

48-10-8/20

K-Spectra of the Absorption of Chlorine in the Chlorides of Alkali Metals

K-spectrum of Na absorption in NaCl, which was obtained by K.Rule (Phys.Rev. 66, 199, 1944) at quite different experimental conditions. 5.) As a result of the decomposition of K-spectra of the chlorine absorption in the compounds of chlorine with alkali metals the regular character of those changes in the structure of the K-spectra, which were observed in the experiment, could be determined, and these changes could be brought into connection with the crystal parameters, as the polarizability of the cation, its ionization potential, and the ion radius. 6.) A physical interpretation of the regularities found is given. It is based upon taking account of the change of the ion character, the bond in halide-alkali-crystals, and of the degree of overlapping of the electron shells in the case of the chlorine ions. 7.) On the strength of the results obtained by this as well as other papers a theoretical scheme of the processes taking place in connection with the K-absorption of X-rays in gas molecules and in halide-alkali crystals is given by Barinskiy, Vaynshteyn and Narbutt in Izvestiya Akad. nauk SSSR, Ser. Fiz., 1957, Nr 10, p 1351. All conclusions to be drawn from

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K-Spectra of the Absorption of Chlorine in the Chlorides of Alkali Metals

this model are in keeping with previously obtained empirical generalizations. There are 9 figures and 6 Slavic references.

ASSOCIATION: Institute of Mineralogy, Geochemistry, and Crystallochemistry of Rare Elements AS USSR (Institut mineralogy, geokhimii i kristalokhimii redkikh elementov Akademii nauk SSSR)

AVAILABLE: Library of Congress

Card 3/3

48-10-9/20

AUTHOR: Barinskiy, R.L., Vaynshteyn, E. *et al.*

TITLE: X-Ray L-Spectra of the Absorption and Emission of Molybdenum in Carbide and Some Other Compounds (Rentgenovskiy L-spektry pogloshcheniya i emissii molibdena v karbide i nekotorykh drugikh soyedineniyakh)

PERIODICAL: Izvestiya Akad.Nauk SSSR, Ser.Fiz., 1957, Vol. 21, Nr 10, pp. 1387-1396 (USSR)

ABSTRACT: By means of a focusing vacuum-X-ray spectrometer the X-ray-L_{III} spectra of the absorption and emission of molybdenum in carbide and a number of other compounds was investigated. The influence exercised by the metal valence and the character of the chemical bond between the atoms in the compound upon the fine structure of these spectra is determined. Basing on the example of X-ray spectra of Mo in molybdenite the possibility of a considerable reciprocal overlapping of the L_{β2} emission band and of the L_{III} spectrum of metal absorption is shown. Hitherto such a phenomenon has been observed only once, viz. on the occasion of the investigation of the M_{IV,γ}-spectra of the absorption and of the M_{d,β} emission of rare earths. Opinions concerning the possible causes of this phenomenon and the conditions necessary herefore are expressed. Experimental data are obtained with respect to Mo₂C, which cannot be brought into line

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X-Ray L-Spectra of the Absorption and Emission of Molybdenum in Carbide and
Some Other Compounds

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with the hypothesis frequently found in publications, according to which, on the occasion of the forming of carbides of the transition elements, a partial filling up of the not completed energetical levels of atoms of transition metals takes place. To what extent this conclusion can be generalized must yet be found out on the basis of experimental material of much greater volume. There are 4 figures and 10 references, 8 of which are Slavic.

ASSOCIATION: Institute for Mineralogy, Geochemistry, and Crystallochemistry of Rare Elements AN USSR and Institute for Geochemistry and Analytical Chemistry *imeni* V.I.Vernadskiy AS USSR (Institut mineralogii, geokhimii i kristallokhimii redkikh elementov Akademii nauk SSSR i Institut geokhimii i analiticheskoy khimii im.V.I.Vernadskogo Akademii nauk SSSR)

AVAILABLE: Library of Congress

Card 2/2

AUTHORS: Semenov, Ye. I., Barinskiy, R. L. SOV/7-58-4-4/13

TITLE: Peculiarities in the Content of Rare Earths in Minerals
(Osobennosti sostava redkikh zemel' v mineralakh)

PERIODICAL: Geokhimiya, 1958, Nr 4, pp. 514 - 535 (USSR)

ABSTRACT: More than 100 samples were investigated; they are from Ye. I. Semenov, partly also from other geologists. Samples from abroad were made available to G. P. Barsanov from the collections of the Mineralogical Museum (Mineralogicheskiy muzey AN SSSR). In the case of most minerals the sum of oxides of the rare earths was separated by the analysts A. V. Bykova, O. F. Deronova, M. Ye. Kazakova, M. V. Kukharchik, I. S. Razina. The individual rare earths were determined by X-ray spectral analysis by R. L. Barinskiy, accuracy 5 - 7 %, sensitivity 0.1 %. The results are given in a great table.

In their paper the authors deal with the following sections:
a) The classification of the contents of rare earths. If the contents of rare earths are plotted on a diagram and the points thus obtained are connected the known toothed

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Peculiarities in the Content of Rare Earths in Minerals

1977, 7 58 4-4/13

line is obtained; if, however, the even-numbered points and the odd-numbered points are connected, two sufficiently simple curves with few maxima are obtained (usually from 1 - 2). These curves are given for a number of minerals. The minerals are divided into three types according to the magnitude of the maximum.

b) Lanthanide couples. The ratio of the content of one of the rare earths with even atomic number to the ratio of the subsequent one is represented graphically.

c) On the classification of the rare earths. It is suggested to draw the boundary line between cerium earths and yttrium oxides in mineralogical-geochemical respect between Tb and Dy. Furthermore it is suggested to combine two elements in one sub-group and to denote it according to the predominant even-numbered element: Cerium group (Ce, La), neodymium group (Nd, Pr), samarium group (Sm, Eu), gadolinium group (Gd, Tb), dysprosium group (Dy, Ho), erbium group (Er, Tu), and ytterbium group (Yb, Lu). There are 5 figures, 1 table and 12 references, 4 of which are Soviet.

Card 2/3

Peculiarities in the Content of Rare Earths in Minerals SOV, 7-58-4-4/3

ASSOCIATION: Institut mineralogii, geokhimii i kristalloghimii redkikh elementov AN SSSR, Moskva
(Moscow Institute of Mineralogy, Geochemistry and Crystal Chemistry of Rare Elements, AS USSR)

PRESENTED: November 6, 1957, at the Jubilee Meeting of the Scientists' Council of the Institute

SUBMITTED: December 28, 1957

1. Minerals--Analysis
 2. Rare earth elements--Separation
 3. Rare earth elements--Determination
 4. X-ray spectroscopy
- Applications

Card 3/3

BARINSKIY, R.L.

Quantitative determination of rare earth elements in minerals
and concentrates by the X-ray fluorescence spectrum method.
Zav. lab. 24 no.5:613-617 '58. (MIRA 11:6)
(X-ray spectroscopy) (Rare earths--Analysis)

ATTN: Derinsky, V. I.

SOV/ 20-2045-19 6.

