"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

68225

Phase Composition, Luminescence Properties, and Structure of Synthetic Zinc Silicates Containing Manganese

S/076/60/00[illegible]/0[illegible]/0[illegible]/0[illegible]
B004/B016

produced. Figure 2 gives the same data at excitation by electrons. The following is found: 1) The intensity of luminescence depends on the conditions of preparation; 2) at excitation by ultraviolet light, the curves show horizontal sections in which the intensity of luminescence is independent of the composition; 3) the curves of the luminescence excited by electrons differ, as far as their shape is concerned, from the curves of the luminescence excited by ultraviolet light; 4) the luminescence curves of the luminophores obtained by melting differ from the curves of the mechanical mixtures. Figure 3 shows the dependence of the maximum and minimum refractive indices on the composition of the luminophores. The luminophores with a composition between ZnO and zinc orthosilicate are two-phase, the luminophores with a composition between zinc orthosilicate and SiO_2 one-phase. It may be seen from the Debye powder patterns (Fig 4) that the structure of zinc orthosilicate undergoes continuous changes at varied composition of the luminophores. The thermograms in figures 5,6 also indicate a different structure of the luminophores of different composition. The following crystallochemical

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Phase Composition, Luminescence Properties, and Structure of Synthetic Zinc Silicates Containing Manganese

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B004/B016

structure of the different phases of zinc silicate is derived from that: With increasing content of SiO_2, the Si atoms substitute the Zn atoms in the crystal lattice. Since one Si atom replaces two Zn atoms, holes are formed. Figure 7 shows the linear dependence of the formula volume on the composition, figure 8 the packing of the oxygen atoms which remains constant. The luminescence spectrum presented in figure 9 (taken by means of TEU-32 and UM-2 type monochromator) and the curves of thermal afterglow (Fig 10) also indicate the constancy of the lattice parameters of the metastable phase of zinc silicate. The author thanks M. A. Konstantinova-Shlezinger for the supervision of work. There are 10 figures and 13 references, 9 of which are Soviet.

SUBMITTED: October 26, 1958

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APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

S/051/60/009/004/010/034
E201/E191

AUTHORS: Osiko, V.V., and Maksimova, G.V.

TITLE: Valence of the Manganese Activator in Crystal Phosphors

PERIODICAL: Optika i spektroskopiya, 1960, Vol 9, No 4, pp 478-481

TEXT: The valence state of the manganese activator was determined in a large number of crystal phosphors. This state was obtained by a chemical method: the total content of manganese was found, as well as the content of manganese with valence greater than 2. The results are given in Table 1 (23 phosphors with the average valence of 2), Tables 2 and 3 (25 phosphors with the average valence greater than 2). These results showed that: 1) in all phosphors with green and yellow luminescence the average valence was 2; 2) phosphors with orange-red and red emission had manganese with the average valence of 2 or greater than 2; 3) there was no unique relationship between the average valence and the ionic radii or structure of the crystals.

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

S/051/60/009/004/010/034
E201/E191

Valence of the Manganese Activator in Crystal Phosphors

Acknowledgements are made to M.A. Konstantinova-Shlezinger, who directed this work, and to N.A. Gorbacheva, Yu.S. Leonov and E.Ya. Arapova for supply of the crystals.
There are 3 tables and 2 English references.

SUBMITTED: January 15, 1960

Card 2/2

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

22155

24,3500

S/048/61/025/004/004/048
B104/B201

AUTHORS: Gorbacheva, N. A. and Osiko, V. V.

TITLE: Valence of Sn and Mn activators in crystal phosphors

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, v. 25, no. 4, 1961, 454-455

TEXT: The present paper has been read at the 9th Conference on Luminescence (Crystal Phosphors), Kiyev, June 20-25, 1960. The authors have studied the relationship between the luminescence properties of Sn- and Mn-activated luminophores and the valence of these activators. The mean valences of Sn have been determined polarographically, and those of Mn by colorimetric and iodometric methods of analysis. Detailed results on Mn-activated luminophores have been earlier published by Osiko et al. (Ref. 1: Osiko, V. V., Maksimova, G. V., Optika i spektroskopiya, 9, vyp. 4). It is noted here that the relationship between the luminescence properties and the mean valence of Mn permits the luminophores under investigation to be classified into three groups. The valence of Sn has been studied on a group of phosphate phosphors. Results are presented in

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

22155

Valence of Sn and Mn...

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B104/B201

Table 1. Tin is shown to be in the bivalent state in all luminophores, regardless of the differences in the luminescence spectra. An oxidation of tin, causing it to pass over into the tetravalent state, and also its reduction to the elementary state, cause luminescence to disappear. It has been further established that a reducing atmosphere is not in all cases necessary to produce a bivalent tin: some luminophores are produced also by sintering in the air. Their composition includes, however, a reducing agent (ammonium salts which are decomposed at t = 1000°C with hydrogen being liberated). In the study of the relationship between valence of the activator in the luminophore and the temperature, on the one hand, and sintering in air and concentration of the activator, on the other, the authors examined the system $ZnO-MnO-O_2$ which was regarded as a physico-chemical model of a luminophore. The specimens produced from mixtures of ZnO and MnO_2, were sintered at different temperatures in an oxygen flow or in a nitrogen flow purified from oxygen. The mean valence of Mn was determined on the resulting specimens. Results are presented in Fig. 1. It shows that the mean valence of Mn is strongly dependent, under equal conditions, on the relative Mn content. It may be also seen that up to a given concentration, the mean valence is 2 and independent of the sintering

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B104/B201

Valence of Sn and Mn...

atmosphere. This confirms that in this case the valence of Mn is determined by the crystallochemical structure. It also follows that one and the same luminophore may have, under otherwise equal conditions of production, a different Mn valence, depending on the Mn content. The fact must be taken into account that a change of the valence state of the activator is connected with changes in the phase composition. The authors were also able to show that when sintering the solid solution (Zn, Mn)O with high Mn content in oxygen, these single-phase systems undergo lamination: Besides the (Zn, Mn)O phase (in which the Mn content is reduced), also manganese oxide is observable in the microscope. There are 1 figure, 1 table, and 2 Soviet-bloc references.

Legend to Table 1:
1) luminescence color;
2) sintering conditions;
3) valence; 4) orange;
5) pink; 6) blue;
7) violet; 8) yellow.

Люминофор	1) Цвет свечения	2) Условия прокаливания	$E^*_{1/2}$	Валентность 3)
$(Sr, Mg)_3(PO_4)_2$ — Sn	Оранжевый 4)	1200° в NH_3	0,56	2
$Ba_2P_2O_7$ — Sn	Розовый 5)	1000° в NH_3	0,56	2
$Sr_2P_2O_7$ — Sn	Голубой 6)	1000° в NH_3	0,56	2
$(Mg, Ca)_2PO_4F$ — Sn	Фиолетовый 7)	1000° в воздухе	0,56	2
$(Mg, Ba)_2PO_4F$ — Sn	Желтый 8)	950° в воздухе	0,56	2

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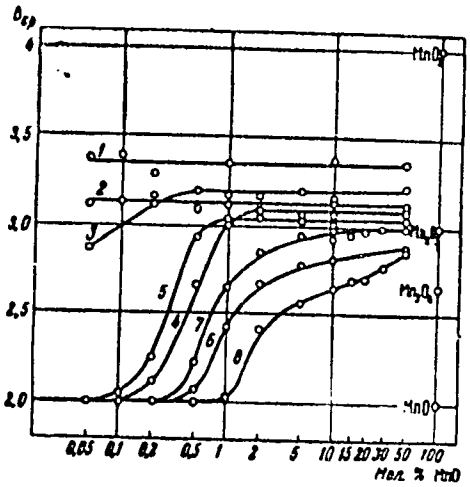
B104/B201

Valence of Sn and Mn...

Legend to Fig. 1: Dependence of the mean valence of Mn on the manganese content, on temperature, and the sintering atmosphere. Sintering time in all cases 30 minutes. 1) 600°C in O_2. 2) 600°C in N_2. 3) 800°C in O_2. 4) 300°C in N_2. 5) 1000°C in O_2. 6) 1000°C in O_2. 8) 1200°C in N_2.

Fig. 1



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APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 18753-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD/JG

ACCESSION NR: AT3002227 S/2941/63/001/000/0239/0244

AUTHORS: Osiko, V. V.; Panasyuk, Ye. I.

TITLE: Optical characteristics of monocrystalline ZnS-Mn

SOURCE: Optika i spektroskopiya; sbornik statey. v. 1: Lyuminestsentsiya. Moscow. Izd-vo AN SSSR, 1963, 239-244

TOPIC TAGS: absorption, excitation, luminescence, recrystallization

ABSTRACT: An investigation of optical characteristics of ZnS-Mn has been made by studying the absorption, excitation, and luminescence spectra of monocrystalline ZnS-Mn in its gaseous phase. Two types of specimens were prepared. The first, ZnS-Mn, Cl by means of a reaction between hydrogen sulphide, Zn vapor and magnesium chloride, at 1050C. The magnesium content of the crystal varied from 0.24 to 0.40% by weight. The second specimen, Zn, Mn S was grown by means of high-temperature recrystallization. The results are plotted on Fig. 1 and Fig. 2 of the enclosures. "The author is grateful to M. V. Fok and V. V. Antonov-Romanovskiy for their evaluation of the work." Orig. art. has: 6 figures and 1 table.

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APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 18424-63 EWT(1)/EWP(q)/EWT(m)/BDS AFFTC/ASD/IJP(C)/SSD JD
ACCESSION NR: AT3002228 S/2941/63/001/000/0244/0249

AUTHOR: Osiko, V. V.

58

TITLE: Luminescence of ZnS-Mn in red spectrum

SOURCE: Optika i spektroskopiya; sbornik statey. v. 1: Lyuminestsentsiya. Moscow. Izd-vo AN SSSR. 1963, 244-249

TOPIC TAGS: luminophor, transition, crystal, lattice, luminescence

ABSTRACT: The luminescence of the luminophor ZmS-Mn was obtained in the red spectrum. The dependence of ZnS-Mn luminescence on Mn concentration, annealing temperature, and annealing time was studied. The nature of the long wave band of Mn luminsecence was attributed to luminescence transitions occurring not in the isolation of Mn atoms from one another but in two or more Mn atoms spreading into the adjacent lattice points, i.e., Mn atom clustering. Orig. art. has: 6 figures.

