

L 19364-63

ACCESSION NR: AR3006967

fluence of the electric field of the molecule on the hydrogen-like system is disclosed, and the effective charge of the iron ion in the investigated compound is found to be +0.7. I. Nikiforov.

DATE ACQ: 06Sep63

SUB CODE: PH

ENCL: 00

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S/081/62/000/005/022/112
B149/B101

AUTHORS: Kukhareenko, A. A., Skrizhinskaya, V. I., Vaynshteyn, E. Ye.,
Kakhana, M. M.

TITLE: Geochemistry of niobium and tantalum in the complexes of
ultrabasic-alkali rocks

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 5, 1962, 122-123,
abstract 5G46 (Zap. Vses. mineralog. o-va, v. 90, no. 2,
1961, 172-192)

TEXT: Certain regularities of Nb and Ta behavior in the formation process
of the ultrabasic-alkali intrusions of the Kola Peninsula are considered.
Numerous chemical and spectral analyses of rocks and minerals have
established that Nb and Ta are characteristic elements of the given
complexes. The average contents of these in the massifs of the Kola
Peninsula fluctuate within the range: $1.34-5.18 \cdot 10^{-2}$ % Nb and
 $1.32-5.96 \cdot 10^{-3}$ % Ta. The character of Nb and Ta distribution and the
forms of their occurrence are different for various stages of massif

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S/OE1/62/000/005/022/112
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Geochemistry of niobium and tantalum in...

formation. Data are supplied regarding the contents of Nb₂O₅ and Ta₂O₅ in 138 specimens of minerals from these rocks (pyroxene, hornblende, phlogopite, melanite, schorlomite, sphene, titanomagnetite, perovskite, baddeleyite, pyrochlore, zirkelite, natroniobite, dysanalyte). During the initial stages of the massifs' formation Nb and Ta do not form individual minerals, but are endocryptically seized by the rockforming silicates and compound oxides of Ti; the process of minerogenesis Ta precedes Nb. In the products of residual crystallization (pegmatites) of a given magma, these elements form individual minerals (pyrochlore) or appear as components of compound oxides of Zr and Ti (baddeleyite, dysanalyte). During the post-magmatic stage the various metasomatic processes bring about their local concentrations. Greater mobility of Nb than Ta is established. The separation of Nb and Ta is conditioned by the factor of crystallo-chemical selection resulting in selective endocryptic position of Ta in structures of Zr-minerals, and collection in the complex oxides with reduced coordination ratio. [Abstracter's note: Complete translation.]

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S/O20/61/136/001/028/037
B004/B056

AUTHORS: Vaynshteyn, E. Ye., Kotlyar, B. I., and Obrutskaya, R. M.

TITLE: Investigation of the Fine Structure of X Ray Absorption K Edges of Manganese in MnTe in the Temperature Range of Antiferromagnetic Transition

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No. 1, pp. 133-135

TEXT: In a paper on absorption spectra of iron in ferrites(Ref. 1) reference was made to a probable relation of some particular features of ferrite structure of X-ray spectra to the influence of antiferromagnetic orderliness of the electron spin. The authors checked this assumption by investigating the temperature dependence of the fine structure of spectra of magnetically active atoms in antiferromagnetics within the Néel temperature (T_N) region. A manganese telluride with $T_N = 310^\circ\text{K}$ which was supplied by N. P. Grazhdarkina was used. Iron $K\alpha_{1,2}$ lines were used as comparison. Previous experiments showed that in the case of 4 mg/cm^3 Mn content a distinct K edge structure is obtained. The best experimental

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conditions were 30 kw, 40 ma, exposure 6 hours. Absorption spectra of Mn in MnTe were investigated in the temperature range of 280 - 325°K. Resolution of the apparatus was examined by taking the absorption spectra of pure Mn and of $KMnO_4$. The experimental data lead to the following conclusions: 1) A considerable decrease in energy of the 4p state of the transition metal occurs on the transition from metal to telluride. The long wave displacement of the maximum on the absorption curve of Mn in MnTe attains 5.4 ev. 2) At the absorption edge of para-phase MnTe alloy, a clear "white" absorption line appears which is near the range of initial absorption in the metal spectrum and agrees with the maximum of the intense white $KMnO_4$ absorption line. In the case of $KMnO_4$, the relationship between occurrence of this line in the spectrum and transition of photoelectrons into the hybridized 3d state may assumed to be proved. 3) On approaching the Néel point, the para-phase of MnTe exhibits a systematic and continuous decrease in intensity of the white line which probably is

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Investigation of the Fine Structure of X Ray
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the Temperature Range of Antiferromagnetic
Transition

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indicative of a continuous variation in probability of the respective electron transition. 4) Vanishing or considerable decrease in intensity of the long-wave white line was observed on passing through the Néel point. Position and relative intensity of the first absorption maximum, which are due to transitions of photoelectrons of the absorbing atom within the range of the 4p states of the metal, remain unchanged just like on passing through the Curie point. The problem of interaction between tellurium atoms and manganese atoms requires further investigations. There are 3 figures and 8 references: 6 Soviet, 1 US, and 1 British.

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Inorganic Chemistry of the Siberian Division of the Academy of Sciences USSR). Odesskiy pedagogicheskiy institut im. K. D. Ushinskogo (Odessa Pedagogical Institute imeni K. D. Ushinskiy)

PRESENTED: July 4, 1960 by A. P. Vinogradov, Academician

SUBMITTED: June 29, 1960

Card 3/3

21974

S/020/61/137/005/018/026
B105/B208

5.5310 1273, 1282, 1334

AUTHORS: Vaynshteyn, E.Ye., Kopelev, Yu.F. and Kotlyar, B.I.

TITLE: Some results of X-ray spectrum analysis of ferrocene and its derivatives

PERIODICAL: Doklady Akademii nauk SSSR, v. 137, no. 5, 1961, 1117 - 1120

TEXT: The authors checked some theoretical calculations of the molecular orbits and of the distribution of electron charge in molecules of aromatic complexes. They proceeded from the fine structure of the K-absorption spectra of iron in $Fe(C_5H_5)_2$ and $Fe(C_5H_5)_2Cl$ which have been studied in their laboratory. Their results have been reported on the All-Union Conference on X-ray Spectroscopy in Rostov-na-Donu, June 30, 1959. Table 1 shows the position of the principal maximum of these K-spectra and of some other iron compounds:

Table 1

| | | | | | | |
|------------|----------------------|------------------|------------------|--------------|----------------|------------------|
| Compound: | $FeSC_4 \cdot 7H_2O$ | $K_4 [Fe(CN)_6]$ | $K_3 [Fe(CN)_6]$ | $Fe(NO_3)_3$ | $Fe(C_5H_5)_2$ | $Fe(C_5H_5)_2Cl$ |
| Energy, ev | 0 | 1.9 | 3.8 | 6.8 | 6.1 | 6.1 |

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Some results of X-ray spectrum ...

Fig. 1 shows the corrected spectra of the ferrocene compounds. It may be seen from these curves that the structure of the K-absorption edges of iron is the same in both cases. In the calculation of these edges, the authors assumed the structure of the system to be similar to the hydrogen structure in which an electron knocked loose from the K-shell moves outside of the completed shells of the absorbing atom in gaseous molecules or in crystalline complexes with an approximately central field symmetry. The system of the selective absorption lines and the continuous edge may be calculated in this approximation by means of the following equations:

$$\xi_n = \xi_\infty \frac{\eta^2}{n^2} Ry \quad (1), \quad \text{and} \quad \frac{\tau_n}{\tau_\infty} = \frac{4\eta^2}{\pi\Gamma} \frac{n^2-1}{n^5} \quad (2),$$

where ξ_n and ξ_∞ denote the energy of the transition of the K-electron to one of the np-levels of the system and the boundary of the continuous spectrum, τ_n is the height of the n-th absorption line, τ_∞ is the height of the continuous spectrum, Γ the width of the absorption lines and the boundary of the continuous spectrum, Ry the Rydberg constant, n the effective principal quantum number of the n-energy level, and η the effective charge of the K-ionized ab-

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sorbing atom in the molecule. The application of relation (2) in the calculation of the K-absorption edge of the metal atom in molecules of the ferrocene-type meets with difficulties. The value τ_n/τ_0 obtained experimentally is higher than that calculated from (2) with consideration of (1). This divergence can be explained by the effect of the electric field of the molecule on the hydrogen-like system which is formed after ionization of the central atom. Table 2 contains the characteristics of all irreducible representations of group D_{5d} . The odd representations of this group are due to transformation of a six-dimensional base. In this field of symmetry the number of states on which the d electron knocked loose during the K-absorption may be captured are thus increased to six, as compared with only 3 p-states of a hydrogen-like system in fields of another symmetry or in the absence of an external field. If the distance between these levels is small, a doubling of the relative intensity of the lines of the selective X-ray absorption of the central atom might be expected, contrary to molecules in whose field the levels are not "multiplied". With increasing degree of ionicity of the binding forces in molecules of the $Me(C_5H_5)_2$ type, and with increasing intensity of the field acting upon

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the central atom, the distance between the energy levels by which the K-electron is captured in the K-absorption, and the width of the selective absorption bands must increase as well. On the other hand, the intensity of these bands must decrease and may only little deviate from the value calculated by equation (2) for nearly ionic compounds such as $Mn(C_5H_5)_2$.

