

84686

S/051/60/009/005/007/019

E201/E191

The Effect of Deformation on the Absorption Spectrum of Cuprous Oxide Crystals at 20 °K

The effect of compression on the absorption bands of the yellow series at 20 °K is shown in Fig. 1. Fig. 2 shows the dependence of the shift of two bands of the green series on the shift of the yellow series due to compression. The yellow series was shifted as one unit, but this was not so in the case of the green series where separate bands were shifted by different amounts (Fig. 2). Constant uniform electric fields produced satellites in the yellow series; in strong fields the yellow bands joined the continuous absorption region moving towards longer wavelengths (Fig. 3a). In the case of the green series electric fields broadened somewhat the bands and caused their gradual merging with continuous absorption (Fig. 3b). The displacement of the yellow series as a whole under uniaxial compression means that its energy gap between valence and conduction bands is affected by pressure. Behaviour of the green series indicates that its Rydberg constant is altered by compression, i.e. the effective electron or hole mass is affected. This evidence favours the hypothesis that the

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two series are due to transitions from two different valence bands. Effective carrier masses were found for the two series by assuming that they have a common conduction band and that they are due to optical transitions from separate valence bands to the exciton levels, and by assuming that the upper edges of the two valence bands are separated by a gap represented by 1100 cm^{-1} (the frequency interval between the limits of convergence of the two series).

Acknowledgements are made to A.F. Prikhot'ko and V.L. Broude for their advice.

There are 3 figures and 14 references: 8 Soviet, 3 English, 1 German, 1 French and 1 Japanese.

SUBMITTED: February 23, 1960

Card 3/3

W

KAFAROV, V.V.; YEREMENKO, V.V.

Conditions of stability and the scale of chemical reactors.
Zhur.prikl.khim. 35 no.10:2251-2262 0 '62. (MIRA 15:12)
(Chemical reactors)

KAFAROV, V.V.; YEREMENKO, V.V.

Conditions for the stability of a process in a semicontinuous reactor. Khim. prom. no.2:125-129 F '63. (MIRA 16:7)

(Chemical reactors)
(Chemical equilibrium)

YEREMENKO, V.V.; MATYUSHKIN, E.V.

Spectral dependence of the photoconductivity of cadmium sulfide crystals arising in steady-state and pulse excitation. Fiz. tver. tela 6 no.2:402-408 F '64.

Diffusion shifting of excitons and electrons in cadmium sulfide crystals. Ibid.:409-413 (MIRA 17:2)

1. Fiziko-tehnicheskii institut nizkikh temperatur AN UkrSSR, Khar'kov.

S/185/63/008/001/013/024
D234/D308

AUTHORS: Yeremenko, V. V. and Popkov, Yu. A.

TITLE: Magneto-optical investigations of crystals in strong magnetic fields. I: Pulse methods

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 8, no. 1, 1963, 88-94

TEXT: The authors describe an experimental installation for photographing the absorption spectra of crystals during intervals 100 - 1000 times smaller than the duration of magnetic field pulses. The pulsed illumination is synchronized with maximum values of the field. The field is produced by discharge of a condenser battery through a small solenoid cooled by liquid helium, nitrogen or hydrogen. The possibility of use of the installation was checked on a $\text{CaF}_2 + \text{Ho}$ crystal (investigated previously by V. A. Arkhangel'skaya and P. P. Feofilov in constant magnetic fields). The pulse duration can affect the relative intensities of Zeeman components. There are 7 figures.

~~Card 1/2~~

Physics-techn. Inst. of Low Temperatures, AS USSR

Kharkov

S/056/63/044/002/011/065
B102/B186

AUTHORS: Belyayev, A. I., Yeremenko, V. V.

TITLE: Temperature dependence of the optical-absorption band
width for MnF_2 crystalsPERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44,
no. 2, 1963, 469-471

TEXT: Shape and intensity of the π and σ components of the C-band were determined at 300, ~ 180 , 90, 77, 65, 55, and 20°K; the measurements were made with polarized light using the high-dispersion spectrographs $\Delta\vec{E}C-8$ (DFS-8) (6 Å/mm) and $\Delta\vec{E}C-3$ (DFS-3) (4 Å/mm). The absorption intensity was determined by the usual photometric method. The absorption coefficients were plotted versus λ for different temperatures and for both $\vec{E} \parallel \vec{c}$ (π) and $\vec{E} \perp \vec{c}$ (σ). From these curves the half-width δ of the C and D bands was calculated. Below the Néel point (68°K), δ increases with T exponentially; at this point the curves show a break and continue linearly, for the π -component almost independently of T, and for the

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Temperature dependence of ...

S/056/63/044/002/011/065
B102/B166

σ -component weakly increasing with T. Since it cannot be assumed that at T_N the phonon spectrum or the electron-phonon interaction changes abruptly, the absorption band width and shape of antiferromagnetic crystals is assumed as determined by interactions with excitations of the type of spin waves. There are 3 figures.

ASSOCIATION: Fiziko-tehnicheskiy institut nizkikh temperatur Akademii nauk USSR (Physicotechnical Institute of Low Temperatures of the Academy of Sciences UkrSSR)

SUBMITTED: August 13, 1962

Card 2/2

ACCESSION NR: AP4013495

S/0181/64/006/002/0402/0408

AUTHORS: Yeremenko, V. V.; Matyushkin, E. V.

TITLE: Spectral dependence of photoconductivity in crystals of cadmium sulfide during steady and pulsing excitation

SOURCE: Fizika tverdogo tela, v. 6, no. 2, 1964, 402-408

TOPIC TAGS: photoconductivity, semiconductor, cadmium sulfide, ISSh 500 lamp, MOM 4 megohmmeter, light absorption, diffusion length, UM 2 monochromator, IO 4 oscillograph

ABSTRACT: The light source for photoelectric excitation was an ISSh-500 lamp. The signal was recorded by an IO-4 pulsed oscillograph, and the steady photoconductivity was measured by means of an MOM-4 megohmmeter. Results showed that the ratio of the initial amplitude of the segment of slow decay to the full amplitude of the pulse declines sharply with decrease in wavelength of the exciting light. The segment of slow decay in the long-wave zone is better defined by an exponent than the short-wave zone. The spectral dependence of the full amplitude of the photocurrent pulse and the initial amplitude of the long-wave segment, like the

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ACCESSION NR: AP4013495

spectral distribution of steady photoconductivity, have a well-defined maximum. The relaxation time, even at low temperatures, is sharply dependent on wavelength of the exciting light. It was found that at 77K, the maximums of spectral dependence (for amplitudes of photocurrent pulses) correspond to maximums of the absorption coefficient, even for samples that exhibit minimums in the same parts of the spectrum for steady photocurrent. Investigation of pulsating photocurrent at low temperatures and a comparison of the spectral dependence with the absorption spectrum permit the determination of both the exciton and electron parameters of diffusion length, the rate of surface annihilation (recombination), and the coefficient of diffusion. "In conclusion, we take this opportunity to express our sincere thanks to Professor B. I. Verkin, corresponding member of the AN UkrSSR, for his interest in the work and for his support." Orig. art. has: 6 figures.

ASSOCIATION: Fiziko-tekhnicheskij institut nizkikh temperatur AN UkrSSR, Khar'kov
(Physicotechnical Institute of Low Temperatures AN UkrSSR)

SUBMITTED: 25Jul63

DATE ACQ: 03Mar64

ENCL: 00

SUB CODE: EG, SS

NO REF SOV: 014

OTHER: 008

Card 2/2

BR

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ACCESSION NR: AP4013496

S/0181/64/006/002/0409/0413

AUTHORS: Yeremenko, V. V.; Matyushkin, E. V.

TITLE: Diffusion displacement of excitons and electrons in a crystal of cadmium sulfide

SOURCE: Fizika tverdogo tela, v. 6, no. 2, 1964, 409-413

TOPIC TAGS: cadmium sulfide, exciton diffusion, electron diffusion, diffusion length, exciton relaxation time, quantum yield

ABSTRACT: This paper is mainly a comparison of results from the authors' previous paper (FTT, 9, 402, 1964) with computations of several other authors. It is assumed that at low temperatures ($kT < E$, E being the ionization energy of excitons) the quantum yield of electrons, because of the higher efficiency of exciton annihilation at the surface and the accompanying generation of free photocarriers, increases with the coefficient of absorption. The relation of quantum yield to the diffusion coefficient may then be determined. From this relationship, a diffusion length of 2.5 microns was determined for CdS at 77K. The diffusion

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ACCESSION NR: AP4013196

may be determined in a different way, as others have done, by measuring the expansion of the exciton absorption band. This requires a knowledge of the diffusion coefficient, but this may be ascertained if the free path is known. Results indicate that the two methods give corresponding values. Determination of relaxation time from the authors' approach is also in good agreement with the computations of others. Some discrepancies appear, however, particularly concerning the extent of diffusion by excitons as stated by G. Diener and W. Hoogenstraaten (Phys. Chem. Sol., 2, 119, 1957). Orig. art. has: 3 figures and 5 formulas.

ASSOCIATION: Fiziko-tekhnicheskii institut nizkikh temperatur AN UkrSSR, Kharkov (Physicotechnical Institute of Low Temperatures AN UkrSSR)

SUBMITTED: 25Jul63

DATE ACQ: 03Mar64

ENCL: 00

SUB CODE: EC, SS

NO REF SOV: 009

OTHER: 009

Card 2/2

YEREMENKO, V.V.; ZVYAGIN, A.I.