ASSOCIATION: none

SUBMITTED: 05Feb62 DATE ACQ: 19May63 ENCL: 00

SUB CODE: PH NO REF SOV: 005 OTHER: 004

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APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 18752-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD/JG

ACCESSION NR: AT3002229 S/2941/63/001/000/0249/0257

6D
57

AUTHOR: Osiko, V. V.

TITLE: Excitation mechanism of manganese luminescence in ZnS-Mn

SOURCE: Optika i spektroskopiya; sbornik statey. v. 1: Lyuminestsentsiya. Moscow, Izd-vo AN SSSR, 1963, 249-257

TOPIC TAGS: excitation mechanism, luminophor , recombination, spectra

ABSTRACT: The role of "blue centers" has been studied in the excitation mechanism of manganese luminescence in ZnS-Mn. In order to compare the characteristics of luminophors with and without blue centers, three different samples were prepared: | Zn,Mn || S,O | -2%NaCl; | Zn,Mn || S,O |; and | Zn,Mn | S. Spectral characteristics of the excitation states of these luminophors and their dependence on composition and mode of preparation were assessed. The results indicate that the type of excitation process and luminescence are independent of the presence of blue centers for continuous excitation on Mn-centers in the discrete band (390-525 millimicron). Furthermore, in the presence of blue centers, energy

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ACCESSION NR: AT3002229

3

of absorption is transmitted from the lattice to the Mn-centers, and the excitation spectra of Mn-light coincides with the excitation spectra of ZnS blue centers. The author combines his experimental results with previous investigations to discuss the recombination mechanism of excited Mn in zinc sulphide. "The author expresses his gratitude to M. A. Konstantinov-Shlezinger, M. V. Fok and V. V. Antonov-Romanovskiy for their valuable advice." Orig. art. has: 6 figures.

ASSOCIATION: none

SUBMITTED: 05Feb62 DATE ACQ: 19May63 ENCL: 00

SUB CODE: PH NO REF SOV: 013 OTHER: 010

Card 2/2

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 45720-65 EWA(k)/FBD/EWG(r)/EWT(1)/EEC(k)-2/EEC(t)/T/EEC(b)-2/EWP(k)/
EWA(m)-2/EWA(h) Pm-4/Pn-4/Po-4/Pf-4/Peb/Pi-4/Pl-4 IJP(c) WG

ACCESSION NR: AP5013663 UR/0386/65/001/001/0005/0009

AUTHOR: Voron'ko, Yu. K.; Kaminskiy, A. A.; Osiko, V. V.; Prokhorov, A. M.

TITLE: Stimulated emission of CaF_2: Ho^{3+} at λ 5512 Å

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 1, no. 1, 1965, 5-9

TOPIC TAGS: laser, calcium fluoride, calcium fluoride laser, stimulated emission, coherent light fluorite

ABSTRACT: The present article, in the form of a letter to the editors, provides preliminary data on a CaF_2: Ho^{3+} laser operating in the middle of the visible spectral range (at 5512 Å) at a temperature of 77K. The faces of the 7.5-cm-long laser rod were coated with layers of a dielectric material. The diameter of the faces was 6.5 mm and their transmittivity at the oscillation wavelength 0.12 and 0.7%. A xenon lamp was the pumping source. Laser action was achieved in samples with an Ho^{3+} concentration of 0.4%. The oscillation threshold was 1200 j. Stimulated emission was due to transitions between the $5g_2$ level and a Stark component of the $5I_8$ level about 370 cm^{-1} above the ground level. The exact wavelength of stimulated emission was determined to be 5512.206 ± 0.003 Å (18141.55 cm^{-1}). The linewidth was 0.04 Å (0.612 cm^{-1}). Orig. art. has: 3 figures. [03]

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APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

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L 45720-65

ACCESSION NR: AP5013663

2

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences SSSR); Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Institute of Nuclear Physics of Moscow State University)

SUBMITTED: 25Jan65 ENCL: 00 SUB CODE: OP

NO REF SOV: 002 OTHER: 003 ATD PRESS: 4001

Card 2/2

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 58467-65 EWA(k)/FBD/EWG(r)/EWT(1)/EWT(m)/EEC(k)-2/EEC(t)/T/EWP(t)/EEC(b)-2/EWP(k)/EWP(b)/EWA(m)-2/EWA(h) Pm-4/Pn-4/Po-4/Pf-4/Peb/Pi-4/Pl-4 SCTB/IJP(c) WG/JD/JG/GG

ACCESSION NR: AP5014193 UR/0386/65/001/002/0003/0007

AUTHOR: Voron'ko, Yu. K.; Kaminskiy, A. A.; Korniyenko, L. S.; Osiko, V. V.; Prokhorov, A. M.; Udovenchik, V. T.

TITLE: Investigation of the stimulated emission in $CaF_2:Nd^{3+}$ crystals (type II) at room temperature

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v radaktsiyu. Prilozheniye, v. 1, no. 2, 1965, 3-7, and insert A

TOPIC TAGS: neodymium, calcium compound, stimulated emission, paramagnetic laser, room temperature laser

ABSTRACT: The present work, a continuation of earlier research (ZhETF, 46, 1964, 386) in which the authors obtained stimulated emission at ~1.047 μ in $CaF_2:Nd^{3+}$ (type I) crystals at 300K, gives preliminary results for laser action at ~1.0885 μ in $CaF_2:Nd^{3+}$ (type II) crystals at 300K. Type II crystals, unlike type I crystals, contain oxygen ions in the structure of their neodymium optical centers. The working crystals, which had 0.2—0.5% Nd^{3+} concentrations, were in the form of cylindrical rods having polished ends with an accuracy of ~15". The diameter and length of the rods were ~6.0 mm and 75 mm, respectively. The optical resonator consisted of externally

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ACCESSION NR: AP5014193

mounted confocal dielectric mirrors (radius of curvature, 500 mm; diameter, 40 mm; transmittivity, ~2% at 1.06 μ). An IFP-800 xenon lamp was used for pumping. Laser action resulted from the $^4F_{3/2} \rightarrow {}^4I_{11/2}$ transition. The lifetime of the excited $^4F_{3/2}$ state at 300K was measured (by means of a taumeter developed for this purpose) as ~1.25 μsec. At 300K, the type II laser operates at a lower frequency (~1.0885 μ) than any other known neodymium laser. Orig. art. has: 1 table and 3 figures. [YK]

ASSOCIATION: Institut yadernoy fiziki Moskovskogo Gosudarstvennogo universiteta (Institute of Nuclear Physics, Moscow State University); Fizicheskiy institut Akademii nauk SSSR (Physics Institute, Academy of Sciences SSSR)

SUBMITTED: 03Feb65 ENCL: 00 SUB CODE: EC, SS

NO REF SOV: 002 OTHER: 008 ATD PRESS: 4015

Card 2/2

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 57129-65 EWT(1)/EWT(m)/T/EWP(t)/EEC(b)-2/EWP(b) Pi-4 IJP(c) JD/JG/GG

ACCESSION NR: AP5014227 UR/0386/65/001/004/0033/0039

AUTHOR: Voron'ko, Yu. K.; Kaminskiy, A. A.; Osiko, V. V.; Prokhorov, A. M.

TITLE: Selective excitation of rare-earth ion centers in crystals

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 1, no. 4, 1965, 33-39

TOPIC TAGS: laser material, rare earth, absorption spectrum, Stark effect

ABSTRACT: The active medium in most solid-state lasers today is a crystal doped with rare-earth ions. For various reasons such crystals behave quite differently, and this study analyzes rare-earth active centers to determine the most desirable types. A method is proposed for studying the Stark structure of the luminescence spectra of rare-earth doped crystals (in this case CaF_2-Er^{3+}) in which the individual types of centers are selectively excited. The experimental equipment consists of a mercury lamp, lenses, monochromator, glass Dewar, quartz light conductors, test sample, prism, and a spectrograph. The monochromator is capable of selecting a band with half-width of ~3 Å from a continuous spectrum.

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ACCESSION NR: AP5014227

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Both static and dynamic methods are used in producing excitation: in the first, excitation is produced in a preselected absorption line; in the second, the wavelengths of the excitation light are scanned. The dynamic luminescence spectrum for one transition at 77°K of CaF_2 doped with 3% Er^{3+} is shown, and the related absorption spectrum is compared. Three different Er^{3+} centers were studied, and excitation in each line of these systems was found to produce identical luminescence spectra. A typical microphotogram is shown and discussed, and the systems are compared. This is claimed to be the first use of selective excitation for Stark structure analysis of luminescence spectra of rare-earth ions in crystals. "The authors express their appreciation to V. B. Aleksandrov for his participation in the experiment." Orig. art. has: 3 figures. [14]

ASSOCIATION: Fizicheskiy institut imeni P. N. Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences, SSSR); Institut kristallografii Akademii nauk SSSR (Institute of Crystallography, Academy of Sciences, SSSR)

SUBMITTED: 16Apr65 ENCL: 00 SUB CODE: EC, SS

NO REF SOV: 000 OTHER: 000 ATD PRESS: 4036

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Card 2/2

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 3725-66 EWA(k)/FBD/EWT(1)/EWP(e)/EWT(m)/EEC(k)-2/EWP(i)/T/EWP(k)/EWA(m)-2/EWA(h)

ACC NR: AP5025788 SCTB/IJP(c) WG/WH SOURCE CODE: UR/0363/65/001/009/1521/1525

AUTHOR: Voron'ko, Yu. K.; Kaminskiy, A. A.; Osiko, V. V.; Khaimov-Mal'kov, V. Ya.