It is assumed on the basis of the available experimental material that in bis-cyclopentadienyl complexes with typical covalent bonds (like ferrocene) the increase of the relative intensity of the selective absorption lines approaches the maximum intensity. In this case, the difficulties in calculating the fine structure of metal spectra may be avoided and also the energy constants of the absorbable atom can be calculated without any hindrances. Figs. 2 and 3 show the calculation of the X-ray K-absorption spectra in $Fe(C_5H_5)_2$ and $Fe(C_5H_5)_2Cl$ molecules. They are in good agreement with the data theoretically calculated. The authors consider the calculation of these values by R.L. Barinskiy (Zhurn. strukt. khimii, 1, 200 (1960)) to be wrong. The amounts of charges concentrated on the iron atoms were in both complexes about + 0.7, $n = 1.75$, $\sigma = 11.2$ ev (as compared

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with the iron spectrum in $K_3Fe(CN)_6$ ($\eta' = \eta - 1 \approx 1$; $n = 1.7$, $\Gamma = 7.5$ eV).

The authors conclude therefrom that the width of the selective absorption bands changes most in the spectra of ferrocene. It is increased by nearly 50% owing to extension of the transmission end level of the photoelectron in the molecule. As was expected from theoretical calculations, a sufficiently intense band appears in the X-ray spectra of the metal in aromatic complexes which is due to the transition of the 1s electron of the absorbing atom to the group of molecular levels of corresponding symmetry, in addition to a series of bands of the "exciton"-type. The authors express their gratitude to V.V. Voyevodskiy for his interest in the work and for the supply of substances. Mention is made of Ye.M. Shusterovich and M.Ye. Dyatkina. There are 3 figures, 2 tables, and 18 references: 13 Soviet-bloc and 5 non-Soviet-bloc.

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Inorganic Chemistry of the Siberian Department of the Academy of Sciences USSR). Institut geokhimii i analiticheskoy khimii im. V.I.

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24.2130

28729
S/020/61/140/003/008/020
B104/B125

AUTHORS: Vaynshteyn, E. Ye. and Zhurakovskiy, Ye. A.
TITLE: Fine structure of X-ray absorption K-spectra of titanium
in complex solid solutions of the TiC-TiN system
PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 3, 1961, 560 - 562

TEXT: This is a contribution to the extensive experimental and theoretical material on carbides and nitrides of transition metals. S. V. Samsonov et al. (DAN, 135, no. 3, (1960)) studied the electrical properties of the TiC-TiN system. The authors used Samsonov's specimens for their tests. The K-absorption edge of titanium was examined with an X-ray spectrograph (G. V. Samsonov et al., Dop. AN USSR, 8, 838 (1958)). The analyzer was a bent quartz crystal, in which the (10 $\bar{1}$ 1) plane was the reflecting plane (radii of curvature, 2600 and 1650 mm). The X-ray photon energy was determined with an error of ± 0.3 ev. K-absorption edges of 7 alloys of the system under consideration, averaged from three measurements, are shown in Fig. 1. The dotted theoretical curves fit the experimental, continuous curves. The theoretical curves of the absorption edges were obtained on the assumption
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that the metal atoms in the octahedral neighborhood change gradually during the transition from pure nitride to pure carbide, and that one metalloid is statistically replaced by the other. This process is accompanied only by a slight change of the lattice constant (about 3%) and a monotonic diminution of the carrier concentration. The authors think that the 3d conduction band of the metal in carbides and nitrides is little filled. The donor-acceptor interaction of the 3d electrons of titanium with the conduction electrons of metalloids is insignificant. The structural changes of the K-absorption edge during the transition from pure carbide to pure nitride are monotonic (Fig.1). The structure of the absorption edge becomes more distinct with increasing carbon content in the vicinity of the titanium atoms. This fact is connected with the scattering power of metalloid atoms. The results obtained are in good agreement with those of G. V. Samsonov (Sborn. nauchn. tr. Mosk. inst. tsvetn. met. i zolota im. M. I. Kalinina, no. 30, v. 1 (1957); ZhTF, 26, 299 (1950)). G. V. Samsonov, Corresponding Member AS UkrSSR, is thanked for providing the specimens and for participating in the work. There are 1 figure and 19 references: 14 Soviet and 5 non-Soviet. The references to English-language publications read as follows: H. J. Juretschke et al., J. Phys. Chem. Solids, 4, 118 (1958); P. Duwez et al., J. Electrochem. Soc., 97, 299 (1950).

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Fine structure of X-ray...

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Inorganic Chemistry of the Siberian Department of the Academy of Sciences USSR), Institut metallo-keramiki i spetsial'nykh splavov Akademii nauk SSSR (Institute of Powder Metallurgy and Special Alloys of the Academy of Sciences USSR)

PRESENTED: May 6, 1961, by A. P. Vinogradov, Academician

SUBMITTED: April 28, 1961

X

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3

BOROVIK-ROMANOVA, T.F.; HELYAYEV, Yu.I.; KUTSENKO, Yu.I.; PAVLENKO, L.I.; SAVINOVA, Ye.N.; FARAFONOV, M.M.; VAYNSHTEYN, E.Ye., prof., doktor khim. nauk, otv. red.; DRAGUNOV, E.S., red. izd-va; ASTAF'YEVA, G.A., tekhn. red.

[Spectral determination of rare and dispersed elements in minerals rocks, soils, plants, and natural waters] Spektral'noe opredelenie redkikh i rasseiannykh elementov; v mineralakh i porodakh, pochvakh, rasteniakh i prirodnykh vodakh. [By] T.F. Borovik-Romanova i dr. Moskva, Izd-vo Akad. nauk SSSR, 1962. 239 p. (MIRA 15:3)

1. Akademiya nauk SSSR. Institut geokhimii. (Spectrum analysis)

UDAL'TSOVA, N.I.; SAVVIN, S.B.; NEMODRUK, A.A.; NOVIKOV, Yu.P.;
DOHROLYUBSKAYA, T.S.; SINYAKOVA, S.I.; BILIMOVICH, G.N.;
SERDYUKOVA, A.S.; BELYAYEV, Yu.I.; YAKOVLEV, Yu.V.;
NEMODRUK, A.A.; CIMUTOVA, M.K.; GUSEV, N.I.; PALEY, P.N.;
VINOGRADOV, A.P., akademik, glav. red.; ALIMARIN, I.P.,
red.; BABKO, A.K., red.; BUSEV, A.I., red.; VAYNSHTEYN, E.Ye.,
red.; YERMAKOV, A.N., red.; KUZNETSOV, V.I., red.; RYABCHIKOV,
D.I., red. toma; TANANAYEV, I.V., red.; CHERNIKHOV, Yu.A., red.;
SENYAVIN, M.M., red. toma; VOLYNETS, M.P., red.; NOVICHKOVA, N.D.,
tekhn. red.; GUS'KOVA, O.M., tekhn. red.

[Analytical chemistry of uranium] Analiticheskaya khimiya urana.
Moskva, Izd-vo Akad.nauk SSSR, 1962. 430 p. (MIRA 15:7)

1. Akademiya nauk SSSR. Institut geokhimii i analiticheskoy
khimii.

(Uranium--Analysis)

BUSEV, Aleksey Ivanovich; VINOGRADOV, A.P., akademik, glav. red.;
ALIMARIN, I.P., red.; BABKO, A.K., red.; VAYNSHTEYN, E.Ye.,
red.; YERMAKOV, A.N., red.; KUZNETSOV, V.I., red.; PALEY, P.N.,
red.; RYABCHIKOV, D.I., red.; TANANAYEV, I.V., red.; CHERNIKHOV,
Yu.A., red.; VOLYNETS, M.P., red.; MAKUNI, Ye.V., tekhn. red.

[Analytical chemistry of molybdenum] Analiticheskaya khimiya mo-
libdena. [By] A.I.Busev. Moskva, Izd-vo Akad. nauk SSSR, 1962.
300 p. (MIRA 16:1)

(Molybdenum--Analysis)

S/849/62/000/000/003/016
A006/A101

AUTHORS: Vaynshteyn, E. Ye., Zhurakovskiy, Ye. A., Staryy, I. B.

TITLE: Roentgenospectral analysis of the force of chemical bond in hydrides of refractory metals on the example of titanium and vanadium compounds

SOURCE: Vysokotemperaturnyye metallokeramicheskiye materialy. Inst. metalloker. i spets. spl. AN Ukr.SSR. Kiev; Izd-vo AN Ukr.SSR, 1962, 19 - 28

TEXT: There are only indirect data available on the type of interatomic interaction in hydrides. The authors attempted for the first time to obtain direct information on the density of electron distribution over the energies in titanium and vanadium hydrides and to check by means of spectroscopy the hypothesis on the presence of a metallic bond between metal and hydrogen atoms in hydrides. For this purpose the authors investigated the fine structure of X-ray absorption K-spectra of titanium in hydrides with 1.2 and about 3 weight % H, and of vanadium in hydrides with 0.12; 0.28; 0.475; 0.75; 1.1 and 1.45 weight % H.

