work of 3d course students at the Faculty of Natural Sciences. Nauk. zap. ChDPI 8:23-26 '56. (MIRA 11:2)
(Natural history--Study and teaching)
(Cherkassy--Teachers, Training of)

USSR/Human and Animal Physiology. Nervous System. T
Higher Nervous System. Behavior.

Abs Jour: Ref Zhur-Biol., No 20, 1958, 93662.

Author : Kurkchiy, M.F., Polinskaya, V.I., Kurkchiy, L.M.
Inst : Cherkask State Pedagogical Institute.
Title : The Problem of the Influence of Fine Differentiation on Subsequent State of the Nervous System.

Orig Pub: Nauk. zap. Cherkas'k. derzh. ped. in-t, 1957, 11, 327-334.

Abstract: After application of fine differentiations to conditioned salivary reflexes in food reinforcement during 2 - 5 days in 3 dogs there appeared a gradual inhibition of all the earlier elaborated reactions, a decrease in the extent of positive reactions, or a chaotic occurrence of positive and inhibitory reactions. The duration

Card : 1/2

USSR/Human and Animal Physiology. Nervous System. T
Higher Nervous System. Behavior.

Abs Jour: Ref Zhur-Biol., No 20, 1958, 93662.

of the resulting inhibition depended on the physical force of the experimental differentiation. Relaxation was conducive to normalization of the UR. -- K.S. Ratner.

Card : 2/2

AUTHOR: Kurkhovskaya, Ye. SOV/4-58-11-22/31

TITLE: Brazil, State of Parana (Braziliya, shtat Parana)

PERIODICAL: Znaniye - sila, 1958, Nr 11, p 32 (USSR)

ABSTRACT: This is a review of the book by the Polish writer and naturalist Arkadiy Fidler, "Tayna Rio de Oro" (The Secret of Rio de Oro") in which he relates his journey into the forests of South America, the nature of this country and the life of the Indians.

Card 1/1

PUSKHELI, A.I.

Cardiac activity in [illegible] to the method of artificial [illegible] i klin. khir. i gemat. [illegible]

(MIRA 10:8)

MATVEYEVA, Rakel; VISKARI, Eyne; FORSMAN, Khel'ga; RANTANEN, Astrid; SALMI, Khil'ya; TERVONEN, Lidiya; KHEGLUND, Lempi; KURKI, Mariya; LEMPINEN, Khanna; RUKHKANEN, Kyullikki; MANNILA, An'ya; PUTTONEN, Katri.

For the common good. Rabotnitsa 36 no.8:22 Ag '58. (MIRA 11:9)
(Russia--Description and travel)

KURKIEWICZ, Grzegorz, dr

Shipyard management and problems of industrial safety. Praca zabosp spol 5 no.8/9:32-35 Ag-S '63.

1. Wyzsza Szkola Ekonomicana, Sopot.

KURKIEWICZ, Grzegorz, dr (Gdansk)

For proper evaluation of the Polish shipbuilding industry during the period between the two World Wars. Bud okretowe Warszawa 8 no.1: 6-7 Ja '63.

KURKIEWICZ, Grzegorz, dr.

Trends of economic progress in the shipbuilding industry.
Bud okretowe Warszawa 8 no.7:217-219 Jl '63.

1. Wyzsza Szkola Ekonomiczna, Sopot.

KURKIEWICZ, T.

On the role of glycogen in segmentation mitosis in vertebrate and invertebrate animals and on its participation in organ-formation in lower animals. Bull soc. amis sci Poznan [Med] Ser. C no.10:23-33 '61.

(GLYCOGEN metab) (CELL DIVISION)

KURKIN, A.

Resistance of metal to cracking in the temperature required for automatic welding, p. 250, ZVARANIE, (Ministerstvo hutneho prumyslu a rudnych bani a Ministerstvo strojarstvo) Baratislava, Vol. 3, No. 8/9, Sept. 1954

SOURCE: East European Accessions List (EEAL) Library of Congress, Vol. 4, No. 12, December 1955

KURKIN, A.

Emphasize the regional offices. Mekh. sil'. hosp. 13 no.8:26 Ag '62.
(MIRA 15:7)

1. Glavnyy inzh.-mekhanizator Poltavskogo territorial'nogo proizvodstvennogo upravleniya kolkhozov i sovkhozov.
(Agricultural administration)

L 23413-66 EWT(d)/EWT(m)/EWP(w)/EWA(d)/EWP(v)/T/EWP(t)/EWP(k)/EWA(h)/ETC(m)-6

ACC NR: AP6004139 IJP(c) JD/WW/ HM/EM SOURCE CODE: UR/0125/66/000/001/0043/0049

AUTHOR: Kurkin, A. S.; Luk'yanov, V. F.; Meshaykin, N. S.; Simonik, A. G.

ORG: [Kurkin, Luk'yanov, Meshaykin] MVTU im. Bauman

TITLE: Tests of base metal, welded joints and models of thin-walled vessels of EP257 high-strength steel

SOURCE: Avtomaticheskaya svarka, no. 1, 1966, 43-49

TOPIC TAGS: hydraulic buckling, metal test, tensile test, weld evaluation, pressure vessel, high-strength steel/ EP257 high strength steel

ABSTRACT: The use of high-strength steels as the material of thin-walled welded vessels working under pressure has shown that the danger of rupture of the vessels in the presence of mean stresses lower than the ultimate strength of the base metal is the greater the higher this ultimate strength is. In this connection, the authors tested the welded joints and base metal of pressurized thin-walled vessels of EP257 high-strength steel by the newly developed method of biaxial streching by means of the hydraulic buckling of flat sheet specimens via a round orifice. In testing the base metal the purpose is to determine the true peripheral stress σ_1 as a function of true deformation in the direction of thickness ε_3 until the instant of rupture. Considering that the shape of the bulge is almost spherical, the measurements (Fig. 1)

Card 1/4 UDC: 621.791.7:672.4:53.092

L 23413-66

ACC NR: AP6004139

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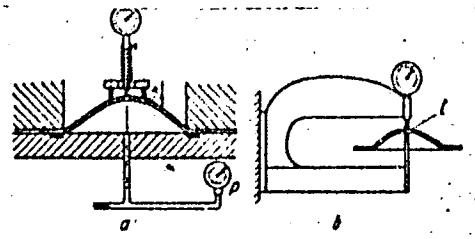

Figure 1. Measuring the principal parameters of pressure:
a - curvatures of surface; b - thickness during test (pressure is measured by a manometer)

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4

of pressure P, radius R of curvature and thickness t in the zone of zenith of the bulge are used to calculate the true stresses σ_1

and the true deformation

$$\sigma_1 = \frac{PR}{2t} \qquad (1)$$

$$\varepsilon_{3p} = \ln\frac{t}{t_0} \qquad (2)$$

where t_0 is initial thickness of the sheet specimen, ε_{3p} is the plastic component of true deformation with respect to thickness. The function $\sigma_1 = f(\varepsilon_3)$ is determined by measuring thickness t in the presence of various levels of loading and then, with the aid of a corresponding formula, used to evaluate the future loadbearing ability of the material in a pressurized cylindrical vessel. Strength is determined according to the magnitude of the stresses in the base metal at the instant of rupture of the welded joint as well as according to the direction of fracture -- along or across the weld. On this basis it is established that the best results are obtained for welded joints subjected to isothermal annealing at 880°C for 20 minutes. Subsequent hydraulic rupturing tests of containers of EP257 steel with welded-on lids and with measurement of strains during loading confirmed the objectivity of the estimates obtained during the tests of flat specimens under conditions of biaxial stretching by the hydraulic buckling method. Thus, the biaxial stretching test may be recommended as a basic test

L 23413-66
ACC NR: AP6004139

for evaluating the effect on the structural strength of a container of different types of treatment, welding and final hot working of the sheet metal from which the container is constructed. Orig. art. has: 5 figures, 3 tables and 15 formulas.

SUB CODE: 11, 13/ SUBM DATE: 19Feb65/ ORIG REF: 002/ OTH REF: 000

Card 4/4

ACCESSION NR: AP4019868 S/0181/64/006/003/0947/0949

AUTHORS: Antipin, A. A.; Kurkin, I. N.

TITLE: Paramagnetic resonance in Gd^{3+} ions imbedded in BaF_2 single crystals

SOURCE: Fizika tverdogo tela, v. 6, no. 3, 1964, 947-949

TOPIC TAGS: paramagnetic resonance, trigonal symmetry, magnetic field, spin Hamiltonian

ABSTRACT: The EPR spectra of Gd^{3+} ($4f^7$, $^8S_{7/2}$) in an electric field with trigonal symmetry and a magnetic field H is written in the form of a spin Hamiltonian. To determine the magnitudes of the constants, the following easily controlled orientations were selected

$$\theta = 0,\ \theta = \arccos\frac{1}{\sqrt{3}},\ \theta = \arccos\left(-\frac{1}{3}\right)$$

where θ - angle between H and the trigonal axis of the complex. Using the perturbation technique the following results are obtained, with the assumption $b_2^0 > 0$:

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ACCESSION NR: AP4019868

$$g_{\parallel} = g_{\perp} = 1.991 \pm 0.001,$$
$$b_2^0 = 0.412 \text{ kMc}, \quad b_4^0 = -0.072 \text{ kMc}$$
$$b_6^0 = 0.002 \text{ kMc}, \quad b_4^3 = 2.090 \text{ kMc}$$
$$b_6^3 = 0.006 \text{ kMc} \quad b_6^6 = 0.0 \pm 0.1 \text{ kMc}$$

It is shown that these values agree closely with those calculated by J. Sierro (Phys. Lett., 4, 178, 1963) with the additional magnitude b_4^3 not appearing in Sierro's work. It should be noted that according to Sierro the splitting Δ = 0.291 cm^{-1} whereas according to the authors' measurements Δ = 0.196 cm^{-1}. "The authors are grateful to P. P. Feofilov, M. M. Zaripov, L. Ya. Shekun, V. G. Stepanov, G. K. Chirkin, and O. I. Tyapina for their help." Orig. art. has: 3 equations and 2 figures.

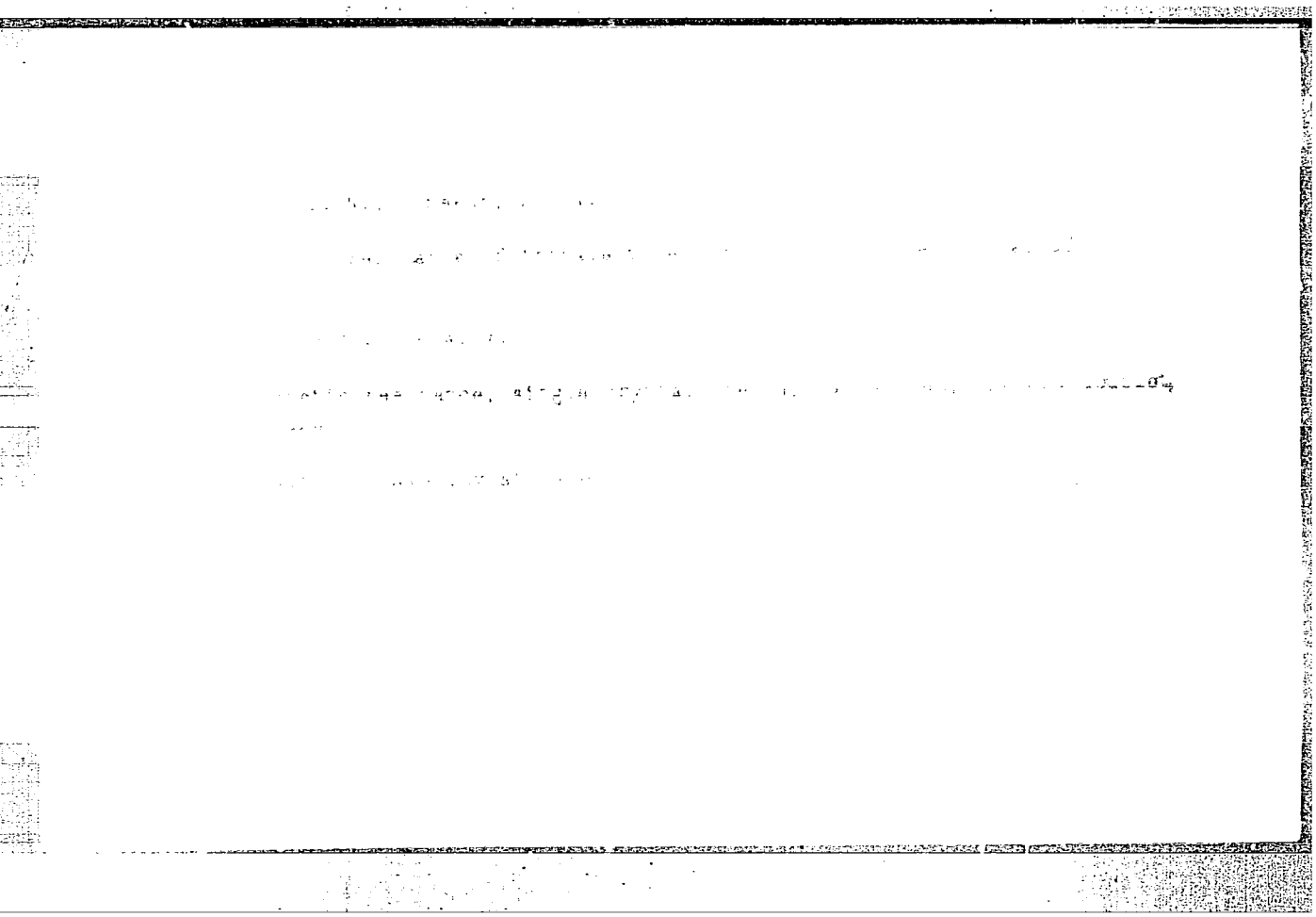
ASSOCIATION: Kazanskiy gosudarstvennyy universitet im. V. I. Ul'yanova - Lenina (Kazan State University)