TO: The Ratio between heavy and light Rare Earth elements in different minerals. Mineralogicheskii zhurnal (Leningrad) 1964, 10, 1, 1-10. (English translation in Journal of Mineralogy)

FROM: Journal of Mineralogy, Vol. 10, No. 1, pp. 1-10, 1964

1. The ratio between heavy and light rare earth elements (Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu) in different minerals is discussed. A proportionality exists between the contents of Ce, La, Pr and Nd as well as between La and Nd, Sm and Ce (Ref. 1). No regularity, however, is observed between Tb and Yb, Gd and Lu. As these ratios in the minerals examined are similar, the ratio between heavy and light rare earth elements is similar. Most of the samples were collected by V. I. Derinsky in the USSR. Some samples were not available for analysis because of their small size. The results of the analysis of the minerals are given in the table. A method of quantitative X-ray structural analysis was used.

SOV/20-120-5-48/67

On the Basis Between Even and Odd Rare Earth Elements in Different Minerals

(Ref. 1). The intensity of 14 lines of rare earths (from La to Lu) was determined by means of a Geiger counter and a computer system. In this diagram (Fig. 1) the quantities (in percent by weight) of the oxides of the rare earths are shown. The sum of which is assumed to be 100%. The curves marked with the numbers represent the representation of the data compared with each other and discussed. (Figs. 2, 3). As may be seen from Figure 2 the curves of the individual elements, which differ greatly as to their shape, exhibit a complete similarity of the even and of the odd components. This also holds for the other examined minerals. From this follows that an approximately proportional dependence must exist between the contents of the corresponding pairs of elements. (Fig. 3). The slope of the straight line corresponds to about the following ratio of the pairs: Ce : La = 3, Nd : Pr = 2, Gd : Tb = 6, Dy : Ho = 4, Er : Tm = 6, and Yb : Lu = 7. The spread of the points (Fig. 3) is caused by the differences of the crystalline structure of the minerals. The above mentioned rules can be explained if certain conditions of the formation of the rare earths and the content of a

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SOV/20-120-3-38/67

On the Ratio Between Even and Odd Rare Earth Elements in Different Minerals

homogeneous composition in their initial melt previous to the onset of crystallization is assumed. The mentioned relations can be used for the simplification of the analysis of rare earths, by computing, for example, the content of odd lanthanides from the content of the corresponding even element and the average value of the ratio of these elements. There are 4 figures and 4 references, 3 of which are Soviet.

ASSOCIATION: Institut mineralogii, geokhimii i kristalloghimii redkikh elementov Akademii nauk SSSR
(Institute of the Mineralogy, Geochemistry and Crystal Chemistry of Rare Elements, AS USSR)

PRESENTED: December 16, 1957, by N. V. Belov, Member, Academy of Sciences, USSR

SUBMITTED: December 12, 1957
Card 3/4

SOV/20-120-3-38/67

On the Ratio Between Even and Odd Rare Earth Elements in Different Minerals

1. Rare earth elements--Quantitative analysis
2. Rare earth elements--Properties
3. Minerals--X-ray analysis
4. Rare earths--X-ray analysis

Card 4/4

24(7)

AUTHORS: Barinskiy, R. L., Vaynshteyn, E. Ye. SOV/48-23-5-11/31

TITLE: The Collective Interaction of Electrons in Crystals and Its Effect on the Structure of the X-ray Absorption Spectrum of Atoms in Polar Crystals (Kollektivnoye vzaimodeystviye elektronov v kristallakh i yego proyavleniye v strukture rentgenovskikh spektrov pogloshcheniya atomov v polyarnykh kristallakh)

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 5, pp 585-590 (USSR)

ABSTRACT: Earlier papers by the authors and others (Refs 1, 2, 3) dealt with the investigation of two line series of absorption, which may be described by the formula applicable to hydrogen-like spectra. To explain these spectra it is necessary to know the excited state of the electron system. A first introduction was given by Ya. I. Frenkel. By the aid of the many-electron theory a description is given of the interaction in solid substances. It is stated that the interacting electrons obey the Bose-statistics. Ye. F. Gross and his collaborators dealt in a series of papers with the collective interaction of electrons in the lattice of solid substances from the quasicorpuscular point of

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The Collective Interaction of Electrons in Crystals and Its Effect on the Structure of the X-ray Absorption Spectrum of Atomic Polar Crystals SOV/48-24-8-11, 1

view. They investigated the optical absorption spectrum of a number of crystals within the range of low temperatures. The formula (1) developed by H. Mott for the computation of the radius of the optical exciton is then given. Next, considerations are made regarding the series boundary of exciton lines, and formula (2) is written down in this connection. Caekels and Mott first discovered the existence of exciton line series in the X-ray spectrum. Papers by these and some other authors, dealing with KCl crystals along these lines, are discussed. Considerations are made of the dielectric constant and formulas (3) and (4) are given. Formulas thus obtained allow a computation of the energy spectrum of the X-ray exciton in the KCl crystals. Numerically and experimentally obtained results of X-ray and optical excitons are shown in a diagram, and the energy states are investigated. Finally, the absorption spectrum in the ultraviolet range of RbBr and CsBr is investigated. There are 2 figures and 23 references, 13 of which are Soviet.

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24.6300

24 (7)

AUTHORS:

Madzhakov, Ye. S., Barinskiy, N. I.

58135

TITLE:

New Method of Calculation of the Intensity of the

REFERENCES:

Doklady Akademii nauk S.S.S.R. 1974, No. 1, p. 117-119 (USSR)

ABSTRACT:

E. Ye. Vaynshteyn and A. I. Rubini (Ref 1) found the empirical formula $I_n^0 = f(Z, l) \frac{E_n^2}{n^3}$ for the intensity I_n^0 of the

successive absorption lines in the H-arc. n denotes the main quantum number, l the charge of the ionized atom, Z the nuclear charge number. R. L. Liberman and the initially mentioned authors (Ref 4) added the Rydberg formula to the above formula for the absorption of lines $I_n = I_n^0 \frac{E_n}{E_n - E_{\infty}}$. Here E_n denotes the energy of the $1s-n$ transition, E_{∞} the energy of transition to the boundary of the continuous spectrum, n^* the effective quantum number, R the Rydberg constant (13.6 eV). The authors proceed from the physical condition that while

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A New Method of Computing X-Ray K-Spectra
of Absorption

SOV 20-100-0-22 69

in the K-shell of the absorbing atom may lead to the formation of a system of levels that are different from the levels of the molecules. In the present paper a new formula for τ_n/τ_0 is derived. A formula for the transition probability is written down. Dipole transitions are investigated. After some steps one finds $\delta_n = (4\pi^2 e^2 \xi_n / c^3) \sum |(r_e)_{1s,np}|^2$, where

$(r_e)_{1s,np}$ is the matrix element of the component r_e of the radius vector in the direction of polarization for the transition from the state 1s into the state np. Summation is carried out over all np states. Here, $\sum |(r_e)_{1s,np}|^2 =$

$$= 6 \left[\int_0^\infty r^3 R_{1s}(r) R_{np}(r) dr \right]^2 \text{ holds. } R_{1s} \text{ and } R_{np} \text{ denote the normalized}$$

radial component of the eigenfunctions of the corresponding states. The authors make use of the well-known fact that in the case of equal density the discrete and the continuous