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Röntgenospectral analysis of the.. .

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Absorption edges of initial metals were also studied. To eliminate undesirable consequences of heating the specimen during the experiments, the emission spectra of Ti in hydrides of various chemical composition were analyzed with the use of the fluorescence method. All the tests were performed on a high-intensity vacuum tube-spectrograph with Johann focusing. The titanium hydrides were prepared and analyzed by V. M. Mikheyeva, and the vanadium hydrides by T. V. Dubovik and G. V. Samsonov. The experiments proved the hypothesis on the "metallization" of the metal-hydrogen bond in the aforementioned compounds and the penetration of 1s-electrons of hydrogen into the vacant 3d-band of the transition metal. This is manifested in the gradual decrease (in comparison with the metal) of intensity of the long wavelength maximum, within the range of the basic edge of the hydride absorption band, and its displacement to the short wavelength side with increasing hydrogen content in the hydrides until this maximum vanishes entirely. A further increase of the hydrogen content in the hydrides does not cause changes in the absorption edge structure of the metal in hydrides. As expected, the long wavelength maximum of absorption in the spectrum of the transition metal in vanadium hydrides vanishes at lesser hydrogen contents in the alloy, than in titanium hydrides. Investigations of the fine structure of the $K_{\beta 5}$ -band of titanium

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Roentgenospectral analysis of the...

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in the hydrides confirm fully the conclusions on the nature of the chemical bond forces in these compounds. The conclusions were drawn from the analysis of experimental data on the absorption spectra of elements in these compounds. However, the peculiarities of the fine structure of Ti emission bands in the hydrides and its changes, depending on the composition of the compounds, may indicate changes in the nature of forces of chemical interaction between hydrogen and metal in the alloys, which differ in the degree of completeness of the transition metal 3d-band. It can also be considered that 1s-electrons of hydrogen do not completely lose their "individual" nature when a generalized sd-band is formed in the hydrides and that the effective hydrogen charge is not equal to 1 and can be different for hydrides rich or poor in hydrogen. This explains also the incomplete vanishing of the K_{β}'' -satellite in the emission spectra of titanium in the hydrides. There are 5 figures.

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45259
S/226/62/000/006/011/016
E039/E535

18.8100

AUTHORS: Vaynshteyn, E.Ye., Gunchenko, A.I., Kotlyar, B.I.,
Ovrutskaya, R.M. and Shapiro, G.A.

TITLE: The effect of small additions of oxides of yttrium,
lanthanum and cerium on certain magnetic character-
istics of magnesium-manganese ferrites and their X-ray
spectra

PERIODICAL: Poroshkovaya metallurgiya, no.6 , 1962, 72-80

TEXT: The properties of Mn and Mg-Mn ferrites containing
43 to 50% Fe₂O₃, from 19 to 50% MnO, from 15 to 28% MgO and for
some ferrites with additions of up to 5% oxides of calcium and
zinc are investigated. The addition of up to 2% La₂O₃ had very
little effect on the induction of the ferrites while the addition
of CeO₂ and Y₂O₃ caused a marked decrease in the induction. The
effect of these additions on the X-ray K spectra of Fe and Mn in
these ferrites is also examined. The changes in the K spectra are
well correlated with the changes in magnetic induction of the
corresponding ferrites. The absorption spectra are most sensitive
to the addition of Y₂O₃ and less so to CeO₂. In ferrites containing
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The effect of small additions of ... S/226/62/000/006/011/016
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a sufficiently large admixture of rare earth elements (more for Ce and significantly less for Y) the effect on the absorption spectrum for iron is to produce an increase in width of the final photoelectric transition level and the appearance of a supplementary absorption band on the short wavelength side of the edge. From the analysis of the experimental data inferences are drawn on the possible mechanism of the effect of admixtures on the energy state of the atoms of the basic components of the ferrites. There are 10 figures.

ASSOCIATIONS: Institut neorganicheskoy khimii SO AN SSSR
(Institute of Inorganic Chemistry SO AS USSR),
Institut metallokeramiki i spetsialnykh splavov
AN USSR (Institute of Metalceramics and Special
Alloys AS UkrSSR),
Odesskiy pedagogicheskiy institut im.K.D.Ushinskogo
(Odessa Pedagogic Institute imeni K.D.Ushinskiy)

SUBMITTED: April 14, 1962

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S/226/62/000/006/012/016
E039/E535

AUTHORS: Vaynshteyn, E.Ye. and Zhurakovskiy, Ye.A.
TITLE: The fine structure of X-ray K-absorption spectra of titanium in complex solid solutions of the TiC-TiN system
PERIODICAL: Poroshkovaya metallurgiya, no.6 , 1962, 61-84
TEXT: The properties of refractory compounds of the transition metals are investigated using samples of TiC-TiN alloys, obtained from G. V. Samsonov. These samples were cut from the centre of hot pressed billets of TiC-TiN mixtures containing 25, 33, 50, 67 and 75% of one component. For determining their phase composition the samples were analysed by X-ray diffraction. The K-absorption edge was obtained using a bent quartz crystal spectrometer (radii quartz crystals 2600 and 1650 mm) which enable X-ray photons to be determined to an accuracy of 0.3 eV. The change in fine structure observed as the composition of the alloy is altered agrees very well with the theoretical formula:

$$\mu(\lambda) = \mu_1(\lambda)x + \mu_2(\lambda)(100 - x).$$

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where μ_1 and μ_2 are the absorption coefficients of Ti in TiC and TiN respectively and x is the percentage content of one phase in the complex solid solution. It is shown that the degree of filling of the 3d-state of the metal and the nature of its interaction with metalloid atoms remains practically unchanged as the composition of the alloy is altered. There is 1 figure. ✓

ASSOCIATIONS: Institut metallokeramiki i spetsial'nykh splavov AN USSR (Institute of Metalceramics and Special Alloys AS UkrSSR) and Institut neorganicheskoy khimii SO AN SSSR (Institute of Inorganic Chemistry SO AS USSR)

SUBMITTED: April 14, 1962

Card 2/2

KOPPELEV, Yu.F.; VAYNSHTEIN, E. Ye.

Comparing the electron structure of bis (benzene) chromium
and its cation on the basis of X-ray spectrum studies. Izv.
Sib. otd. AN SSSR no.7:93-110 '62 (MIRA 17:3)

I. Institut neorganicheskoy khimii Sibirskogo otdeleniya
AN SSSR, Novosibirsk.

S/058/62/000/012/023/048
A160/A101

AUTHORS: Vaynshteyn, E. Ye., Korolev, V. V., Savinova, Ye. N.
TITLE: The use of a plasma generator for the spectral analysis of titanium-base alloys
PERIODICAL: Referativnyy zhurnal, Fizika, no. 12, 1962, 31, abstract.12G311 ("Chem. analit." (Polska), no. 1, 1962, w7, 187 - 194; summary in Polish)

TEXT: The expediency is shown of using a plasma generator as a spectrum-excitation source during a quantitative analysis of alloying admixtures (Al, Cr, Mo, V, Mn, Fe, Si, Sn, etc.) in titanium alloys. A method was developed for determining the first five of these elements whose contents in the various alloys vary within 0.1 - 10%. Presented are parts of the design, outside view, and the parameters of the plasma generator which are best for carrying out the analysis. The alloys, subject to the analysis, were preliminarily converted to solution, or the standard solutions were converted to aerosol by an atomizer and introduced, together with the cooling gas, in the interior cavity of the generator,

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The use of a plasma generator for...

and later on - in the jet of the plasma. The mean arithmetic error of the reproducibility of the spectral determination is 3 - 4%. A satisfactory conformity of the results of the chemical and spectral analyses of standard alloys was obtained.

F. Ortenberg

[Abstracter's note: Complete translation]

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S/192/62/003/002/002/004
D267/D301

AUTHORS: Vaynshteyn, E., Staryy, I.B., Blokhin, S.M.
and Paderno, Yu.B.