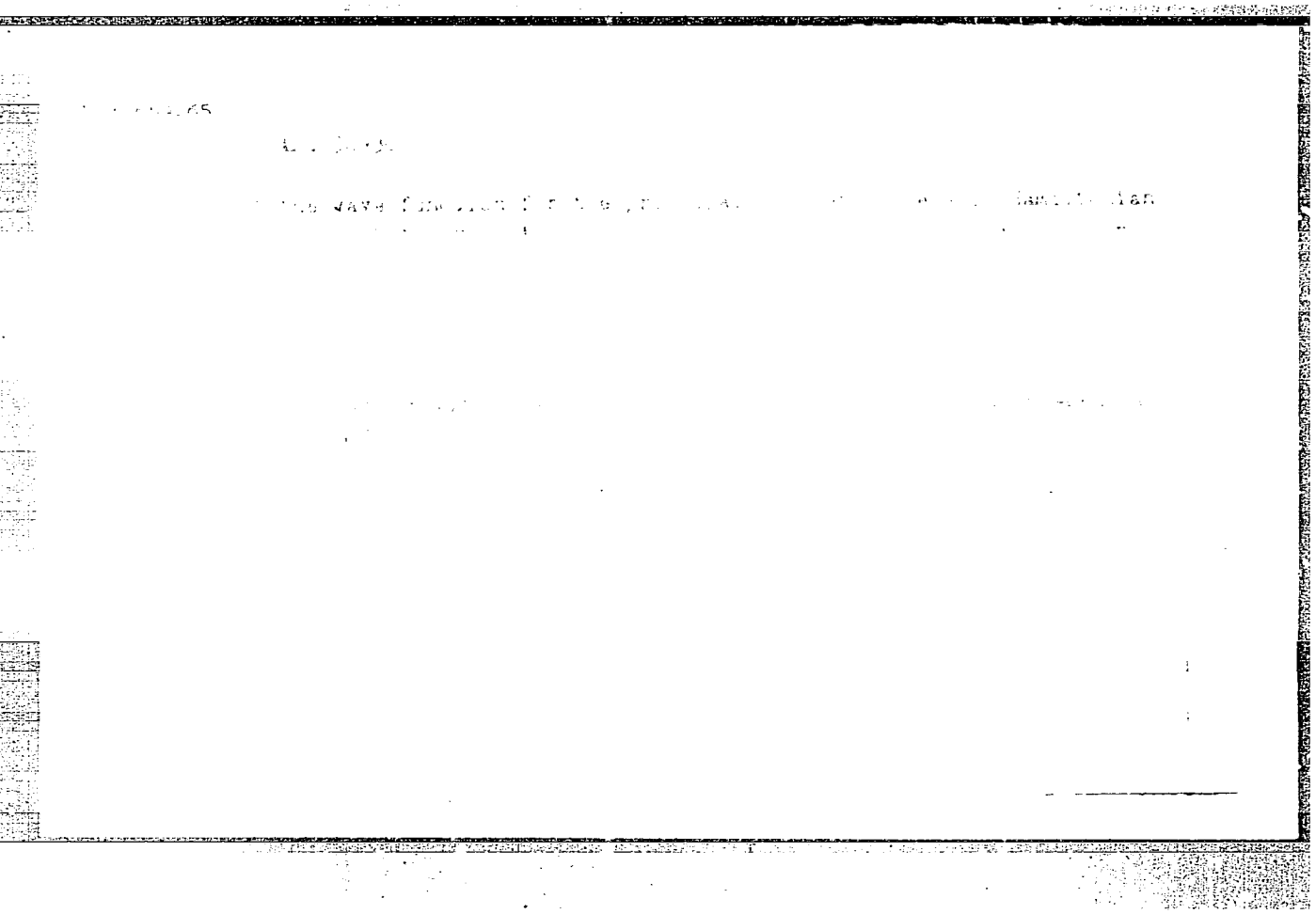
SUBMITTED: 04Nov63 DATE ACQ: 31Mar64 ENCL: 00

SUB CODE: PH NO REF SOV: 004 OTHER: 001

Card 2/2

APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000927720006-8"





ACCESSION NR: AP4041695 S/0181/64/006/007/1975/1978

AUTHOR: Kurkin, I. N.; Shekun, L. Ya.

TITLE: Investigation of paramagnetic resonance of Gd+++ in artificial lead molybdate

SOURCE: Fizika tverdogo tela, v. 6, no. 7, 1964, 1975-1978

TOPIC TAGS: lead compound, electron paramagnetic resonance, gadolinium ion, crystal structure, lattice

ABSTRACT: Continuing earlier research on the EPR of rare-earth ions imbedded in single crystals with the structure of $CaWO_3$, the authors measured the EPR spectra of Gd^{3+} in the artificial single crystal $PbMoO_4$ with the hope that comparison of the spectra of the impurity ions in two similar lattices, $CaWO_4$ and $PbMoO_4$, will help determine the locations of the energy levels of these ions. The measurements

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ACCESSION NR: AP4041695

were made at room temperature with the magnetic field parallel to the c axis and frequencies ~10 and ~36 Gc/sec. Although the signs of the obtained spin-Hamiltonian constants for both lattices agree, the results are still inconclusive. "We are grateful to P. P. Feofilov for the lead-molybdate single crystals and to V. G. Stepanov and V. M. Vinokurov for great help." Orig. art. has: 2 figures, 1 formula, and 1 table.

ASSOCIATION: Kazanskiy gosudarstvenny*y universitet im. V. I. Ul'yanova-Lenina (Kazan' State University)

SUBMITTED: 14Jan64 ENCL: 01

SUB CODE: NP, SS NR. REF SOV: 003 OTHER: 004

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ACCESSION NR: AP4041695

ENCLOSURE: 01

Spin Hamiltonian constants

	$g_\parallel$	$g_\perp$	$\Delta j \cdot 10^4$	$\Delta j \cdot 10^4$	$\Delta j \cdot 10^4$	$\Delta j \cdot 10^4$	$\Delta j \cdot 10^4$	Temp.	Reference
			cm^{-1}					Температура, °K	Литературная ссылка
$CaWO_4$	1.9915 ± 0.0004	1.9916 ± 0.0004	−916.7 ± 1	−24.0 ± 0.2	−0.6 ± 0.3	−145.1 ± 1	0.0 ± 0.3	77	[3]
$PbMoO_4$	1.992 ± 0.001	1.992 ± 0.001	−800 ± 2	−12.00 ± 2.0	−0.0 ± 2.0	−91.0 ± 10	0.0 ± 10	290	Настоящая работа This work

Card 3/3

ACCESSION NR: AP4041701 S/0181/64/006/007/2014/2016

AUTHORS: Antipin, A. A.; Kurkin, I. N.; Chirkin, G. K.; Shekun, L. Ya.

TITLE: Electron paramagnetic resonance of Ce^{+++} ions interpenetrated in single crystals of SrF_2 and BaF_2

SOURCE: Fizika tverdogo tela, v. 6, no. 7, 1964, 2014-2016

TOPIC TAGS: electron paramagnetic resonance, single crystal, spectral analysis, barium compound, strontium compound, tetragonal system, cerium

ABSTRACT: To provide a comparison with results obtained by optical tests, the authors investigated the EPR of SrF_2 and BaF_2 single crystals containing about 0.5% Ce^{3+}, at 4.2K and a frequency close to 9 Gc/sec. In view of the closeness of the results to those obtained by Baker et al. for CaF_2 (Proc. Phys. Soc. v. 73, 942, 1959),

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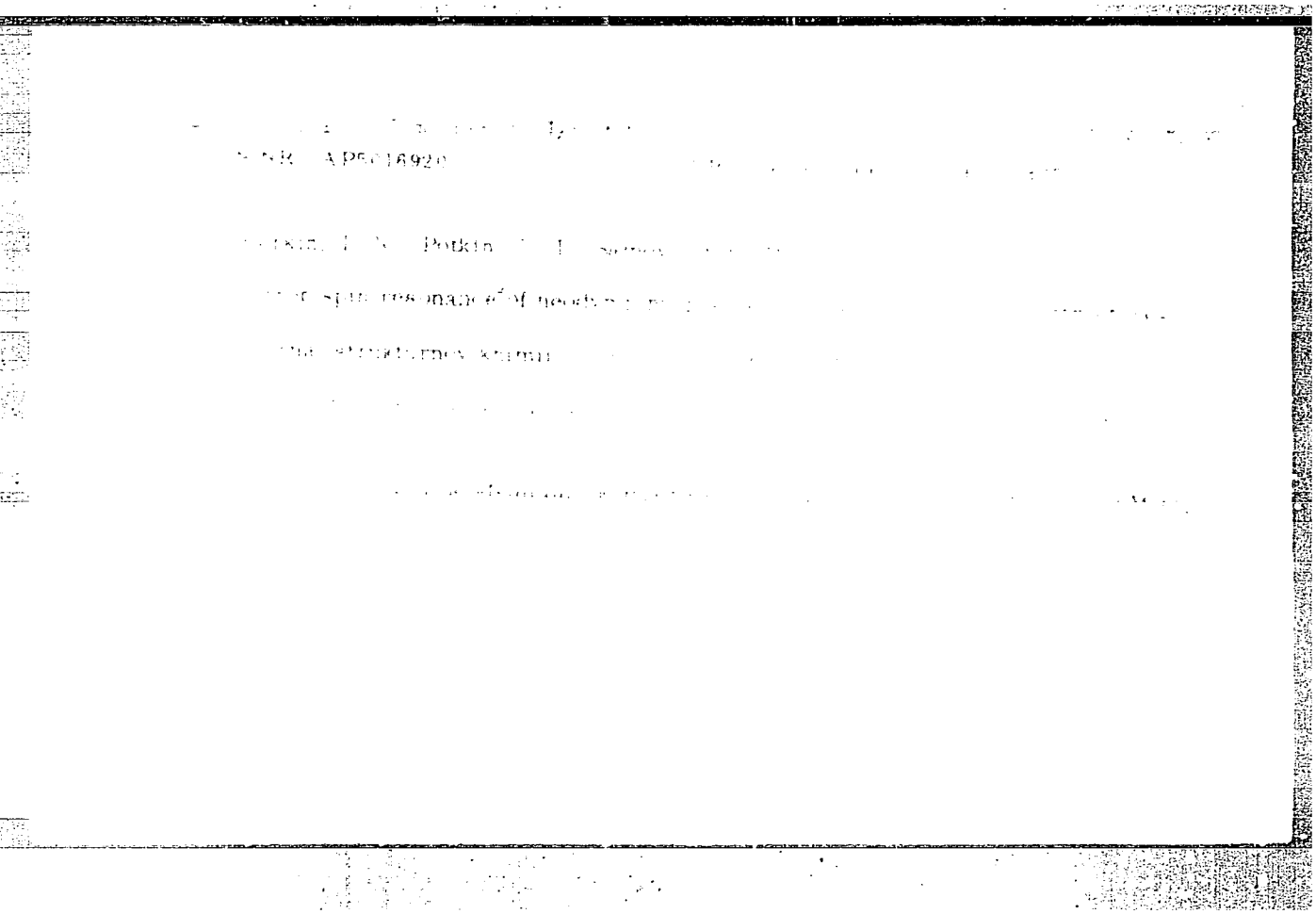
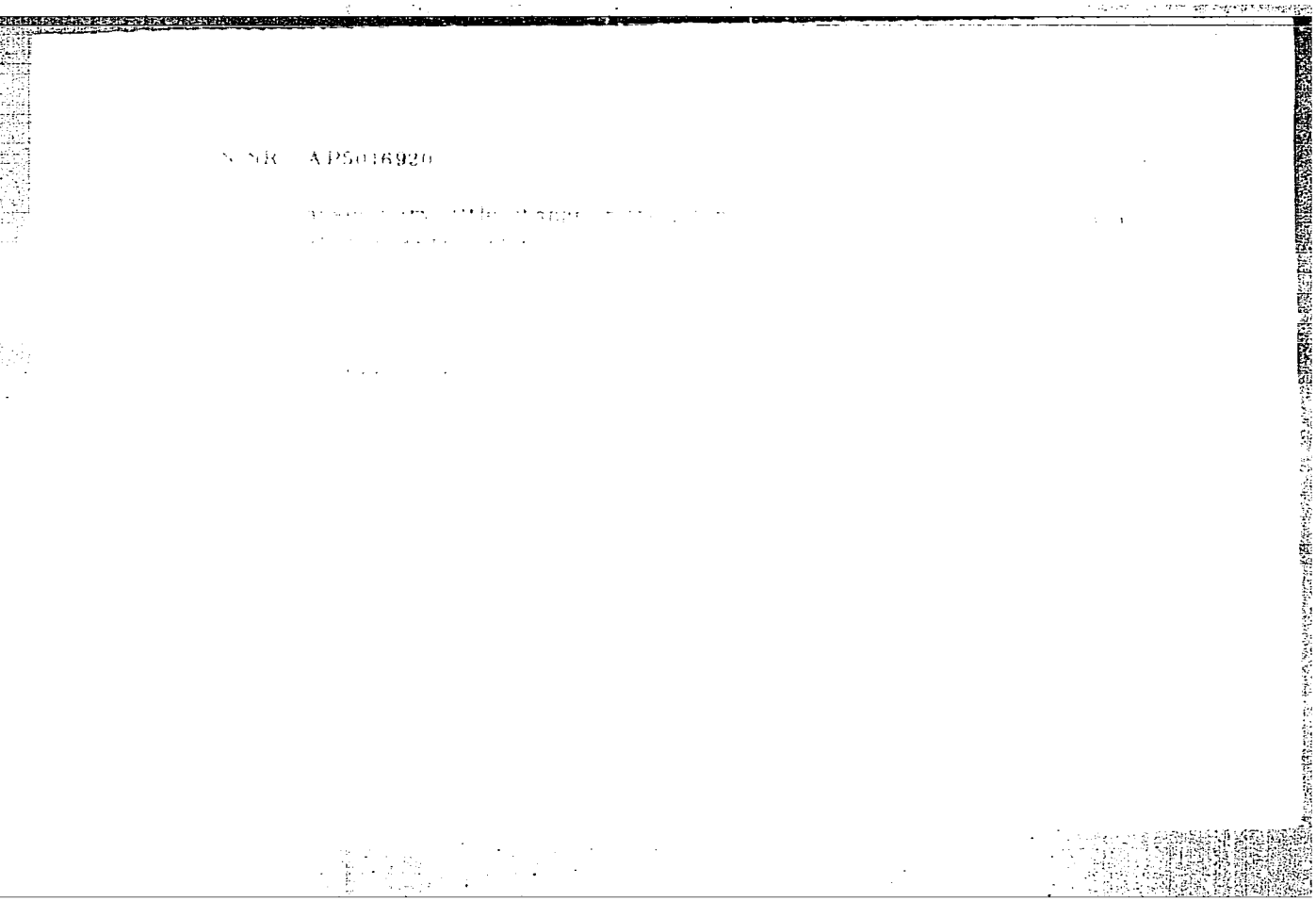
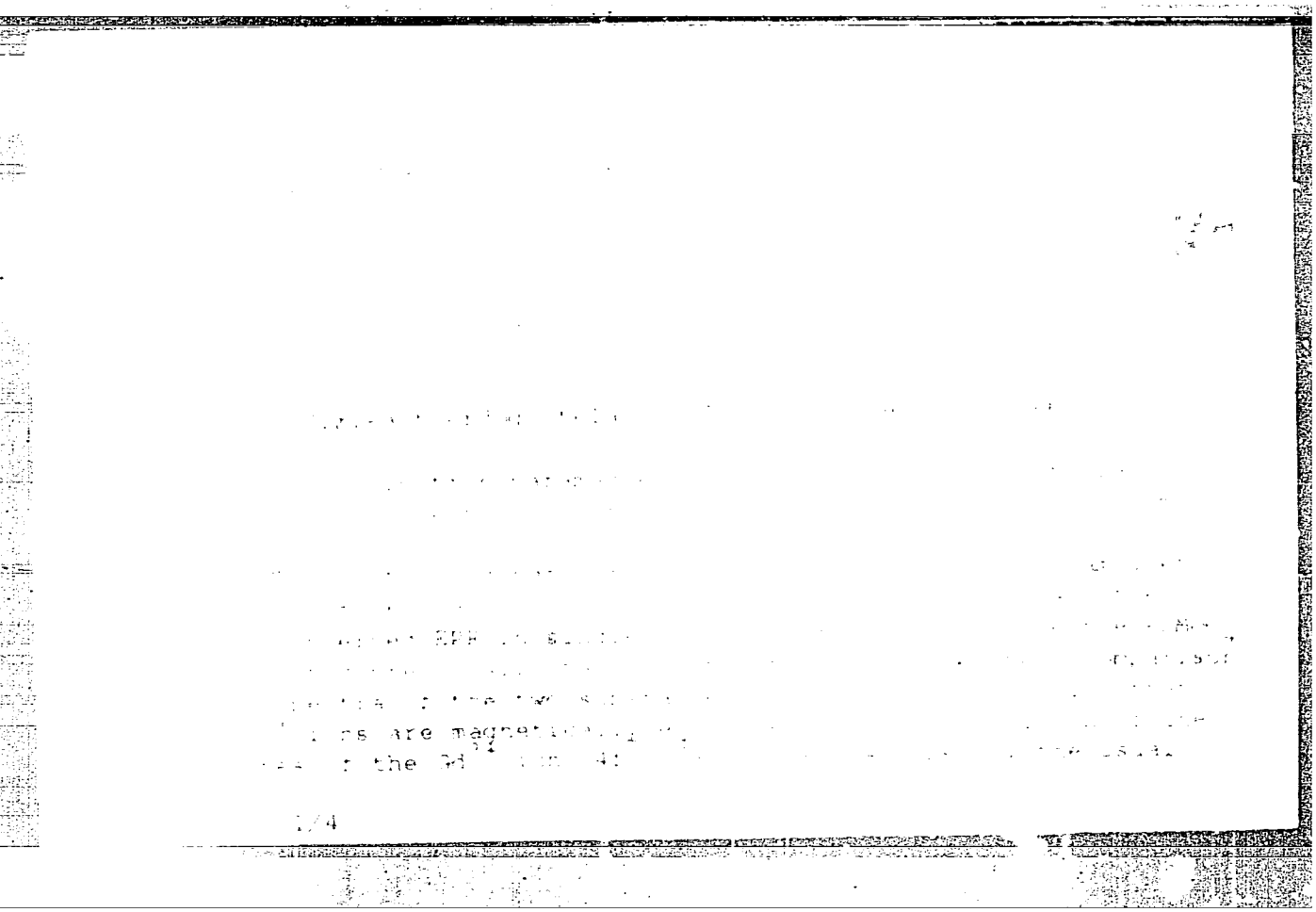
ACCESSION NR: AP4041701