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A New Method of Computing X-Ray K-Spectra
of Absorption

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Sov. J. Nucl. Energy

spectrum have the same limit, i. e. $\lim_{\lambda \rightarrow \infty} \mu(\lambda) = \lim_{\lambda \rightarrow \infty} \frac{1}{\lambda^2} \frac{d\mu}{d\lambda} = \frac{1}{\lambda^2} \frac{d\mu}{d\lambda}$

Herefrom an expression is found by boundary transition for

After some steps the final formula $\frac{d\mu}{d\lambda} = \frac{4\pi^2}{3} \frac{Z^2}{n^3} \frac{1}{\lambda^2} \left(\frac{1}{n} - \frac{1}{n+1} \right)$

obtained, where $f_n = 2\gamma_n/Ry$ denotes the width of the main
line in Rydbergs. By means of the second and the first formula
it is then possible to determine η and n from the experimental
curve of K-absorption. In this calculating method the approxi-
mations are connected with the hydrogen model. This method
was checked by means of the spectra of atoms with a previously
known charge, and the results obtained by calculating n and
the effective charge η are given in table 1. For example for
the K-spectra of Ar and Zn²⁺ in solution. (Difference of 7.05%)
already noticeably deteriorates approximation. In these cases
in which zero charge is to be expected, and also for Zn²⁺ (where

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A New Method of Computing X-Ray K-Spectra of
Absorption

SOV/20-129-6-22/69

a +2 charge is expected), this calculation method gives very good results in spite of its approximate character. These facts, and also the agreement between experimental and theoretical curves confirm the formula last written down. There are 1 figure, 1 table, and 10 references, 6 of which are Soviet.

ASSOCIATION: Fizicheskiy institut Bolgarskoy Akademii nauk (Physics Institute of the Bulgarian Academy of Sciences) Institut redkikh elementov Akademii nauk SSSR (Institute of Rare Elements of the Academy of Sciences of the USSR)

PRESENTED: August 18, 1959, by N. V. Belov, Academician

SUBMITTED: August 15, 1959

Card 4/4

S/007/60/000/004/001/005
B002/B055

AUTHORS: Borodin, L. S., Barinskiy, R. L.

TITLE: Rare earths in perovskites (knopites) from massifs of ultra-
basic alkali rocks

PERIODICAL: Geokhimiya, no. 4, 1960, 291-297

TEXT: In general, previous geochemical studies of rare earth elements were only concerned with individual rare-earth minerals. The present publication, however, deals with the rare-earth (RE) content of perovskites and knopites, the variety richer in RE, from various rocks. The study aimed at establishing the properties of perovskites as geochemical indicators of RE and other rare elements. The chemical composition of 13 perovskite samples from ultrabasic alkali rocks (Kareliya, Kol'skiy peninsula, Polar Siberia and Aldan) was determined. The samples were collected by L. S. Borodin. One sample was supplied by S. P. Stoyalov. R. L. Barinskiy determined the chemical composition X-ray spectroscopically in chemically separated RE precipitates. The chemical separation was carried out by Z. Katayeva.

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Rare earths in perovskites...

S/007/60/000/004/001/005
B002/B055

T. A. Kapitonova and I. S. Razina, analysts of the IMGRE AN SSSR (Institute of Mineralogy, Geochemistry, and Crystallochemistry of Rare Elements, AS USSR). All the perovskite samples were found to contain relatively large amounts of cerium, lanthanum, neodymium and praseodymium, and very small quantities of yttrium earths. A plot of the total RE content (abscissa) against the relative content of individual RE (relative to $\Sigma RE=100\%$) (ordinate) makes the following geochemical conclusions possible (Fig. 1): The total RE content of perovskites and the concentrations of the individual RE elements are correlated. The relative contents of neodymium and praseodymium, i.e., the less basic elements, increase with decreasing age of the perovskite generations, whereas the lanthanum content decreases. The cerium content remains more or less constant (46-52% of ΣRE). A correlation also exists between the relative contents of the individual elements and those of lanthanum (Fig. 2) and neodymium (Fig. 3). Altogether, the perovskites may be divided into two types: 1) perovskites with higher concentrations of basic elements, especially lanthanum. These perovskites come from olivinites, pyroxenites, melilitites and rocks containing perovskites of conventional habit; 2) perovskites containing larger

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B002/B055

Rare earths in perovskites...

quantities of the less basic lanthanides, generally termed knopites. The total RE- and niobium contents of this type are high. From these results it is assumed that perovskites are of a hydrothermal-metasomatic origin. Mention is made of E. A. Bagdasarov, Ye. M. Epshteyn, A. A. Kukhareno, and Ye. I. Semenov. There are 3 figures, 1 table, and 15 references: 12 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATION: Institut mineralogii, geokhimii i kristalloghimii redkikh elementov AN SSSR, Moskva (Institute of Mineralogy, Geochemistry, and Crystallochemistry of Rare Elements, AS USSR) ✓

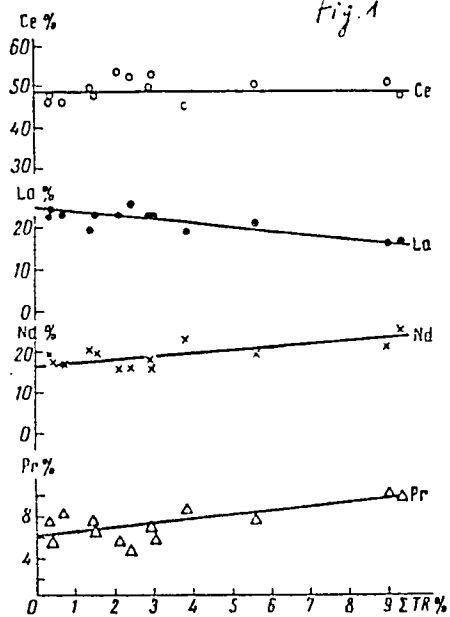
SUBMITTED: December 29, 1959

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Rare earths in perovskites...

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B002/B055

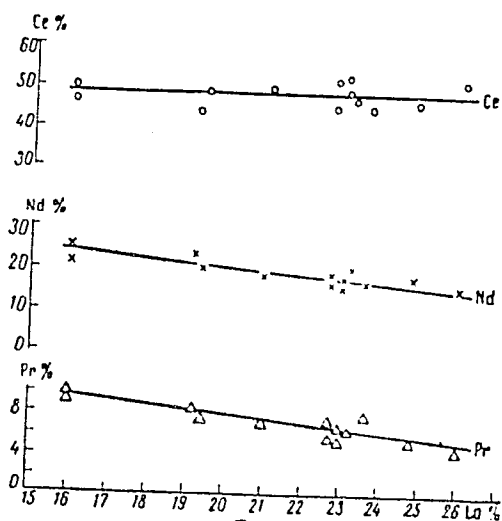
Fig. 1



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Rare earths in perovskites....

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B002/B055



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Fig. 2

BARINSKIY, R.L.