ORG: Institute of Crystallography, Academy of Sciences, SSSR (Institut kristallografii Akademii nauk SSSR); Physics Institute im. P. N. Lebedev, Academy of Sciences, SSSR (Fizicheskiy institut Akademii nauk SSSR)

TITLE: Investigation of the optical inhomogeneity of $CaF_2:Dy^{3+}$ laser crystals

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 9, 1965, 1521-1525

TOPIC TAGS: laser, solid state laser, laser rod, laser crystal, fluorite, fluorite laser, optical inhomogeneity, excitation threshold

ABSTRACT: Experiments were performed to determine the effect of different types of optical inhomogeneities on the excitation threshold of CaF_2 laser rods doped with 0.5% Nd^{3+}. Crystals 150 mm long with a 15-mm diameter were grown from the same melt under identical conditions and had the same concentration of active impurities. Thirteen laser rods, each about 73 mm long and 6.5 mm in diameter, were fabricated from the crystals. Measurements of the excitation threshold, the gradient of the index of refraction, the local inhomogeneities, and small angle scattering showed that the optical defects differed from crystal to crystal. These differences were attributed to minute, uncontrollable variations in the temperature regime during the growth process and to differences in the crystallographic orientation of the growing crystals. It was estab-

Card 1/2 UDC: 546.41'161:548.55

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 3725-66

ACC NR: AP5025788

lished that the scattering angle of a beam from a He-Ne laser directed along the geometrical axis of the rod shows the greatest amount of correlation with the excitation threshold of the laser rod. This parameter should therefore be used in selecting the $CaF_2:Nd^{3+}$ crystal rods to be used in lasers. Orig. art. has: 4 figures and 1 table. [CS]

SUB CODE: SS/ SUBM DATE: 02Jun65/ ORIG REF: 008/ OTH REF: 000/ ATD PRESS: 4120

Card 2/2

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 9498-66 EWA(k)/FBD/EWT(1)/EEC(k)-2/T/EWP(k)/EWA(m)-2/EWA(h) SCTB/IJP(c)
ACC NR: AP6001224 WG/GG SOURCE CODE: UR/0363/65/001/012/2088/2092

AUTHOR: Bagdasarov, Kh. S.; Voron'ko, Yu. K.; Kaminskiy, A. A.; Osiko, V. V.

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences SSSR (Fizicheskiy institut Akademii nauk SSSR); Institute of Crystallography, Academy of Sciences SSSR (Institut kristallografii Akademii nauk SSSR)

TITLE: Fluoride-base systems as active quantum electronic materials

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 12, 1965, 2088-2092

TOPIC TAGS: laser, infrared laser, solid state laser, stimulated emission, fluoride base laser

ABSTRACT: Stimulated emission in the infrared spectral region (10,540 Å) has been achieved with a low generation threshold (about 50 J) from Nd^{3+} activated BaF_2-LaF_3 single crystals at room temperature. The crystals, described as a new laser material, were grown by Stockbarger technique from a BaF_2-LaF_3 mixture of variable composition with 1% NdF_3 addition. The growth technique was described earlier [Yu. K. Voron'ko, V. V. Osiko, V. T. Udovenchik, M. M. Fursikov. Fiz. tv. tela, 7, 267 (1965)]. Preliminary study of the absorption and luminescence spectra of the crystals indicated the characteristics required for laser, i.e., an unusually high absorption coefficient in the 0.6—1.0 μ region at 300K and the highest luminescence intensity

Card 1/2 UDC: 546.161

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 9498-66

ACC NR: AP6001224

peak at 1.05 μ, corresponding to $^4F_{3/2}$—$^4I_{11/2}$ transition, also at 300K. The line width in the luminescence spectrum insignificantly increased with temperature increase from 77K to 300K. These favorable spectral characteristics were attributed to the distribution of Nd^{3+} ions between different types of electric crystal fields. Stimulated emission was excited with a Xe-flash lamp in single crystal rods (75 x 5.5 mm) in the cavity consisting of external confocal dielectric mirrors. The emission possessed usual laser characteristics as shown by the time dependence at different pumping energies. The physical properties of the crystals make possible a continuous laser emission at 300K. Orig. art. has: 4 figures. [JK]

SUB CODE: 20/ SUBM DATE: 13Jul65/ ORIG REF: 002/ OTH REF: 005/ ATD PRESS: 4164

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 12824-66 EWT(1) AT

ACC NR: AP6001775 SOURCE CODE: UR/0386/65/002/010/0473/0478

25

AUTHOR: Voron'ko, Yu. K.; Kaminskiy, A. A.; Osiko, V. V.

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences SSSR (Fizicheskiy institut Akademii nauk SSSR)

B

21, 44, 55

TITLE: Effect of hard radiation on the optical centers of TR^{3+} ions in crystals

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 2, no. 10, 1965, 473-478

TOPIC TAGS: luminescence center, rare earth element, Gamma irradiation, crystal symmetry

ABSTRACT: The authors have observed a new effect, wherein the structure and optical properties of the TR^{3+} centers in crystals with TR^{3+} impurity are changed by hard radiation. The investigations were carried out with the crystals $CaF_2:Nd^{3+}$ (0.3 wt.%), $CaF_2:Er^{3+}$ (0.3 wt.%), and $CaF_2:Eu^{3+}$ (0.3 wt.%, type I), synthesized by a procedure described earlier (FTT v. 7, 267, 1965). The absorption spectra were obtained with a diffraction spectrometer. In all crystals, irradiation greatly reduced the intensities of some lines and gave rise to new lines. From a comparison of the absorption coefficients at the line maxima before and after irradiation it is easily seen that: 1) the lines comprising a single system are decreased in like fashion, and 2) the decrease is strongest in rhombic-symmetry lines and practically nil in the tetragonal system. It is concluded that γ irradiation changes the structure of the optical TR^{3+} centers, with some centers becoming disintegrated

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L 12824-66

ACC NR: AP6001775

and replaced by others of still unknown structure. Two possible mechanisms of TR^{3+}-center transformation are discussed. The ionic mechanism, which presupposes dissociation (destruction) of the centers, and the electron-hole mechanism, which is tantamount to formation of a center of a new type. It is still unclear which of these mechanisms predominates. It is noted in conclusion that the effect observed in this investigation can be used for an analysis of the optical TR^{3+} centers in crystals by observing the inhomogeneous change in the absorption-line intensity following irradiation. In addition, a study of the optical properties of the TR^{3+} centers in irradiated crystals can yield valuable information on the character of the processes which occur when hard radiation interacts with crystalline matter. Orig. art. has: 3 figures and 1 table.

[02]

SUB CODE: 20/ SUBM DATE: 29Sep65/ ORIG REF: 004/ OTH REF: 003/ ATD PRESS: 4183

Card 2/2

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L-20936-65 EPF(c)/EPR/EWT(m)/EWP(b)/EWP(t) Pf-4/Ps-4 IJP(c) JW/JD/JG

ACCESSION NR: AP5003441 S/0181/65/007/001/0238/0243

AUTHORS: Krotova, L. V.; Osiko, V.V.; Udovenchik, V. T.

TITLE: Effect of oxygen impurity on the optical properties of CaF_2-Sm crystals

SOURCE: Fizika tverdogo tela, v. 7, no. 1, 1965, 238-243

TOPIC TAGS: fluorite crystal, optical property, oxygen impurity, samarium impurity, doping

ABSTRACT: The authors have established that the reduction of samarium in fluorite crystals, and consequently also the optical properties of these crystals, is closely related with the presence of oxygen impurities. The crystals were grown of natural fluorite by three different methods. The samarium was added in all cases in the form of Sm_2O_3 in concentrations 0.05—0.1 wt.%. The samarium was reduced either by additive coloring in calcium or magnesium

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 29936-65

ACCESSION NR: AP5003441

vapor, or by irradiation with gamma rays from Co^{60}. The results of the tests are analyzed in light of simultaneous investigations of the optical properties of CaF_2-Sm^{3+} crystals and other types of fluorite crystals doped with rare-earth elements. It is concluded from all the results that for a non-equilibrium reduction of the rare-earth ion in the fluorite it is necessary that part of the rare-earth ions be contained in the "cubic" centers and that the crystal contain oxygen ions (or some other impurities) to act as acceptors for the holes and to stabilize the divalent state of the rare-earth ion. Although the doped fluorite crystallizes in four crystal-chemical modifications, only one of the modifications satisfies this condition. Orig. art. has: 4 figures and 1 formula. [02]

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR, Moscow (Physics Institute, AN SSSR)

SUBMITTED: 16Apr64 ENCL: 00 SUB CODE: SS, OP

NR REF SOV: 003 OTHER: 002 ATD PRESS: 3194

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APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 22571-65 EPF(c)/EPR/EWT(m)/EWP(b)/EWP(t) Pr-4/Ps-4 IJP(c) JW/JD
ACCESSION NR: AP5003446 S/0181/65/007/001/0267/0273

AUTHOR: Voron'ko, Yu. K.; Osiko, V. V.; Udovenchik, V. T.; Fursikov, N. M.

TITLE: Optical properties of calcium fluoride doped with triply ionized disprosium

SOURCE: Fizika tverdogo tela, v. 7, no. 1, 1965, 267-273

TOPIC TAGS: calcium fluoride, absorption spectrum, emission spectrum, luminescence, laser material, laser disprosium, rare earth element, luminescence center

ABSTRACT: The absorption, emission, and excitation spectra of CaF_2 doped with Dy^{3+} were investigated using samples which differed in chemical composition and in their growth conditions. It was found that there are at least three types of Dy^{3+} doped CaF_2 crystals. The differences can be attributed to a set of optical centers characteristic of each type of crystal. Centers of tetragonal symmetry characterize Type I crystals and centers of trigonal symmetry, Type II. The center structure of type III crystals could not be determined. It was

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L 22571-65
ACCESSION NR: AP5003446

established that electronic transitions of Dy^{3+} centers correspond to electronic transitions of the free ion. The oxygen impurities in the Dy^{3+} ion are responsible for the appearance of specific absorption bands in the short-wavelength ultraviolet part of the spectrum. Investigation of the optical properties of chemically different Dy^{3+} doped CaF_2 crystals has shown that the crystals are rarely mixtures of more than one type. Orig. art. has: 5 figures and 2 tables. [CS]

ASSOCIATION: Fizicheskiy institut imeni P. N. Lebedev (Physics Institute)

SUBMITTED: 09May64 ENCL: 00 SUB CODE: SS

NO REF SOV: 002 OTHER: 001 ATD PRESS: 3172

Card 2/2

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

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[illegible], V. V.