TITLE: The X-ray absorption spectra L_{II} and L_{III} of
the rare-earth elements in oxides and hexa-
borides. I. Absorption spectra of barium,
lanthanum and cerium

PERIODICAL: Zhurnal strukturnoy khimii, v. 3, no. 2, 1962,
200 - 207

TEXT: Owing to the remarkable properties of the borides
of rare-earth elements (in particular their high thermal-emission
characteristics) the authors undertook a systematical investigation
of the X-ray emission spectra and of the emission of metal atoms in
the hexaborides of all rare-earth elements. The respective oxides
(and the Ba compounds) were also included. The hexaborides, obtained

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The X-ray absorption spectra ... S/192/62/003/002/002/004
D267/D301

by reducing the respective very pure oxides with B or boron carbide, were found to contain only the hexaboride phase. The absorption spectra of metals in oxides and hexaborides were obtained with the aid of a focusing tube spectrographs in the second order of reflection from the plane (1011) of a bent quartz crystal. A very strong resemblance was found to exist for the L_{II} and L_{III} absorption edges between the oxides and the hexaborides in the case of Ba and La, and there even exists an analogy between Ba and La. On the contrary, the curves for CeO_2 differ strongly from those for CeB_6 , and from the curves for Ba and La compounds. The fine structure of the L absorption spectra of Ba, La and Ce in oxide and hexaborides can be interpreted quite satisfactorily as a result of superposition of continuous absorption and of a group of selective lines which arise mainly due to the transition of the 2p-electrons of metals on the d-symmetry energy levels. There are 8 figures. The most important English-language references read as follows: B. Post, D. Moskowitz, F. Glaser, J. Amer. chem. Soc., 81, 1800, 1956; H. Longuet-Higgins, M. Roberts, Proc. Roy. Soc., 224, 336, 1954.

Card 2/3

The X-ray absorption spectra ...

S/192/62/003/002/002/004
D267/D301

ASSOCIATION: Institut neorganicheskoy khimii SO AN SSSR,
Institut metallokeramiki i spetsial'nykh
splavov AN USSR, Odesskiy pedagogicheskiy
institut im. K.D. Ushinskogo (Institute of
Inorganic Chemistry, Siberian Branch, AS USSR;
Institute of Powder Metallurgy and Special
Alloys, AS UkrSSR; Odessa Pedagogical Institute
im. K.D. Ushinskiy)

SUBMITTED: July 24, 1961

Card 3/3

S/126/62/013/005/016/031
E202/E492

AUTHORS: Samsonov, G.V., Vaynshteyn, E.Ye., Paderno, Yu.B.
TITLE: Certain results of electrophysical and X-ray studies
of rare earth hexaborides

PERIODICAL: Fizika metallov i metallovedeniye, v.13, no.5, 1962,
744-749

TEXT: Using 12 x 12.5 x 0.5 mm specimens cut by spark erosion from the respective hexaborides blanks, the authors measured the following properties: specific resistivity, Hall coefficient (extrapolating for the zero porosity), thermoelectric emf, effective coefficient of resistance, concentration of the carriers u^* and an auxiliary quantity δ , related to Hall coefficient ($\delta = R/e \cdot 2$), expressing the magnitude of the fraction $n_{-}u_{-}^2 - n_{+}u_{+}^2$. These data are summarized in a table. The electronic structure, distribution within the valency band and the magnitude of the charge on the metal were studied in some of these compounds by analysing the fine structure of the LII and LIII.

Card 1/0 3

Certain results of electrophysical ...

S/126/62/013/005/016/031
E202/E492

absorption X-ray spectra of barium and some rare earth elements in their oxides and hexaborides respectively. For this purpose, a focusing spectrograph was used working with the second order reflections from the 1011 of a bent quartz analyser. Dispersion within the working region was approximately 6 X mm^{-1} and the accuracy in the determination of the energy of the separate points of the fine structure absorption edges of the elements was of the order of 0.2 ev. The analysis of the absorption of the L-spectra in these compounds confirmed that the charge on the metal atom in all the rare earth hexaborides is 3, and on the barium atom 2. A considerable shift (5 ev) was observed in the LII absorption spectrum of Ce in CeB_6 , as compared with similar spectra of La or Ba, this was attributed generally to the change in the degree of screening of the terminal levels of the 2p-electrons transition in the process of L-absorption by the cerium atoms, but in the opinion of the authors this phenomenon is not fully accounted for, chiefly due to the lack of further experimental data. There are 4 figures and 1 table.

Card 2/3

S/126/62/013/005/016/031

Certain results of electrophysical ... E202/E492

ASSOCIATIONS: Institut metallokeramiki i spetssplavov AN UkrSSR
(Institute of Cermets and Special Alloys AS UkrSSR)
Institut neorganicheskoy khimii SO AN SSSR
(Institute of Inorganic Chemistry SO AS USSR)

SUBMITTED: August 1, 1961

Card 3/4 3

S/032/62/028/005/005/009
B163/B102

AUTHORS: Tsukerman, V. G., Staryy, I. B., and Vaynshteyn, E. Ye.

TITLE: Reduction of the time lag of cadmium sulfide photoresistors when weak X-ray intensities are recorded

PERIODICAL: Zavodskaya laboratoriya, v. 28, no. 5, 1962, 592-594

TEXT: The CdS photoresistor ФСКМ (FSKM) is a valuable tool for recording the radiation intensity in X-ray spectroscopy and dosimetry, but for low X-ray intensities time lags of several minutes may occur. The resistors are fed with direct current, and the dependence of the signal-to-noise ratio on the applied voltage and the intensity of irradiation is studied. It varies from resistor to resistor but there is always a distinct maximum at about 20-40 volts. The reduction of the time lag by pre-irradiation with X-rays is shown in Fig. 3. Before curve 1 was measured the resistor was kept in the dark for a long time. The following curves 2, 3, and 4 show the results of subsequent measurement series with the same resistor under the same conditions where after each series of measurements the resistor was kept in the dark for one hour. The pre-irradiation remains effective ✓

Card 1/2

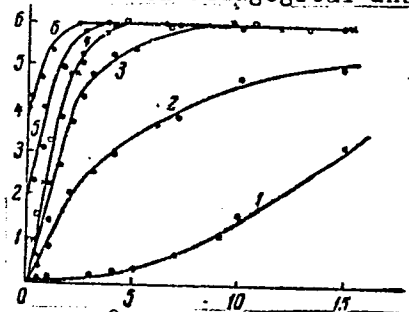
Reduction of the time...

S/032/62/028/005/005/009
3163/B102

for about 5 to 6 hours. Pre-illumination with visible or ultraviolet light has a similar effect; with infrared pre-illumination sensitivity is lower, and the time-lag longer than without pre-irradiation. There are 4 figures.

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii nauk SSSR i Odesskiy pedagogicheskiy institut (Institute of Anorganic Chemistry of the Siberian Branch of the Academy of Sciences USSR and Odessa Pedagogical Institute)

Fig. 3. Variation of the time Δt necessary for the establishment of a stationary value of the photocurrent with X-ray pre-irradiation of a photoresistor (Curves 1-4) and for different values of the dark current (Curves 4-6). For the curves 4-6: \bullet - $\Delta t = 45$ min; \times - $\Delta t = 60$ min; \circ - $\Delta t = 120$ min.



Legend: Abscissa t in minutes, ordinate $I_{\text{phot}} \cdot 10^8$ amp.

Card 2/2

32818

18.1215

4016, 1454, 1418

S/O20/62/142/001/016/021
B103/B110

AUTHORS: Vaynshteyn, E. Ye., Blokhin, S. M., and Kripyakevich, P. I.

TITLE: X-ray spectroscopic study of titanium beryllides with a high beryllium content

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 142, no. 1, 1962, 85-87

TEXT: Following Ref. 1 (E. Ye. Vaynshteyn et al., DAN, 135, 642 (1960)), the authors investigated: (a) Phases of the system Ti-Be with a still higher Be content (alloys containing 88, 90, and 93 atom% of Be). (b) The data of Ref. 1 were checked and defined by increased resolving power of the spectroscopic equipment (AFC (DRS) vacuum longwave spectrograph produced at the experimental workshops of the Rostovskiy gosudarstvennyy universitet (Rostov State University)). Alloys were produced by Ye. I. Gladyshevskiy in corundum crucibles in the Tamman furnace in an argon atmosphere. Both emission and absorption spectra were taken. The reflecting (1010) surface of a bent quartz crystal was used. The method of inclined planes was applied to magnify resolution up to 10,000 times. Emission spectra were taken with an aluminum anode. A tantalum anode was

X

Card 1/5

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S/020/62/142/001/016/021
B103/B110

X-ray spectroscopic study ...

used for the absorption spectra. The experimental form and the width of the K_{α_1} line on Ge was investigated to examine dispersion of the function of distortion caused by the parameters of the apparatus, and to determine its half-width. It was found that the two first samples of the alloys had the same trigonal structure: $a = 7.40 \text{ \AA}$, $c = 10.84 \text{ \AA}$, and $c/a = 1.465$. This lattice is equal to that of $\text{Th}_2\text{Zn}_{17}$ (space group $R\bar{3}m$, $Z = 3$); hence, it is concluded that $\text{Ti}_2\text{Be}_{17}$ is produced (in accordance with Ref. 4, see below). It is also possible, however, that solid solutions of TiBe_{12} are involved. These two structures, being very similar to each other (as well as TiBe_2), belong to the class of densest packages of unequally large atoms with high coordination numbers. The line broadening is 0.39 eV, i.e., $\sim 28\%$ of the natural half-width of the line. The form of the experimental spectra and the broadening were corrected according to I. Ya. Nikiforov (Izv. AN SSSR, ser. fiz., 21, 1362 (1957)). It was found that the shape and the relative placement of the K absorption edges and of the last emission lines in the titanium spectra of Ti-Be phases with varying Be content were almost