it is concluded that spectral characteristics of magnetic centers with tetragonal symmetry were observed for both host substances. Satellite lines analogous to those observed in CaF_2 were observed. The g-factors were determined by using the position of the DPPH line at liquid helium temperature. The values obtained for CaF_2, SrF_2, and BaF_2 were 0.834, 0.829, and 0.825, respectively. It is suggested that the g-factor of the free ion is closer to 0.825 than to the ideal Russel-Saunders value 6/7 = 0.856. The reason for this is that the crystal field adds states with J = 5/7 to the ground state J = 5/2. "In conclusion we thank P. P. Feofilov for supplying the cerium activated SrF_2 and BaF_2." Orig. art. has: 7 formulas.

ASSOCIATION: Kazanskiy gosudarstvenny*y universitet im. V. I. Ul'yanova-Lenina (Kazan' State University)







[illegible]-65

[illegible]ION NR: AP5003453

[illegible] Hamiltonian of tetragonal symmetry with effective spin S = 7/2. [illegible] for the spin Hamiltonian [illegible]

$$\mathcal{H} = g_{\parallel}\beta H_z S_z + g_{\perp}\beta (H_x S_x + H_y S_y) + \frac{1}{3} b_2^0 O_2^0 +$$

$$\frac{1}{60}(b_4^0 O_4^0 + b_4^4 O_4^4) + \frac{1}{1260}(b_6^0 O_6^0 + b_6^4 O_6^4),$$

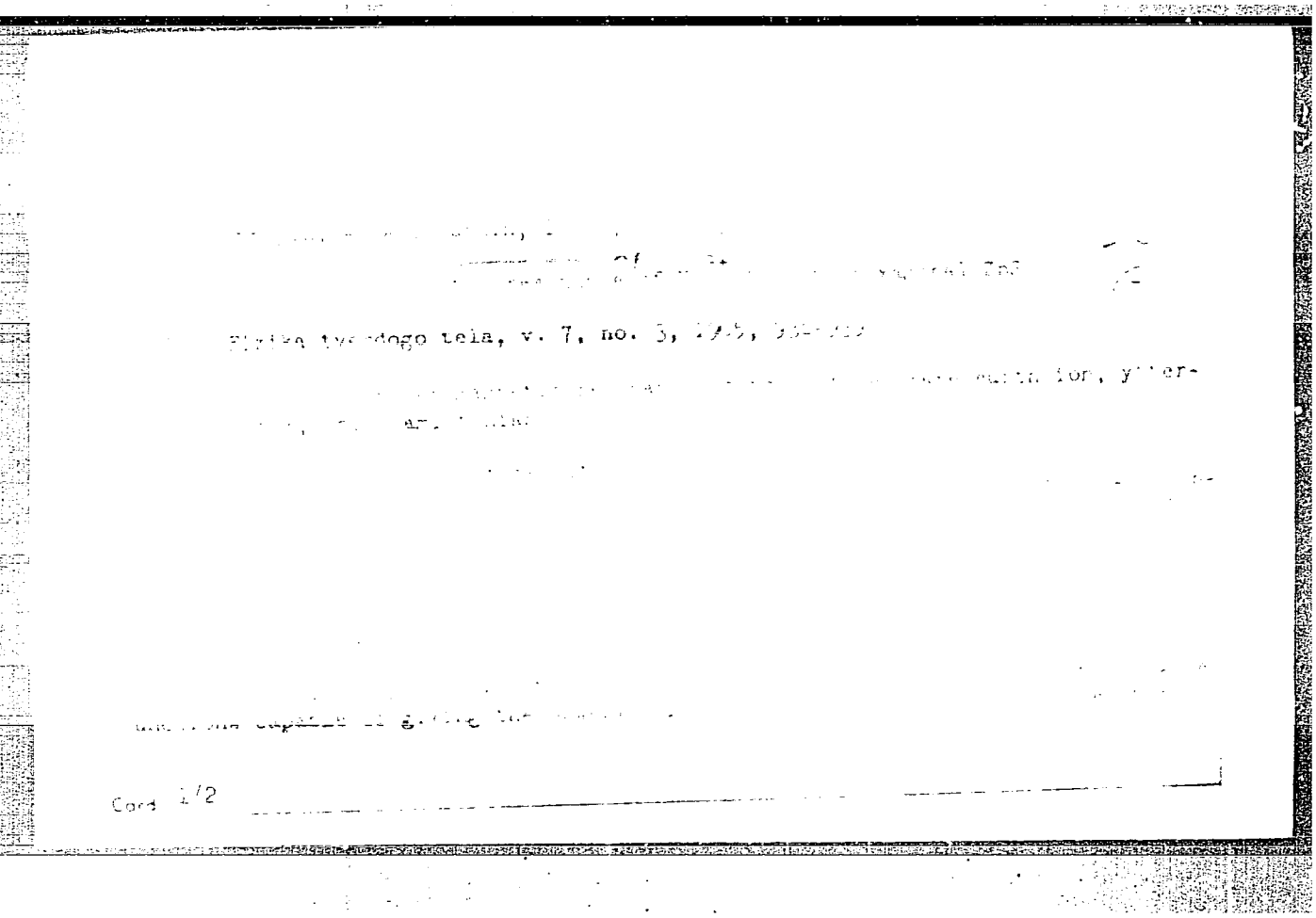
where z -- c-axis of the crystal. The table is shown in the enclo[illegible]. The constants of the Hamiltonian were determined by measure[illegible] with the field parallel and perpendicular to the c axis of [illegible] crystal. The constants are tabulated together with the earlier [illegible] lead molybdate. The [illegible] each [illegible] both lattices [illegible] parameters of [illegible] two crystals are nearly equal. [illegible] has: 1 formula and 1 table.

[illegible]ATION: Kazanskiy gosudarstvennyy universitet im. V. I. Lenina

SUBMITTED: 28Jul64 ENCL: 01 SUB CODE: GS, NP

NR REF SOV: 001 OTHER: 000

Card 2/4



Fizika tverdogo tela, v. 7, no. 3, [illegible]

Card 1/2

work. Orig. art. has:

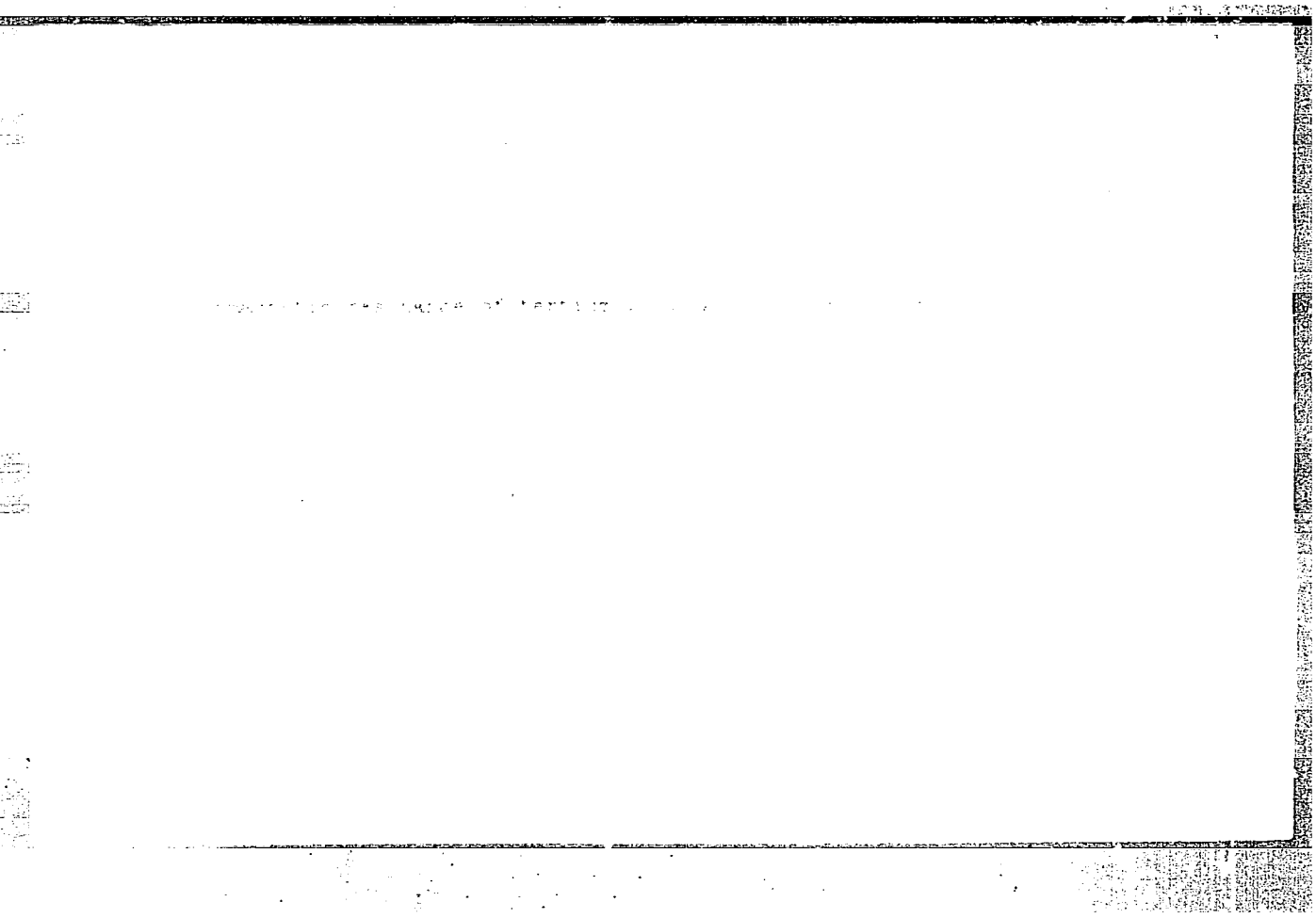
ATION: Kazanskiy gosudarstv

Kazan' State University)