[illegible] of optical centers in [illegible] [illegible] [illegible]
[illegible] 1294-1302 My '65. [illegible]

1. Fizicheskiy institut imeni P. N. Lebedeva AN [illegible], M[illegible]

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 55120-65 EWT(1)/EWT(m)/EPF(c)/EPR/EWP(b)/EWP(t) Pr-4/Ps-4/Pi-4 IJP(c) JD/JW

ACCESSION NR: AP5014584 UR/0181/65/007/006/1800/1807

AUTHOR: Voron'ko, Yu. K.; Krotova, L. V.; Osiko, V. V.; Udovenchik, V. T.; Fursikov, M. M.

TITLE: Optical properties of the CaF_2-Nd^{3+} crystals

SOURCE: Fizika tverdogo tela, v. 7, no. 6, 1965, 1800-1807

TOPIC TAGS: absorption spectrum, luminescence spectrum, fluorite crystal, neodymium activation, optical center, calcium fluoride

ABSTRACT: Optical methods were used to investigate a large number of CaF_2-Nd^{3+} crystals, grown by different methods and having different neodymium concentrations. The absorption and luminescence spectra of crystals whose optical centers contain ions of oxygen are investigated and described for the first time. The absorption spectra were recorded with a "Unicam" SP-700 instrument at room and nitrogen temperatures in the 53,000—5,000 cm^{-1} range, at a resolution of approximately 15—20 cm^{-1}. The luminescence spectra were also obtained at room and nitrogen temperatures using a monochromator, a photomultiplier, and a recorder. Two types of crystals were

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crystals were used: [illegible], and an automatic re-
type I, having optical spectra similar

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ACCESSION NR: AP5014584

to those described by Z. Kiss (J. Chem. Phys. v. 38, 1476, 1963), were obtained by the dropping-crucible method using a fluoridizing atmosphere, while crystals of type II were obtained by introducing the neodymium in the form of an oxide. The dependence of the optical spectra of the crystals on the concentration of neodymium was studied, and it is shown that a relative change takes place in the number of different optical centers with variation of the total concentration. The experimental data are compared with the theoretical calculation made previously by one of the authors (Osiko, FTT v. 7, 1294, 1965). The two types of crystals did not contain any coinciding lines and differed in the number of components in each

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

of type II crystals showed less sensitivity to the concentration than crystals of type I. Orig. art. has: 7 figures. [02]

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR, Moscow (Physics Institute, AN SSSR)

SUBMITTED: 09Oct64 ENCL: 00 SUB CODE: SS, OP

NO REF SOV: 002 OTHER: 010 ATD PRESS: 4025

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L 58536-65 EWT(1)/EWG(m) JW

ACCESSION NR: AP5012532 UR/0181/65/007/005/1294/1302

AUTHOR: Osiko, V. V. 13 12 B

TITLE: Thermodynamics of optical centers in CaF_2-TR^{3+}

SOURCE: Fizika tverdogo tela, v. 7, no. 5, 1965, 1294-1302

TOPIC TAGS: thermodynamic equilibrium, optical center, rare earth element, fluorite crystal, equilibrium concentration, absolute concentration

ABSTRACT: This is a continuation of earlier work by the author (Collection: Rost kristallov [Crystal Growth], v. 5, M., 1965) devoted to a crystal-chemistry analysis of the CaF_2-TR^{3+} system. In the present article the author obtains, with the aid of an approximate quantitative calculation of the equilibrium of pointlike defects in CaF_2-TR^{3+} numerical values of the concentration of defects as a function of the equilibrium conditions. The calculations are made for the equilibrium states $n(L_{Ca}\cdot F_i) \approx n(L_{Ca}) + n(F_i)$, $2n(L_{Ca}\cdot F_i) \approx n(L_{Ca}\cdot F_i)_2$, $n(L_{Ca}) + 2n(F_i) \approx n(L_{Ca}\cdot 2F_i)$, and $2n(L_{Ca}) + n(F_i) \approx n(2L_{Ca}\cdot F_i)$ in crystals of the (CaF_2-LF_3) type.

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ACCESSION NR: AP5012532

It is shown that it is necessary to account for the formation of at least 11 types of optical centers of different chemical compositions and structures. These are summarized in Table 1 of the Enclosure. The absolute concentrations of the various centers are discussed. Orig. art. has: 6 figures, 10 formulas, and 1 table.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR, Moscow (Physics Institute, AN SSSR)

SUBMITTED: 22Jul64 ENCL: 01 SUB CODE: OP, SS

NR REF SOV: 004 OTHER: 003

Card 2/3

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 58536-65

ACCESSION NR: AP5012532 ENCLOSURE: 01

Table 1. Optical centers in CaF_2-TR^{3+} crystals of type I

Formula	Nearest neighbor symmetry	Electric model	$A_1 \cdot 10^{11}$, erg
L_{Ca}	Cubic		—
$L_{Ca} \cdot F_i$	Tetragonal I		1.22
$(L_{Ca} \cdot F_i)_2$	Rhombic		0.71
$(L_{Ca} \cdot F_i)_2$	Tetragonal II and III		0.40
$(L_{Ca} \cdot F_i)_2$	Monoclinic I - IV		0.29
$2L_{Ca} \cdot F_i$	Tetragonal IV		0.61
$L_{Ca} \cdot 2F_i$	Tetragonal V		0.61

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L 2329-66 EWA(k)/FBD/EWT(1)/EWT(m)/EPF(c)/EEC(k)-2/T/EWP(t)/EWP(k)/EWP(b)/ EWA(m)-2/EWA(h) SCTB/IJP(c) WG/JD/JW/JG

ACCESSION NR: AP5024560

UR/0070/65/010/005/0746/0747
548.0

AUTHOR: Bagdasarov, Kh. S.; Voron'ko, Yu. K.; Kaminskiy, A. A.; Osiko, V. V.; Prokhorov, A. M.
44 44 44 44 44

62
56
B

TITLE: Stimulated emission of neodymium-doped yttrofluorite at room temperature

SOURCE: Kristallografiya, v. 10, no. 5, 1965, 746-747, and top half of insert facing p. 743

TOPIC TAGS: solid state laser, neodymium, yttrofluorite, stimulated emission
25,44

ABSTRACT: Certain basic characteristics of a neodymium-doped yttrofluorite (CaF_2—YF_3) laser operating at room temperature on two wavelengths are described. The present work is part of a study to improve the optical properties of active materials for fluorine-compound lasers. Type I CaF_2—YF_3 crystals with 0.1—0.5% (by weight) concentrations of Nd^{3+} were used. Generation at ∿10461 and ∿10640 Å corresponded to threshold energies of ∿130 and ∿35 J, respectively, supplied to a standard IFP-800 xenon flashlamp. The flashlamp was surrounded by a tubular glass (ZLS-17) filter in order to prevent undesirable aging of the neodymium. The space between the flashlamp and filter was filled with cooling water. The working crystals

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

ACCESSION NR: AP5019213 UR/0056/65/049/001/0031/0035

AUTHOR: Kaminskiy, A. A.; Korniyenko, L. S.; Maksimova, G. V.; Osiko, V. V.; Prokhorov, A. M.; Shipulo, G. P.

81
79
B

TITLE: CW $CaWO_4:ND^{3+}$ laser operating at room temperature

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 1, 1965, 31-35

TOPIC TAGS: CW laser, neodymium laser, glass laser, room temperature laser, water cooled laser

ABSTRACT: The design and fundamental characteristics of a CW neodymium-doped $CaWO_4$ water-cooled laser, operating at room temperature, are described in detail. Single crystals were grown by the Czochralski method. The $CaWO_4$ mixture was prepared by sedimentation. The starting materials were ammonium paratungstate and calcium chloride, specially refined for this purpose. The neodymium was introduced in the form of a binary salt $NaNd(WO_4)_2$. Na_2WO_4 was introduced into the melt in a concentration seven times greater than that of Nd. Growth was conducted on seed crystals oriented according to both axis c and axis a at a rate of 7—12 mm/hr for a seed

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rotation of 90 rpm. The neodymium concentration was varied from 0.1 to 5 percent.

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ACCESSION NR: AP5019213

Reduction of the growth rate from 12 to 7 mm/hr led to significant improvement in the optical quality of the crystal. The infrared luminescence of the neodymium ions due to transitions from the $^4F_{3/2}$ level to the different levels of the ^4I multiplet (the most intense luminescence being at 1.06 μ, which corresponds to the transition $^4F_{3/2} \rightarrow {}^4I_{11/2}$) and its absorption spectrum were considered. A crystal 5 mm in diameter and 42 mm long with an Nd^{3+} concentration of about 3.0 percent, was selected for the laser. The lifetime of the excited state $^4F_{3/2}$ of this crystal at room temperature and lower was 172 ±2 μsec. A xenon lamp was placed at one focal point of an elliptical reflector, while the working crystal (ZhS-17 glass) was placed at the other. The optical resonator consisted of multilayer dielectric mirrors placed at the confocal ends of the crystal. The laser operated at λ = 10,584 Å with a line width of approximately 1 Å. The laser action was sustained at a pumping power of 2.6 kw, and a 40% increase in the threshold power resulted in a laser output of several tens of mw with a 1° beam divergence. The threshold of the working crystal pulse excited by a 2.6-kw pumping source was 2 j. Basic difficulties in constructing a $CaWO_4:Nd^{3+}$ laser are shown to be the selection of suitable transmission bands and the selection of the crystal diameter for a given Nd^{3+} concentration. Orig. art. has: 5 figures. [YK]

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 62763-65

ACCESSION NR: AP5019213

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ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Institute of Nuclear Physics, Moscow State University); Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences, SSSR)

SUBMITTED: 25Jan65 ENCL: 00 SUB CODE: EC

NO REF SOV: 004 OTHER: 007 ATD PRESS: 4056

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 63088-65 EWA(k)/FBD/EWT(1)/EEC(k)-2/EWP(i)/T/EEC(b)-2/EWP(k)/EWA(h)/EWT(m)/
EWA(m)-2 SCTB/IJP(c) WG/JW/GG/WH

ACCESSION NR: AP5021102 UR/0056/65/049/002/0420/0428

AUTHOR: Voron'ko, Yu. K.; Kaminskiy, A. A.; Osiko, V. V.