Light absorption by cobalt fluoride crystals near the Neel point.
Fiz. tver. tela 6 no. 4:1013-1017 Ap '64. (MIRA 17:6)

1. Fiziko-tehnicheskij institut nizkikh temperatur AN UkrSSR,
Khar'kov.

S/0181/64/006/004/1138/1140

ACCESSION NR: AP4028442

AUTHORS: Yeremenko, V. V.; Popkov, Yu. A.

TITLE: The effect of deformation and a strong magnetic field on exciton absorption of light in crystals of CdS

SOURCE: Fizika tverdogo tela, v. 6, no. 4, 1964, 1138-1140, and insert facing page 1140

TOPIC TAGS: light absorption, exciton, magnetic field, cadmium sulfide, spectrograph ISP 67, comparator IZA 2, diffraction spectrograph DFS 8

ABSTRACT: A number of peculiarities in light absorption by CdS cannot be explained by the rather simple interpretation normally given. The complex structure of the transition $n = 1$ in the A series cannot be understood without consideration of how much the wave vector of light absorption differs from zero. This means that the quasimomentum of the exciton must be considered. The authors examine the absorption of light by this first exciton transition in CdS crystals. Measurements were made at the temperature of liquid hydrogen. The magneto-optic determinations were made on an ISP-67 spectrograph with self-collimating camera, the linear dispersion being

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ACCESSION NR: AP4028442

1.8 $\text{\AA}/\text{mm}$. Piezospectroscopic results were obtained on a DFS-8 diffraction spectrograph with a linear dispersion of 6 $\text{\AA}/\text{mm}$. Frequency was measured by comparing spectra on an IZA-2 comparator with emission Fe lines. When the CdS crystal was compressed unidirectionally along the x axis, the C_{6v} group changed to the C_{2v} group. Application of a magnetic field along the x axis changed the C_{6v} group to the C_3 group. Fields up to 160 000 oersteds, however, caused no observational change in intensity of the A_F band. Nor was Zeeman splitting of the A_F or A_L bands observed. Uniaxial compression weakened the A_L band. These results support the authors' belief concerning the need to consider the quasimomentum of the exciton (differing from zero) and to take into account energy differences between longitudinal and transverse excitons in seeking an understanding of the magneto-optical and piezospectrographic properties. Orig. art. has: 5 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut nizkikh temperatur AN UkrSSR, Kharkov
(Physicotechnical Institute of Low Temperatures AN UkrSSR)

Card 2/3

ACCESSION NR: APL028442

SUBMITTED: 31Oct63

DATE ACQ: 27Apr64

ENCL: 00

SUB CODE: SS, OP

NO REF SOV: 006

OTHER: 006

Card 3/3

ACCESSION NR: AP4041694

S/0181/64/006/007/1967/1974

AUTHORS: Yeremenko, V. V.; Belyayeva, A. I.

TITLE: Features of the spectrum of light absorption by manganese carbonate crystals near the Neel temperature

SOURCE: Fizika tverdogo tela, v. 6, no. 7, 1964, 1967-1974

TOPIC TAGS: manganese alloy, antiferromagnetism, optical spectrum, absorption band, frequency shift

ABSTRACT: Continuing an earlier effort (V. V. Yeremenko, A. I. Zvyagin, PTT v. 6, 1013) to clarify the factors that mask the influence of antiferromagnetic ordering on the optical spectrum, the authors investigated the absorption spectrum of $MnCO_3$ crystals, since these differ from all other antiferromagnetic crystals previously investigated both in their crystallographic and their magnetic structures. The tests were made at 7000--2500 Å and 400--4.2K.

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ACCESSION NR: AP4041694

Particular attention was paid to the frequency shift, and to the shape and intensity of the bands as the MnCO_3 crystal was cooled below the Neel temperature (29.4K). It was observed that all the investigated absorption bands connected with the optical transitions ${}^6S_{5/2}({}^6A_{1g}) \rightarrow \{ {}^4G({}^4E_g, {}^4A_{1g}), \rightarrow {}^4D({}^4T_{2g}), \rightarrow {}^4D({}^4E_g), \text{ and } \rightarrow {}^4P({}^4T_{1g})$ in the third shell of the Mn^{++} ion begin to shift rapidly to the short-wave region of the spectrum on approaching the Neel temperature. The value of the shift is close to the value of the Zeeman splitting of the ground state level ${}^6S_{5/2}({}^6A_{1g})$ in an exchange field $H_E \approx 3 \times 10^5$ Oe. The temperature dependence of the half-width of the observed bands is made complicated either by the doublet structure of the transitions, or by interaction with the phonons. In the case of the D and F bands, a noticeable change in the temperature dependence is observed near the Neel temperature, where the asymmetry of the bands also increases markedly. The

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ACCESSION NR: AP4041694

anomaly in the temperature dependence of the frequency shift is approximately the same for all observed absorption bands. The peculiarities of the spectrum due to the antiferromagnetic ordering are discussed. "The authors thank corr. member of AN UkrSSR B. I. Verkin and Professor A. S. Borovik-Romanov for continuous help and support." Orig. art. has: 8 figures and 1 table, and 1 formula.

ASSOCIATION: Fiziko-tekhnicheskii institut nizkikh temperatur AN UkrSSR, Khar'kov (Physicotechnical Institute of Low Temperatures, AN UkrSSR)

SUBMITTED: 24Sep63

ENCL: 00

SUB CODE: EM, OP

NR REF SOV: 007

OTHER: 011

Card 3/3

YEREMENKO, V.V.; KOVNER, N.N.; MATYUSHKIN, E.V.

Effect of uniaxial compression on the electroconductivity
and photoconductivity of cadmium sulfide single crystals.
Fiz. tver. tela 6 no.10:3190-3192 0 '64. (MIRA 17:12)

1. Fiziko-tekhnicheskiy institut nizkikh temperatur AN UkrSSR,
Khar'kov.

ACCESSION NR: AP4019210 S/0056/64/046/002/0488/0491

AUTHORS: Belyayeva, A. I.; Yeremenko, V. V.

TITLE: Effect of antiferromagnetic ordering on the optical absorption spectrum in manganese carbonate crystals

SOURCE: Zhurnal eksper. i teor. fiz., v. 46, no. 2, 1964, 488-491

TOPIC TAGS: magnesium carbonate, magnesium carbonate crystal, light absorption spectrum, antiferromagnetic ordering, optical absorption spectrum, antiferromagnetic ordering, optical absorption spectrum, Neel temperature, manganese fluoride, exchange interaction, optical band broadening, temperature frequency shift

ABSTRACT: To check on the universality of the influence of antiferromagnetic ordering previously discovered by the authors (ZhETF 44, 469, 1963), similar investigations were carried out on the absorption spectra of $MnCo_3$, which has different crystalline and fer-

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ACCESSION NR: AP4019210

ferromagnetic structures. The absorption spectra were obtained at temperatures from 4 to 300K, the absorption intensity being measured by photographic photometry. The optical absorption spectrum of MnCo_3 crystals was found to be very similar to that of MnF_2 crystals, with narrow bands observed due to the transitions ${}^6S_{5/2} \rightarrow {}^4G_{3/2}$, ${}^4D_{3/2}$ and ${}^4P_{3/2}$ in the Mn^{2+} ion. All the observed MnF_2 bands are shifted by approximately the same amount towards the ultraviolet relative to the corresponding MnCo_3 bands. The frequency shift of all the optical bands increases on approaching the Neel point. The ${}^6S_{5/2} \rightarrow {}^4D_{3/2}$ band narrowed down appreciably on cooling below the Neel temperature (29.4K), thus indicating that the observed anti-ferromagnetic ordering is a universal effect. The lack of anomaly in the temperature dependence of the bandwidths of the other transitions might have been due to a complex structure, which could not be

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ACCESSION NR: AP4019210

resolved. "In conclusion, we take this opportunity to thank Professor B. I. Verkin and Professor A. S. Borovik-Romanov for their interest in the work and for their support." Orig. art. has: 4 figures and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut nizkikh temperatur AN UkrSSR (Physicotechnical Institute of Low Temperatures, AN UkrSSR)

SUBMITTED: 25Jul63

DATE ACQ: 27Mar64

ENCL: 01

SUB CODE: PH

NO REF SOV: 006

OTHER: 006

Card: 3/3

YEREMENKO, V.V.; POPKOV, Yu.A.; LITVINENKO, Yu.G.

Zeeman effect in the optical spectrum of antiferromagnetic MnF_2 crystals. Zhur. eksp. i teor. fiz. 47 no.5:1733-1735 N 164.

(MIRA 18:2)

1. Fiziko-tehnicheskii institut nizkikh temperatur AN URSR.

L 10572-66 EWT(1)/EWT(m)/T/EWP(t)/EWP(b)/EWA(c) IJP(c) JD/JW/GG
ACC NR. AP5025393 SOURCE CODE: UR/0101/65/007/010/3102/3104

AUTHOR: ^{44,55} Zvyagin, A. I.; ^{44,55} Yeremenko, V. V.; ^{44,55} Kut'ko, V. I.