TTED: 22Oct64 ENCL: 00 SUB

NR REF SOV: 000 OTHER: 002

2/2



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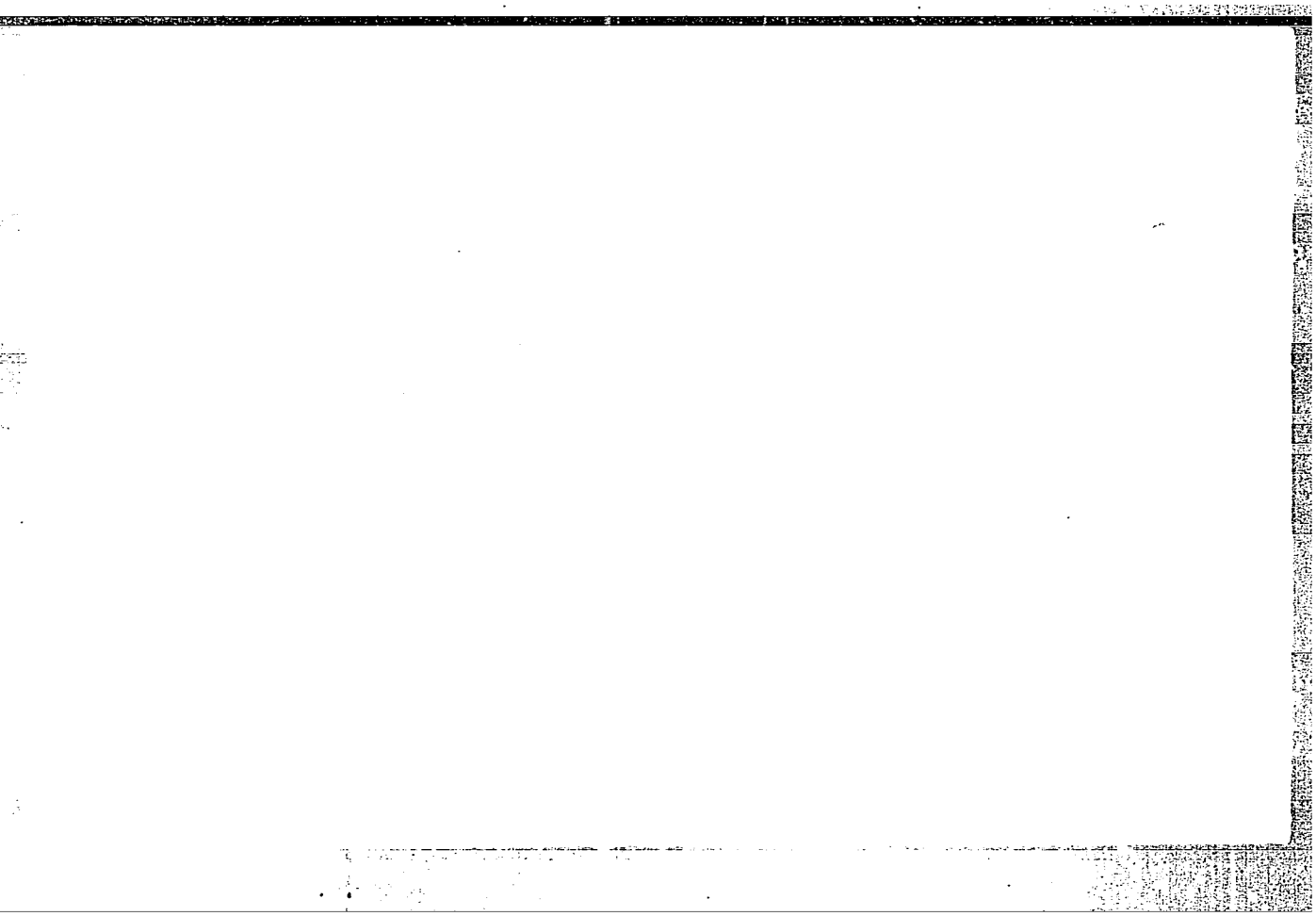
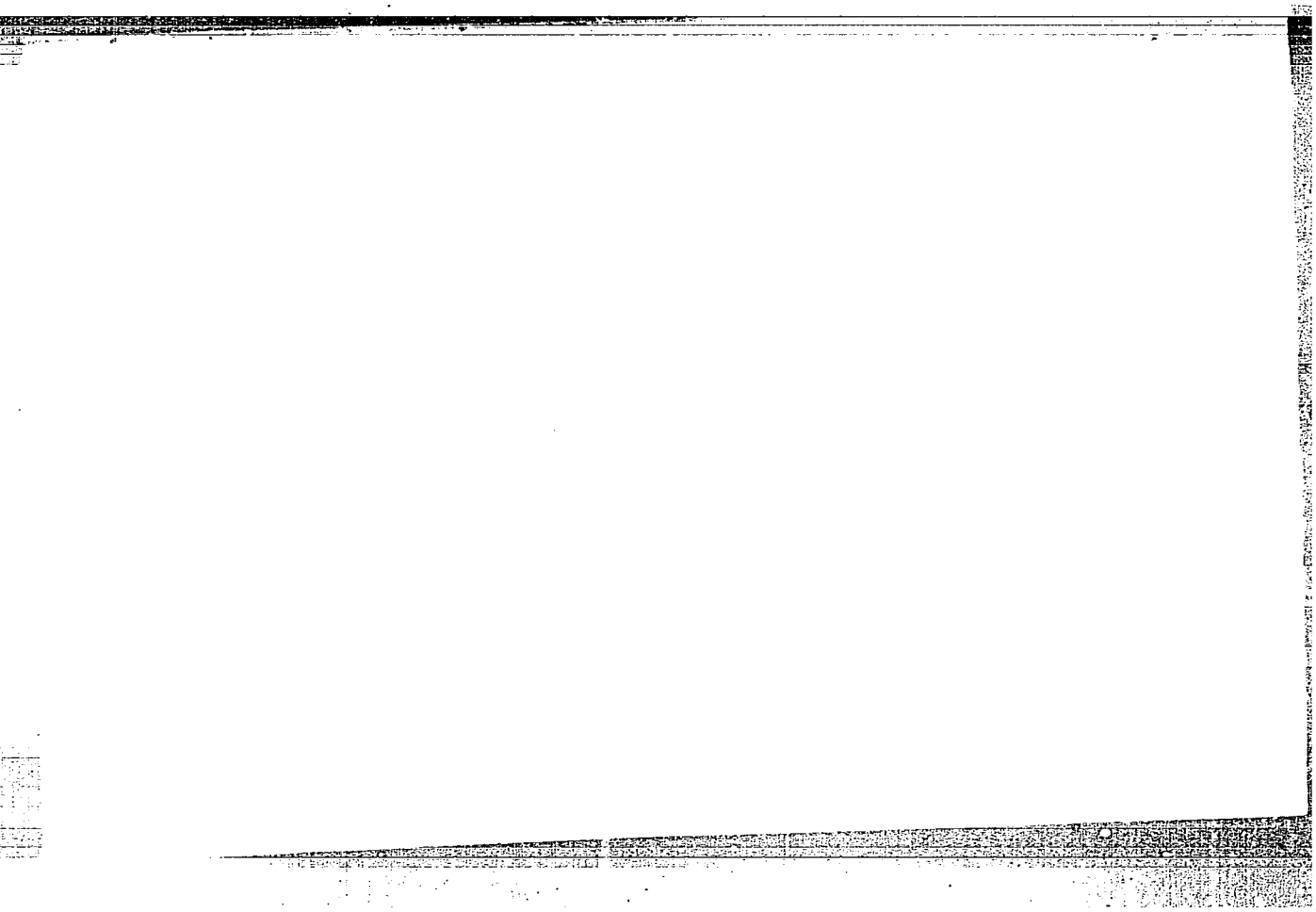
trum of four equidistant lines, which undoubtedly belong to Tb^{3+} ($4f^8$, $^7F_6$) could be observed at ~35 and 46 Oes. The constants of the effective Hamiltonian describing the line positions were determined, the longitudinal g-value being 17.8 ± ± 0.2. It is shown that the EPR is observed between singlets levels, where irre- representations and wave-function forms are determined. The conditions



[redacted] is observed already at room temperature, consisting of groups that con-



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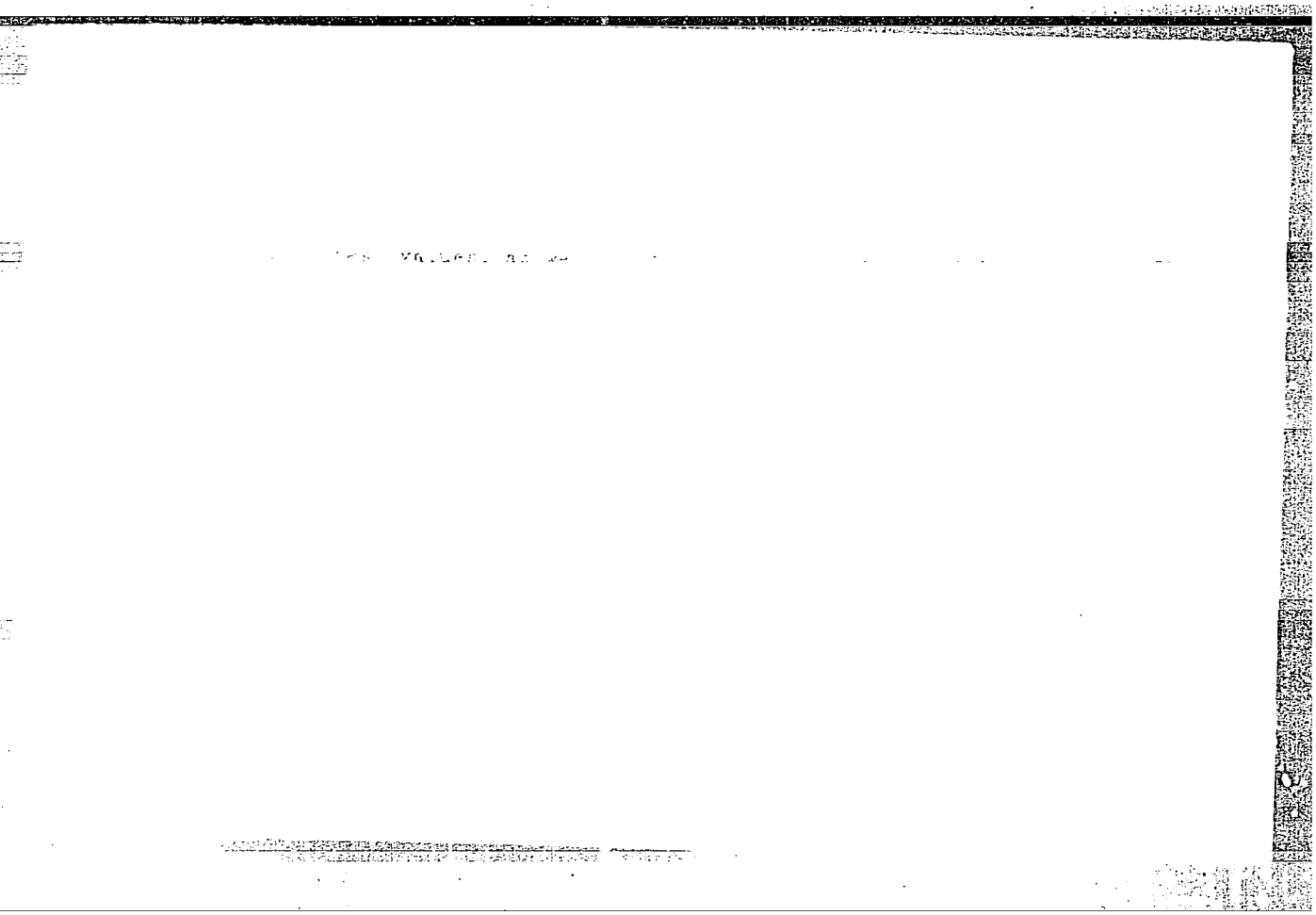

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L 9249-66 EWT(l)/EWI(m)/EIC/EWA(m)/EWP(t)/ETI(b) IJP(c) ...