Determination of the effective charges of atoms in complexes
by means of X-ray absorption spectra. Zhur. struk. khim. 1
no.2:200-208 JI-Ag '60. (MIRA 13:9)

1. Institut redkikh elementov AN SSSR.
(Complex compounds--Spectra)
(Electric charge and distribution)

S/048/60/024/04/01/009
BOG6/BO17

AUTHORS: Narbutt, K. I., Barinskiy, R. L., Smirnova, I. S.
TITLE: A Nuclear X-Ray Generator for Fluorescence Spectrum Analysis
PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya. 1960.
Vol. 24, No. 4, pp. 354-361

TEXT: The present article is a reproduction of a lecture delivered at the 4th All-Union Conference on X-Ray Spectroscopy (Rostov-na-Donu, June 29 - July 6, 1959). In the introduction some suggestions made in non-Soviet periodicals on possibilities of replacing the X ray tube by artificially radioactive sources, are discussed. The authors themselves used the gamma- and X ray emission of Tu^{170} for fluorescent excitation of the (X-ray) K-radiation of the elements from ^{30}Zn to ^{92}U . In Tu^{170} radiation (Tu^{170} decays due to beta gamma decay) the following occurs: 969-keV and 884-keV beta radiation, 84-keV gamma radiation, X radiation of ytterbium and thulium ($Yb-K_{\alpha 1,2}$, $Tu-K_{\alpha 1,2}$ 52 keV), and

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A Nuclear X-Ray Generator for
Fluorescence Spectrum Analysis

S/046/60/024/04/01/009
B006/B017

bremsstrahlung (in slowing down the beta particles). The preparation of the Tu source is described. Fig. 1 shows a picture of the partly dismantled container so that also the internal part which houses the source can be seen. Fig. 2 gives a total view. In the following, the determination of the radiant energy is discussed. The instrument used for this purpose, which consisted essentially of a scintillation counter and an amplitude analyzer, is schematically shown in Fig. 3, and its details are described. Next, the author describes the background and possibilities of its reduction. Some details on the excitation of K-series of Ge (excitation energy 11.1 kv), Ag (excitation energy 25.5 kv), Eu (excitation energy 48.6 kv), Os (excitation energy 78.1 kv), and of U (excitation energy 115 kv) are then given. Fig. 5 shows the curves of pulse-amplitude distribution. Fig. 6 shows the Z-dependence of the excitation efficiency of K-emission of the elements from Z=30 to Z=92 by X-ray and gamma emission of Tu^{170} . It is shown that this excitation is the most effective in the range from Z=47 to Z=64. Further results on characteristic radiations, studied by means of a scintillation spectrometer (its characteristic dispersion $D(E)$ and resolution $\Delta E/E$ are shown in Fig. 8), are discussed, and the amplitude distribution curves in recording the

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A Nuclear X-Ray Generator for
Fluorescence Spectrum Analysis

S/048/60/024/04/01/009
B006/B017

characteristic emission of tantalum, niobium, rare earths, and various minerals are reproduced. As may be seen from Fig. 11, each of the minerals investigated has its own characteristic amplitude distribution function corresponding to the spectral composition of the K-series. Hence, this method allows the determination of minerals. In a table the results of quantitative determinations of rare-earth groups by means of a nuclear generator and a scintillation spectrometer are compared with those obtained by means of an X-ray tube and the crystal diffraction method. Agreement is good. Analysis by means of a nuclear generator takes about one hour (measurement alone and the evaluation of results take only 20 minutes, the remaining time is used for preparing the sample). A. L. Yakubovich is mentioned. There are 11 figures, 1 table, and 14 references: 5 Soviet, 7 American, and 2 Scandinavian.

ASSOCIATION: IGYeM Akademii nauk SSSR (IGYeM of the Academy of Sciences, USSR) IMGRE Akademii nauk SSSR (IMGRE of the Academy of Sciences, USSR)

Card 3/3

S/048/60/024/04/07/009
B006/B017

AUTHORS: Barinskiy, R. L., Nadzhakov, Ye. G.

TITLE: Calculation of the Atomic Charge in Molecules According to
the X-Ray Absorption K-Spectra

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya fizicheskaya, 1960,
Vol. 24, No. 4, pp. 407-414

TEXT: The present article is a reproduction of a lecture delivered at
the 4th All-Union Conference on X-Ray Spectroscopy (Rostov-na-Donu,
June 29 - July 6, 1959). In a previous paper (Ref. 1) the authors suggest-
ed a new method of calculating the X-ray absorption K-spectra of atoms
in molecules, which makes it possible to determine quantum number and
total charge of the absorbing atom. This method has already been applied
to some simple cases (free argon- and neon atoms, Cl₂ and Br₂ molecules,
and Zn²⁺ in solution). In the present paper, the absorption spectra of
atoms in complex molecules (gases, crystals) are computed by this method
in a case in which the atomic charge is not known in advance. For this ✓

Card 1/3

Calculation of the Atomic Charge in Molecules
According to the X-Ray Absorption K-Spectra

S/048/60/024/04/07/009
B006/B017

purpose such molecules are selected for which it can be assumed that the field in the neighborhood of the absorbing atom deviates only inconsiderably from central symmetry. In this case the K-absorption spectrum can be well approximated by means of a Rydberg series of absorption lines and a true edge, as demonstrated in Ref. 1. This assumption is also confirmed by the agreement between theoretical and experimental results. The formulas used for computations are also taken from Ref. 1. Numerical results are compiled in a table. Here, n denotes the quantum number, and η' the effective charge at the periphery of the atom. For comparison, the charges according to Pauling are given. Absorption K-spectra are reproduced in diagrams. In all diagrams, the solid line indicates the experimental shape, the broken line the theoretically calculated shape, and the fine solid curve shows the course of the true edge and the absorption lines. Fig. 1: Cl_2 ($\eta' = 0.0$) and HCl ($\eta' = 0.2$); Fig. 2: Br in ZnBr_2 ($\eta' = 0.24$), and Zn in ZnBr_2 ($\eta' = 0.5$); Fig. 3: Br in GeBr_4 ($\eta' = 0.15$), and Ge in GeBr_4 ($\eta' = 0.75$); Fig. 4: Zn in $\text{Zn}(\text{C}_6\text{H}_5)_2$ ($\eta' = 0.2$), and Zn in $\text{Zn}(\text{C}_5\text{H}_7\text{O}_2)_2$ ($\eta' = 1.6$); Fig. 5: Fe in $\text{Fe}(\text{CO})_5$ ✓

Card 2/3

Calculation of the Atomic Charge in Molecules
According to the X-Ray Absorption K-Spectra

S/048/60/024/04/07/009
B006/B017

($\eta' = 0.4$), and Fe in $K_3Fe(CN)_6$; and Fig. 6: Cr in $Cr(CO)_6$ ($\eta' = 0.4$),
and Cr in K_2CrO_4 ($\eta' = -0.1$). There are 6 figures, 1 table, and 9 refer-
ences: 5 Soviet, 2 American, and 2 West German.