7A
67
B

ORG: Physicotechnical Institute of Low Temperatures AN UkrSSR, Kharkov (Fiziko-tekhnicheskii institut AN UkrSSR)

TITLE: Infrared absorption spectra of ^{21,44,55} antiferromagnetic crystals in the $CoF_2(1-x)-MnF_2_x$ system

SOURCE: Fizika tverdogo tela, v. 7, no. 10, 1965, 3102-3104

TOPIC TAGS: cobalt compound, manganese compound, fluoride, solid solution, single crystal, crystal theory, antiferromagnetic material, IR spectrum, absorption spectrum

ABSTRACT: The authors study the ^{21,44,55} infrared absorption spectra of single crystal specimens containing 100, 90, 10 and 5% CoF_2 in systems where cobaltous and manganous fluorides form solid solutions. The spectral measurements were made in the 15-300°K range. The IR spectra of single crystal specimens of mixed composition are very similar to those of pure CoF_2 . The absorption intensity in the 100-200 cm^{-1} range decreases with a reduction in cobalt concentration without any noticeable deviation from Beer law, and may be compensated by an appropriate increase in the thickness of the specimen. The differences between the spectra of mixed specimens and those of pure cobaltous fluoride were a broadening of the bands in mixed specimens apparently

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ACC NR: AP5025393

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due to some irregularity in composition, and a considerable shift in the spectrum toward the low frequency region. When the crystals were cooled below the Néel point, an anomalous reduction was observed in the width of the Co^{2+} bands in both pure and mixed specimens, as well as a sharp shift in the frequency of these bands. However, the shift in pure CoF_2 is toward the longer waves, while the bands are shifted toward the shorter wave region in crystals with a high MnF_2 content. A theoretical explanation is given for this phenomenon based on the difference in the ground state exchange energies for the two types of crystals. In conclusion, we take this occasion to express our gratitude to N. N. Mikhaylov and S. V. Petrov, who graciously furnished the single crystal specimens for the present study. Orig. art. has: 2 figures.

SUB CODE: 20,07/

SUBM DATE: 19Apr65/

ORIG REF: 008/

OTH REF: 006

HW
Card 2/2

L 3356-66 ENT(1)/ENT(m)/T/EMP(t)/EXP(b) IJP(c) JD/M/CG

ACCESSION NR: AP5013474

UR/0185/65/010/005/0525/0530

AUTHOR: Zvyahin, A. I. (Zvyagin, A. I.); Yeremenko, V. V.

TITLE: Infra-red absorption spectra of crystals of antiferromagnetic cobalt compounds

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 10, no. 5, 1965, 525-530

TOPIC TAGS: IR absorption, antiferromagnetic materials, cobalt compound

ABSTRACT: The absorption of light was studied in the near infra-red region over a wide temperature range (from ~ 10 to 400°K) in a number of cobalt compounds (CoF_2 , CoO , CoCO_3 , CoCl) and crystalline ZnS with a small addition ($\sim 1\%$) of Co , all of which become antiferromagnetic at some definite temperature T_N . Samples were in the form of thin (0.03-0.05 mm) slices. Special care was taken to maintain the CoCl_2 free from water. In all the above compounds an absorption band was observed in the range $\nu_{\text{max}} \approx 7000 \text{ cm}^{-1}$, which was relatively wide (half width $\delta \approx 2000 \text{ cm}^{-1}$) and intense ($k_{\text{max}} \approx 10^3 \text{ cm}^{-1}$), associated with the transition between energy levels resulting from a splitting of the ground level of Co^{++} (${}^4F_{3/2}$) by internal electric fields. The infra red band corresponds to the transition $\Gamma_4 \rightarrow \Gamma_5$, which is forbid-

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ACCESSION NR: AP5013474

den in the electric dipole approximation, and it is assumed that this transition is made possible by the interaction of the electrons with the optical phonons. By comparing the experimental values of the total intensity of the transition with the theoretical calculations of A. D. Liehr and C. J. Ballhausen, *Phys. Rev.*, 106, 1161 (1957), an estimate was made of the frequency ω_0 of phonons effective in the mechanism of the $\Gamma_4 \rightarrow \Gamma_5$ transition. The estimated values obtained were $\omega_0 \approx 400 \text{ cm}^{-1}$ for CoO, CoF₂, CoCO₃ and $\omega_0 \approx 240 \text{ cm}^{-1}$ for CoCl₂. Absorption measurements were made in the far infra-red region (400-1400 cm^{-1}) to verify the assumption of electron-optical phonon interaction. They showed an increase in absorption, at frequencies in good agreement with the above estimates of ω_0 evidently connected with the excitation of the crystal lattice oscillations. Also the ω_0 for CoCl₂ is in good agreement with the intervals ($\Delta\nu = 235 \pm 5 \text{ cm}^{-1}$) observed in the optical spectra of MnCl crystals. The variation of the maximum of the absorption band with temperature was studied. Within the resolution of the spectrometer ($\sim 100 \text{ cm}^{-1}$) the position of the maximum was found to vary linearly with temperature even in the vicinity of T_H . Graphs show the variation of the half width of the absorption band with temperature. Again no sudden changes in the vicinity of T_H were observed. It is assumed that the high energy of the optical phonons (which allow the transition $\Gamma_4 \rightarrow \Gamma_5$) as compared with the value of the exchange energy, masks the effect of the

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ACCESSION NR: AP5013474

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antiferromagnetic ordering on the band parameters. Orig. art. has: 3 fig., 2 tables.

ASSOCIATION: Fizyko-tekhnichnyy instytut nyz'kykh temperatur AN URSS, Kharkiv
(Physico-Technical Institute of Low Temperature Research, AN URSS)

SUBMITTED: 29Jun64

ENCL: 00

44,55 a SUB CODE: SS, OP

NO REF SOV: 004

OTHER: 009

Card 3/3 DP

L 1585-66 EWT(1)/EPA(s)-2/EWT(m)/ETC/ENG(m)/T/EWP(t)/EWP(b)/EWA(c) IJP(c) RDW/

ACCESSION NR: AP5015439 UR/0185/65/010/006/0630/0635 70
44.55 64

AUTHORS: Chubova, L. K.; Havaleshko, M. P. (Gavaleshko, N. P.);
Yeremenko, V. V. 44.55 71 B

TITLE: Galvanomagnetic properties of single crystals of mercury
telluride 21

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 10, no. 6, 1965, 630-635

TOPIC TAGS: mercury compound, telluride, galvanomagnetic effect,
magnetoresistance, Hall effect, impurity scattering

ABSTRACT: The article presents results of measurement of the Hall
coefficient and the transverse magnetoresistance at 293, 90, 77, and
20.4K on samples of n- and p-type HgTe single crystals in magnetic
fields between 0--3 kgauss. The pure HgTe crystals were grown by
zone crystallization. Judging from the measured Hall coefficients,
the purest samples were n-type with a carrier density of $\sim 5 \times 10^{17}$
 cm^{-3} and a mobility $\sim 2 \times 10^4 \text{ cm}^2/\text{v-sec}$ at room temperature. The

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measurements were carried out with the usual compensation circuit including a potentiometer with a photomultiplier as a null indicator. As a result of estimates based on the measurements, it was found that the mobility of the carriers in samples containing impurities does not exceed 10^2 -- 10^3 cm²/v-sec, whereas the carrier density is of the order of 10^{19} cm⁻³ even at 20.4K. In pure n-type samples with a carrier concentration of 5×10^{17} cm⁻³ at room temperature and 4×10^{16} at 20.4K the electron mobility varies nonmonotonically with temperature, a maximum occurring between room and liquid nitrogen temperature. Estimates indicate that scattering by impurities dominates. In pure n-type HgTe at high temperatures phonon scattering predominates, while at low temperatures scattering by ions of the impurities is most important. Several observations cannot be explained on the basis of a simple one-zone model. These include the nature of the field dependence of the magnetoresistance at 20.4 K and its anisotropy. Orig. art. has 4 formulas, 4 tables, and 4 figures.

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ACCESSION NR. AP5015439

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ASSOCIATION: Fizyko-tekhnichnyy instytut niz'kyk temperatur AN URSR,
Kharkiv [Fiziko-tekhnicheskyy institut nizkikh temperatur AN UkrSSR]
(Physicotechnical Institute of Low Temperatures, AN UkrSSR); Chernivets'-
kyy derzhuniversitet (Chernovtsy State University)

SUBMITTED: 15Jul64

ENCL: 00

SUB CODE: ^{4/155}SS, EM

NR REF SOV: 005

OTHER: 006

Card

3/3 DP

L 1584-66 EWT(1)/EWT(m)/T/EWP(t)/EWP(b) IJP(c) JD/HW/CO

ACCESSION NR: AP5015440

UR/0185/65/010/006/0636/0644 57

AUTHORS: Zvyahin, A. I. (Zvyagin, A. I.); Yeremenko, V. V. 44 55 45 B 21.44.55

TITLE: Investigations of infrared absorption spectra of crystals of antiferromagnetic cobalt compounds. II. Absorption in CoO and CoF₂ caused by the spin-orbit splitting of the lowest level

SOURCE: Ukrayinsk'yy fizychnyy zhurnal, v. 10, no. 6, 1965, 636-644

TOPIC TAGS: ir spectrum, absorption spectrum, cobalt compound, anti-ferromagnetic material 27

ABSTRACT: This is a continuation of earlier work by the authors (FTT v. 5, 1013, 1964; Ukr. fizychn. zh. v. 10, no. 5, 1965). With the aim of ascertaining the effect of the transition to a magneto-ordered compound on the optical spectrum of antiferromagnets, the authors investigated (in polarized light) over a range of 10 -- 400K the behavior of absorption bands due to transitions between components of spin-orbit splitting of the lowest level of the term ⁴F_{9/2} of the Co⁺⁺