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S/O20/62/142/001/016/021
B103/B110

X-ray spectroscopic study ...

identical. The alloys investigated are very similar with respect to atomic interaction, but differ considerably from beryllides with a lower Be content (Figs. 1, 2). This variation is a result of transitions of the K electron into the portion of the hybridized energy band of the alloy close to the 3d energy levels of the main absorption edge. It follows from the spectra investigated; (1) a considerable weakening of the superposition degree of energy bands of valence electrons of the alloy components in Ti_2Be_{17} ; (2) a weakening of the hybridization degree of the wave functions in the range of the 3d4sp band of the transition metal; and (3) a considerable increase in significance of the role of Be interaction. This leads to a noticeable variation of the effective difference of electronegativities between the two alloy components. Its value can be estimated on the basis of X-ray spectrum data by the relation between the difference (Δx) of the electronegativities of the components of a binary compound and the energy distance (ΔE) ($K_{\beta}'' - K_{\beta_5}$)

in the X-ray spectrum of the transition metal. Since this value is 4.8 eV, the effective electronegativity of Be must differ in the intermetallic compound from that of Ti by approximately 0.6 eV instead of

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S/020/62/142/001/016/021
B103/B110

X-ray spectroscopic study ...

X

being practically equal. There are 2 figures and 10 references: 8 Soviet and 2 non-Soviet. The two references to English-language publications read as follows: Ref. 2: R. F. Raeuchle, R. E. Rundle, Acta Crystallogr., 5, 85 (1952); Ref. 4: P. M. Paine, J. A. Carrabine, Acta Crystallogr., 13, 680 (1960).

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Inorganic Chemistry of the Siberian Branch of the Academy of Sciences USSR). L'vovskiy gosudarstvennyy universitet im. I. Franko (L'vov State University imeni I. Franko)

PRESENTED: July 1, 1961, by A. P. Vinogradov, Academician

SUBMITTED: July 8, 1961

Fig. 1. X-ray K absorption spectra and last emission lines of Ti in $TiBe_2$ and Ti_2Be_{17} . Legend: Abscissa: ν .

Fig. 2. X-ray K absorption spectra of Ti in $TiBe_2$ and Ti_2Be_{17} after Card 4/5

32818

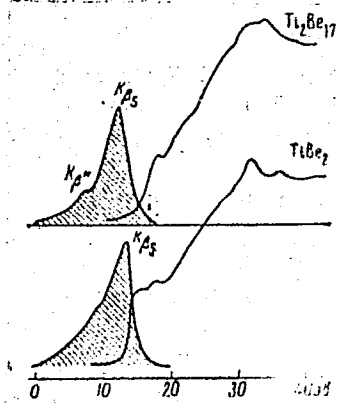
S/020/62/142/001/016/021
B103/B110

X-ray spectroscopic study ...

correction for distortions due to parameters of the apparatus and for the width of the K level of Ti which was assumed to be 0.74 ev.

Legend: Abscissa: ev.

Fig. 1



Card 5/5

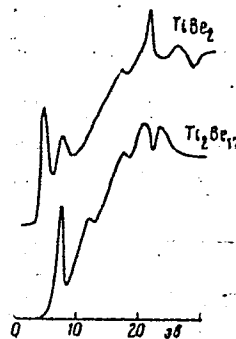


Fig. 2

S/020/62/145/005/007/020
B181/B104AUTHORS: Vaynshteyn, E. Ye., and Chirkov, V. I.

TITLE: Peculiarities of the X-ray emission spectrum of titanium in carbon nitrides

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 145, no. 5, 1962, 1031-1034

TEXT: The K_{β}'' -satellite line in the X-ray emission spectrum of metallic compounds was assumed to originate in the cross transition of electrons from the valence level of the anion to freedom as the result of a K-ionization of the 1s-levels of the absorbing metal ion. For this reason the K_{β}'' -energy may be expected to depend strongly on the character of the bond. Where various elements are bound, a splitting into K_{β_1}'' and K_{β_2}'' is

to be expected. A APC-2 (DRS-2) spectrometer was used to investigate the spectrum of titanium carbon nitrides. The X-ray apparatus was operated with 20 kv and 8 ma. The lines were recorded with the MF-4 (MF-4) microphotometer at a rate of 6 mm/min and a slit width of 0.3 mm,

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S/020/62/145/005/007/020
B181/B104

Peculiarities of the X-ray ...

the same conditions having been taken as a basis in the previous paper on the fine structure of the X-ray-K-spectrum (DAN, 140, 560 (1961)). The lines $K_{\beta 1}$ and $K_{\beta 2}$, occurring in carbon nitride, show a dependence on the

C-concentration which differs from that of the corresponding substance in a mixture of titanium carbide with titanium nitride. There are 3 figures and 1 table. ✓

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Inorganic Chemistry of the Siberian Department of the Academy of Sciences USSR)

PRESENTED: April 9, 1962, by A. P. Vinogradov, Academician

SUBMITTED: February 23, 1962

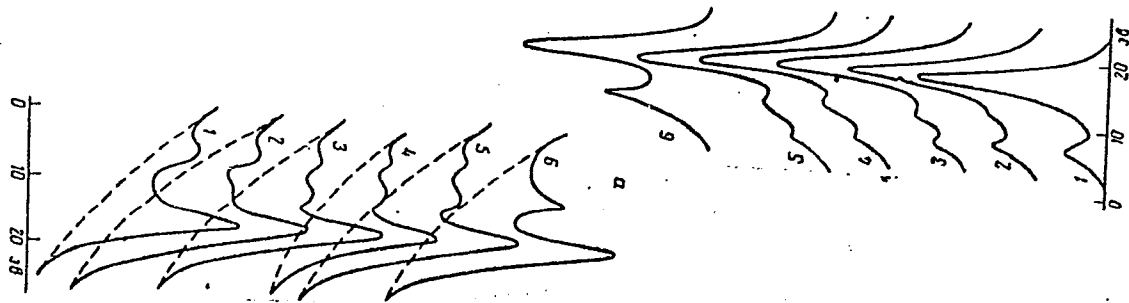
Card 2/3

Peculiarities of the X-ray ...

S/020/62/145/005/007/020
B181/B104

Fig. 1. The lines of the K_{β} -group of the X-ray spectrum of titanium in carbides, nitrides and carbon nitrides at various C-concentration, (a) shows the experimental microphotometric curves (recorded on a photographic plate); (b) shows the same curves after elimination of the superposed K_{β_1} -line (dotted on picture a) and of the variation of intensity.

Legend: $\frac{C}{C+N}$ in %: (1) 0; (2) 22; (3) 26; (4) 35; (5) 43; (6) 100.



Card 3/3

VAYNSHTEYN, E.Ye.; OVRUTSKAYA, R.M.; KOTLYAR, B.I.; LINDE, V.R.

Use of X-ray spectrum analysis in studying the valent state of manganese atoms in certain oxide semiconductors. Fiz. tver. tela 5 no.10:2935-2939 0 '63. (MIRA 16:11)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR i Odesskiy pedagogicheskiy institut im. K.D. Ushinskogo.

L 13C11-63

EWT(1)/EWP(q)/EWT(m)/BDS AFFTC/ASD WW/JD

ACCESSION NR: AP3002906

S/0289/63/000/001/0096/0105

AUTHOR: Tsukerman, V. G.; Vaynshteyn, E. Ye.; Stary'y, I. B.

59
57

TITLE: Utilization of monocrystalline photoresistance of CdS in x-ray spectral analysis

27

SOURCE: AN SSSR. Sibirskoye otdeleniye. Izvestiya. Seriya khimicheskikh nauk, no. 1, 1963, 96-105

TOPIC TAGS: CdS photoresistance, x-ray spectroscopy, x-ray dose measurement, x-ray irradiation

ABSTRACT: The present study is a continuation of the investigation of the peculiarity of CdS monocrystal. The results of analysis of the photo-resistance of CdS during its subjection to a variable voltage of a varied frequency is described, and the description of a special dosimetric construction used in the measurement of the intensity and the dose of x-ray irradiation is given. The effect of various factors such as the frequency of variable voltage which is fed into the photoresistance, the dose of preliminary x-ray irradiation, the size of crystals and the automatic illumination with a visible light were studied. These factors were compared with the sensitivity and inertness of the monocrystalline CdS.

Card 1/2

L 13011-63

ACCESSION NR: AP3002906

photoresistance during its use in the spectral analysis for the registration of the weak intensities of the x-ray radiation. An experimental model for measuring the photoresistance has been proposed which has been experimentally tested and which allows the increase of sensitivity of the apparatus up to 20 to 40 times as compared to the existing ones. A method is given for the improvement of the transmitter. The dosimetric construction described in this paper can also be used successfully as a monitor and as a discriminator in the devices for measuring impulses. Orig. art. has: 12 figures, 7 formulas, and 1 table.