ASSOCIATION: Institut redkikh elementov Akademii nauk SSSR (Institute of
Rare Elements of the Academy of Sciences, USSR).
Fizicheskiy institut Bolgarskoy Akademii nauk (Physics
Institute of the Bulgarian Academy of Sciences)

Card 3/3

✓

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SOV/20-130.2-13/69

24(7)
AUTHORS:

Narbutt, K. I., Barinskiy, R. L., Smirnova, I. S.

TITLE:

X-Ray Spectroscopic Fluorescence Analysis With a Nuclear Source of Primary Radiation

PERIODICAL:

Doklady Akademii nauk SSSR, 1960, Vol 130, Nr 2, pp 291 - 294 (USSR)

ABSTRACT:

The authors attempted to carry out an X-ray spectroscopic fluorescence analysis by replacing the X-ray tube by the artificially radioactive isotope Tu^{170} . The X-ray and γ -emission of this source were used for the fluorescence excitation of the K-radiation of the elements between ^{30}Zn and ^{92}U . Because of the low intensity of the excited fluorescence X-ray emission it was not necessary to investigate the spectral composition by the crystal-diffraction method and to use a scintillation counter with an amplitude analyzer. Pressed, hard tabloids were used. The Tu^{170} source (initial activity: 12 c) consisted of pulverulent Tu_2O_3 which was pressed into an aluminum-foil vessel, and was intensely

Card 1/4

X-Ray Spectroscopic Fluorescence Analysis With a Nuclear ^{170}Yb Source of Primary Radiation

irradiated with neutrons. This Tu^{170} source emits the following radiations: 1) β -radiation with an energy of 968 and 884 keV; 2) γ -radiation with an energy of 84 keV; 3) the characteristic X-ray emission of ytterbium and thulium (primarily $\text{YbK}\alpha_{1,2}$ and $\text{TuK}\alpha_{1,2} \approx 52$ keV); 4) a bremsstrahlung occurring in the slowing down of β -particles in the substance of the source. Figure 1 shows the lines produced by the K-series of several elements under various conditions of excitation. The K-series of Ag (excitation energy of 25.5 kv) is found between the respective values of Ce and Eu. The K-series of Eu (excitation energy of 48.6 kv) is best excited by a 52-keV radiation. The γ -radiation and the bremsstrahlung also participate in its excitation. The K-radiation of Os (excitation energy of 78.1 kv) is excited by an 84-keV radiation and a bremsstrahlung, but not by a 52-keV radiation. The K-series of U is excited only by the bremsstrahlung. Figure 2 illustrates the dependence of the efficiency of excitation of the K-radiation of elements (from $Z = 30$ to $Z = 92$) by the X-ray emission and the γ -radiation.

Card 2/4

67539

X-Ray Spectroscopic Fluorescence Analysis with a Nuclear ^{230}Th Source of Primary Radiation

of the ^{230}Th source upon Z. This nuclear generator is the most efficient for elements from $Z = 50$ to $Z = 63$. The occurrence of false maxima is pointed out. The dispersion curve of the scintillation spectrometer is a broken line consisting of two straight sections. Despite the low resolution of the scintillation spectrometer used it is possible to solve some analytical problems. This method is employed to analyze the element pairs Ta - Nb and Hf - Zr, for example. The authors tested the above described nuclear generator first in a qualitative determination of the total amount of rare earths in various minerals. The results obtained were in close agreement with those found by ordinary fluorescence X-ray spectroscopic analysis and the crystal-diffraction method. The method described is further suited for a rapid determination of minerals, and the small size of the apparatus is advantageous for investigations in the open air. There are 4 figures, 1 table, and 11 references, 2 of which are Soviet.

Card 3/4

5289

X-Ray Spectroscopic Fluorescence Analysis With a Nuclear SOV/20-130-2-13/69
Source of Primary Radiation

ASSOCIATION: Institut geologii rudnykh mestorozhdeniy, petrografii,
mineralogii i geokhimii Akademii nauk SSSR (Institute for the
Geology of Ore Deposits, Petrography, Mineralogy, and Geo-
chemistry of the Academy of Sciences of the USSR). Institut
mineralogii i geokhimii redkikh elementov Akademii nauk SSSR
(Institute for the Mineralogy and Geochemistry of Rare
Elements of the Academy of Sciences of the USSR)

PRESENTED: July 25, 1959, by N. V. Belov, Academician ✓

SUBMITTED: July 24, 1959

Card 4/4

S/081/62/000, 002, 020, 007
B151 B108

AUTHORS Narbat, K. I., Barinskiy, R. L., Smirnova, I. S.
TITLE Application of nuclear radiation in X-ray spectral analysis
PERIODICAL Referativnyy zhurnal. Khimiya, no. 2, 1962, 157, abstract
 2D15 (Sb. "Radioakt. izotopy i yadern. izlucheniya v nau-
 kh-ve SSSR. v. 4. M., Gostoptekhnizdat, 1961, 148-200)

TEXT The construction of an PCg-1 (RSYa-1) X-ray spectrometer with a
 radioactive source instead of an X-ray tube is described. The
 characteristic radiation of the analyzed element is excited by a Ta¹⁴⁰
 source, of about 500 μ curies activity, and is registered by a scintilla-
 tion counter with a differential pulse height analyzer at its output. The
 apparatus can be used for the separate determination of such pairs of
 elements as Ta and Nb, Hf and Zr, Sr and Ba, for determination of the
 overall content in rare-earth elements (REE) (Ce and Y groups separately),
 and also for the determination of the content of any element from As to
 Au when the sample contains no neighbouring (with regard to atomic num-
 bers) elements. The sensitivity of determination of the total of Ce-group REE
 is 10⁻⁶ g/g.

Abstract of nuclear radiation...

S/061/000002/026/10
3151/B108

is 0.5%; with an REE content of 5-100% the relative error of the determination is 0.5%. The apparatus can also be used for the analysis of minerals containing heavy elements (Z > 55) as their main components and differing in their contents of these elements. The form of the curve at the spectrometer output is determined by the chemical composition of the mineral. It is called the characteristic curve by the authors. The minerals can be identified from the shape of this curve. The apparatus is suitable for work in field conditions. [Abstracter's note: Complete translation.]

Card 2/2

LYAKHOVICH, V.V.; BARINSKIY, R.L.

Characteristics of rare earth composition in accessory minerals of
granitoids [with summary in English]. Geokhimiia no.6:467-479 '61.
(MIRA 14:6)

1. Institute of Mineralogy, Geochemistry and Crystal Chemistry
of Rare Elements, Academy of Sciences U.S.S.R., Moscow.
(Rare earth metals)
(Rocks, Igneous)

BORODIN, L.S.; BARINSKIY, R.I.

Rare earth composition in pyrochlores from massifs of ultrabasic-alkaline rocks and carbonatites. *Geokhimiia* no.6:486-492, 1961.
(MIRA 14:6)

1. Institute of Mineralogy, Geochemistry and Crystal Chemistry of Rare Elements, Academy of Sciences U.S.S.R., Moscow.
(Rare earth metals)
(Pyrochlore)

BARINSKI, R. L. [Barinskiy, R. L.]