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ion of the antiferromagnetic compounds CoO and CoF₂ in the frequency region 600 -- 2000 cm⁻¹. An IKS-14 spectrometer was used. The CoO, CoF₂, and ZnS + Co⁺⁺ samples were polished platelets 0.03 -- 0.05, 0.3 -- 0.5, 0.4 -- 10 mm thick with an area 3 x 5 mm. The larger number of absorption bands in the CoF₂ spectrum than expected from a consideration of the spin-orbit splitting of the ⁴F_{9/2} term in a D_{2h} field at temperatures above the Neel point can be understood by assuming removal of translational degeneracy. The strong frequency shift of a number of band maxima (up to 30 cm⁻¹) on magnetic ordering to the long-wavelength side is related to the fact that the Zeeman splitting of the ground state of the Co⁺⁺ ion in the exchange field is smaller than that of the excited states. The anomalous intensity decrease observed by Newman and Chrenko (Phys. Rev. v. 115, 1147, 1959) of the 1235 cm⁻¹ band with unpolarized light on transition through the Neel point was not observed in polarized light. The sharp change in the temperature dependence of the half-width of the bands

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ACCESSION NR: AP5015440

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at the Neel point is apparently connected with a difference in the dominant mechanism responsible for the shape of the bands: above the Neel point interaction with phonons is dominant, while below it interaction with spin waves predominates. 'The authors thank Corresponding Member of the Ukrainian Academy of Sciences, B. I. Vyerkin,^{4/5} and Professor Borovik-Romanov,^{4/5} for interest in the work; and V. H. Yurko,^{4/5} for assistance in carrying out the experiment.' Orig. art. has: 2 formulas, 1 table, and 6 figures

ASSOCIATION: Fiziko-tekhnichnyy instytut nyz'kykh temperatur AN URSSR, Kharkiv [Fiziko-tekhnicheskyy institut nizkikh temperatur AN UkrSSR, Khar'kov] (Physicotechnical Institute for Low Temperatures, AN UkrSSR)

4/5

SUBMITTED: 29Jun64

ENCL: 00

SUB CODE: SS, OP

NR REF SOV: 006

OTHER: 009

Card 3/3 SP

YEREMENKO, V.V.; BELYAYEVA, A.I.; MARISOVA, S.V.

Nature of the structure of the long-wave light absorption edge in
mercury iodide crystals. Opt. i spektr. 18 no.5:820-824, My '65.
(MIRA 18:10)

L 1563-66 EWT(1)/EWT(m)/T/EWP(t)/EWP(b)/EWA(c) IJP(e) JD/JG

ACCESSION NR: AP5019215

UR/0056/65/049/001/0047/0053

AUTHOR: Belyayeva, A. I.; Yermenko, V. V.; Mikhaylov, N. N.; Petrov, S. V.

TITLE: Light absorption spectra for Mn²⁺, Co²⁺, Ni²⁺, and Ho³⁺ ions in antiferromagnetic fluoride crystals

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 1, 1965, 47-53

TOPIC TAGS: manganese alloy, holmium, transition element, light absorption, absorption spectrum, antiferromagnetic material

ABSTRACT: This is claimed to be the first attempt to alloy MnF₂ single crystals with holmium, and also to grow fluorides containing two different transition metal ions, Mn²⁺ and Co²⁺ or Mn²⁺ and Ni²⁺. The absorption spectra of these crystals were investigated from 4.2 to 100K, and their characteristics near the magnetic ordering temperature of the solvent crystal are discussed. The single crystals of the pure transition-metal fluorides were obtained by a procedure described elsewhere (Kristallografiya, in press). Some of the difficulties and special techniques involved in the growing of mixed single crystals are discussed. An analysis of the optical absorption spectra indicates that the added ions enter the MnF₂ lattice. The results also show that the antiferromagnetic transition of the solvent crystal is ac-

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ACCESSION NR: AP5019215

15

accompanied by an anomalous shift of the optical absorption bands of the added Mn^{2+} and Co^{2+} towards the shorter waves, together with a pronounced narrowing which is of the same order as for the band of pure MnF_2 and CoF_2 crystals. The absorption lines of Ho ions are not affected by the antiferromagnetic transition of MnF_2 . "We thank P. L. Kapitsa for his interest, A. B. Borovik-Romanov for a discussion of the results, and V. A. Timofeyev for providing the $Ho_3Al_5O_{12}$ single crystals." Orig. art has: 5 figures and 2 tables.

ASSOCIATION: Institut fizicheskikh problem Akademii nauk SSSR (Institute of Physics Problems, Academy of Sciences, SSSR); Fiziko-tehnicheskiy institut nizkikh temperatur Akademii nauk Ukrainской SSR (Physicotechnical Institute of Low Temperatures, Academy of Sciences, UkrSSR)

SUBMITTED: 28 Jan 65

44.55

ENCL: 00

SUB CODE: 88

NR REF SOV: 015

OTHER: 009

Card 2/2

JP

L 22578-66 EWT(1)/EWT(m)/EWP(t)/EWA(h) IJP(c) JD

ACC NR: AP6009718 SOURCE CODE: UR/0386/66/003/004/0180/0183

AUTHORS: Bogod, Yu. A.; Yeremenko, V. V.

61
8

ORG: Physicotechnical Institute of Low Temperatures, AN UkrSSR,
Khar'kov (Fiziko-tekhnicheskij institut nizkikh temperatur AN UkrSSR)

TITLE: Magnetoresistance of bismuth in strong magnetic fields

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma
v redkatsiyu. Prilozheniye, v. 3, no. 4, 1966, 180-183

TOPIC TAGS: bismuth, single crystal, magnetoresistance, impurity
conductivity, crystal impurity, *strong magnetic field*

ABSTRACT: Using data by L. A. Fal'kovskiy and G. S. Razina (ZhETF
v. 49, 265, 1965) and using rough estimates of the possible change in
the Fermi level of bismuth, assuming total spilling of the electrons
from one ellipsoid of the Fermi surface to another, the authors show
that open trajectories can be produced in bismuth by means of a unique
magnetic breakdown. The existence of open trajectories greatly af-
fects the behavior of the magnetoresistance, and this fact was used

Card 1/2

L 22978-66

ACC NR: AP6009718

to investigate the electric resistivity of single-crystal bismuth of varying purity and orientation in transverse pulsed magnetic fields up to 80 Oe at temperatures 4.2 and 20.4K. Measurements were also made at 77K, but the field could reach only 60 kOe in this case. The samples were plates measuring 1 x 1 x 12 mm. It was observed that for certain magnetic field directions and for $H > 30$ kOe the character of the magnetoresistance curve changes appreciably, with a tendency to saturate. This peculiarity of the magnetoresistance is strongly pronounced at helium and hydrogen temperatures, is somewhat smoothed out at 77K, and appears at all temperatures in the vicinity of 30 kOe. The occurrence of the effect in identical fields but different temperatures, and also the fact that the samples investigated were very pure, indicate that the observed anomaly is not connected with impurities, but is due to the appearance of open trajectories in fields close to 30 kOe. It is pointed out, however, that magnetic breakdown in the usual sense can also occur in bismuth. Orig. art. has: 2 figures.

SUB CODE: 20/ SUBM DATE: 07Jan66/ ORIG REF: 005/ OTH REF: 002

Card 2/2

L-21563-66 - FWT(1) - IJP(e)
 ACC NR: AP6008745

SOURCE CODE: UR/0386/66/003/006/0233/0237

AUTHOR: Yeremenko, V. V.; Popkov, YU. A.; Kharchenko, L. T.

ORG: Physicotechnical Institute of Low Temperatures, Academy of Sciences, UkrSSR
 (Fiziko-tekhnicheskii institute nizkikh temperature Akademii nauk UkrSSR)

TITLE: Zeeman effect on exciton-magnon bands in antiferromagnetic MnF₂ crystals

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 3, no. 6, 1966, 233-237

TOPIC TAGS: Zeeman effect, exciton, magnon, antiferromagnetic material, manganese compound, spin wave, magneto-optics, *strong magnetic field, crystal*

ABSTRACT: This is a continuation of earlier work (ZhETF v. 47, 1733, 1964) dealing with the influence of a strong magnetic field, sufficient to flop the spin structure of MnF₂ (spin flopping), on the structure of the optical transition ${}^6A_1({}^6S) - {}^4T_2({}^4D)$. In the present study, as a part of a search for additional more direct and more unambiguous experimental proof of the realization of the simultaneous excitation of an exciton and a magnon in a crystal, the authors studied the response of the optical absorption spectrum to magnetic fields strong enough to change the magnetic structure of an antiferromagnetic crystal. MnF₂ was chosen because its internal field is high (90 koe). Magneto-optical investigations in this magnetic-field range, made possible by a pulse technique developed by the authors (Ukr. fiz. zh, v. 8, 88, 1963), were carried out on the narrow absorption bands due to the optical transitions ${}^6A_1 - {}^4T_2$.

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L 21564-66

ACC NR: AP6008745

$^4T_{1g}(^4G)$ and $^6A_{1g} \rightarrow ^4T_{1g}(^4P)$. The 18473 cm^{-1} band in the former transition and the 31943 and 32065 cm^{-1} bands in the latter had previously been identified with exciton-magnon transitions. The influence of the magnetic field on the exciton-magnon light-absorption was estimated qualitatively, but for the 18473 cm^{-1} band no qualitative similarity was found between the experimental behavior in the magnetic field and the calculation. This band is not split by an external field but, to the contrary, or reaching critical field it coalesces with its satellite at 18478 cm^{-1} , forming a single narrower and more intense band. This suggests that the interpretation of the 18473 cm^{-1} band as being an exciton-magnon transition is not the only one possible. Qualitative agreement between calculation and experiment in the behavior of the 31943 cm^{-1} band in a magnetic field, since a non-monotonic dependence of the Zeeman splitting on the magnetic field intensity is predicted, is observed. However, the agreement is not complete, and a deeper theoretical analysis of the features of light absorption in antiferromagnetic crystals is needed. It is concluded that the 31943 and 32065 cm^{-1} bands are due to exciton-magnon transitions. This statement is not contradicted by a careful analysis of the shape of these bands, which have noticeable asymmetry. Orig. art. has: 2 figures and 1 table.