ACC NR: AP5022739 SOURCE CODE: UR/0181/65/007/009/2852/2853

AUTHOR: Kurkin, I. N.; Shekun, L. Ya.

ORG: Kazan State University im. V. I. Ul'yanov-Lenin (Kazanskiy gosudarstvennyy universitet)

TITLE: Comparison of electron paramagnetic resonance of Nd^{3+} and Ce^{3+} ions in two crystals of the homologous scheelite series

SOURCE: Fizika tverdogo tela, v. 7, no. 9, 1965, 2852-2853

TOPIC TAGS: calcium compound, strontium compound, tungstate, EPR, neodymium, cerium, crystal lattice structure

ABSTRACT: The authors study the paramagnetic properties of trivalent neodymium and cerium impurity ions in the tungstates of strontium and calcium. The measurements were made at 4.2°K and a frequency of 10 Gc. The electron paramagnetic resonance spectra indicate that the overwhelming majority of the lanthanon ions are magnetically equivalent and are located in a uniaxial (apparently tetragonal) crystal field. The spectral parameters for the impurity ions are tabulated. A comparison of the results with previously published data shows that the tetragonal centers of the Nd^{3+} and Ce^{3+} ions in $CaWO_4$ are faithfully reproduced in spite of wide differences in the

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ACC NR: AP5022739

6

conditions under which the crystals were grown. A transition from $CaWO_4$ to $SrWO_4$ causes only a slight change in the g-tensor of the same ion, so that all spectral data may be referred to centers of the same type. Anisotropy in the g-factor for trivalent neodymium increases with a transition from calcium to strontium tungstate. The reverse is true for the Ce^{3+} g-tensor. The authors are grateful to A. M. Morozov for preparing the specimens, and to P. P. Feofilov for his constant interest in the work. Orig. art. has: 2 tables, 1 formula. 44,55

SUB CODE: 07,20/ SUBM DATE: 03Apr65/ ORIG REF: 003/ OTH REF: 003

Card 2/2 fv

L 10570-66 EWT(1)/EWT(m)/EWP(t)/EWP(b) IJP(c) JD/WW/JG/GG
ACC NR: AP5025394 SOURCE CODE: UR/0181/65/007/010/3105/3106

AUTHOR: Antipin, A. A.; Kurkin, I. N.; Potkin, L. I.; Samoylovich, M. I.; Shekun, L. Ya.

ORG: Kazan State University im. V. I. Ul'yanov-Lenin (Kazanskiy gosudarstvennyy universitet)

TITLE: Electron paramagnetic resonance of trivalent neodymium in barium tungstate

SOURCE: Fizika tverdogo tela, v. 7, no. 10, 1965, 3105-3106

TOPIC TAGS: neodymium, barium compound, tungstate, EPR spectrum, crystal, magnetic anisotropy

ABSTRACT: The authors studied electron paramagnetic resonance in $BaWO_4:Nd^{3+}$ specimens containing 0.05% neodymium. The crystals were grown from a molten salt solution. The spectral lines for the trivalent lanthanon ion in these crystals are given for orientations of $\theta = 0°$, where θ is the angle between the magnetic field and crystal axis c. A comparison of these experimental data with theoretically calculated resonance fields shows a divergence of no more than 15 oersteds. Data

Card 1/2

L 10570-66

ACC NR: AP5025394

from electron paramagnetic resonance measurements of trivalent neodymium in $CaWO_4$, $PbMoO_4$ and $BaWO_4$ lattices indicate magnetic centers of a single type. However, the degree of change in anisotropy is much greater in barium tungstate than that observed for the same ion in the homologous fluorite series. Orig. art. has: 1 figure.

SUB CODE: 07,20/ SUBM DATE: 26Apr65/ ORIG REF: 002/ OTH REF: 003

Card 2/2

L 7219-66 EWT(l)/EWP(e)/EWT(m)/ETC/EWG(m)/EWP(t)/EWP(b) IJP(c) RDW/JD/WW/
ACC NR: AP5027395 GG/WH SOURCE CODE: UR/0181/65/007/011/3209/3212

AUTHOR: Antipin, A. A.; Kurkin, I. N.; Potvorova, L. Z.; Shekun, L. Ya.

ORG: Kazan' State University im. V. I. Ul'yanov-Lenin (Kazanskiy gosudarstvennyy universitet)

TITLE: Investigation of tetragonal centers of trivalent samarium ions in rutile single crystal by means of EPR

SOURCE: Fizika tverdogo tela, v. 7, no. 11, 1965, 3209-3212

TOPIC TAGS: single crystal, crystal property, samarium, EPR spectrum, EPR spectrometry, rutile

ABSTRACT: The authors observed the electron paramagnetic resonance of ions of Sm^{3+} ($4f^5$, $^6H_{5/2}$) in $CaWO_4$ single crystals. The samples were grown by the Czochralski method for a melt containing 0.5% Sm and a corresponding amount of Na_2WO_4 (to compensate for the excess charge). All the Sm^{3+} ions were magnetic-equivalent. A study of the EPR spectrum of the $CaWO_4$:Sm:Nd specimen indicates that the major axes of the magnetic centers of Sm^{3+} and Nd^{3+} coincide, which leads to the conclusion that both centers are identical in nature. The results are discussed from the theoretical viewpoint. "In conclusion the authors express sincere gratitude to A. M. Morozov for the preparation of the $CaWO_4$ single crystals with samarium." Orig. art. has: 1 figure and 5 formulas. [08]

SUB CODE: 20 / SUBM DATE: 29Apr65 / ORIG REF: 001 / OTHER REF: 003 /
ATD PRESS: 4150
Card 1/1

L 15730-66 EWT(m)/T/EWP(t)/EWP(b) IJP(c) JD/JG

ACC NR: AP6000890 SOURCE CODE: UR/0181/65/007/012/3685/3685

AUTHORS: Antipin, A. A.; Kurkin, I. N.; Potvorova, L. Z.; Shekun, L. Ya. 53 B

ORG: Kazan' State University im. V. I. Ul'yanov-Lenin (Kazanskiy gosudarstvenny universitet)

TITLE: Observation of paramagnetic resonance of Dy^{3+} ions in single crystal $CaWO_4$

SOURCE: Fizika tverdogo tela, v. 7, no. 12, 196', 3685

TOPIC TAGS: dysprosium, line broadening, epr spectrum, Stark effect, paramagnetic ion, single crystal

ABSTRACT: The authors observe paramagnetic resonance of Dy^{3+} in a single crystal $CaWO_4$ grown by the Czochralski method and containing nominally one per cent of Dy. At ~ 3 Oe and 4.2K, the EPR spectrum contains predominantly of one broad intense line, accompanied by the hyperfine structure of Dy^{161} and Dy^{163}. Its intensity increases when

Card 1/2

the temperature is reduced to 1.6K so that this line can be attributed to the ground state doublet of the Stark structure of the $^6H_{15/2}$ level. The line position can be described by the usual axial spin Hamiltonian with S = 1/2, for which the constants are given. Increasing the frequency to 10 Gc not only broadens the already existing lines but leads to the appearance of new lines, some of which decrease in intensity on cooling to 1.6K. Additional research is necessary to explain these features of the spectrum. Orig. art. has: 1 formula.

SUB CODE: 07 / SUBM DATE: 10Jul65/ ORIG REF: 001/

Title: Electron paramagnetic resonance spectrum of Yb^{3+} (

ASSOCIATION: None

AUTHOR: Kurkin, I. N.; Morozov, A. M.; Shekun, L. Ya.

[illegible] SSSR. Doklady, v. 161, no. [illegible]

[illegible] electron paramagnetic resonance, cerium, lead molybdate, single crys- [illegible] rare earth element

ABSTRACT: Results are presented of an investigation of electron paramagnetic re- [illegible] simplest of the rare-earth ions (Ce^{3+}, [illegible]) in a single crys- [illegible] $PbMoO_4$ (scheelite structure). The measurements were made with a sample [illegible] melt and containing nominally 0.3 mol.% of Ce^{3+} and Yb^{3+} each, intro- [illegible] the melt in the form of CeO_2 and Yb_2O_3. The excess charge was compen- [illegible] by the amount of $NaMoO_4$. In spite of the fact that the sample was [illegible], the magnetic resonance of Ce^{3+} and Yb^{3+} was relatively observed at [illegible] line belonging to Ce^{3+}, indicating that only one of the doublets [illegible] 2K. The parallel and perpendicular g-factors were found to be

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L 50524-65
ACCESSION NR: AP5010157

2

2.684± 0.005 and 1.514 ± 0.015, respectively. This is within 4% of the values obtained if it is assumed that the wave function of the principal doublet is transformed in accordance with the irreducible representation Γ_{t7}. Certain data derived on the quality of the investigated crystals and on the character of their imperfections, based on the EPR results, are summarized. "The authors thank P. P. Feofilov for interest in the work." This report was presented by Ye. K. Zavoyskiy. Orig. art. has: 4 formulas.

ASSOCIATION: Kazanskiy gosudarstvennyy universitet im. V. I. Ul'yanova-Lenina (Kazan' State University)

SUBMITTED: 05Oct64 ENCL: 00 SUB CODE: SS, NP

NR REF SOV: 000 OTHER: 002

Card 2/2

L 22522-66 EWT(1)/EWT(m)/T/EWP(t) IJP(c) JD/JG/GG
ACC NR: AP6009651 SOURCE CODE: UR/0181/66/008/003/0731/0735

AUTHOR: Kurkin, I. N.

ORG: Kazan State University im. V. I. Ul'yanov-Lenin (Kazanskiy gosudarstvennyy universitet)

TITLE: EPR of tetragonal Nd^{3+} centers in certain crystals of the homological series of scheelite

SOURCE: Fizika tverdogo tela, v. 8, no. 3, 1966, 731-735

TOPIC TAGS: calcium compound, tungstate, neodymium, rare earth element, hyperfine structure, wave function, impurity center, EPR, crystal, magnetic property

ABSTRACT: In view of the lack of data on the crystalline field acting on the TR^{3+} ion in the lattice of scheelite ($CaWO_4$), the author has investigated the EPR of Nd^{3+} and the variation of its magnetic properties in six hosts with general formula $Me(W, Mo)O_4$, namely $CaWO_4$, $CaMoO_4$, $SrWO_4$, $PbMoO_4$, $BaWO_4$, and $BaMoO_4$. The experiments were made at 4.2K using video spectroscopes for the 3- and 10-cm bands. The g factors and the hyperfine structure constants were determined. The results show that with increasing crystal-lattice parameters (on going from $CaWO_4$ to $BaMoO_4$), $g_{\parallel}$ decreases rapidly but $g_{\perp}$ remains practically constant. This indicates that the

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magnetic centers are all of the same nature. The g-factor variation is almost linear. The results can be reconciled with theory if it is assumed that the crystalline field is close to cubic. From the g factors and the hyperfine structure constants the author estimates the form of the wave function of the principal doublet and the admixture of states with spin $J \neq 9/2$. It is suggested on the basis of the results that the cubic part dominates over the axial parts in the potential of the tetragonal centers in sheelites. The author thanks L. Ya. Shekun for useful advice. Orig. art. has: 3 figures, 2 formulas, and 3 tables.

SUB CODE: 20/ SUBM DATE: 17Jul65/ OTH REF: 004

L 30100-66 EWT(m)/T/EWP(t)/ETI IJP(c) JD/JG

ACC NR: AP6012518 SOURCE CODE: UR/0181/66/008/004/1308/1309

AUTHORS: Antipin, A. A.; Kurkin, I. N.; Shekun, L. Ya. 56 5 B

ORG: Kazan' State University im. V. I. Ul'yanov-Lenin (Kazanskiy gosudarstvennyy universitet)

TITLE: EPR of holmium in single crystal $PbMoO_4$

SOURCE: Fizika tverdogo tela, v. 8, no. 4, 1966, 1308-1309

TOPIC TAGS: holmium, epr spectrum, lead compound, molybdate, hyperfine structure, line width

ABSTRACT: The authors investigated $PbMoO_4$ single crystals grown by the Czochralski method and containing nominally 0.5% of Ho^{167}. At 4.2K they observed an EPR spectrum which undoubtedly belongs to $Ho^{3+}(4f^{10})$. The spectrum consists of eight hyperfine-structure lines due to Ho^{167}. Their position, in accordance to measurements at frequencies from 10 to 35 Gcs, are described by a spin Hamiltonian

$$\mathcal{H} = g_{\parallel}\beta H_z S_z + A I_z S_z$$

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ACC NR: AP6012518

with effective spin S = 1/2 and with constants

$$\left.\begin{aligned} g_{\parallel} &= 14.05 \pm 0.05, \\ A &= (0.308 \pm 0.005)\ \text{cm}^{-1}. \end{aligned}\right\}$$

The Ho^{3+} line intensity is found to be weaker than that of equal amounts of Pb^{3+}. The lines were somewhat asymmetrical and had an approximate width of 70 Oe. The authors thank A. M. Morozov for preparing the samples of $PbMoO_4$.Ho. Orig. art. has: 2 formulas.