TITLE: Analysis of optical spectra of CaF_2—Nd^{3+} crystals

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 2, 1965, 420-428

TOPIC TAGS: laser, fluorite/laser, neodymium doped laser, laser emission spectrum, paramagnetic laser

ABSTRACT: The "concentration series" method was used for the spectral analysis of rare-earth ions in type-1 CaF_2 crystals. The designation "type-1" was taken from the crystallochemical classification of V. V. Osiko (Rost kristallov, 5, Izd. AN SSSR, 1965). The aim of the analysis was to determine the suitability of Nd^{3+} as an activator for certain types of lasers, in particular for the CaF_2 crystal, with which emission was obtained recently at room temperature on the 10,461 Å wavelength and on five other wavelengths at temperatures of 90 to 15K. The experiments involved the study of absorption, luminescence, and stimulated emission and measurements of the lifetime of the Nd^{3+} excited states. The crystals contained 0.003 to 2.0% Nd^{3+} by weight. The preparation of the crystals and methods used for measurements

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

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ACCESSION NR: AP5021102

are outlined in some detail. The absorption spectra at 77 and 4.2K showed significant changes with the increase of Nd^{3+} concentration: the number of lines increased and their intensity was redistributed. Fewer lines were observed at 4.2 than at 77K, and near the basic lines many weak lines of varying width appeared at the lower temperature. Luminescence spectra were taken at 77K only, and at wavelengths of 0.9 and 1.05 μ. A redistribution of intensities, similar to that in absorption spectra, was observed when Nd^{3+} concentration was increased. The lifetime investigations covered the temperature range from 300 to 4.2K. Generally, luminescence quenching time at 77K was somewhat longer than at 300K, which indicates the existence of certain radiationless transitions from the $^4F_{3/2}$ level; the lifetime of nonradiative transitions from that level at 300K (at 0.5% concentration) was 9 μsec and 6.5 μsec for transitions to 77 and 4.2K, respectively. Stimulated emission was obtained at both 77 and 300K. Generation occurred at Nd^{3+} concentrations in the range from 0.07 to 0.7%. At a 0.02% concentration, generation did not occur even at 15K and high pumping energies. At 300K laser action occurred at 10,461 Å for all specimens. At between 50 and 15K some specimens showed new lines corresponding to wavelengths of 10,447.6, 10,456.2, 10,466, 10,480, 10,506.5, and 10,648 Å. A 5-Å general wavelength shift toward shorter values was observed with the change from 300K to lower temperatures. At 77K, three wavelengths (10,447.6, 10,456.2, and 10,466 Å) were observed for all specimens except those with a 0.07% Nd^{3+} concentration; specimens with a 0.07% Nd^{3+} concentration emitted only on two wavelengths (10,456.2, and 10,466 Å) at

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ACCESSION NR: AP5021102

temperatures down to 20K. The shorter wave lost intensity as the temperature was lowered and ceased at 18K. In general, the number of absorption lines observed, even at helium temperatures, considerably exceeded the theoretical, a condition attributed to the fact that neodymium ions in the fluorite lattice belong to structurally varying types of centers. An analysis of the thermodynamic balance of optical centers in fluorite crystals revealed a specific concentration dependence for cubic, tetragonal, and rhombic centers corresponding to transitions between the Stark components of the levels. The same applied to luminescence lines. A synthesis of absorption, luminescence, and emission lines at room, nitrogen, and helium temperatures was used to build energy-level diagrams for each type of center. Positive identification of the centers, however, was attempted only on the basis of measurements of the EPR of the neodymium in the fluorite carried out by other researchers on the same specimens. Orig. art. has: 6 figures.

[FP]

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences, SSSR)

SUBMITTED: 10Mar65 ENCL: 00 SUB CODE: EC

NO REF SOV: 010 OTHER: 006 ATD PRESS: 4074

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APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 2129-66 EWT(m)/EPF(c)/EWP(t)/EWP(b) IJP(c) JD/JW/JG

ACCESSION NR: AP5024688 UR/0056/65/049/003/0724/0729

AUTHOR: Voron'ko, Yu. K.; Kaminskiy, A. A.; Osiko, V. V.

40
38
B

TITLE: Analysis of optical spectra of Pr^{3+}, Nd^{3+}, Eu^{3+}, and Er^{3+} in fluorite crystals by the "concentration series" method

21

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 3, 1965, 724-729

TOPIC TAGS: fluorite, fluorite spectrum, doped fluorite, doped fluorite spectrum, admixture spectrum, dope spectrum, spectral analysis, absorption spectra, luminescence spectra

ABSTRACT: A new experimental method for the analysis of absorption and luminescence spectra of type-1 CaF_2 crystals with admixtures of rare-earth ions (TR^{3+}) is described and the investigation results are discussed. The crystal classification is that of V. V. Osiko (Rost Kristallov, 5, Izd. AN SSSR, 1965). The designation "concentration series" refers to the staggered admixture concentration in the set of samples used for the investigation. The method is based on the difference in the character of concentration dependence of various admixtures. This character is specific for structurally different admixture centers as a function of the

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ACCESSION NR: AP5024688

overall concentration of the rare-earth admixture in the crystal at equilibrium temperature. Thus, at low concentrations the greatest number of TR^{3+} ions are found in cubic centers. With an increased concentration, the tetragonal centers increase and exceed the number of cubic centers at a concentration of 10^{-3}. A further concentration leads to an increasing proportion of rhombic centers. The concentrations investigated ranged from 0.003 to 2% by weight of each kind of admixture. Special care was taken to insure perfect uniformity of the specimens (except for admixture concentrations) and even distribution of the centers. Preliminary studies of absorption spectra were carried out at 77K by the SP-700 spectrophotometer within the 0.185 to 2.5 μ range. Further investigations concerned the selected line groups most convenient for study. The absorption in these groups was determined by the DFS-12 defraction spectrometer with a 0.1 Å resolution at 77K. A photomultiplier with an oxygen-cesium photocathode was used to detect the light pulses which were amplified and recorded by an EPP-09M1 potentiometer. The concentration series of absorption curves thus obtained clearly displayed a redistribution of line intensities with the increase of concentration of a given admixture. The peak values of absorption coefficients were then determined for each spectral group. The dependence of absorption coefficients on concentration, charted in the double logarithmic scale, showed families of parallel curves of distinct character, each family representing a

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ACCESSION NR: AP5024688

different kind of admixture. A similar intensity redistribution effect was obtained in the investigation of the luminescence spectra. A strong reabsorption of resonance lines, however, prevented a quantitative evaluation. By combining the analysis by the concentration series method with spectrum study at helium temperatures it is possible to construct the pattern of energy levels for each type of center. To identify the specific line groups with definite center structures however, the concentration series method must be used in combination with some other method. Orig. art. has: 4 figures. [FP]

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences, SSSR)

SUBMITTED: 10Mar65 ENCL: 00 SUB CODE: SS, OP

NO REF SOV: 006 OTHER: 002 ATD PRESS: 4117

Card 3/3

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 5040-66 EWT(1)/EWT(m)/T/EWP(t)/EWP(b) IJP(c) JD/JG/GG

ACC NR: AP5026588 SOURCE CODE: UR/0056/65/049/004/1022/1027

AUTHOR: Voron'ko, Yu. K.; Kaminskiy, A. A.; Osiko, V. V.

ORG: Institute of Crystallography, Academy of Sciences, SSSR (Institut kristallografii Akademii nauk SSSR); Physics Institute im. P. N. Lebedev, Academy of Sciences, SSSR (Fizicheskiy institut Akademii nauk SSSR)

TITLE: Optical relaxation of Ho^{3+} and Er^{3+} ions in the CaF_2 lattice (Type I) in the optical wavelength region

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 4, 1965, 1022-1027

TOPIC TAGS: laser, lifetime, calcium bifluoride, holmium ion, erbium ion, nonradiative transition, luminescence spectrum, absorption spectrum, rare earth ion

ABSTRACT: The lifetimes of the $^5S_2$ and $^5F_5$ excited states of Ho^{3+} and the $^4S_{3/2}$ and $^4F_{9/2}$ states of Er^{3+} in CaF_2 host crystals (activator concentration 0.01—2% by weight) were investigated in the range of temperatures of 77—300K. An analysis made of the influence of nonradiative transitions on the reduction of lifetimes of the excited states included a discussion of the possible causes of the failure

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L 5040-66

ACC NR: AP5026588

to obtain generation in the yellow-green of the spectrum of $CaF_2:Er^{3+}$ at 77K. The samples were cut from crystals into cylindrical rods of various lengths. The ends were polished. Emission was excited by a stroboscopic lamp, and a photomultiplier with a multiple alkali metal cathode was employed for oscilloscope display. The experiments showed a shortening of the excited state lifetimes with increasing concentrations of Ho^{3+} and Er^{3+} ions in CaF_2, which may be explained by a mutual dipole-dipole magnetic interaction of the ions. At room temperature, nonradiative transmissions, which significantly shorten the lifetimes of spontaneous transmissions, played an essential part. In the case of $CaF_2:Er^{3+}$, an anomalous dependence of lifetimes on the concentration was found for the $^4S_{3/2} \rightarrow {}^4I_{15/2}$ transition at 77K. Orig. art. has: 5 figures. [ZL]

SUB CODE: 55, OP/ SUBM DATE: 08Apr65/ ORIG REF: 005/ OTH REF: 005

ATD PRESS: 4132

Card 2/2

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 16025-66 EWT(1)/EWP(e)/EWT(m)/EWP(t) IJP(c) JD/JW/JG/WH

ACC NR: AP6004912 SOURCE CODE: UR/0056/66/050/001/0015/0022

AUTHORS: Voron'ko, Yu. K.; Kaminskiy, A. A.; Osiko, V. V.