SUB CODE: 20/ SUBM DATE: 31Dec65/ ORIG REF: 005/ OTH REF: 003

ULR

Card 2/2

L 21131-66 EWT(m)/T/EWP(t) IJP(c) JD

ACC NR: AP6009068

SOURCE CODE: UR/0185/66/011/003/0280/0285

AUTHOR: Popkov, Yu. A.; Yerenenko, V. V. 46
B

ORG: Institute of Low-temperature Physics and Technology, Academy of Sciences of the Ukrainian SSR, Khar'kov (Fizyko-tekhnichnyy institut nyz'kykh temperatur AN URSR)

TITLE: The anisotropy of thin-line light absorption spectra in CdS single crystals v7 v1

SOURCE: Ukrayins'ky fizychnyy zhurnal, v. 11, no. 3, 1966, 280-285

TOPIC TAGS: crystal anisotropy, cadmium compound, absorption band, absorption spectrum, exciton

ABSTRACT: The authors investigated the effect of the orientation of the light propagation vector K , with respect to the crystallographic axis C_6 of CdS single crystals on the intensity of thin absorption bands connected with "local" exciton transitions; the temperature used in the process was 4.2K. The dependence of the intensity of some narrow long-wave bands on the orientation of the vector K is equally strong as that of the bands of "free" excitons in which the peculiarity observed may be associated with the effect of spatial dispersion. This casts doubts on the identification of all narrow bands with

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L 21131-66

ACC NR: AP6009068

"local" optical transitions. The estimations of the intensity of light required for the critical (relative to the Bauset-Einstein condensation at 4.2K) concentrations of excitons are revised. The estimation should be raised by two to three orders (up to 10^{21} to 10^{22} photons/cm² sec.) since the coefficient of the absorption band A_T , connected with the lowest exciton state, $k \sim 10^2 - 10^3 \text{ cm}^{-1}$, is two to three orders less than in case of the A_T band, regarded earlier as the lowest exciton band. Orig. art. has: 1 figure, and 1 table. [Based on author's abstract] [JKP]

SUB CODE: 20/ SUBM DATE: 30Apr65/ ORIG REF: 011/ OTH REF: 006

Card 2/2 *db*

L 25898-66 EWT(l)/EWT(m)/EWP(w)/T/EWP(t) IJP(c) JD

ACC NR: AP6010401

SOURCE CODE: UR/0126/66/021/003/0362/0366

AUTHORS: Bogod, Yu. A.; Yoremenko, V. V.

ORG: Physicotechnical Institute of Low Temperatures, AN UkrSSR (Fiziko-
tekhnicheskiy institut nizkikh temperatur AN UkrSSR)

TITLE: Some characteristics of the galvanomagnetic properties of bismuth

SOURCE: Fizika metallov i metallovedeniye, v. 21, no. 3, 1966, 362-366

TOPIC TAGS: magnetoresistance, bismuth, valence band, conduction band, current carrier, crystal impurity, transverse magnetic field, longitudinal magnetic field

ABSTRACT: The magnetoresistance of bismuth single crystals in pulsed magnetic fields at the boiling points of nitrogen and hydrogen is studied. The measurement method was described by N. Ye. Alekseyevskiy and V. S. Yegorov (ZhETF, 1963, 45, 448). The measurements were made in transverse magnetic fields of up to 35 kOe at the nitrogen temperature and up to 50 kOe at the hydrogen temperature, and also in longitudinal fields of up to 60 kOe at T = 77K and 90 kOe at 20.4K. The specimens were cylindrical with a diameter of 1.5-2 mm and a length of 10-20 mm. The anisotropy of the magnetoresistance of bismuth is found to decrease with a decrease in temperature (see Fig. 1). The experimental result indicates a possible relationship between the described anomalies of the magnetoresistance of bismuth with the

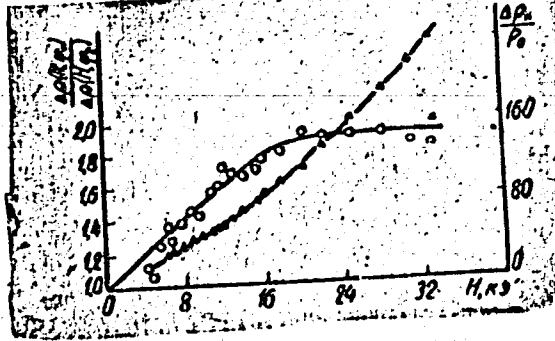
UDC: 539.292:538.63

Card 1/2

L 25898-66

ACC NR: AP6010401

Fig. 1. Specimen B1-1: $\blacktriangle - \Delta\rho_H/\rho_0$,
 $T = 77K, \varphi = 110^\circ$; $\circ - \Delta\rho(H, \varphi_1)/$
 $\Delta\rho(H, \varphi_2), T = 77K, \varphi_1 = 140^\circ,$
 $\varphi_2 = 110^\circ.$



appearance of an energy gap between the valence band and the conduction band.
 Orig. art. has: 3 graphs and 1 formula.

SUB CODE: 11, 20/ SUBM DATE: 03Apr65/ ORIG REF: 007/ OTH REF: 002

Cord 2/2 *BLS*

ACC NR: AP6022998 SOURCE CODE: UR/0185/66/011/004/0395/0403

AUTHOR: Yeremenko, V. V. ; Popkov, Yu. A.

ORG: Physicotechnical Institute of Low Temperatures, AN URSR, Kharkov
(Fizikotekhnichnyy instytut nyz' kykh temperatur AN URSR)

TITLE: Absorption spectrum and Zeeman effect of Mn^{2+} ions in ZnS

SOURCE: Ukrayna' kyy fizychnyy zhurnal, v. 11, no. 4, 1966, 395-403

TOPIC TAGS: absorption spectrum, Zeeman effect, temperature dependence, ion distribution, crystal symmetry, activated crystal, zinc sulfide single crystal, manganese ion

ABSTRACT: An attempt has been made to investigate the absorption spectra of manganese ions introduced into transparent ZnS single crystals with a wurzite structure (C_{6v}) in the region of transition of $^6S_{5/2} \rightarrow ^6G$ at temperatures of 4, 2 and 20.4 K. Equidistant series are derived and interpreted as electron vibrational. On the basis of Bethe theory, developed by Hellwege, the pattern of Zeeman splitting is calculated under the assumption that the local symmetry of Mn^{2+} ions

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ACC NR: AP6022998

in ZnS is C_{3v} . An experimental investigation of the Zeeman effect in fields up to 1.5×10^5 oe indicated a qualitative similarity of field dependences of the splitting of bands with those calculated for the $E_{1/2} \rightarrow E_{1/2}$ transition. The authors thank B. S. Skorobogatov for providing single-crystal samples. Orig. art. has: 4 figures, 2 formulas, and 3 tables. [Based on authors' abstract] [NT]

SUB CODE: 20/ SUBM DATE: 11May66/ ORIG REF: 005/ OTH REF: 013/
//

Card 2/2

ACC NR: AP6037000

(A, N)

SOURCE CODE: UR/0181/66/008/011/3397/3400

AUTHOR: Antonov, A. V.; Belyayeva, A. I.; Yerezenko, V. V.

ORG: Physicotechnical Institute of Low Temperatures, AN UkrSSR, Khar'kov (Fiziko-tekhnicheskiy institut nizkikh temperatur AN UkrSSR)

TITLE: Low temperature anomaly in the absorption spectra of antiferromagnetic RbMnF_3 and KMnF_3

SOURCE: Fizika tverdogo tela, v. 8, no. 11, 1966, 3397-3400

TOPIC TAGS: absorption spectrum, antiferromagnetic material, Neel temperature, temperature dependence, low temperature research, line splitting, luminescence spectrum

ABSTRACT: This is a continuation of earlier work (FTT v. 6, 3646, 1964 and preceding) and is devoted to the C-group ($\sim 3900 \text{ \AA}$) of bands in the absorption spectrum of antiferromagnetic RbMnF_3 (Neel temperature $T_N = 82\text{K}$) and KMnF_3 ($T_N = 88\text{K}$), whose structure becomes quite complicated at $T < T_N$. The measurement procedure was described earlier (FTT v. 6, 1967, 1964). Investigations were made at 4.2 - 200K. The absorption spectrum was photographed with a diffraction spectrograph (DFS-8) and then photometrized (MF-2 microphotometer). The results show that with decreasing temperature the number of bands in the C group increases from two to seven in the case of RbMnF_3 and six in the case of KMnF_3 , in analogy with the splitting observed for other antiferromagnetic crystals. The temperature dependence of the most intense of the bands was also investigated and the connection between the anomalies in the absorp-

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ACC NR: AF6037000

tion spectrum and the anomalies in the luminescence spectrum of $RbMnF_3$ and $KMnF_3$ is discussed. It is deduced that the anomaly in the absorption spectrum, observed by the authors for the first time, can also be related to the ordering of the spins of the excited Mn^{++} ions. Particular attention is paid to the temperature dependence of the first band to appear with decreasing temperature (C_2), which exhibits an anomaly below 30K, and which is a magnon satellite of one of the original bands (C_1). Orig. art. has: 2 figures and 1 table.