Determining effective charges of atoms in complex compounds on the
basis of roentgen absorption spectra. Analele chimie 16 no.1:39-49
Ja-Mr '61. (EEAI 10:9)

(Atoms) (Complex compounds) (Absorption spectra)
(X rays)

S. B. LAV, Ye. S. ...; M. P. ...; V. N. ...; M. I. ...

Research in phosphorites. (No. 424-430-111)

(MIRA 1-77)

1. Institute of Mineralogy, Geochemistry and Crystal Chemistry of
Rare Elements, M.S.S.R., Moscow.
(Rare earths) (Phosphorites)

3/601
S/048/02/026/003/013/015
B102/B104

24,3600 (1035, 1138, 1147, 1385)

AUTHORS: Barinskiy, R. L., and Kalyukov, B. A.

TITLE: Interpretation of the K absorption spectra of sulfur in molecules and crystals by the exciton Stark effect

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 3, 1962, 412 - 418

TEXT: In order to explain the nature of the Zeeman and Stark effects observed at the K absorption spectra, an experimental and theoretical investigation of these spectra of S in the gaseous molecules of SO₂, SOCl₂, SO₂Cl₂ and H₂S and in the CaSO₄ crystal was carried out. S was chosen because of its narrow K-band (0.35 ev). The spectra of the first three gases are very similar; the first and most intensive line is narrow (1.0 ± 0.05 ev), i.e., the first exciton level of the K-spectrum of sulfur will not exceed 0.1 ev. This first line of the H₂S spectrum is much broader and shows a structure on its shortwave side. According to calculations of the charge distribution in this molecule, the exciton p-levels

Card 1/3

Interpretation of the K absorption...

S/048/62/026/003/013/015
B102/B104

should be split. This line can thus be assumed as being composed of three lines of equal intensity (1.0 ev broad), two non-split lines (0.05 ev) and a third line shifted to the shortwave side by 0.5 ev. The splitting of the exciton p-levels in H_2S is carried out with the well-known Pauling - Van Vleck method (cf. Cotton, Ballhausen), in first perturbation-theoretical approximation. It is shown that the threefold degenerate p-levels are split into three sublevels due to the action of the electrostatic field of the H molecules: K

$$\begin{aligned} \epsilon^{(1)} &= -2e^2qG_0 + 0,17, \\ \epsilon^{(2)} &= -2e^2qG_0 - 0,08, \\ \epsilon^{(3)} &= -2e^2qG_0 - 0,085. \end{aligned}$$

cf. Fig. 4. These results agree with the experimental ones. Due to its T_d symmetry, the $CaSO_4$ molecule should display no splitting of its exciton p-levels. The first line of its K-spectrum is, however, rather broad, which could be attributed to a p-level splitting caused by more distant lattice atoms (the crystal is of C_{2v} symmetry). The maximum possible

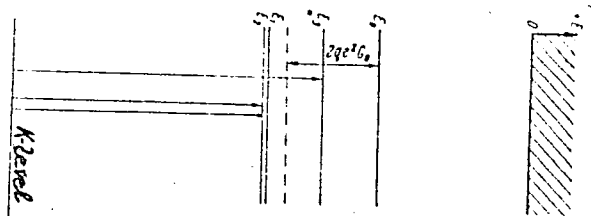
Card 2/3

Interpretation of the K absorption...

S/048/62/026/003/013/015
B102/B104

splitting was calculated to amount to $E = 1.8$ ev. The parameters of the Slater function were found to be $\gamma=1.4$ and $n=1.5$. There are 5 figures and 10 references: 6 Soviet and 4 non-Soviet. The two references to English-language publications read as follows: L. G. Parratt, Rev. Mod. Phys. 31, no. 3, 616, 1959; F. A. Cotton, C. J. Ballhausen, J. Chem. Phys. 25, no. 1, 617, 1958.

Fig. 4



Card 3/3

S/048/63/027/003/0C9/025
B117/B234

AUTHORS: Barinskiy, R. L., and Malyukov, B. A.

TITLE: Stark effect and hybridization in X-ray K-absorption spectra

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 27, no. 3, 1963, 351-358

TEXT: These authors showed in their previous paper (Izv. AN SSSR, Ser. fiz., 26, no. 3, 412 (1962)) that in molecules and crystals where ionic bonding is prominent the first line in the K-spectrum is split, whereas in compounds which have a maximum covalent bond the Stark effect practically never occurs. In the present paper they show that there may be cases where the first line is not split and the Stark effect does not occur till the second line. This happens where the quantum number of the first line approximates to 1 and $\lambda \gg \lambda_0$, e.g. in the K-absorption spectra of chromium in K_2CrO_4 and $K_2Cr_2O_7$ and of manganese in $KMnO_4$. Examination of the fine structure of the absorption spectra of $[CrO_4]^{2-}$ and $[MnO_4]^-$ in aqueous solution showed that in crystals too the Stark effect is attributable less to the crystal lattice field than to the surrounding oxygen. This

Card 1/3

Stark effect and hybridization...

S/O48/63/027/003/009/025
B117/B234

"contradiction" can be explained by the interaction occurring between the p and d levels of the exciton in the external electrical disturbing field, which was not taken into account in the previous paper. In consequence of this, the K-electron can go over to a new level system formed from the original level of the p and d symmetry. Assuming that the p and d levels coincide when the disturbing electrical field is absent, the distance between these levels in the field of the tetrahedron was determined. The splitting was shown to be subject to the stated precondition that

$$\Delta \approx (8\sqrt{15}/21) \text{ eq } G_3 = 20 \text{ q}G_3(\text{ev}) \quad (7).$$

To calculate this amount for the anions under examination, the charges of the oxygen atoms and the multiplier G_3 have to be determined as functions of the effective quantum number of the absorbing atom. The values so determined indicated too small an amount of splitting in the first line to be noticeable, but in the second of the lines examined the splitting was greater by one order of magnitude. Finally, it was established that an additional maximum occurs between the first and second line. This maximum, which does not fit into the exciton series of absorption lines, covers about 10% of the surface of the first line. It could be observed also in most

Card 2/3

Stark effect and hybridization...

S/048/63/027/003/009/025
B117/B234

of the K-absorption spectra of gas molecules and can be attributed to interaction (hybridization) between the p and d levels of the exciton. This interaction between the p and d levels of the excitons and the electrical field of the surrounding particles, as here established, can be used as a basis for explaining details of the X-ray absorption spectra qualitatively, in part also quantitatively. It should be pointed out, however, that the method based on the theory of disturbances which has been followed in the present and in the earlier paper may not always be reliable and should be replaced by a more reliable method. There are 5 figures.

ASSOCIATION: IMGRE

Card 3/3

PAVLOV, M. M., MALYNEKOV, B. A.

On different states of sulfur in pyrosulfite according to
x-ray absorption spectra. Zhur. strukt. khim. 5 no. 4, 624-
627, 1966. (MIRA 12:3)

On the role of mineral acids in the synthesis of crystalline
sulfur.

ACCESSION NR: AP4038763

S/0048/64/028/005/0790/0796

AUTHOR: Barinskiy, R.L.; Malyukov, B.A.