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences SSSR (Fizicheskiy institut Akademii nauk SSSR); Institute of Crystallography, Academy of Sciences SSSR (Institut kristallografii Akademii nauk SSSR)

TITLE: Optical centers of Er^{3+} in cubic crystals of the fluorite type

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 50, no. 1, 1966, 15-22

TOPIC TAGS: rare earth element, color center, fluorite, cubic crystal, erbium, yttrium, optic activity

ABSTRACT: The authors investigated the character of the distribution of the erbium ions over centers of varying structure, and constructed the energy level scheme for each of them, using two methods previously developed by them — the method of selective excitation (ZhETF

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ACC NR: AP6004912

Pis'ma, v. 1, no. 4, 33, 1965) and the method of concentration series (ZhETF v. 49, 724, 1965). The concentration series were obtained for CaF_2-Er^{3+} (type 1) crystals with erbium concentration ranging from 0.03 to 2 per cent by weight, at temperatures from 300 to 4.2K. The absorption spectra were measured in the wavelength range 0.185 to 2.5 μ, and the luminescence was measured at wavelengths above 520 nm, with special attention to the band near 540 nm. From the variation of the absorption coefficient with the wavelength, it is concluded that the erbium introduced into the crystals can be distributed over as many as four centers, each having a spectral fine structure. The level scheme is presented for three of these centers. The results are compared with EPR data. The influence of an yttrium impurity on the optical spectra of CaF_2-Er^{3+} was investigated and it was found that addition of Y^{3+} does not give rise to new spectral lines, but the presence of appreciable amounts of yttrium causes the majority of the erbium ions to become parts of complicated optical centers. It is concluded that the decisive effect on the change in spectrum is

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ACC NR: AP6004912

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exerted not by the type of ion (Y^{3+} or Er^{3+}), but only by the symmetry of the centers. Authors thank V. B. Aleksandrov for help with the experiments and S. P. Afaras'yev for help with growing the crystals. Orig. art. has: 6 figures and 1 formula. [02]

SUB CODE: 20/ SUBM DATE: 21Jul65/ ORIG REF: 009/ OTH REF: 004
ATD PRESS: 4203

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Card 3/3

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 36955-66 EWT(m)/T/EWP(t)/ETI IJP(c) JW/JD/JG

ACC NR: AT6020041 (A) SOURCE CODE: UR/2564/65/005/000/0383/0390

AUTHOR: Voron'ko, Yu. K.; Osiko, V. V.; Fursikov, M. M.

ORG: none

TITLE: The study of the structure of CaF_2-Sm^{3+} crystals by optical means

SOURCE: AN SSSR. Institut kristallografii. Rost kristallov, v. 5, 1965, 383-390

TOPIC TAGS: crystal optic property, crystal absorption, crystal growing, calcium fluoride

ABSTRACT: The present paper reports on studies of absorption, luminescence, and excitation spectra of a large number of CaF_2-Sm^{3+} crystals grown under various conditions with the aim of establishing a fast method for the study of the structure of fluorite crystals. An analysis of the results shows that in CaF_2-Sm^{3+} crystals there are basically three types of optical centers the relative concentration of which depends on the conditions under which the crystals were produced. If no oxygen admixtures are present, the crystals contain a single type of centers (I) of tetragonal symmetry, as determined by P. P. Pashinin of the Oscillation Laboratory of the Physics Institute, AN SSSR, (Laboratoriya kolebaniy Fizicheskogo instituta AN SSSR) using electron paramagnetic resonance. These centers consist of Sm^{3+}-F^{1-} ion pairs located at one of the

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

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ACC NR: AT6020041

nearer internodal points. Type II centers have a trigonal symmetry and seem to consist of Sm^{3+}-O^{2-} ion pairs. The structure of type III centers is not yet understood. Orig. art. has: 3 figures and 1 table.

SUB CODE: 20/ SUBM DATE: 00/ ORIG REF: 004/ OTH REF: 003

Card 2/2

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 20581-66 T/EWP(t) IJP(c) JD/JW/JG

ACC NR: AP6002044 SOURCE CODE: GE/0030/65/012/002/0905/0912

67
64
B

AUTHOR: Bagdasarov, Kh. S.; Voronko, Yu. K.; Kaminskii, A. A.; Krotova, L. V.; Osiko, V. V.

ORG: P. N. Lebedev Physical Institute of the Academy of Sciences of the USSR, Moscow; Institute of Crystallography of the Academy of Sciences of the USSR, Moscow

TITLE: Modification of the optical properties of CaF_2-TR^{3+} crystals by yttrium admixtures

SOURCE: Physica status solidi, v. 12, no. 2, 1965, 905-912

TOPIC TAGS: optic crystal, crystal imperfection, crystal impurity, yttrium compound, absorption spectrum, luminescence spectrum, equilibrium constant, fluoride, ionic crystal, rare earth element

ABSTRACT: Absorption and luminescence spectra of CaF_2-Nd^{3+} (type 1) (V. V. Osiko, Crystal growth, Encyclopedia, v. 5, Publishing House of the Academy of Sciences SSSR, 1965) crystals were investigated as a function of the concentration of added yttrium fluoride. The appearance of new lines and a decrease in the line intensities because of the addition of yttrium is attributed to a shift in the equilibrium of Nd centers. Some possible models are discussed. The equilibrium of centers of rare-earth ions (TR^{3+}) in the presence of yttrium fluoride

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 20581-66

ACC NR: AP6002044

in CaF_2-Nd^{3+} crystals was calculated approximately. The authors thank S. P. Afanasev and M. F. Limanovskaya for the growth of crystals and V. B. Aleksandrov for his help in the experiment. Orig. art. has: 4 figures and 2 formulas. [Based on author's abstract] [NT]

SUB CODE: 20/ SUBM DATE: 11Sep65/ ORIG REF: 008/ OTH REF: 005

Card 2/2 BK

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 44703-66 EWT(m)/EWP(t)/ETI IJP(c) JD/JG

ACC NR: AP6031335 SOURCE CODE: UR/0386/66/004/003/0092/0096

AUTHOR: Kaminskiy, A. A.; Osiko, V. V.; Fursikov, M. M.

55 B

ORG: Institute of Crystallography, Academy of Sciences SSSR (Institut kristallografii Akademii nauk SSSR)

TITLE: The photoreduction $TR^{3+} \rightarrow TR^{2+}$ in fluorite crystals

SOURCE: Zh. eksper. i teoret. fiz. Pis'ma v redaktsiyu. Prilozheniye v. 4, no. 3, 1966, 92-96

TOPIC TAGS: fluorite, activated crystal, rare earth element, ionization, photoelectric effect

ABSTRACT: The authors describe the photoreduction of Nd^{3+} ions in CaF_2 crystals (type 1) to the divalent state under the influence of powerful light flashes. This effect has been observed so far only under the influence of hard radiation (γ, neutrons, deuterons, fast electrons), in chemical reactions, or in electrolysis. The investigations were carried out with CaF_2 crystals with 0.5 wt.% Nd^{3+} (type 1) at 300K. The crystals were synthesized by a procedure described earlier (Fizika tverdogo tela, v. 7, 267, 1965). In addition to $CaF_2:Nd^{3+}$, crystals containing, besides neodymium, small amounts of oxygen (O^{2-}) and cerium (Ce^{3+}) were also investigated. The powerful light flashes were produced by IFP-800 xenon lamps placed in an elliptical illuminator. The test procedure consisted in obtaining the absorption and luminescence spectra of the crystals prior to illumination at 77 and 300K, and comparing them with the spectra of

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ACC NR: AP6031335 0

the illuminated crystals. The exposure to light colored the $CaF_2:Nd^{3+}$ (type 1) crystals light brown. A detailed analysis of the optical spectra of these crystals has disclosed the appearance of absorption bands, characteristic of the Nd^{2+} ions in CaF_2, and no noticeable change in the intensities of the components of the initial Stark spectrum of the Nd^{3+} ions. The experimental results show that when $CaF_2:Nd^{3+}$ (type 1) crystals are exposed to powerful light flashes the Nd^{3+} is reduced to Nd^{2+}. This is attributed tentatively to free electrons produced by the illumination, either by a two-photon mechanism or by ionization of the impurity levels. The photoreduction is found to be influenced also by some extraneous impurities. Thus, for example, O^{2-} and Ce^{3+} impurities, which are assumed to produce additional levels of hole localization, by the same token increase the stability of the produced Nd^{2+} ions. The observed effect explains also the "aging" of $CaF_2:Nd^{3+}$ crystals (type 1) under stimulated emission conditions, as observed by one of the authors earlier (Kaminskiy et al., ZhETF v. 48, 476, 1965). A more detailed report of the study of the photoreduction in $CaF_2:TR^{3+}$ crystals will be published in a separate paper. Orig. art. has: 2 figures.

SUB CODE: 20/ SUBM DATE: 24May66/ ORIG REF: 002/ OTH REF: 003

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Card. 2/2

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 46107-66 EWT(1)/EWT(m)/T/EWP(t)/ETI LJP(c) JD/JW/GG

ACC NR: AP6023908 SOURCE CODE: UR/0363/66/002/007/1161/1170

AUTHOR: Voron'ko, Yu. K.; Kaminskiy, A. A.; Osiko, V. V.; Prokhorov, A. M.