SUB CODE: 20/ SUBM DATE: 23May66/ ORIG REF: 004/ OTH REF: 008

Card. 2/2

BEZUGLIYY, P.A.; YEREMENKO, V.V.; KUKUSHKIN, I.S.; KULIK, I.O.; MANZHELIY,
V.G.; PERESADA, V.I.; PESCHANSKIY, V.G.; POPOV, V.A.; SHISHKIN, L.A.

Conference on the physics of the condensed state. Usp. fiz. nauk
88 no.2:387-393 F '66. (MIRA 19:2)

1. Fiziko-tehnicheskiy institut nizkikh temperatur AN UkrSSR.

YUREMENKO, V.V., kand. tekhn. nauk; DULEPOVA, T.V., inzh.

Using wastes from coal preparation in the Kuznetsk Basin. Stroi.
mat. 10 no.10:31-33 0 '64. (MIRA 18:2)

33

"APPROVED FOR RELEASE: 09/01/2001

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APPROVED FOR RELEASE: 09/01/2001

CIA-RDP86-00513R001962720003-1"

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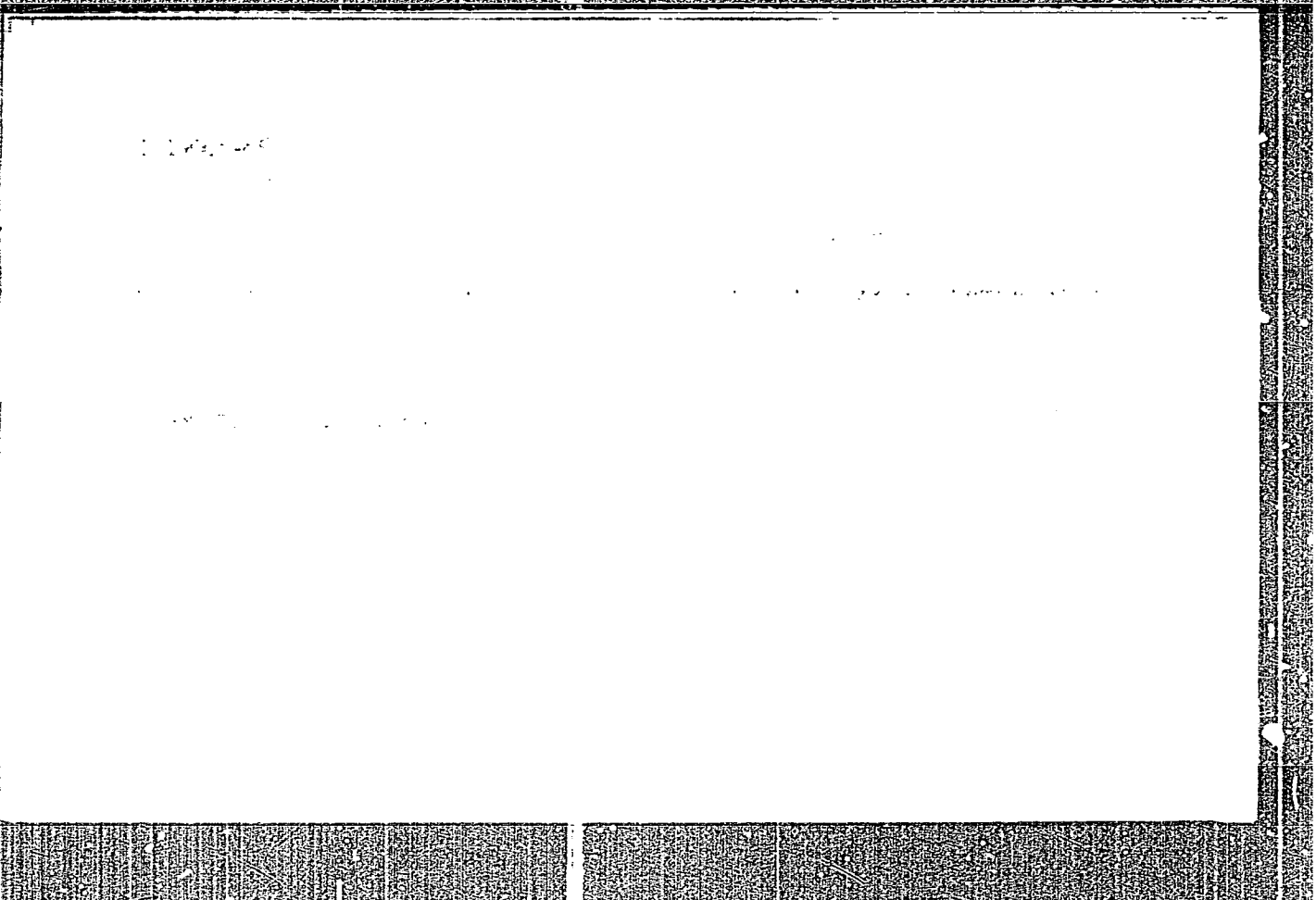
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spectrograph with linear dispersion approximately 3 Å/mm. The most



YEREMENKO, V. V.

Yeremenko, V. V.

"The Structural-Mechanical Properties of Uzbekistan
Ceramic Raw Materials." Acad Sci Uzbek SSR. Inst of Structures.
Tashkent, 1955. (Dissertations for the Degree of Candidate in
Technical Sciences).

SO: Knizhnaya Letopis', No 27, 2 July 1955

SOV/124-57-5-5723

Translation from: Referativnyy zhurnal. Mekhanika, 1957, Nr 5, p 90 (USSR)

AUTHOR: Yeremenko, V.V.

TITLE: On a Method for Determining the Yield Stress in Shear and the Apparent Viscosity of Bingham Fluids by Means of a Rotary Viscosimeter
(K voprosu o metodike opredeleniya dinamicheskogo predel'nogo napryazheniya sdviga i strukturnoy vyazkosti na rotatsionnom viskozimetre)

PERIODICAL: Dokl. AN UzSSR, 1956, Nr 5, pp 27-31

ABSTRACT: The author proposes a new method for analyzing the experimental data used to determine the yield stress in shear and apparent viscosity of pseudoplastic Bingham fluids (e. g., of a plastic ceramic slip). To investigate such fluids the author used a rotary-type model RV-8 M.P. Volarovich viscosimeter. Mean values for the apparent viscosity and yield stress in shear are usually calculated from the experimental data by the method of least squares, or a mean value for each is found by simply computing the arithmetical averages of the values obtained in a number of specific cases. In either event the calculations are very time-consuming. What the author does here is to divide the

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SOV/124-57-5-5723

On a Method for Determining the Yield Stress in Shear and the Apparent (cont.)

experimental data into two quantitatively equal parts or groups, and then write an expression for the mean numerical value found for the yield stress in shear for each group of data separately. Taking the difference between these expressions, the author evolves an equation for the mean value of the apparent viscosity. From this mean value for the apparent viscosity a mean value is found for the yield stress in shear. A single example is adduced to show that this new method of analyzing the experimental data yields results in close agreement with those obtained when the method of least squares is used. A general evaluation of the accuracy achievable with the new method is not attempted, however.

A. I. Golubev

Card 2/2

~~YEREMENKO, V. V.~~

124-11-13243

Translation from: Referativnyy Zhurnal, Mekhanika, 1957, Nr 11, p 139 (USSR)

AUTHOR: Yeremenko, V. V.

TITLE: On the Surface Sliding of Pasty Soils.
(O pristennom skol'zhenii gruntovykh past)

PERIODICAL: Izv. A N UzSSR, 1956, Nr. 9, pp 49-58

ABSTRACT: The paper discusses the results of an experimental study of the surface sliding phenomenon in Uzbekistani clays and loess-type loams. In a first approximation it is suggested that, for pasty soils, the thickness of the surface-contact layer be considered equal to the moisture content of the paste relative to the unit surface of the soil particles. The external friction of the soil paste against a metal is defined as the flow of a water-gel along a solid surface. It is shown that the structural-mechanical characteristics of the surface-contact layer may serve as a criterion for the evaluation of the structure of water-gel films in the ground. The tests performed substantiate the diffusive consistency of the surface-contact layer.
Bibliography: 13 references.

Card 1/1

(O. V. Luzhin)

YEREMENKO, V.V.

Relaxation phenomena in soil pastes. Izv. AN Uz.SSR. Ser. tekhn. nauk
no.2:41-46 '58. (MIRA 11:9)

1. Institut sooruzheniy AN UzSSR.
(Soil mechanics)

YEREMENKO, V.V.; KOVALENKO, V.H.

Relation of the effective adhesiveness of soil pastes to shear stress.
Dokl. AN Uz. SSR no.8:35-38 '58. (MIRA 11:9)

1. Institut sooruzheniy AN UzSSR. Predstavleno akademikom AN UzSSR
M.T. Urazbayevym.

(Soil mechanics)

YEREMENKO, V.V.

Evaluation of drying properties of wet soils on the basis of
the calculation of plastic deformations. Dokl. AN Uz. SSR no. 12:
47-50 '58. (MIRA 12:1)

1. Institut sooruzheniy AN UzSSR. Predstavleno chlenom-korrespon-
dentom AN UzSSR R.A. Alimovym.
(Soil physics)

YEREMENKO, V.V., kand.tekhn.nauk; VERSHININA, E.N., inzh.

Over-all automation of the operation of tunnel dryers.
Trudy Zap.-Sib.fil.ASIA no.3:51-60 '60. (MIRA 15:2)
(Drying apparatus--Bricks)

YEREMENKO, V.V., kand.tekhn.nauk; YEFIMOVA, A.F., inzh.