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk (Institute of Inorganic Chemistry, Siberian Department AN SSSR); Odesskiy pedagogicheskii institut (Odessa Pedagogical Institute)

SUBMITTED: 14Feb62

DATE ACQ: 24Jul63

ENCL: 00

SUB CODE: 00

NO REF SOV: 004

OTHER: 000

Card 2/2

OVRUTSKAYA, R.M.; KOTLYAR, B.I.; VAINSHTEYN, E.Ye.

Shape and width of X-ray $K_{\alpha 1,2}$ lines of manganese in MnTe
in the temperature region of antiferromagnetic transforma-
tions. Fiz. met. i metalloved. 15 no.2:303-304 F '63.
(MIRA 16:4)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya
AN SSSR i Odesskiy pedagogicheskiy institut imeni Ushinskogo.
(Manganese telluride—Magnetic properties)
(X-ray spectroscopy)

L-16973-63

EWP(j)/EPP(c)/EWT(m)/ S/020/63/149/006/020/027

BDS ASD PC-4/Pr-4 EM/WW/MAY

AUTHOR: Waynshteyn, E. Ye., and Kopelev, Yu. P. 65

TITLE: X-ray spectroscopic study of certain polyferrocenes 4

PERIODICAL: Akademiya nauk SSSR. Doklady. v. 149, no. 6, 1963, 1360-1363

TEXT: In recent years several studies have been published concerning the physicochemical properties of polyferrocenes. These studies considered the optico-magnetic and magnetic characteristics of these compounds and advanced a series of hypotheses on the relationship between these properties and the electron structure of molecules. New information on the electron density distribution in polyferrocene molecules can be obtained by investigating these molecules by the X-ray spectroscopic method. The authors attempted to solve by experiment the question whether the method of investigating the X-ray spectra of iron absorption in polyferrocenes could be used to study the effect of polymerization on the nature of the distribution of charges between the metal and ligands in various polymer molecules. To this end five varieties of polyferrocene were investigated by the X-ray spectroscopic method, upon also using the technique, recently developed by the authors, of processing data for the direct estimate of the η/n^* ratio according to the form of the spectra prior to their separation into components corresponding to successive bands of selective absorption and true boundary. The resulting values of effective charges and other spectrum parameters are tabulated. There are 3 figures and 2 tables.

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii nauk

Card 1/

L 16973-63

6/020/63/149/006/020/027

X-ray spectroscopic study of certain polyferrocenes

SSSR (Institute of Inorganic Chemistry, Siberian Division of the Academy of Sciences
USSR)

SUBMITTED: December 10, 1962

Card 2/2

L 13704-63

ACCESSION NR: AP3003515

S/0020/63/151/001/0120/0121

44

AUTHORS: Vaynshteyn, E. Ye.; Stary*y, I. B.; Brill', M. N.

TITLE: X-ray L-absorption spectra for lanthanum, praseodymium, neodymium, and samarium in oxides and fluorides

SOURCE: AN SSSR. Doklady*, v. 151, no. 1, 1963, 120-121

TOPIC TAGS: X-rays, absorption spectrum, lanthanum, praseodymium, neodymium, samarium

ABSTRACT: Authors obtained absorption spectra of rare-earth elements in compounds of peroxides, oxides, oxyfluorides, and fluorides with a focusing tube spectrograph. Results are shown in a figure and are discussed. "The authors express their gratitude to L. V. Soboleva and L. R. Batsanova for the presentation of some of the compounds which were analyzed in this work." The paper was presented by Academician A. P. Vinogradov on 9 March 1963. Orig. art. has: 1 figure.

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Inorganic Chemistry, Siberian Department, Academy of Sciences SSSR; Odesskiy pedagogicheskiy institut im. K. D. Ushinskogo (Odessa pedagogical

Card 1/2

L 18963 -63

EWP(q)/EWT(m)/BDS AFFTC/ASD JD/JG.

ACCESSION NR: AP3006598

S/0020/63/151/006/1360/1363/2

AUTHORS: Vaynshteyn, E. Ye.; Bril', M. N.; Stary*y, I. B.; KoSt, M. Ye. 39

TITLE: Some results of X-ray study of cerium[^] and lanthanum[^] hydrides[^]

SOURCE: AN SSSR. Doklady*, v. 151, no. 6, 1963, 1360-1363

TOPIC TAGS: electron bond, valence, hydrogen bond, metallic bond, La, Ce, X-ray spectra, hydride preparation, hydride storage

ABSTRACT: Use of hydrides of rare earth elements in metallurgy, vacuum technique, and synthesis created interest for additional information concerning the physico-chemical properties of these compounds. Authors studied the hydrides $LaH_{1.97}$, $LaH_{2.26}$, $LaH_{2.55}$, CeH_2 , $CeH_{2.24}$, and $CeH_{2.66}$ by X-ray spectrometry. Samples for investigation were prepared by

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L 18963-63

ACCESSION NR: AP3006598

2

direct reaction of hydrogen and metals at room temperature. Hydrides with lower hydrogen content were prepared by heating high hydrogen-content hydrides. Hydrides were impregnated on silk cloth and sealed in polyethylene envelopes. Preparation was accomplished in a dry chamber, filled with CO₂ and operated from outside. Prepared samples were kept in a container under vacuum. Results of investigation indicate that cerium and lanthanum in hydride form have three valences and valence energy only partly used in formation of ionic bonds with hydrogen, while the rest of it is used to produce metallic bonds. This fact has a direct bearing on decrease of electrical conductivity with an increase of hydrogen content. Orig. art. has: 4 figures.

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Inorganic Chemistry, Siberian Division, Academy of Sciences, SSSR), Institut neorganicheskoy khimii im. N. S. Kurnakova Akademii nauk SSSR (Institute of Inorganic Chemistry, Academy of

Card 2/82

AKOPDZHANOV, R.G.; VAYNSHTEYN, E.Ye.; KEYYLR, N.P.; KEPELLI, L.M.; RUKHADZE,
Ye.G.

X-ray absorption K-spectra of copper in some catalytically active
chelate (inner-complex) polymers. Kin. i kat. 5 no.4:616-623 J1-
Ag. '64. (MIRA 17:11)

1. Institut kataliza Sibirskogo otdeleniya AN SSSR i Institut
neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.

ACCESSION NR: AP40/W4386

5/0195/64/005/004/001

AUTHOR: Akopdzhanov, R. G.; Vaynshteyn, E. Ye.; Keyer, N. P.; Kefeli, L. M.; Rukhadze, Ye. G.

TITLE: X-ray K-absorption spectra of copper in some catalytic chelate polymers

SOURCE: Kinetika i kataliz, v. 5, no. 4, 1964, 616-623

TOPIC TAGS: copper, K-absorption spectrum, chelate, sodium bis-dithiocarbamate, chelate polymer, copper chelate polymer, catalysis, X-ray analysis

ABSTRACT: Polychelates of copper synthesized from sodium bis-dithiocarbamates containing a Cu(SS) chelate unit were investigated by X-ray spectral analysis. The optimal conditions for the study of the fine structure of the principal K-region absorption of copper in polychelates are obtained by working with absorbents having a density of 3.5-5 mg/cm²; for the study of the fluctuation in an ultra fine structure this should be 10 mg/cm². The data on the K-region absorption of metallic copper obtained in these experiments were in good agreement with the spectrum registered by a double-crystal spectrometer. The reproducibility of data in three parallel experiments (the points lay on a single curve) for polychelates with two different radicals R₅=(C₆H₄)₂ and R₃=(CH₂)₆ was also plotted. When the structure of the X-ray absorption spectrum of a Cu²⁺ ion in aqueous solution was compared with that of copper in some oxygen- and sulfur-containing inorganic compounds (CuS, Cu₂O),

Card 1/3
Card

ACCESSION NR: AP4044X386

the general form of the long-wave structure of the spectrum was found to be essentially independent of the change in the ionic charge. It depended rather on the nature of the bond of the electrons in the absorbing atom and the atoms in its close vicinity in the metal or its compounds, especially on the participation in this bond of the electrons with p-symmetry. Upon transition from the spectrum of the metal to that of the oxide, there is a regular shift (~ 1.5 e.v.) of the spectrum toward the short-wave side. It can be assumed that the valence of copper in the polymers studied is close to unity. Analysis of the long-wave fine structure of the X-ray K-spectra of copper in polychelates in comparison with the spectrum of the metal revealed a change in the valence of copper atoms in polychelates depending on the organic radical in the polymer chain. This change can be due to a change in the degree of overlapping of the sp-functions of electrons producing the bond between the copper atom in the chelate and additives, such as sulfur atoms. In polychelates containing R_4 and R_5 aromatic radicals in the polymer chain, the absorption spectra show a decrease in intensity in the initial and medium regions, as compared to those of metal. In the spectra of polymers containing R_2 and R_3 organic aliphatic radicals, the intensity of absorption is increased in these regions. The difference in the effect of aromatic and aliphatic radicals in the polymer chain on the nature of the reaction of copper with the additives in polychelates is also revealed by the change in the catalytic activity of these polychelates. "The authors thank V. I. Petrosyan for supplying the copper foil."