SUB CODE: 20/ SUBM DATE: 27Nov65/ ORIG REF: 002/ OTH REF: 002

Card 2/2 CC

L 12868-66 EWT(m)/T/EWP(t)/ETI LJP(c) JD/JG

ACC NR: AP6020385 (A) SOURCE CODE: UR/0192/66/007/001/0110/0111

AUTHOR: Antipin, A. A.; Kurkin, I. N.; Potkin, L. I.; Shekun, L. Ya.

ORG: Kazan State University (Kazanskiy gosudarstvennyy universitet)

TITLE: Electron spin resonance of neodymium in scheelite structures: $BaMoO_4$

SOURCE: Zhurnal strukturnoy khimii, v. 7, no. 1, 1966, 110-111

TOPIC TAGS: EPR spectrum, neodymium, molybdate, barium compound

ABSTRACT: The ESR spectrum of Nd^{3+} ions was studied in $BaMoO_4$ single crystals grown from a solution in the salt melt. All the ions were magnetically equivalent; their spectrum is described by a spin Hamiltonian of axial symmetry. In the orientation $\theta = 90°$ (θ being the angle between the magnetic field and the c axis of the crystal), the measurements were made at a frequency of 10 KMc. As the orientation $\theta = 0$ was approached, the lines broadened sharply, and the spectrum shifted to high fields. For this reason, measurements in the orientation $\theta = 0$ were performed at a frequency of 3 KMc. However, even at this frequency, the hyperfine structure could not be observed because of the large width of the lines, and only the value of $g_{\parallel}$ was obtained. The Hamiltonian parameters which could be determined were as follows:

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L 42888-66
ACC NR: AP6020385

$$g_{\parallel} = 0.706 \pm 0.002$$
$$g_{\perp} = 2.580 \pm 0.004$$
$$B^{143} = (270 \pm 2)\ 10^{-4}\ cm^{-1}$$
$$B^{145} + (167 \pm 2)\ 10^{-4}\ cm^{-1}$$

Comparison of the g factors of Nd^{3+} in the lattices of $CaWO_4$, $PbMoO_4$, and $BaMoO_4$ shows that $g_{\perp}$ remains almost unchanged, whereas $g_{\parallel}$ decreases sharply with increasing lattice parameters.

SUB CODE: 07,20/SUBM DATE: 31May65/ ORIG REF: 002/ OTH REF: 001

Card 2/2

ACC NR: AP6018741 SOURCE CODE: UR/0057/66/036/006/1118/1120

AUTHOR: Antipin, A.A.; Kurkin, I.N.; Livanova, L.D.; Potvorova, L.Z.; Shekun, L.Ya.

ORG: Kazan' State University im. V.I.Ul'yanov-Lenin (Kazanskiy gosudarstvennyy universitet)

TITLE: EPR in calcium, strontium, and barium fluoride crystals containing samarium

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 6, 1966, 1118-1120

TOPIC TAGS: EPR, calcium, strontium, barium, samarium, fluoride, single crystal, crystal growing, EPR spectrometry

ABSTRACT: The EPR spectra of CaF_2:Sm, SrF_2Sm, and BaF_2Sm crystals were investigated at 4.2 °K with an EPR spectrometer operating in the 3 and 10 cm wavelength regions. The crystals were grown under a variety of conditions, and both colorless crystals and crystals showing the characteristic tint due to the presence of Sm^{2+} ions were obtained. The only tetragonal Sm^{3+} centers observed in CaF_2:Sm were those with $g_{\parallel} = 0 \pm 0.6$ and $g_{\perp} = 0.823 \pm 0.003$. The tetragonal Sm^{3+} centers reported by M.J.Weber and R.W.Bierig (Phys.Rev., 134, No. 6A, 1492, 1964) and W. Lowe (Phys. Rev., 134, No. 6A, 1479, 1964) were not confirmed. In SrF_2:Sm there were observed tetragonal Sm^{3+} centers with $g_{\parallel} = 0 \pm 0.06$ and $g_{\perp} = 0.829 \pm 0.002$, and in the best samples it was possible to resolve the hyperfine structure due to the Sm isotopes. No resonances that could be ascribed to Sm^{3+} were observed in BaF_2:Sm, although many crystals grown under a wide variety of conditions were examined and resonances with g-factors as low as 0.2 or 0.3 would have

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ACC NR: AP6018741

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been detected. It is suggested that the absence of Sm^{3+} EPR in BaF_2:Sm may be due to the Sm^{3+} centers having trigonal rather than tetragonal symmetry in that host: in a cubic field the ground state Γ_8 quartet contains a nonresonating Kramers doublet that could be depressed to ground position by distortion of the field along the C_3 axis. It is suggested that there may be trigonal Sm^{3+} centers in CaF_2:Sm and SrF_2Sm also. Orig. art. has: 2 formulas and 1 figure.

SUB CODE: 20 / SUBM DATE: 16Jul65 / ORIG. REF: 003 / OTH REF: 005

Card 2/2 MLP

L 01820-67 EWT(m)/T/EWP(t)/ETI IJP(c) JD/JW/JG

ACC NR: AP6030965 SOURCE CODE: UR/0181/66/008/009/2664/2667

AUTHOR: Antipin, A. A.; Kurkin, I. N.; Livanova, L. D.; Potvorova, L. Z.; Shekun, L. Ya.

ORG: Kazan State University im. V. I. Ul'yanov-Lenin (Kazanskiy gosudarstvennyy universitet)

TITLE: Investigation of paramagnetic centers of Er^{3+} in BaF_2 and SrF_2 single crystals

SOURCE: Fizika tverdogo tela, v. 8, no. 9, 1966, 2664-2667

TOPIC TAGS: single crystal, impurity center, paramagnetic center, erbium, barium fluoride, strontium fluoride

ABSTRACT: The authors investigated SrF_2 and BaF_2 single crystals with a Er^{3+} impurity. More trigonal and less cubic Er^{3+} centers were detected in both single crystals. The dependence of the relative concentration of cubic and trigonal centers on the total concentration of Er^{3+} was traced for the BaF_2:Er sample. Orig. art. has: 1 formula and 2 tables. [Based on authors' abstract] [NT]

SUB CODE: 20/ SUBM DATE: 31Jan66/ ORIG REF: 003/ OTH REF: 005/

Card 1/1 fv

L 06267-67 EWT(m)/EWP(t)/ETI IJP(c) JD/JG

ACC NR: AP6030982 SOURCE CODE: UR/0181/66/008/009/2808/2809

AUTHOR: Antipin, A. A.; Kurkin, I. N.; Potkin, L. I.; Shekun, L. Ya.

ORG: Kazan State University im. V. I. Ul'yanov-Lenin (Kazanskiy gosudarstvennyy universitet)

TITLE: Paramagnetic resonance of Co^{3+} and Yb^{3+} in $BaMoO_4$ single crystals

SOURCE: Fizika tverdogo tela, v. 8, no. 9, 1966, 2808-2809

TOPIC TAGS: EPR, cerium, ytterbium, barium compound, molybdate

ABSTRACT: EPR measurements of Co^{3+} and Yb^{3+} were made at 4.2°K on $BaMoO_4$ single crystals, which have the most elongated cell of all crystals in the scheelite homologous series. The rare earth ion was present in the amount of 0.1% and entered chiefly into the composition of the tetragonal centers. The constants of the spin Hamiltonian of Ce^{3+} ion, determined at ~10 kMc, were found to be

$$Ce^{3+}\begin{cases} g_{\parallel} = 2.637 \pm 0.004; \\ g_{\perp} = 1.541 \pm 0.003. \end{cases}$$

For the Yb^{3+} ion, only one of the principal orientations, $H \perp z$, could be observed. The corresponding parameters of the spin Hamiltonian are

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ACC NR: AP6030982

$$Yb^{3+}\begin{cases} g_{\perp} = 3.91 \pm 0.01; \\ B^{171} = 3111 \pm 20 \text{ Mc} \\ B^{173} = 860 \pm 10 \text{ Mc} \end{cases}$$

As the H∥z orientation was approached, the lines broadened markedly, and for this reason the spectrum of Yb^{3+} at frequencies of ~9 and ~3 kMc could not be observed in this orientation. From the angular dependence of the spectrum it is concluded that

$$g_{\parallel} = 0.43 \pm 0.04.$$

SUB CODE: 20/ SUBM DATE: 07Apr66/ ORIG REF: 005/ OTH REF: 002

Card 2/2 ecp

ACC NR: AP7005868 SOURCE CODE: UR/0181/66/008/012/3658/3659

AUTHOR: Kurkin, I. N.; Shekun, L. Ya.

ORG: Kazan' State University im. V. I. Ul'yanov-Lenin (Kazanskiy gosudarstvennyy universitet)

TITLE: EPR of neodymium in $CdMoO_4$ scheelites

SOURCE: Fizika tverdogo tela, v. 8, no. 12, 1966, 3658-3659

TOPIC TAGS: laser material, epr spectrum, neodymium, activated crystal, cadmium compound, molybdate, scheelite, EPR, Hamiltonian

ABSTRACT: The authors determined the parameters of the spin Hamiltonian describing the EPR of Nd^{3+} contained in single-crystal $CdMoO_4$. The samples were prepared by the Czochralski method. The values of the constants obtained at 4.2K and ~9.4 GHz are listed. By comparing the results with data obtained for other scheelites in an earlier paper (FTT v. 8, 731, 1966) it is concluded that the parameters of the Hamiltonian of Nd^{3+} in $CdMoO_4$ obey the same laws that characterize all other scheelites, namely a smooth dependence on the lattice constant c. In particular, extrapolation of the curve for the g-factors in the earlier investigation yield excellent agreement with experiment. To decide conclusively that the regularities observed are universal, it is necessary to carry out experiments with Nd^{3+} in $SrMoO_4$ and $PbWO_4$. The authors thank A. M. Morozov for preparing the $CdMoO_4$:Nd samples. Orig. art. has: 1 table. [WA-14] [02]

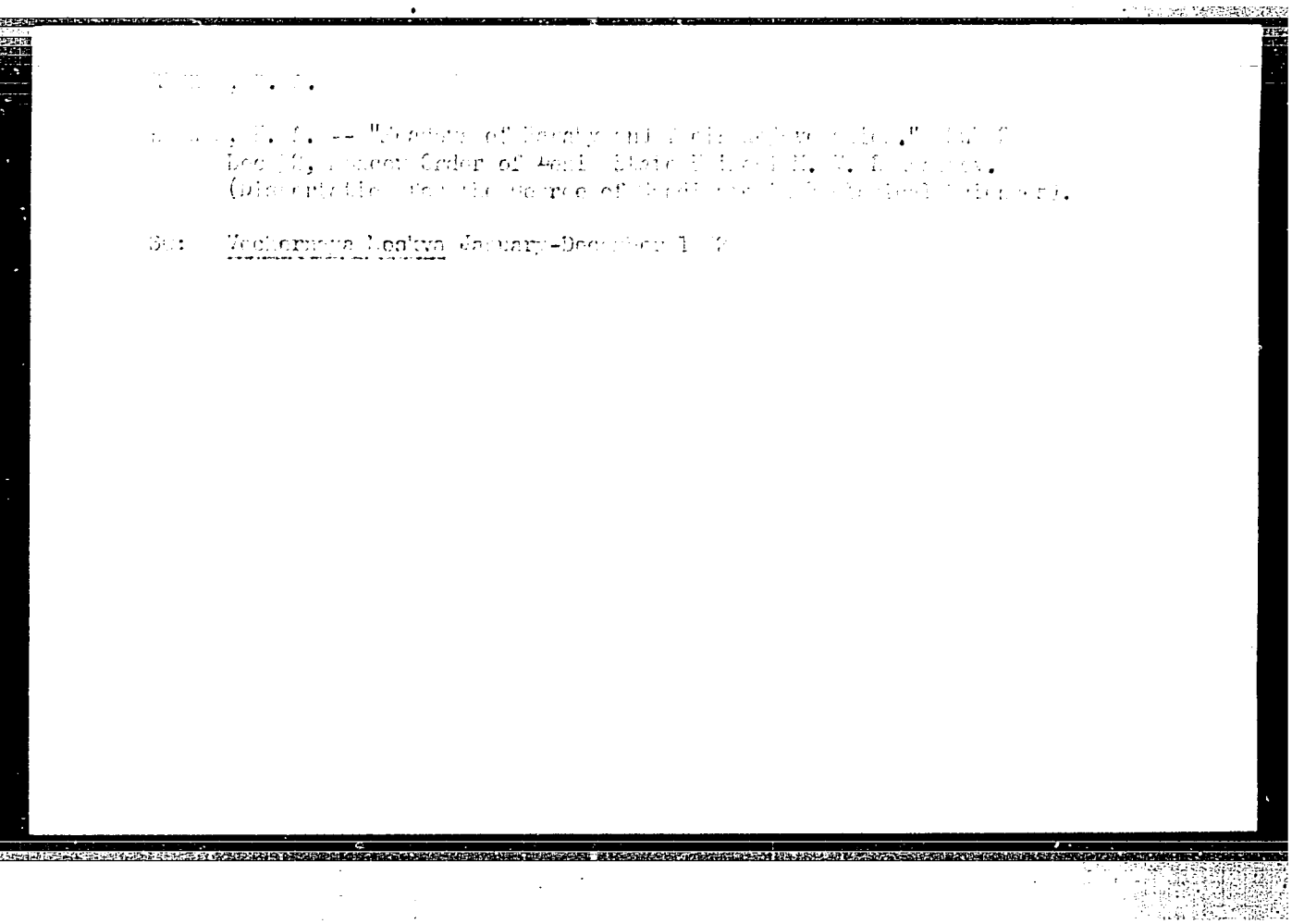
SUB CODE: 20/ SUBM DATE: 20Jun66/ ORIG REF: 001/ OTH REF: 001

Card 1/1 UDC: none

KURKIN, K.