TITLE: K Absorption spectra of calcium, potassium and chlorine ions in water [Report, Seventh Conference on X-Ray Spectroscopy held in Yerevan 23 Sep-1 Oct 1963]

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.5, 1964, 790-796

TOPIC TAGS: x-ray absorption, x-ray spectrum, ionization phenomena, solution, calcium, potassium, chlorine, exciton theory

ABSTRACT: In continuation of a program of testing the applicability of the exciton theory in the form given by Ye.G.Nadzhakov and R.L.Barinskiy (Dokl.AN SSSR 129,1279, 1959; Izv.AN SSSR,Ser.fiz.24,407,1960) the K absorption spectra of Ca^{2+} , K^+ and Cl^- in aqueous solution were obtained and are discussed. The experimental technique is described elsewhere (R.L.Barinskiy, B.A.Malyukov,Izv.AN SSSR,Ser.fiz.28,805,1964) [see Abstract AP4038766]. The Ca^{2+} spectrum was obtained with a 0.7 N CaCl_2 solution and an absorption path of 20 microns. The shape was adequately reproduced by calculations employing the method of Nadzhakov and Barinskiy (loc.cit.) with an effective charge of 3 and an effective quantum number of 2.6. These values agree with

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ACCESSION NR: AP4038763

data obtained from the Sc III optical spectrum. The K^+ spectrum was obtained with an undisclosed solution. The shape agreed with that obtained by S.Kiyono (Sci.Repts. Tohoku Univ., Ser.1,37, No.3, 1953) and was adequately reproduced by calculations employing the method of Nadzhakov and Barinskiy with an effective charge of 2 and an effective quantum number of 2.5. These values agree with data obtained from the Ca II optical spectrum. The field of the water molecules surrounding the doubly charged K-ionized K^+ ion was approximated by that of two charged spheres, and the Schrodinger equation for the motion of an electron in this field was solved. Three bound states were found, and the shape of the K^+ K absorption spectrum was adequately explained in terms of their influence. Thus the spectrum can be explained both with and without taking account of the water; it is concluded that experiments with the spectra of ions in solution are insufficiently sensitive to distinguish between the two interpretations discussed. The Cl^- spectra were obtained using 0.25 N, 0.5 N and 2 N HCl solutions and a 0.5 N KCl solution. The HCl spectra agreed within the experimental error, and they were accordingly averaged. The long wavelength edge of the absorption band was well represented by an inverse tangent with width equal to that of the first chlorine line in gases. The absorption band showed two maxima and a minimum. This structure could not be explained by bound states in the field of the K-ionized Cl^- ion and the surrounding water molecules, and it is ascribed to

Card 2/3

ACCESSION NR: AP4038763

Kronig fine structure. Orig.art.has: 6 formulas and 8 figures.

ASSOCIATION: Institut mineralogii, geokhimii i kristallochimi redkikh elementov
(Institute of Minerology, Geochemistry and Crystallochemistry of Rare Elements)

SUBMITTED: 00

DATE ACQ: 12Jun64

ENCL: 00

SUB CODE: OP

NR REF SOV: 009

OTHER:015

Card 3/3

ACCESSION NR: AP4038766

S/0048/64/028/005/0805/0808

AUTHOR: Barinskiy, R.L.; Malyukov, B.A.

TITLE: Stark effect in the K absorption spectra of chlorine compounds Report,
Seventh Conference on X-Ray Spectroscopy held in Yerevan 23 Sep-1 Oct 1963

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.5, 1964, 805-808

TOPIC TAGS: x-ray spectrum, x-ray absorption, chlorine, chlorine compound, Stark effect

ABSTRACT: The chlorine K absorption spectra were recorded for $C_2H_4Cl_2$, SO_2Cl_2 and $SOCl_2$ in the gaseous state and for $CKlO_3$ and $LiClO_4$ in both the solid state and in 2N aqueous solutions. All experimental details except the construction of the absorption cell for the solutions are described elsewhere (R.L.Barinskiy, B.A.Malykov, Izv.AN SSSR,Ser.fiz.26,412,1962). The absorption cell was a sandwich of three thin films held together by the surface tension of the solution. A 4 mm opening in the central film constituted the cell proper and provided a 20 micron path. Six to eight hour exposures were required with 100 mA and 5.6 kV on the x-ray tube. The gaseous spectra indicated a small charge (approximately -0.1) on the chlorine ion, in agree-

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ACCESSION NR: AP4038766

ment with a conclusion previously drawn from the sulfur spectra (loc.cit supra). A second absorption line was present. This is ascribed to the partly forbidden transition of the K electron to a d state of the exciton. Both the solid state and the solution spectra of $KClO_3$ indicated an effective charge of 0.7 on the chlorine ion. The width of the first absorption line in the solid was 1.3 eV. In the solution, the first absorption line was double, with the low intensity component about 1 eV on the high energy side. Otherwise the two spectra were very similar. Stark effect calculations considering only the three oxygen atoms in the ClO_3^- ion are said to predict a smaller separation and a displacement in the opposite direction than observed. The assumption that an oxygen atom from the solvent approaches the chlorine ion on its unprotected side, however, is said to lead to agreement with the experiment. The two $LiClO_4$ spectra, solid and solution, were identical within the experimental error. The first absorption line in both cases was 0.8 eV wider than in the gaseous spectra. In the solid state this broadening can be ascribed to the influence of the lattice. In the solution the broadening must be ascribed to solvation. The mechanism is unclear, however, since there is no "unprotected side" of the Cl ion in ClO_4^- , and no estimate of the effect of solvation is submitted. Orig.art.has: 4 figures.

Card 2/3

ACCESSION NR: AP4038766

ASSOCIATION: Institut mineralogii, geokhimi i kristallokhiimi redkikh elementov
(Institute of Minerology, Geochemistry and Crystallochemistry of Rare Elements)

SUBMITTED: 00

DATE ACQ: 12Jun64

ENCL: 00

SUB CODE: OP

NR REF SOV: 004

OTHER: 000

Card 3/3

1. The first step in the synthesis of the polymer is the

study of the polymerization of the monomer in solution. It is
observed that the polymerization of the monomer in solution
proceeds in a stepwise manner, and the structure of the polymer
is determined by the conditions of the reaction.

2. The first step in the synthesis of the polymer is the
study of the polymerization of the monomer in solution.

BARINSKIY, R.L.

Calculation and experimental investigation of absorption L-spectra of noble gases. Izv. AN SSSR. Ser. fiz. 25 no.8:947-953 Ag '61. (MIRA 14:8)

1. Institut redkikh elementov AN SSSR.
(Gases, Rare--Spectra)

SECRET

1. The purpose of this document is to provide information on the activities of the [redacted] in the [redacted] area. This information is being provided to you for your information only and should not be disseminated to other personnel.