Card

2/3

ACCESSION NR: AP4044386

Orig. art. has: 8 figures and 1 chemical structure.

ASSOCIATION: Institut kataliza SO AN SSSR (Institute of Catalysis, SO AN SSSR);
Institut neorganicheskoy khimii SO AN SSSR (Institute of Inorganic Chemistry, SO
AN SSSR)

SUBMITTED: 16Oct63

SUB CODE: OC, OP

NO REF SOV: 017

ENCL: 00

OTHER: 002

Card

3/3

L 12445-65

ACCESSION NR: AP4046596

of a quartz crystal. The spectra were recorded photographically. The L_{12} and L_{13} lines of europium were used as the comparison lines.

absorption curves

ACCESSION NK: AP4048596

2

ASSOCIATION: Institut neorganicheskoy khimii SO AN SSSR (Institute

Card 3/3

AUTHORS: Maralov, L. N.; Vaynshteyn, E. Ya.; Trushnikova, L. N.

TITLE: X-ray fluorescence spectra of potassium in mixed alkali crystals

SOURCE: Zhurnal teoreticheskoy i eksperimental'noy fiziki, 1964, 34, 11-12, 2487

ICRD CLASS: X-ray spectra; fluorescence spectrum; spectrum shift; crystal, potassium compound.

APPROXIMATE WORD COUNT: 1000

1 1 99 1 6 5
ACCESSION NO: 100 4 1 1 1 1

was used as the reference material. The structure of all com-
pounds was determined by mass spectrometry. The molecular weight

1. The first part of the document is a list of names and titles.

2. The second part is a list of dates.

3. The third part is a list of locations and activities.

Card 417

ACCESSION NR. A1000949

NO. 1000949

SP/
Card 2/2

VAYNSHTEYN, E.Ye.; BLOKHIN, S.M.; PADERNO, Yu.B.

X-ray L-spectra of lanthanum absorption in tetra- and hexaborides
with defect lattices. Fiz. met. i metalloved. 18 no.3:450-451 S
'64. (MIRA 17:11)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR
i Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR.

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trum of the element in the oxide form. The spectrum is
similar, but the absorption edge is shifted, very little in carbides, much more
in sulfides. This is attributed to an increased valence state of the rare-earth
metal in transition from a semiconductor to a metallic state. Orig. art. has: 3

KOPELEV, Yu.F., VAYNSHTEYN, E. Ye.

Determination of the effective charges of iron atoms in some
polyferrocenes based on X-ray absorption spectra. Zhur. ob.
khim. 34 no.11:3667-3673 N '64 (MIRA 18:1)

L. Institut neorganicheskoy khimii Sibirskogo otdeleniya
AN SSSR.

KOPELEV, Yu.F.; VAYNSTEYN, E. Ye.

Determination of the effective charges of iron atoms in some
polyferrocenes from X-ray absorption spectra. Izv. SO AN SSSR
no.7 Ser. khim. nauk no.2:3-9 '64 (MIRA 18:1)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR,
Novosibirsk.

VAYNSHTEYN, E. Ye.; CHIRKOV, V.I.

X-ray K-spectra of titanium emission in lower oxides (Ti - TiO₂)
Dokl. AN SSSR 155 no. 2:381-384 Mr '64. (MIRA 17:5)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN
SSSR. Predstavleno akademikom I.V.Taranayevym.

ACCESSION NR: AP4042210

6/0020/64/157/002/0388/0391

AUTHOR: Vaynshteyn, E. Ye.; Chirkov, V. I.; Vinogradov, A. P., Academician

TITLE: The structure of x-ray $K \beta_5$ -lines emitted by titanium in its oxides
($TiO_{0.85}$ - $TiO_{1.20}$)

SOURCE: AN SSSR. Doklady*, v. 157, no. 2, 1964, 388-391

TOPIC TAGS: x ray emission lines, titanium monoxide, x ray spectrum, fine structure

✓ ABSTRACT: The purpose of this study was to investigate the fine structure of x-ray $K \beta_5$ -line emitted by titanium in specimens which correspond to titanium monoxide composition. X-ray studies were conducted on six samples of the following compositions: $TiO_{0.850}$; $TiO_{0.912}$; $TiO_{1.020}$; $TiO_{1.072}$; $TiO_{1.178}$; $TiO_{1.191}$. In addition Ti spectrum was studied in nitride close to stoichiometric composition, which similar to titanium monoxide has the NaCl type structure. The temperature during studies was 80 - 100 C. The results of experiments are shown in Figures 1 and 2 of the enclosure. The position of $K \beta_5^{III}$ band in the titanium spectrum in all compositions remains essentially constant. The greatest differences in the

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ACCESSION NR: AP4042210

structure of K_{β} band of titanium in lower oxides, corresponding to different intervals of changes of index n , are associated with the difference of the relative intensity of band components. "The authors express their gratitude to S. M. Airy and Ya. V. Vasil'yev for preparation of specimens and L. I. Perevalova for the help with the experimental part". Orig. art. has: 4 figures and 1 table.

ASSOCIATION: Institut neorgicheskoy khimii Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Inorganic Chemistry Siberian Branch ... Academy of Sciences SSSR)

SUBMITTED: 28Feb64

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SUB CODE: (OP

NO REF SOV: 002

OTHER: 006

Card 2/4

ACCESSION NR: AP4042210

ENCLOSURE: 01

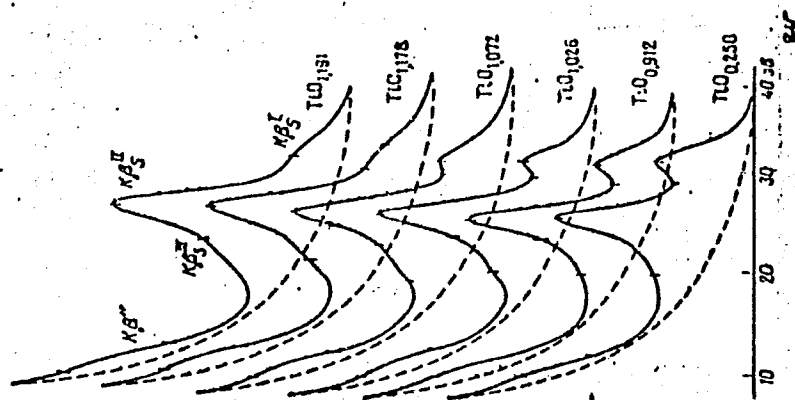


Fig. 1. The structure of the last $K\beta$ -emission bands of Ti in lower oxides (experimental curves).

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ACCESSION NR: AP4042210

ENCLOSURE: 02

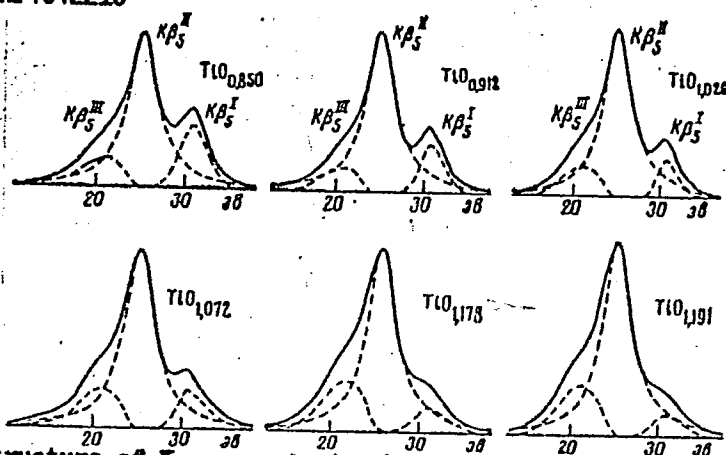


Fig. 2. Fine structure of $K\beta$ emission band of Ti in its oxides after removal of the background from $K\beta$ - line and after reduction to the same scale (according to the integral intensity of $K\beta$ -line). Dotted lines indicate components of the band.

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BLOKHIN, S.M.; VAYNSHTEYN, E.Ye.

Fine structure of the main X-ray L_{II} -absorption spectrum and the last L_{II} -emission band of ytterbium in oxide and hexaboride. Dokl. AN SSSR 158 no.3:694-696 S '64. (MIRA 17:10)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR. Predstavleno akademikom A.P.Vinogradovym.