How to arrange the placement of crops. Zemledelie 25 no.2:67 F '63. (MIRA 16:5)

1. Meshcherskaya zonal'naya opytno-meliorativnaya stantsiya.
(Field crops)



1. KURKIN, K. A.

2. USSR (600)

4. Meadows

7. Shredding soil in meadows of low productivity in Baraba. Korm. baza. 3, No. 10, 1952.

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

USSR/Biology - Plant Ecology FD-1610

Card 1/1 : Pub. 129-13/23

Author : Kurkin, K. A.

Title : Certain bio-ecological characteristics of Carex Caespitosa L.

Periodical : Vest. Mosk. un., Ser. fizikomat. i yest. nauk, 9, No 8, 83-93, Dec 1954

Abstract : The bio-ecological characteristics of Carex caespitosa L. were investigated in connection with attempts to reclaim the Baraba swamps. The water and soil requirements and their seasonal variations are noted. The results of the investigations are given on two charts. The text is illustrated by six sketches and two photographs. Twenty-seven Soviet references and two non-Soviet references are given.

Institution : Chair of Geobotany

Submitted : February 2, 1954

KURKIN, K.A.

Earthen mounds in meadows of the Baraba Steppe. Biul.MOIP. Otd. biol. 59 no.4:33-40 Jl-Ag '54. (MLRA 7:9)
(Baraba Steppe--Meadows) (Meadows--Baraba Steppe)

KURKIN, Konstantin Aleksandrovich; STANKOV, S.S., otvetstvennyy redaktor; TERENT'IEVA, M.I., redaktor izdatel'stva; POLESITSKAYA, S.M., tekhnicheskiy redaktor

[Baraba meadows and their improvement] Luga Baraby i ikh uluchshenie. Moskva, Izd-vo Akad.nauk SSSR, 1957. 146 p. (MLRA 10:9)
(Baraba steppe--Pastures and meadows)

KURKIN, K. A.

Vestnik Akad. Nauk SSSR, Vol 27, No. 8, 1957

New Books

30-8-37/37

Theoretical treatment of the problem concerning the influence exercised by minerals on the water contained by plants. Analysis of investigations carried out.

Kurkin, K. A.: The Baraba Meadows and the Possibility of Improving them. Popular Science series. Published 1957, 148 pp., 2000 copies, price 2 Roubles 80 Kop., - The author describes the particular features of the Baraba meadows and gives advice as to how they might be improved and utilized more rationally.

✓ **Melekhov,** I.S.: A Survey of the Development of the Science of Forestry in Russia. Popular Science series, 1957, 208 pp., with illustrations, 8000 copies, price 3 Roubles 10 Kop. A survey of the development of forestry in Russia.

Automation and Industrial Plants. Conference report 15 - 20 October 1956, scientifical and technical problems of automation, 1957, 444 pp., 6500 copies, price 19 Roubles 50 Kop. - Conference reports dealing with automation.

✓ **Uzhik,** G.V.: The Durability and the Plastic Properties of Metal at Low Temperatures. 1957, 193 pp., 5000 copies, price 7 Roubles 70 Kop. Work carried out by the Institute for Metallurgy (Baykov Institute), I. edition. Moscow 1957, 260 pp., 3000 copies,

Card 4/8

KURKIN, K.A.; TIKHONENKO, T.I.

Nitrophilous plants and the criterion of nitrophily [with summary in English]. Bot.zhur. 43 no.12:1682-1689 D '58. (MIRA 11:12)

1. Moskovskiy universitet imeni M.V.Lomonosova.
(Plants--Nutrition) (Nitrates)

KURKIN, K.A.; STEBAYEV, I.V.

Outbreak of mass multiplication of solitary locuts in Baraba and its effect on meadow vegetation. Biul.MOIP.Otd.biol. 64 no.1: 51-60 Ja-F '59. (MIRA 12:7)
(Baraba Steppe--Locusts)
(Pastures and meadows)

KURKIN, K.A.

Basic characteristics of the transformation process of meadows under the influence of shallow cultivation of sod and soil. Biul. MOIP. Otd. biol. 68 no.2:63-76 Mr-Ap '63. (MIRA 17:2)

KURKIN, K.A.

Surface cultivation as a method of preserving moisture in the salinized meadow soils in [illegible]. Pochvovedenie no. 3:77-90 Mr '64. (MIRA 17:4)

1. Moskovskaya [illegible] sel'skokhozyaystvennaya stantsiya.

KURKIN, K.A.

Cycle of the year-to-year variability of two cenoses of the formation of Hordeeta brevisubulati in the forest steppe of Western Siberia. Biul. MOIP. Otd. biol. 69 no.4:73-85 Jl-Ag '64.

(MIRA 17:11)

KURKIN, K.A.

Principles of the natural classification of meadow biogeocenoses. Bot.zhur. 50 no.11:1523-1535 N '65.

(MIRA 19:1)

1. Meshcherskaya zonal'naya opytno-meliorativnaya stantsiya Vsesoyuznogo nauchno-issledovatel'skogo instituta gidrotekhniki i melioratsii, poselok Solodtcha Ryazanskoy oblasti.
Submitted April 26, 1965.

KURKIN, L., shlifoval'shchik, deputat Verkhovnogo Soveta SSST; YEMEL'YANOVA-SHCHUKINA, K., Geroy Sotsialisticheskogo Truda; POPKOV, A.; BITKOV, V.

An honorary title must be earned. Sov.profsoiuzy 17 no.10:17-18 My '61. (MIRA 14:5)

1. Instrumental'nyy tsekh Moskovskogo avtomobil'nogo zavoda imeni Likhacheva (for Kurkin). 2. Brigadir brigady kommunisticheskogo truda liteynogo tsekha no.3 Moskovskogo avtomobil'nogo zavoda imeni Likhacheva (for Yemel'yanova-Shchukina). 3. Master smeny kommunisticheskogo truda remontno-mekhanicheskogo tsekha Moskovskogo avtomobil'nogo zavoda imeni Likhacheva (for Popkov). 4. Predsedatel' zavkoma Moskovskogo avtomobil'nogo zavoda imeni Likhacheva (for Bitkov).

(Moscow--Automobile industry) (Socialist competition)

COUNTRY	:	USSR
CATEGORY	:	Cultivated Plants. Cereals. M
[illegible]	:	Referat. Zhur., Biol., No.14, 1958, No. 63297
[illegible]	:	Markin, A., Karpunin, I.
Inst.	:	-
TITLE	:	On the Methods of Soil Tillage for Winter Wheat in the Central Zone of the Kray.
ORIG. PUB.	:	Peredov. opyt s. - kh. proiz-va Stavropol'ya, 1957, iyul' - avg., 12-14
[illegible]	:	No abstract.

Card: 1/1

S/126/62/014/003/001/022
E032/E314

AUTHOR: Kurkin, M.I.

TITLE: On the theory of spin waves in a collective model of a system of electrons. I. Energy spectrum

PERIODICAL: Fizika metallov i metallovedeniye, v.14, no.3, 1962, 327-336

TEXT: This paper is concerned with spin waves in a system of electrons with an arbitrary dispersion law and ferro-, ferri- and antiferromagnetic spin order. The theory is developed using the method for describing collective excitations in a system of electrons (excitons and plasmons) as described by C. Horrie (Prog. Theor. Phys., 1959, 21, 113), K. Sawada (Phys. Rev., 1957, 106, 372) and K. Sawada et al (Phys. Rev., 1957, 108, 507). The first section of the paper is concerned with the ferromagnetism of a system of electrons with an arbitrary dispersion law and a positive exchange integral. The Hamiltonian is assumed to be of the form:

$$H_1' = E_0 + H_0 + H_1. \qquad (5)$$

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On the theory of spin waves ...

where

$$H_0 = \sum_{k\sigma} \tilde{E}_\sigma(k) n_{k\sigma}; \quad \tilde{E}_\sigma(k) = E_\sigma(k) - \sum_{k'} I(kk') n_{k'\sigma};$$

$$H_1 = -\frac{1}{2} \sum_{\substack{kk'q \\ \sigma\sigma' (\sigma \neq \sigma')}} I(kk'q)\, a^+_{k+q\sigma} a_{k'+q\sigma'} a^+_{k'\sigma'} a_{k\sigma}. \qquad (6)$$

In these expressions $a^+_{k\sigma}$ and $a_{k\sigma}$ are the electron creation and annihilation operators and $I(kk'q)$ is the exchange-interaction matrix element. The electron energy thus turns out to be dependent on the spin orientation. It is then assumed that states with uncompensated spins are available and collective excitations associated with spin flip are discussed. It is shown that the particular feature of the collective model is that, in general, there are ℓ nondegenerate spin-wave branches, where ℓ is the number of states with uncompensated spins. This splitting is of a similar nature to that for the levels in the exciton spectrum of semiconductors, i.e. the electron and the hole

Card 2/4

On the theory of spin waves ....

forming the spin wave may be at various effective distances from each other, giving rise to differences in the energy of these spin waves. The second section of the paper is concerned with ferri- and antiferromagnetism, in which the system is assumed to consist of two sub-lattices with opposite magnetic moments. It is further assumed that states with uncompensated spins are available in each sub-lattice. Only exchange interactions between the sub-systems are taken into account and the Hamiltonian is assumed to consist of the sum of two terms, with the result that there are two branches of spin waves. As before, expressions are derived for the energy of the spin waves. The general conclusion is that the main results of the homeopolar and phenomenological models remain, except that there are ℓ rather than two spin-wave branches and, in general, these branches are non-degenerate. It is stated that the effect of the mobility of the "magnetic electrons" (i.e. the fact that they are not localized at lattice sites) on the temperature-dependence of the magnetic properties of antiferromagnetics and on ferromagnetic resonance will be discussed in a future paper.

Card 3/4

S/126/62/014/003/001/022
E032/E314

On the theory of spin waves ....

ASSOCIATION: Institut fiziki metallov AN SSSR
(Institute of Metal Physics of the AS USSR)

SUBMITTED: May 6, 1962

Card 4/4

ACCESSION NR: AP4009372 S/0126/63/016/006/0808/0811

AUTHOR: Kurkin, M. I.

TITLE: Spin wave theory in the collective electron model. 2. Line width of ferromagnetic resonance

SOURCE: Fizika metallov i metallovedeniye, v. 16, no. 6, 1963, 808-811

TOPIC TAGS: spin wave, collective electron model, ferromagnetic resonance, ferromagnetic resonance line width, spin wave scattering, magnetic electron

ABSTRACT: Two mechanisms for ferromagnetic resonance line broadening are discussed, using the model of collective electrons. The first is the attenuation of spin waves with zero quasimomentum due to their scattering at the magnetic electrons. If the spread of the Fermi surface is assumed to be 0.1 for the magnetic electrons, then the attenuation of spin waves with zero quasimomentum is given by

$$\Gamma_{0n} = 0{,}1 \cdot 2^{-1}(2\pi)^{-3} v\hbar a^{-4} N^{-2} m^{*-1} k_F^4,$$

where v is the volume of the basic region, a is the lattice constant, N is the

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number of magnetic electrons, m^* is their effective mass, k_F is the wave vector at the Fermi surface, and n is the quantum number characterizing the relative position of electron and hole in the spin wave. Taking $m^* = 10^{-26}$g, then since $k_F = 10^6$-10^7 $\Gamma_{On} = 10^6$-10^{10} sec^{-1}, which corresponds to the range of experimentally observed values of ferromagnetic resonance line width. The indicated temperature independence of the attenuation (and hence of the line width due to this mechanism) is due to the fact that the temperature spread of the Fermi surface reaches 0.1 only near the Curie temperature. The second mechanism is the effect of magnetic interactions. It is shown that magnetic interactions can remove the degeneracy in n of the spin wave spectrum. This splitting is also independent of temperature. It is pointed out that both mechanisms are very sensitive to the structure and the degree of occupancy of the magnetic electron energy band (which depend on the impurities). It is concluded that the two mechanisms can explain the large magnitude (about 10^3 oe) and the weak temperature dependence of the ferromagnetic resonance line width, but the abundance of parameters in the theory makes quantitative comparison with experiment very difficult. The author thanks S. V. Vonsovskiy, Ye. A. Turov, and A. N. Voloshinskiy for valuable discussions. Orig. art. has: 8 equations.

ACCESSION NR: AP4009372

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Physics of Metals AN SSSR)

SUBMITTED: 11Mar63	DATE ACQ: 03Feb64	ENCL: 00
SUB CODE: GP	NO REF SOV: 004	OTHER: 005

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ACCESSION NR: AP4013086 S/0126/64/017/001/0003/0009

AUTHOR: Kurkin, M. I.