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences, SSSR (Fizicheskiy institut Akademii nauk SSSR); Institute of Crystallography, Academy of Sciences, SSSR (Institut kristallografii Akademii nauk SSSR)

TITLE: New type of crystals for lasers with optical excitation

56
55
B

SOURCE: AN SSSR. Izv. Neorg materialy, v. 2, no. 7, 1966, 1161-1170

TOPIC TAGS: fluoride, neodymium, laser optic material, lanthanum compound, cerium compound, yttrium compound, barium compound, strontium compound, calcium fluoride, mixed crystal

ABSTRACT: The paper reports new results obtained from a study of the optical properties and induced emission at 300°K of a group of crystals of mixed fluorides containing a neodymium admixture. All the crystals contained from 0.5 to 2.0% Nd^{3+} and had the following composition: CaF_2-YF_3 (1, 2, 3, 7%); CaF_2-CeF_3 (7%); SrF_2-LaF_3 (30%); BaF_2-LaF_3 (30%). The absorption and luminescence spectra of the crystals at 300 and 77°K were studied. The synthesized mixed fluorides constitute a new type of laser materials. Structurally they are typical crystals, but from the standpoint of their spectral properties, they occupy an intermediate position between crystals and glasses. The thresholds of generation excitation were found to be much lower than in crystals.

UDC: 546.161:548.55

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APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

L 45107-66

ACC NR: AP6023908

of pure fluorides, and the efficiency was found to be several times higher. The working concentrations of neodymium in the mixed fluorides are several times higher than in CaF_2-Nd^{3+}. The weaker concentration quenching is apparently due to the removal of the structural degeneracy of the optical centers. Migration of the excitation energy between various groups of In^{3+} optical centers is possible in the mixed fluoride crystals. The latter may prove effective as sources of excitation for semiconductor lasers. Orig. art. has: 7 figures and 2 tables.

SUB CODE: 20/ SUBM DATE: 30Dec65/ ORIG REF: 015/ OTH REF: 010

Card 2/2 JS

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

ACC NR: AP7000005 SOURCE CODE: UR/0070/66/011/006/0936/0938

AUTHOR: Voron'ko, Yu. K.; Kaminskiy, A. A.; Osiko, V. V.; Fursikov, M. M.

ORG: Physics Institute im. P. N. Lebedev (Fizicheskiy institut); Institute of Crystallography, AN SSSR (Institut kristallografii AN SSSR)

TITLE: Cerofluorite with neodymium admixture as active laser material

SOURCE: Kristallografiya, v. 11, no. 6, 1966, 936-938

TOPIC TAGS: crystal laser, laser optic material, laser emission, calcium fluoride, fluorite, cerofluorite, absorption spectrum, luminescence spectrum

ABSTRACT: Preliminary data were reported on absorption and luminescence spectra and stimulated emission of neodymium activated cerofluorite (CaF_2—CeF_3) crystals. The material was selected for the study because earlier studies of the mixed fluoride crystals of elements of groups II and III indicated the possibility of obtaining laser action with a low (~10 j) generation threshold at room temperature. The cerofluorite crystals activated with 0.5—1.0 wt% Nd were grown by a method previously described [A. A. Kaminskiy, V. V. Osiko. Neorganicheskiye materialy, 1, 2043, 1965]. Crystal rods ~45 mm long and ~55 mm in

Card 1/2 UDC: 548.0:535:80

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

ACC NR: AP7000005

diameter were used in the experiments. Very broad peaks characterized the electronic spectra of cerofluorite crystals as of the similar mixed fluoride crystals. The peaks were unresolved even at 77K. Spiked output was obtained on the ~10657 Å line from the cerofluorite crystal activated with ~1.0% Nd at a pump energy of ~50 J delivered to an IFP-800 xenon flash lamp. The cavity was formed by confocal spherical mirrors with dielectric coating. Width of the emission line was ~3 cm^{-1} for an excitation energy nearly equal to the threshold energy. Generation characteristics of the crystal were not inferior to those of the best CaF_2—Nd^{3+} crystals, although the cerofluorite crystals used were optically heterogeneous. Energy transfer between different optical centers of Nd was assumed to be the mechanism of the generation mode. Orig. art. has: 2 figures.

SUB CODE: 20/ SUBM DATE: 27Nov65/ ORIG REF: 008/ OTH REF: 003/
ATD PRESS: 5107

Card 2/2

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

TITOV, V.I.; OSIKO, Ye.P.

Photometric determination of small amounts of uranium with arsenazo after the separation of hexavalent uranium with α-nitroso-β-naphthol in the presence of complexon III. Zhur.anal.khim. 17 no.1:129-131 Ja-F '62. (MIRA 15:2)

(Uranium--Analysis)

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

S/075/62/017/005/001/007
I033/I233

AUTHORS: Bruda', V.G., Titov, V.I., Osiko, Ye. P., Dr_pkina, D. A., and Smirnova, K.A.

TITLE: Sulphonazo as a reagent for the determination of scandium

PERIODICAL: Zhurnal analiticheskoy khimii, v.17, no.5, 1962, 568-573

TEXT: Properties of various reagents which produce colored compounds with Sc ions were investigated and compared. The best results were obtained in the case of sulphonazo. For a solution of pH 4.0 - 5.5, buffered by urotropine or acetate, the peak of optical density is obtained at 610-620 mμ. The Beer law is obeyed

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

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I033/I233

Sulphonazo as a reagent....

up to a concentration of 80 μg/25 ml. In an urotropine medium color develops immediately and is less affected by changes of pH; in an acetate medium the reaction is more selective. 50 μg of Sc may be determined in the presence of of 20 mg Y. V(V), Co, and Ga should be absent; In, Cu, U(VI), Ni, Al, and Zn also interfere. 500-1000-fold excesses of alkali metals, alkaline earths, R.E., Mn(II), Tl, Be, Cr(III), Cd, Pb, Ge, Mo and Re do not interfere. This method was used for determination of Sc in rocks. The results agree with those obtained by the spectrochemical method within 10%.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh reaktivov i osobo chistykh khimicheskikh veshchestv i Vsesoyuznyy nauchno-issledovatel'skiy

Card 2/3

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

S/075/62/017/005/001/007
I033/I233

Sulphonazo as a reagent....

institut mineral'nogo syr'ya (All-Union Scientific Research Institute of Chemical Reagents and High Purity Chemical Substances, and All-Union Scientific Research Institute of Mineral Raw Materials) Moscow

SUBMITTED: May 20, 1961

Card 3/3

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

TITOV, V.I.; OSIKO, Ye.P.; ANTONOVA, E.A.

Determination of the magnitude of random errors in chemical analysis of geological samples. Zav.lab. 29 no.3:316-321 '63. (MIRA 16:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut mineral'nogo syr'ya.
(Mineralogical chemistry)
(Errors, Theory of)

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIKOVSKI, Georgi

Official duties and innovation proposals. Ratsionalizatsiia 15 no.5:7-10 '64

1. Institute of Inventions and Rationalization.

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIKOVSKI, G.

" Rationalization and Invention Movement during 1952," p. 3.
" Machine for the Automatic Filling and Measuring of Jelly, Syrup, etc.," p.8.
" Improving the Tongi Machine for Baling Tobacco," p. 9.
" Traffic Lights at the Crossroad for Streetcars and Trolley Buses," p. 10.
" Calorimeter for Measuring the Quality of Red Pepper," p. 10.
" Device for Grinding a Crankshaft," p.11.
" New Type of Furnace for Preparing Lime," p. 12.
" Knife Holder for Wood Carving," p. 13.
" Device for Casting Basic Bearings for Motorcars," p. 14.
" New Method for the Finishing of Horns," p. 16.
" Rationalizers' Competitions," p. 17.
(Ratsionalizatsiia, Vol.3, No.5, May 1953, Sofiya.)

SO: Monthly List of ~~Russian~~ East European Accessions, Vol.2, No.9 Library of Congress, September 1953, Uncl.

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIKOVSKI, G.

"The Rationalizers' Movement During the First Half of 1[illegible]", [illegible] (BAT [illegible]), Vol. [illegible], no. [illegible], Sept [illegible], Sofiya, Bulgaria,.

SC: Monthly List of East European Accessions, LC, Vol. [illegible], No. [illegible], April [illegible].

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

Osikovski, G.

"New Form for Accounting for Rationalizers' Activities" , P. 3
(RATSIONALIZATSIIA , Vol. 4, No. 3, March 1954 - Bulgaria)

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

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIKOVSKI, G.

Terms for payment of author rewards according to sec. 128 of the Pravilnik (Collection of Regulations). p. 1.

RATSIONALIZATSIIA. Vol. 6, no. 2, Feb. 1956.

Sofiia, Bulgaria

SOURCE: East European Accessions List (EEAL) Library of Congress, Vol. 6, No. 1, January 1957

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIKOVSKI, G.

OSIKOVSKI, G. Competition premiums for thematic rationalization plans. p. 1. Vol. 6, no. 7, July 1956. RATSIONALIZATSIA. Sofiia, Bulgaria

SOURCE: East European Accessions List (EEAL) Vol 6, No. 4--April 1957

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIKOVSKI, G.

OSIKOVSKI, G. Transferring a foreign experience as a rationalization proposal. [illegible]

Vol. [illegible], No. 9, Sept. 1956.
RATSIONALIZATSIIA.
TECHNOLOGY
Sofiia, Bulgaria

So: East European Accession, Vol. 6, No. 3, March 1957

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIKOVSKI, Georgi

National conference, factor for new development in the inventions and rationalization movement. Ratsionalizatsiia 11 no.8:1-3 '61.

(Inventions) (Industrial management)

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIKOVSKI, Georgi

Right of control, and functions of the responsible departments and district people's councils in the field of rationalization. Ratsionalizatsiia no.5:14-16 '62.

1. Chlen na Redaktsionnata kolegiia, "Ratsionalizatsiia, Standardizatsiia".

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIKOVSKI, Georgi

Planned figures, and rewards for their realization. Ratsionalizatsiia 13 no.2:12-14 '63.

1. Chlen na Radaktsionnata kolegiia, "Ratsionalizatsiia standardizatsiia".

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIKOVSKI, Georgi

Why the rationalizer activities in some districts are lagging. Ratsionalizatsiia 13 no.8: 4-6'63.

1. Nachalnik-otdel v Instituta za izobreteniia i ratsionalizatsii.

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

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OSILENKER, B.P.