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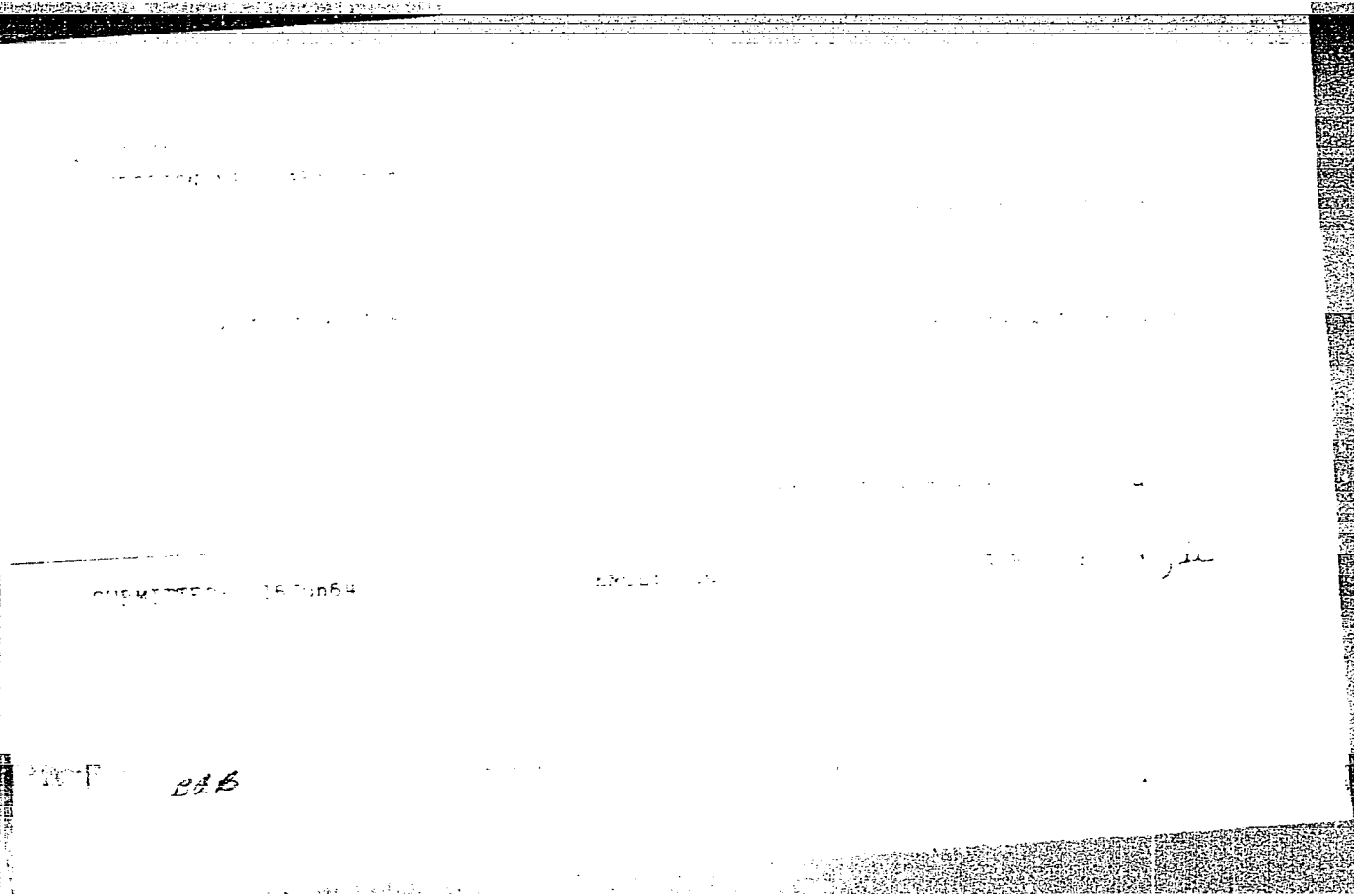
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APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001859120005-0"

ABSTRACT: Data from X-ray analysis of ...



TSUKERMAN Viktor Grigor'yevich; VAYNSHTEYN, Emmanuil Yefimovich;
SHPAKOVSKAYA, L.I., red.

[Photoconductors in X-ray dosimetry] Fotoprovodniki v dozi-
metrii rentgenovskogo izlucheniia. Novosibirsk, Red.-izd.
otdel Sibirskogo otd-niia AN SSSR, 1965. 52 p.
(MIRA 18:3)

TSURUMAN, V.O.; LYUBIN, V.M.; STARYY, I.P.; VAYNSHTEYN, E.Y.

Photosensitivity of some semiconductor layers in the X-ray
region of spectrum. Izv. SO AN SSSR no.3 Ser. khim. nauk
no.1:124-125 '65. (MIRA 18:8)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya
AN SSSR, Novosibirsk.

LAVRENT'YEV, Yu.G.; VAYNSHTEYN, E.Ye.

Effect of the instrumental error on the precision and sensitivity
of X-ray spectral analysis. Report 1. Zhur. anal. khim. 20
no.9:918-926 '65.. (MIRA 18:9)

1. Institut geokhimii i analiticheskoy khimii imeni V.I.
Vernadskogo AN SSSR, Moskva.

VAYNSHTEYN, E.Ye.; KOPELEV, Yu.F.; KOTLYAR, B.I.

Study of the structures of ferrocene and ferricinium from X-ray
K-spectra of absorption. Nauch. zap. Od. ped. inst. 25 no.2:59-
64 '61. (MIRA 18:2)

STARYY, I.B.; TSUKERMAN, V.G.; VAYNSHTEYN, E.Ye.

Study of the dark background of cadmium sulfide photoresistors
used as transducers in recording weak X rays. Nauch. zap. Od.
ped. inst. 25 no.2:71-73 '61.

(MIRA 18:2)

spectrum

QUALIFIED ACCESS TO INFORMATION

1965, 124-125

TOPIC TAGS: cadmium sulfide, tellurium sulfide, arsenic selenide, thallium arsenic
selenide, semiconducting film, photosensitive film

PROCESSED BY THE... The specific dark resistance of the materials ρ_d and their
values ρ_d are noted.

ACCESSION NR: AP5017061

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SOURCE: Filled [unclear]

[unclear] crystal, x ray spectrum,

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L 63040-65 EPF(c)/EMF(j)/EMT(m)/T Pc-l/Pr-l JAJ/ER

ACCESSION NR: AP5019059

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678.01:53

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47

AUTHORS: Vaynshteyn, E. Ya.; Mendel'son, T. S.; Kafets, I. M.; Kuznetsov, N. P.

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APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001859120005-0"

VAYNSHTEYN, E.Ye.; AKOPDZHANOV, R.G.; KEFELI, L.M.; KEYYER, N.P.

X-ray absorption K-spectra of copper in some chelate (inner-complex) molecules and polymers. Vysokom. soed. 7 no.5:847-853 My '65.
(MIRA 18:9)

1. Institut kataliza i Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.

AUTHORS: Blokhin, S. M.; Vaynshteyn, E. Ye.; Bertenev, V. M.
 SOURCE CODE: UR/0181/65/007/012/3558/3561
 IJP(c) JD/HW/JG
 ORG: Institute of Inorganic Chemistry AN SSSR SO, Novosibirsk
 (Institut neorganicheskoy khimii AN SSSR SO)
 TITLE: X-ray spectral investigation of the valent state of samarium
 in the metal and in the monosulfide
 SOURCE: Fizika tverdogo tela, v. 7, no. 12, 1965, 3558-3561
 TOPIC TAGS: samarium, samarium compound, x ray absorption spectrum,
 rare earth element, conduction band
 ABSTRACT: In connection with the peculiarities of the electronic
 structure of the samarium atom, the authors experimentally investigated
 the x-ray L_{III} absorption spectrum of this element in the metal and in
 the monosulfide. A thin metallic samarium layer⁶ approximately 10 μ
 thick was deposited on an aluminum foil⁶ in vacuum; this deposit was
 then sputtered with aluminum in vacuum. An absorber prepared in this
 manner was stable in air and had the proper surface density. The L_{III}
 absorption edge was obtained with a spectrometer (URS-II) with a quartz

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LAVRENT'YEV, Yu.G.; VAYNSHTEYN, E.Ye.

Effect of an instrumental error on the precision and sensitivity
of X-ray spectral analysis. Report No.2. Zhur. anal. khim. 20
no.10:1033-1037 '65. (MIRA 18:11)

1. Institut geokhimi i analiticheskoy khimii imeni V.I. Vernadskogo
AN SSSR, Moskva.

AKOPDZHANOV, R.G.; VAYNSHTEYN, E.Ye.

Method of correction of X-ray spectra for nondispersion
instrumental distortion. Opt. i spektr. 18 no.3:495-500
Mr '65. (MIRA 18:5)

BLOKHIN, S.M.; VAYNSHTEYN, E.Ye.

Results of studying X-ray L-spectra of rare-earth metal compounds.
Fiz. met. i metalloved. 19 no.3:371-374 Mr '65. (MIRA 18:4)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.

Author: Raymond G. ...

... anisotropically isotropic cylinder.

STRESSED STATE OF AN INFINITE CIRCULARLY SYMMETRIC
STRIP OF LENGTH $2l$ IN THE STRESSED STATE OF AN INFINITE TRANSVERSELY