TITLE: Spin wave theory in the collective electron model. 3. Transverse and longitudinal susceptibility of antiferromagnetics

SOURCE: Fizika metallov i metallovod., v. 17, no. 1, 1964, 3-9

TOPIC TAGS: spin wave, collective electron model, spin wave energy spectrum, antiferromagnetic, transverse magnetic susceptibility, longitudinal magnetic susceptibility

ABSTRACT: The spin wave energy spectrum of an antiferromagnetic in a transverse magnetic field is found on the basis of the collective electron model. It is assumed that the system of magnetic electrons can be divided into two subsystems α and β with ferromagnetic ordering of spins in each. The magnetic moments of the subsystems in the absence of an external field are taken parallel and antiparallel to the z axis. The applied external magnetic field H is directed along the x axis. The Hamiltonian of the system, considering exchange interaction only between electrons of the different subsystems, is written in terms of

$$a^{+}_{k\sigma},\ a_{k\sigma},$$

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the electron creation and annihilation operators for the α -subsystem, and

$$\beta^+_{k\sigma},\ \beta_{k\sigma},$$

the corresponding operators for the β -subsystem. Diagonalization of the Hamiltonian with respect to σ is accomplished by the canonical transformation

$$a^+_{k\sigma} = \lambda_k a^+_{k\sigma} + \delta_k a^+_{k,-\sigma};\ \beta^+_{k\sigma} = \lambda_k d^+_{k\sigma} - \delta_k d^+_{k,-\sigma};$$

$$a^+_{k,-\sigma} = -\delta_k a^+_{k\sigma} + \lambda_k a^+_{k,-\sigma};\ \beta^+_{k,-\sigma} = \delta_k d^+_{k\sigma} + \lambda_k d^+_{k,-\sigma};$$

$$\lambda^2_k + \delta^2_k = 1.$$

This corresponds to a rotation of the k spin by an angle φ_k for the α -subsystem and by $-\varphi_k$ for the β -subsystem where

$$u_k = \cos\varphi_k = \lambda^2_k - \delta^2_k;\ v_k = \sin\varphi_k = 2\lambda_k\delta_k.$$

The dependence on k of λ and δ is weak and will be neglected. The spin wave energy spectrum is given by

$$\varepsilon_{1q\,n} = \sqrt{(M_{q\,n} - L_q)^2 - N_q^2},\quad \varepsilon_{2q\,n} = \sqrt{(M_{q\,n} + L_q)^2 - N_q^2},$$

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where

$$M_{qn} = \varphi_{qn} + IN(1-2v^2) + 2\mu Hv;$$

$$N_q = I(q)N(1-v^2);\ L_q = I(q)Nv^2;$$

$$\varphi_{qn} = \sum_k (E(k+q) - E(k))\,|f_{qn}(k)|^2;$$

with the conditions

$$\sum_k^{(1)} f^*_{qn}(k) \sum_{k'} f_{qn}(k') = N_0;$$

and

$$\sum_k^{(1)} |f_{qn}(k)|^2 = 1.$$

Here

$$\sum_k^{(1)},$$

indicates summation over the region

$$0 < k < k_F.$$

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The dependence on n of M and $\mathcal{E}$ is assumed negligiblo (i.e. $\varepsilon_q = \varkappa q$).

Then for a small field the transverse magnetic susceptibility of an antiferromagnetic

$$\chi_\perp = \chi_\perp^0 = \frac{8\pi^2\mu^2}{3\varkappa^2}\left(1 - \frac{\Delta^2}{(1-\Delta)^2}\right)(kT)^2,$$

where

$$\Delta = \frac{\frac{1}{N}\sum_{qn}\frac{\varepsilon_{qn}}{M_{qn}}}{2\left(2 - \frac{1}{N}\sum_{qn}\frac{M_{qn}}{\varepsilon_{qn}}\right)}.$$

The longitudinal susceptibility

$$\chi_\parallel = -\frac{\partial^2\Omega}{\partial H^2} = \frac{32\mu^2\pi^2}{3\varkappa^2}(kT)^2 + 2\mu^2 N(E_F) +$$

$$+ \frac{\pi^2\mu^2}{3} N(E_F)\left(\frac{d^2 \ln N(E)}{dE^2}\right)_{E=E_F}(kT)^2,$$

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where N(E) is the density of states and E_F is the Fermi energy. The author thanks S. V. Vonsovskiy, Yu. P. Irkhin and K. V. Vlasov for valuable discussions and Ye. A. Turov for consultations. Orig. art. has: 24 equations.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Physics of Metals AN SSSR)

SUBMITTED: 11Mar63 DATE ACQ: 26Feb64 ENCL: 00

SUB CODE: GP NO REF SOV: 005 OTHER: 002

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KURKIN, M.I.

Spin waves in ferromagnetic materials. Fiz. met. i metalloved. 20 no.4:494-503 O '65.

(MIRA 18:11)

1. Institut fiziki metallov AN SSSR.

ACC NR: AP6018548 SOURCE CODE: UR/0181/66/008/006/1839/1846

AUTHOR: Kurkin, M. I.; Parfenova, N. G.

ORG: Institute of Physics of Metals, AN SSSR, Moscow (Institut fiziki metallov AN SSSR)

TITLE: Effect of interaction of nuclear spins with spin waves on the quadrupole splitting of the nuclear magnetic resonance line

SOURCE: Fizika tverdogo tela, v. 8, no. 6, 1966, 1839-1846

TOPIC TAGS: nuclear magnetic resonance, nmr spectroscopy, nuclear spin, spin wave, antiferromagnetism, Green function, Hamiltonian, Neel temperature

ABSTRACT: In order to determine the influence of the NMR frequency shift due to the nuclear-spin and spin-wave interaction at temperatures of the order of 1 - 10K on the quadrupole splitting of the resonance line, the authors investigated the NMR spectrum in antiferromagnets with antiferromagnetism axes lying in the basal plane, with account taken of the quadrupole interaction. The nuclear excitation spectrum is determined by a Green's function method. The transition from the spin operator to the spin-wave creation and annihilation operators in the Hamiltonian is by a standard procedure. On the basis of the theoretical calculations, certain general conditions are deduced, under which the frequency shift becomes experimentally observable. These conditions are that the parameter of the quadrupole interaction be appreciably larger than the width of the resonance line to permit observation of the quadrupole splitting,

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ACC NR: AP6018548

and that the interaction between the nuclear spins and the spin waves be sufficiently strong. It is possible that $CoCO_3$ may be a suitable substance for such experiments, in spite of its low Neel temperature ($T_N \sim 18K$). The authors thank Ye. A. Turov for a discussion. Orig. art. has: 27 formulas.

SUB CODE: 20/ SUBM DATE: 15Nov65/ ORIG REF: 005/ OTH REF: 002

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KURKIN, M.I.; ZHELEZNOV, B.L., red.; GABDULLAZYANOVA, F.Kh., tekhn.red.

[Costs of collective farm production and ways to reduce them] Sebestoimost' kolkhoznoi produktsii i put' ee snizheniia. Kazan', Tatarskoe knizhnoe izd-vo, 1960. 52 p.
(MIRA 14:1)

(Tatar A.S.S.R.--Collective farms--Costs)

VOLKOV, Yu.A.; KURKIN,M.I., red.; LEONIDOV,P.I., red.; KHUSNUTDINOV,Sh.S.,tekh.red.

[Ways of raising the economic effectiveness of fruit culture; based on the example of the collective farms of Verkhniy Uslon District Tatar A.S.S.R.] Puti povysheniia ekonomicheskoi effektivnosti sadovodstva; na primerakh kolkhozov Verkhne-Uslonskogo raiona TASSR. Pod red. M.I.Kurkina. Kazan', Tatarskoe knizhnoe izd-vo, 1960. 53 p. (MIRA 14:9)

(Tatar A.S.S.R.—Fruit culture)

KURKIN, N.A.

Some problems related to the sign of absolute magnitude. Uch. zap. Kar. ped. inst. 14:28-45 '63. (MIRA 17:3)

KUDRYAVTSEV, A.S., prof., doktor ekonom. nauk, zasl. deyatel' nauki i tekhniki RSFSR; LYASNIKOV, I.A., dots.; KOSTIN, L.A., dots.; PUNSKIY, Ya.M., prof.; PETROCHENKO, P.F., kand. ekonom. nauk; GUR'YANOV, S.Kh., dots.; KURKIN, N.I., st. prepodavatel'; KOTOV, F.I., dots.; REMIZOV, K.S., kand. ekonom. nauk; POLYAKOV, I.A., starshiy prepodavatel'; REZNIKOV, B.N., retsenzent; KOPYLOVA, L.P., red.; ANDREYEVA, L.S., tekhn. red.

[Labor economics in the U.S.S.R.] Ekonomika truda v SSSR. 2., perer. izd. Moskva, Izd-vo VTsSPS Profizdat, 1961. 623 p. (MIRA 15:2)

(Labor and laboring classes)

SOV/96-58-8-1/22

AUTHORS: Ostrovskiy, Ya. M., Candidate of Technical Science, Kurkin, N.P., Kryukov, A.I., Tsyrkin, I.Z., Engineers

TITLE: The Operation of Thermal Power Stations in a System under Variable Load Conditions (Rabota teplovykh elektrostantsiy sistemy v usloviyakh peremennykh nagruzok)

PERIODICAL: Teploenergetika, 1958, Nr 8, pp 3-8 (USSR)

ABSTRACT: The load curve of Mosenergo power stations has always exhibited sharp peaks because of the large light industry, domestic and traction loads. Until the Moscow-Kuybyshev transmission line was opened in 1956, the base load was mainly covered by thermal stations, which made up 85% of the installed capacity. Small hydro stations took some of the peaks, and low- and medium-pressure stations were unloaded at off-peak hours. When large imports of power began to be taken from Kuybyshev, the conditions of electricity supply in Moscow and the central regions greatly improved. However, in order to avoid wasting water at Kuybyshev, load had to be taken as uniformly as possible throughout the day to the full capacity of two 400-kV transmission lines. Therefore, the load peaks on the thermal stations became much more marked; moreover,

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The Operation of Thermal Power Stations in a System under Variable Load Conditions

it was necessary to keep sets in reserve in case of failure of supply from Kuybyshev. The overall ratio of maximum to minimum load on the steam stations became about 2.4. Many sets and boilers had to be started up to meet the morning peak. Combined heat- and electric-power-supply turbines, which formed about 26% of the total capacity, could only be unloaded to the extent permitted by their heat loads; moreover, some stations had to burn excess gas, particularly in summer when the gas is less used for heating and cooking. Finally, the Cherepet' station, because it uses very-high-pressure sets of high efficiency, was kept on base load as far as possible. Therefore, on many thermal stations, the ratio of maximum to minimum load was up to 5, as indicated by the graph in Fig 1. In some cases stations had to be kept loaded to maintain the voltage in particular districts. When peat was specially plentiful, peat-fired stations were kept running. Load curves of a thermal station containing turbines type VK-100-2, (100 MW) with direct-flow boilers, and turbines VK-35 with drum-type

boilers, are given in Fig 2, the steam conditions being 60 atm 485°C. Further effects of supplies from Kuybyshev are seen in the following figures for the annual number of hours of utilisation of installed capacity: 1955, 6981; 1956, 6358; 1957, 4507. The reliability and quality of power supply was, however, much improved when power was received from Kuybyshev. Because there was more reserve plant, more attention could be paid to maintenance and reconstruction work and the number of faults was much reduced. Turbines and boilers could then be run for longer periods without stopping, as will be seen from Table 1, which shows, for different years, the number of sets not requiring major overhaul. Some small inefficient turbines were converted to back-pressure operation. The way in which a 17,600-kW Metropolitan-Vickers turbine was reconstructed for back-pressure operation is shown in Fig 4. Curves of the installed capacity and rise in output of high- and super-high-pressure sets are given in Fig 3. The increase in the number of times boilers were started up will be seen from Table 2; tests were accordingly made to cut down the time required to bring turbines and boilers on load. Because of the need to keep sets in running

The Operation of Thermal Power Stations in a System under Variable Load Conditions

reserve, many had to work on very light loads, causing various problems, which are explained. Economy of feed water on high-pressure sets was important. As a result of tests made, the distribution of load between equipment within a given station and between stations was reviewed. It was found that most medium- and high-pressure turbines could be made to work indefinitely at the lightest loads without disconnecting the regenerative heaters. This facilitated taking up load. It was more difficult to run boilers on light load. However, in every case when the Kuybyshev station became disconnected the load was successfully taken up without serious frequency drop. Barring gear was installed on many medium-pressure turbines. Special efforts were made to keep to a minimum the number of sets in running reserve, but the possibilities were limited by the need to maintain voltage in particular parts of the system. Data on the number of starts made in 1955-57, mainly to regulate the system load on suburban stations, are given in Table 3. The amount of fuel

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The Operation of Thermal Power Stations in a System under Variable Load Conditions

consumed in starting-up rose from 4000 tons in 1956 to 8000 tons in 1957; hence the importance of making rapid starts. Despite the more severe operating conditions that resulted from the accentuated peaks in the load curve, the power stations operated reliably, the technical and economic efficiencies of the power system as a whole were improved, and the reserve was sufficiently flexible when faults occurred on the Moscow-Kuybyshev transmission line.

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There are 4 figures and 3 tables.

ASSOCIATION: Mosenergo

1. Steam power plants--Performance

KURKIN, N P

SOV/96-58-9-6/21

AUTHORS: Ostrovskiy Ya.M., (Candidate of Technical Science), Kurkin N.P., Krylkov A.I., and Tsyrkin I.Z. (Engineers)

TITLE: Reducing the Starting-time of Boilers and Turbines (Sokrashcheniye vremeni puska kotlov i turbin)

PERIODICAL: Teploenergetika, 1958, Nr 9, pp 34 - 38 (USSR)

ABSTRACT: Until power began to be transmitted from Kuybyshev in 1957 the load curve of stations on the Moscow power system was uniform and so the time required to start up boilers was not of great importance. Now the matter is otherwise, because boilers are started much more often. The boiler starting schedules laid down by the manufacturers are given in Table 1 and are very lengthy; they involve considerable fuel consumption and loss of feed water. A number of special tests were made on boilers with the object of reducing these times. Figs 1 and 2 show respectively graphs of accelerated (1 hour 45 minutes) and normal (3 hours 45 minutes) starts on a boiler type TP-230. In both cases the boiler had been in reserve for about 32 hours. Starting was accelerated by putting two muffle burners on the furnace and connecting two fuel feeders to

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