Expanded clay filler from shale of Novosibirsk Province.
Trudy Zap.-Sib.fil.ASiA no.3:147-149 '60. (MIRA 15:2)
(Novosibirsk Province--Shale)
(Lightweight concrete)

NIKOLAYEV, S.S., inzh.; SEDOVA, M.F., inzh.; BUSHTEDT, I.I., inzh.
SEMENDIYAYEV, V.P., inzh.; YEREMENKO, V.V., kand.tekhn.nauk;
VRUBLEVSKIY, L.Ye., inzh.

Using clay shale for manufacturing keramzit. Stroi. mat.
7 no.7:34-37 JI '61. (MIRA 14:7)
(Shale) (Aggregates (Building materials))

YEREMENKO, V.V.; DOLGINA, L.V.

New method of determining the sensitivity of clays to drying.
Stek. i ker. 18 no. 7:20-29 Ji '61. (min 14:7)
(Clay--Testing)

YEREMENKO, V.V., kand.tekhn.nauk; VRUBLEVSKIY, L.Ye., inzh.; SHAMANSKIY,
I.L., geolog

Make efficient use of the raw materials of Western Siberia
for the production of porous filler. Stroi. mat. 8 no.2:
14-15 F '62. (MIRA 15:3)

(Siberia, Western--Concrete)

YEREMENKO, V.V., kand. tekhn. nauk; BEZVERKHIY, A.A., inzh.;
GAPORENKO, P.S., inzh.; SHEKHOVTSEV, Yu.G., inzh.

First Siberian plant for the production of agloporites in a
brick factory. Stroi. mat. 9 no.6:22-24 Je '63. (MIRA 17:8)

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001962720003-1

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001962720003-1"

2 figures and 1 formula.

Author: [Illegible]

TITLE: [Illegible] spectra of crystals of antiferromagnetic [Illegible]

Source: [Illegible] 1964, 1646-1652

[Illegible] crystals of [Illegible]

L 10200-90

A 10200-90 NE 49 10200-90

10200-90

2/1

Card 3/3

BELYAYEVA, A.I.; YEREMENKO, V.V.

Effect of antiferromagnetic ordering on the spectrum of
light absorption by manganese carbonate crystals. Zhur.
eksp. i teor. fiz. 46 no.2:488-491 F '64. (MIRA 17:9)

1. Fiziko-tekhnicheskiy institut nizkikh temperatur AN UkrSSR.

VERKIN, B.I.; PELIKH, L.N.; YEREMENKO, V.V.

Quantum oscillations of the contact potential difference of
the bismuth-niobium pair. Dokl. AN SSSR 159 no.4:771-774 D '64
(MIRA 18:1)

1. Fiziko-tekhnicheskiy institut nizkikh temperatur AN UkrSSR.
Predstavleno akademikom P.L. Kapitsey.

YEREMENKO, V.V.; BELYAYEVA, A.I.

Optical absorption spectra of crystals of antiferromagnetic
cobalt compounds. Fiz. tver. tela 6 no.12:3646-3652 D '64
(MIRA 18:2)

1. Fiziko-tehnicheskiy institut nizkikh temperatur AN UkrSSR,
Khar'kov.

light absorption, absorp-

... spectra of light

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001962720003-1

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001962720003-1"

Card 3/3

L 27741-66 EWT(1)/EWT(m)/EWP(t)/ETI IJP(c) JH/JD
 ACC NR: AP6018705 SOURCE CODE: UR/0386/66/003/011/0447/0452

AUTHOR: Chiang, Yu. N.; Yerezenko, V. V.

ORG: Physicotechnical Institute of Low Temperatures, Academy of Sciences Ukrainian SSR (Fiziko-tekhnicheskij institut nizkikh temperatur Akademii nauk Ukraïnskoj SSR)

TITLE: Singularities of the temperature dependence of electric conductivity of aluminum at helium temperatures

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 3, no. 11, 1966, 447-452

TOPIC TAGS: aluminum, electric conductivity, temperature dependence, electron scattering, impurity scattering, resistivity, phonon interaction

ABSTRACT: In view of the expected deviations in the proportionality of the conductivity of aluminum to T^5 (T = temperature) at very low temperatures, the authors have investigated this temperature dependence by a procedure very similar to that described by De Vroomen and C. Van Baarle (Physica v. 23, No. 1957). The measured samples had transverse dimensions 5 - 10 mm, which was much larger than the mean free path for electron scattering by impurities. The measurements have shown that at temperatures below 4.2K sufficiently pure samples exhibit a noticeable temperature dependence of the electric resistivity, which does not agree with the empirical formula proposed for this dependence by B. N. Aleksandrov (Dissertation, Khar'kov, FTI NT AN UkrSSR, 1964). The experimental curves exhibited a stronger dependence than the

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L 27741-66

ACC. NR: AP6018705

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fifth power of the temperature. From this, and from a comparison of the curves for samples with high and low impurity content, it is deduced that the temperature dependence of the resistivity of aluminum has a singularity, which can be ascribed to normal collisions (without umklapp) between the electrons and the phonons. For pure samples the singularity occurs almost entirely at helium temperatures, while for more contaminated ones it occurs at higher temperatures. Comparison of the experimental results for pure samples with theory shows agreement within ~13%. It is concluded that to obtain more data on the temperature dependence of the singularity it is necessary to be able to produce samples with a prescribed broad range of purity, and to carry out measurements in a broader temperature interval. The authors thank B. I. Verkin for continuous interest in the work, R. N. Gurzhi for a valuable discussion, and O. G. Shevchenko for help with the experiments. Orig. art. has: 2 figures and 4 formulas.

SUB CODE: 20/ SUBM DATE: 05Apr66/ ORIG REF: 004/ OTH REF: 003

Card 2/2

35974-66 EWT(m) JW/JD

ACC NR: AP6016045

(A)

SOURCE CODE: UR/0185/66/011/005/0520/0526

AUTHORS: Zvyahin, A. I.--Zvagin, A. I.; Yeremenko, V. V.;
Skorobogatova, I. V.--Skorobogatova, I. V.

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TITLE: Infrared absorption spectrum of crystals of antiferromagnetic
cobalt compounds. Part III. Absorption in CoCO_3 and CoCl_2

SOURCE: Ukrayins'kyy fizchnyy zhurnal, v. 11, no. 5, 1966, 520-526

TOPIC TAGS: co lt compound, IR spectrum, IR absorption, electron
transition, antiferromagnetic material

ABSTRACT: A study has been made of light absorption by CoCO_3 and CoCl_2
in the 600-2000 cm^{-1} region and in the 10-300-K temperature range. It
has been shown that the formation of more absorption bands than expected
from splitting the ground term $4F_{9/2}$ of the Co^{++} ion in the crystalline
field, taking into consideration spin-orbit interaction, can be
explained by the presence of vibrational (and, possibly, electron-
vibrational) bands. Using Lines arrangement [Lines, M. E., Phys. Rev.,
131, 546, 1963] for splitting the lower triplet of the ground term

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ACC NR: AP6016045

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${}^4F_{9/2}$ of the Co^{++} ion in CoCl_2 and proceeding from the identification of absorption bands in the CoCl_2 spectrum, it was possible to define the parameters of the intercrystalline field and spin-orbit interaction. An analysis was made of the effect of the antiferromagnetic transition on electron and vibrational absorption bands. During the transition of the CoCl_2 crystal to the antiferromagnetic state, anomalous frequency changes in the electron absorption bands were observed, the magnitude of which is chiefly attributable to the splitting of the ground state of Co^{++} ion in an exchange field. No changes were observed in the maximum, shape, and halfwidth of vibration bands in CoCO_3 , CoCl_2 , and MnCO_3 spectra during the transition of crystals to a magnetoordered state. The authors thank B. I. Verkin, corresponding Member of the AN UkrSSR for his interest in this work and V. I. Kut'ko for his help in carrying out measurements. Orig. art. has: 6 figures. [Based on authors' abstract] [NT]

SUB CODE: 11, 20/ SUBM DATE: 14Jun65/ ORIG REF:005/ OTH REF: 005/

na
Card 2/2

L 40172-00 (1) (1) (1) (1)

ACC NR: AP6020200

SOURCE CODE: UR/0056/66/050/006/1472/1477

AUTHOR: Belyayeva, A. I.; Yeremenko, V. V.; Mikhaylov, N. N.; Pavlov, V. N.;
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Institute of Physical Problems, Academy of Sciences, SSSR (Institut fizicheskikh problem Akademii nauk SSSR)

TITLE: Magnon and phonon excitation during light absorption in antiferromagnetic NiF₂

SOURCE: Zh Eksper i teor fiz, v. 50, no. 6, 1966, 1472-1477

TOPIC TAGS: magnon, phonon, magnon excitation, phonon excitation, light absorption, nickel fluoride, antiferromagnetic material, *NICKEL COMPOUND, FLUORIDE; ABSORPTION SPECTRUM, ELECTRON TRANSITION, LIGHT EXCITATION*

ABSTRACT: The structure of the $^3A_{2g} \rightarrow ^1T_{2g}$ transition in the absorption spectrum of antiferromagnetic nickel fluoride at temperatures between 4.2 and 77K has been analyzed on the basis of experimental data on its vibrational frequencies. It has been shown that band $\nu_I = 20,622 \text{ cm}^{-1}$ and band $\nu_{II} = 20,717 \text{ cm}^{-1}$ are due to electron-magnon transitions with the formation of one and two magnons, respectively, with maximum frequencies. The maximum frequency of the magnon $\nu_m = 100 \text{ cm}^{-1}$. The magnon