Example of a unicellular Volterra operator with two involutions. Usp. mat. nauk 20 no.6:143-146 N-D '65. (MIRA 18:12)

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSILOV, A. E.

Category: USSR/General Biology. Genetics. B-5

Abs Jour: Referat Zh.-Biol., No 6, 25 March 1957, 21569

Author : Osilov, A.E.
Inst : not given
Title : Vegetative hybridization in selection of cereal cultures.

Orig Pub: Agrobiologiya, 1956, No 3, 78-88

Abstract: Graftings of wheat, oats and barley seedbuds onto the endosperm of other cereals, beginning with types of other forms of the same species down to types of such distant groups as brome grass and rice are described. The effect of the stock on the scion is stated, which becomes apparent in the change of morphological and especially the biological properties. In the descendants of scions, changed by the action of stocks, the author describes a division resembling one observed in F_2 hybrids. In this case, some properties which in ordinary crossings are dominant behave as recessive in the descendants

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EPP
.B93697

Osilov, Geogriy Osipovich

V dal'ney razvedke [on distant travels]
Moskva, Izd-vo "Molodaya Gvardiya", 1957.

75 p. illus.

Bibliographical footnotes.

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

CHIZHEVSKIY, M.G., doktor sel'skokhozyaystvennykh nauk, prof.;
BALEV, P.M., kand.sel'skokhozyaystvennykh nauk, dotsent;
OSIN, A.Ye., aspirant

Cultivation and increasing the fertility of light turf-Podzolic soils [with summary in English]. Izv. TSKhA no.2: 40-56 '61. (MIRA 14:8)

(Podzol) (Soil fertility)

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIN, A.Ye., kand.sel'skokhoz. nauk; SIDORTSOV, N.I.

Stubble crops in Gomel' Province. Zemledelie 25 no.7:47-48 Jl '63. (MIRA 16:9)

1. Gomel'skaya oblastnaya gosudarstvennaya sel'skokhozyaystvennaya opytnaya stantsiya.

(Gomel' Province—Field Crops)

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1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

20

Ca

Cement. I. V. Smirnov and B. V. Osin. Stroy 57, 502, June 30, 1940. A cement is prepd. by mixing $CaSO_4.0.5H_2O$ with dissolved $Ca(OH)_2$.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIN, B. V.

Electroconductivity of lime in the course of slaking and setting. L. B. Rabinovich and B. V. Osin. ZHUR. PRIKLAD. KHIM. 19 [1] 90-96 (1946).--The conductivity of the system $CaO-H_2O$ taken in definite proportions was studied to examine more closely the phenomenon observed by Osin that when lime is slaked in 70 to 150% of its weight of water and the temperature of the mix does not exceed 100°, slaking and setting take place concurrently, the latter being completed within 1 hr. To eliminate the effect of temperature on the conductivity, the measurements were carried out isothermally. Samples of technical and pure CaO were used. The CaO; H_2O weight ratios were 0.7, 1, 1.5, and 2. No measurements could be taken at the 0.7 ratio because the heat evolved was too intense and could not be led away quickly. Immediately following mixing, the conductivity of all the mixtures was high, approximately 5×10^{-3}. It then dropped rapidly over a period of 7 min. for the pure CaO and 16 min. for the technical CaO. After this, some of the curves showed a minimum, others a short leveling off, and still other a slower drop. The conductivity kept on declining at a rate which became slower with time. When H_2O and CaO are mixed, a chemical reaction first takes place. The reaction takes place on the interface as the low solubility of the $Ca(OH)_2$ formed prevents deeper penetration of H_2O.

(Card 1--of 2)

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Since, however, the product is somewhat soluble and dissociates strongly, the conductivity rises sharply above that of H_2O. The solution soon becomes saturated and precipitation starts, causing the conductivity to drop. The H_2O becomes fixed in the process of setting and the viscosity increases, both of which reduce the conductivity still more. In the process of slaking, colloidal particles are also formed. These were determined as carrying a positive charge. The charged particles raise the conductivity of the system to some extent but not enough to compensate for the drop caused by the other factors. The conductivity phenomena observed in the system $CaO-H_2O$ are analogous to those observed in setting concrete.

M. Ho.

(Card 2--of 2)

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIN, B.V.; REBINDER, P.A., akademik, redaktor; TYUTYUNIK, M.S., redaktor; LYUDKOVSKAYA, N.I., tekhnicheskiy redaktor

[Quicklime as a new binder] Negashenaia izest' kak novoe viazhushchee veshchestvo. Pod red. P.A.Rebindera. Moskva, Gos. izd-vo po stroit. materialam, 1954. 383 p. (MLRA 8:7)
(Lime) (Binders (Chemistry))

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIN, B.V.; TURIY, S.A.

Problems of the theory of designing the composition of concrete. Izv.vys.uch.zav.; stroi. i arkhit. 5 no.4:86-98 '62. (MIRA 15:9)

1. Odesskiy inzhenerno-stroitel'nyy institut.
(Concrete)

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

SLIN, I. .

Vysokopr izvoditel'nye [illegible] mashiny i ikh [illegible]ovki. Iz opyta f[illegible] Ural'mashzavoda [Higher productive methods of machine [illegible]; experience of molders of the Ural's Heavy Machinery Plant]. Moskva, Mashgiz, 1[illegible].

So: Monthly List of Russian Accessions, Vol. No. 2 May [illegible].

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

GILEV, V.S.; OSIN, I.A.; VOLPYANSKIY, L.M., redaktor; DUGINA, N.A., tekhnicheskiy redaktor

[Making moulds for small castings] Formovka melkikh otlivok. Pod. red. L.M.Volpianskogo. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1954. 37 p. (Nauchno-populiarnaia biblioteka rabochego-liteishchika, no.5) [Microfilm] (MLRA 8:2)
(Founding)

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIN, I.A.

123 - 1 - 395

Translation from: Referativnyy Zhurnal, Mashinostroyeniye, 1957, Nr 1, p. 68 (USSR)

AUTHOR: Osin, I.A.

TITLE: Mechanized Production of Large Castings (Mekhanizatsiya proizvodstva krupnykh otlivok)

PERIODICAL: In the book: Primery avtomatiz. i mekhaniz. proiz-va. Moscow - Sverdlovsk, Mashgiz, 1955, pp. 55 - 67

ABSTRACT: Description of special rollers designed by the Uralmashzavod is made. The following characteristics are given: the inner diameter of the ladle - 3,050 mm, depth of ladle - 450 mm, number of runners - three pairs, weight of single runner - 775 kg, electric motor - 50 kw, total weight of the unit - 28.7 ton, and its through put - 50 cu m/h. Described also are: a molding machine of 17-ton load capacity,

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIN, Ivan Afanas'yevich; [illegible], L.R., inzhener, retsenzent; DUGINA, N.A., tekhnicheskiy redaktor

[Reducing overgage allowances in castings; practices of the founding section of the Ural Machine Plant.] Snizhenie pripuskov na otlivkakh; iz opyta liteinogo tsekha Uralmashzavoda. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1956. 29 p. (MLRA 10:5)

(Steel castings)

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIN, I. A., Eng.

"Reduction of Allowances in Castings" p. 614-620 in book Increasing the Quality and Efficiency of Machinery, Moscow, Mashgiz, 1957, 626pp.

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIN, I.A., inzh.; KESEL', N.A.

Mechanizing the preparation of molding mixtures. Mashinostroitel' no.9:8-10 S '57. (MLRA 10:9)

(Sand, Foundry)

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIN, I.A., inzh.

Automatic machines for making flask hooks. Mashinostroitel' no.12:27 D '57. (MIRA 10:12)
(Machine shop practice) (Foundry machines and supplies)

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIN, I.A., tekhnicheskiy informator

The public office of technical information at the Ural Heavy Machinery Factory. Opyt rab. po tekhn. inform. i prop. no.4: 38-40 '63. (MIRA 17:1)

1. Ural'skiy mashinostroitel'nyy zavod.

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIN, I.A.; GORSHKOV, G.B.; BUROV, V.S., inzh., retsenzent; ZHESTKOVA, I.N., inzh., red.

[Technical achievements of the mold makers at the Ural Machinery Plant] Tekhnicheskie dostizheniia formovshchikov Uralmashzavoda. Moskva, Mashinostroenie, 1964. 62 p. (MIRA 17:10)

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

OSIN, I.I.

Improvements in exploratory drilling stations. Neftianik 2 no.6:20-21 Je '57. (MIRA 10:10)

1. Starshiy inzhener proizvodstvenno-tekhnicheskogo otdela kontory razvedochnogo bureniya tresta Tatneftegazrazvedka.
(Boring)

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

KAARMA, Iokhannes Yanovich; OSIN, Nikolay Petrovich; LAANMYAE, Vambola Eduardovich [Laanmäe, V.]; MAGON, E.E., red.; BARANOVA, L.G., tekhn. red.

[Estonian meat-type swine] Estonskaia bekonnaia poroda svinei. Leningrad, Sel'khozizdat, 1962. 109 p. (MIRA 16:4)
(Estonia--Swine breeding)

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

KOSTSOVA, A.G.; KOZACHENKO, E.I.; OSINA, O.M.; VOLOKHOVA, V.P.; MA[illegible]

Alkanesulfo acids. Part 32: Some alkanesulfomorpholides. Zhur. org. khim. 1 no.4:728-730 Ap '65. (MIRA 18:11)

1. Voronezhskiy gosudarstvennyy universitet.

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

AUTHORS: Osin, F.M., Yurikov, F.A., Engineer SOV/91-58-3-19/28

TITLE: How the P-4.5 Insulators Were Damaged by Lightning on a 110 kv Power Line (Razrusheniye izolyatorov tipa P-4.5 na linii elektroperedachi 110 kv tokami molnii) Exchange of Experience (Obmen opytom)

PERIODICAL: Energetik, 1958, Nr 3, pp 24-26 (USSR)

ABSTRACT: The authors report and prove by photos that lightning is able to badly damage power line insulators even though, for the moment, the line is idle.
There are 4 photos and 1 Soviet reference.

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