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ACC NR: AP6020200

nature of band ν_1 has been confirmed by an analysis of its shape, temperature dependence of spectral position, and half-width. Orig. art. has: 5 figures, 1 formula, and 1 table. [Based on authors' abstract] [NT]

SUB CODE: 20/ SUBM DATE: 13Jan66/ ORIG REF: 002/ OTH REF: 005

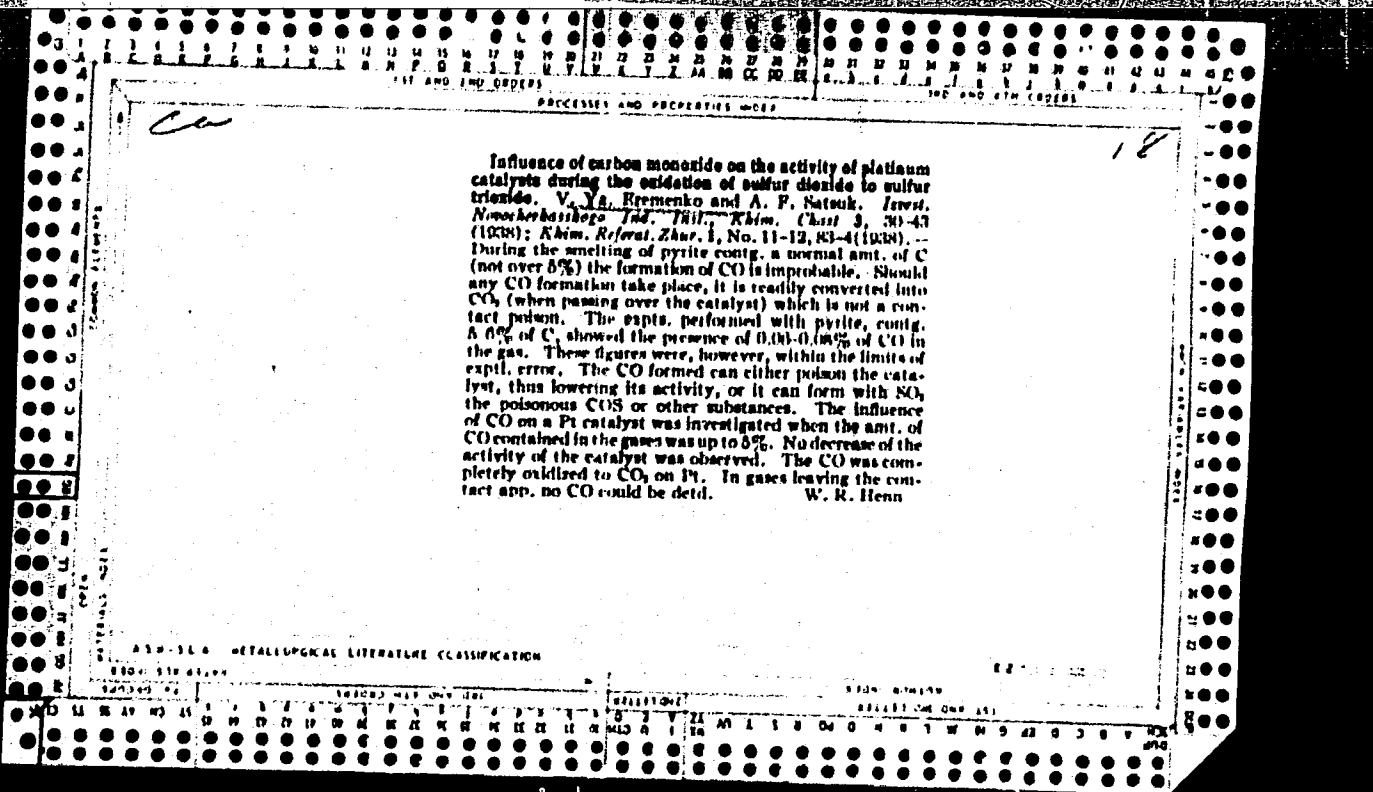
Card: 2/2/72/1

YEREMENKO, V.V., kand. tekhn. nauk; KOLPAKOV, S.V., kand. tekhn. nauk

Method of controlling the consistency of the protective mixtures
for reinforcement. Stroi. mat. 10 no.9:21-22 S '64
(MIRA 18:2)

Influence of the temperature of drying of blast-furnace
 slag on the hydraulic properties of slag cement. V. Ya.
 Kremenko. *Cement* 3, No. 6, 36-40 (1935).--In slag
 contg. 45-70% of CaO drying temps. of 600° to 1600°
 decreased the mechanical strength of the cement, but the
 rate of decrease falls with the increasing temp. The
 decrease takes place only during the early hardening
 period and nearly disappears in 28 days. The setting
 time of the cement decreases only slightly. A drying
 temp. of 600° is recommended for the case investigated.
 E. K. Stefanovsky

AS 35 4 METALLURGICAL LITERATURE CLASSIFICATION



PROCESSES AND PROPERTIES INDEX

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ca

Theory of the process of formation of thermoanthracite.
 V. Ya. Eremenko. *Izvest. Novocherkasskogo Ind. Inst.*
 im. S. Ordzhonikidze 6, Ser. Khim. 20-44(1940); cf.
 C. A. 34, 5625. — In the high-temp. zone of thermo-
 anthracite furnaces the gas has a compn. close to that of
 producer gas with H and not CO predominating. A sample
 compn. is CO 21-22, H 17.0-26, CO₂ 0.6-7.7, CH₄ 0.2-
 0.7, H₂S 0.2-0.7, C₂H₆ and homologs 0.065 and NH₃
 0.0085-0.00414%. Content of naphthalene and other
 heavy hydrocarbons forming insol. picrates was 15-17.2
 mg./l. calcd. as naphthalene. Picrates m. 126-32°. The
 amt. of O increases with approach of the gas to the furnace
 top and more on the periphery than in the center. Theo-
 retical calcs. of gas compn. are given. B. Z. Kamich

ASM-51A METALLURGICAL LITERATURE CLASSIFICATION

GROUP	CLASS	SUBCLASS	SECTION	ENTRY
1	2	3	4	5

YEREMENKO, V. YA.

Yeremenko, V. Ya. "On a study of waters of four mines of the Nesvetayantratsit trust," (reference), Soobshch. o nauch. rabotakh chlenov Vsesoyuz. khim. o-va im. Mendeleeva, 1948, Issue 2, p. 25-26

SO: U-2888, Letopis Zhurnal'nykh Statey, No. 1, 1949

CA

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A rapid method for determining a low quantity of hardness in water. V. Ya. Eremonko (Gidrokhim. Inst., Novocherkassk). *Gidrokhim. Materialy* (Hydrochem. Materials), 15, 72-9 (1948). -- The method is based on the turbidity produced by the oleates of Ca and Mg. Five ml. of the water in test tubes are treated with 0.5 ml. K oleate soln., admitting the latter along the wall of the test tube. The standards and the unknowns are quickly mixed and after 15 min. the turbidity is compared nephelometrically on a black background. Previous to mixing with the K oleate, the water is neutralized, boiled to drive off the CO₂, and a drop of NaOH added to make it alk. to phenolphthalein. The K oleate is prepd. by dissolving 15 ml. of oleic acid in 600 ml. of 90-95% alc., 400 ml. of H₂O is added, and 1 g. KOH dissolved in it. After 3-4 days the soln. is clear and ready for use. The presence of salts, org. matter, and Na phosphate do not interfere with the detn. J. S. Joffe.

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CA

Substances dumped into the Azov Sea by the river Don.
 V. Ya. Buzanov (Hydrochem. Inst., Novocherkassk).
Gidrobiol. Materialy (Hydrochem. Materials) 15, 80-128
 (1968).—The total salts carried into the Azov sea by the
 Don river was 15.9 million tons in 1931/32, 7 million tons
 in 1935/36, 7 million in 1939/40, and 10.5 million in
 1940/41. The av. was calcd. as 11.8 million tons. The
 quantity of salts and biogenic elements (N, P, Si, which con-
 tribute to the prevalence of phytoplankton) varies in direct
 proportion to the quantity of runoff. In the classification
 nomenclature of Palmer the waters of the Don belong to
 Class III, carbonates of Ca and Mg. The bulk of the
 biogenic elements consists of Si 74.1%, N 21.2%, and P
 4.8%. The seasonal distribution of the salts brought in by
 the Don river is: 55.2% in the spring, 18.4% in the summer,
 15.4% in the winter, and 10.8% in the fall. The distribu-
 tion of the biogenic elements is: 71.08% in the spring,
 15.11% in the winter, 7.66% in the summer, and 6.1% in
 the fall. The extensive data on the comp. of the water at
 various times, months, and years, as well as other chem.
 data, are presented in 26 tables. J. S. Joffe

Chem A

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Determination of arsenic in water. V. Ya. Bremenai (Hydrochem. Inst. Acad. Sci. U.S.S.R., Novocherkassk) *Gidrokhim. Materialy (Hydrochem. Materials)* 10, 16-21 (1949) --The spot-filtration method by Saterlee and Blackett (C.A. 30, 4830^b) is more sensitive and accurate than the Zenger-Black method. For As content of 0.01-0.7 γ , the error did not exceed 0.01 abs. For over 0.7 γ , error rises rapidly and for over 1 γ , detn. is impossible because of darkening of the field. In making the detn., add 80 ml. concn. HCl to 100 ml. of water to be analyzed, add 7 g. Zn, maintain vacuum at 570 mm. at first (for intensive sepn. of H₂) and then at 380 mm., after 30 min. treat disks with 10% KI soln., wash, dry, and compare spots. B. Z. Kamich

1957