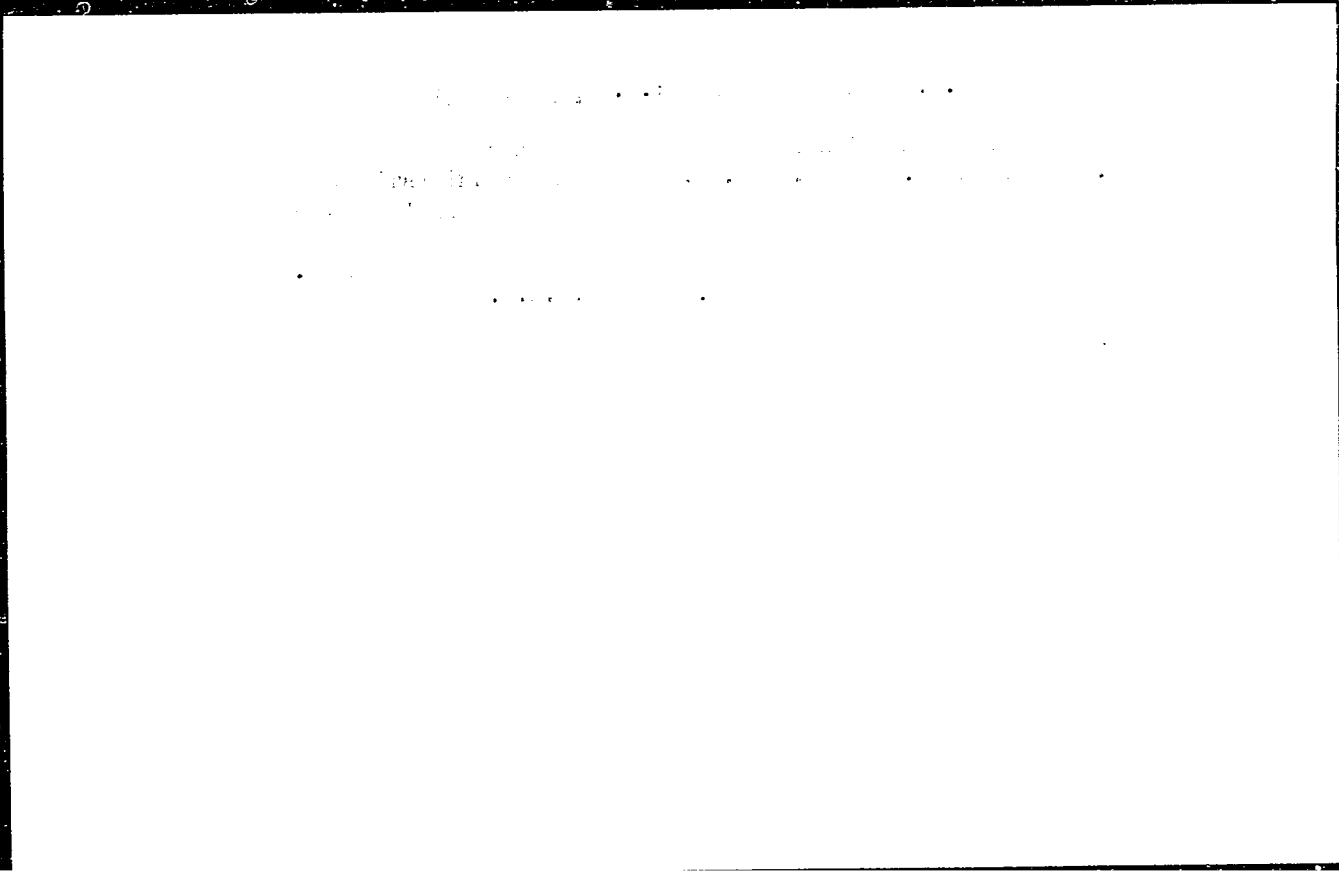
2. The information contained in this document is classified as SECRET and is exempt from automatic downgrading and declassification. It is to be controlled in accordance with the provisions of the [redacted] and the [redacted].

DZHUVARLY, Ch.M.; BARIROV, M.A.; VECHKHAYZER, G.V.

Experimental study of the electrothermal treatment of an oil-bearing
layer. Neft. khoz. 38 no.12:34-39 D '60. (MIRA 14:4)
(Oil fields--Production methods)

BARISHANSKIY, V.M.; ZABLOTSKAYA, T.V.; IVASHCHENKO, N.I.

Heat transfer due to metallic sodium moving in a tube.
Atom. energ. 16 no.6:524-526 Je '64. (NIRE 17:7)



IVANOV, P., inzh.; BARISHMAN, F.

Automatic control of the running in of engines. Avt. transp. 46
no.1:27-29 Ja '62. (Milg. 1,11)
(Motor vehicles--Engines) (Electronic control)

S/250/62/006/006/003/006
I046/I242

AUTHORS: Fisher, I.Z. and Barishovskiy, V.G.
TITLE: Radiation of a spark between metallic contacts
PERIODICAL: Akademiya nauk Belorusskoy SSR. Doklady, v.6, no.6, 1962,
360-362

TEXT: High-voltage sparks between planar metallic electrodes are made up of very thin streams of current that shift continuously at a characteristic frequency of $10^8 - 10^9$ cps. Calculations with an idealized model, viz., a steady-current element of finite length oscillating harmonically at right angles to its length, show that the radiation is essentially restricted to the equatorial plane of the element where it propagates mainly in the direction of the mechanical oscillation. No exact solution can be obtained for the actual case allowing for diffraction at the electrodes and for the nonlinearity and anharmonicity of spark oscillation. An approximation that considers the spark-stream motion as a random process

Card 1/2

S/250/62/006/006/003/006
I046/I242

Radiation of a spark...

shows that radiation, losing its line directivity, is still restricted to the equatorial plane. The radiative power output in the actual case is close to that of the idealized model.

ASSOCIATION: Belorusskiy gosudarstvennyy universitet im. V.I. Lenina (Belorussian State University im. V.I. Lenin)

PRESENTED: by M.A. Yel'peshovich, Academician, AS BSSR

SUBMITTED: September 20, 1961

Card 2/2

S/262/62/000/021/002/003
E194/E435

AUTHORS: Ivanov P., Barishman, E.

TITLE: Automatic control of running-in of an engine

PERIODICAL: Referativnyy zhurnal. Otdel'nyy vypusk.
42. Silovyye ustanovki, no.21, 1962, 52,
abstract 42.21.311. (Avtomob. transport., no.1, 1962,
27-29)

TEXT: The operation and schematic diagram of an installation developed in TsNIIME are described. The equipment automatically records changes in friction loss and adjusts the engine speed and load to the next set of conditions required. The equipment can be used to select the optimum running-in conditions for any engine and makes the running-in process automatic.

[Abstracter's note: Complete translation.]

Card 1/1

For [unclear] A.I.
LENYUNSKIY, A. T., KAMACHNEVSKIY, S. D., AZU ANTONOV, G. A., BELAR, YA. A. S.,
KARACHENSKIY, A. I., GAIKIN, V. I., SHAVIRSKIY, Ya. Y., LITVIN, S. A. and [unclear] M. Y.

Effective Cross-Section Measurements of Fast Neutron Reaction Capture.

to be presented at 2nd Int. Conf. on the Peaceful Uses of Atomic Energy, Geneva, 1-11 Sept 64.

PROCESSES AND PROPERTIES INDEX

u-3

BARISHNIKOVA, A. N.
BC

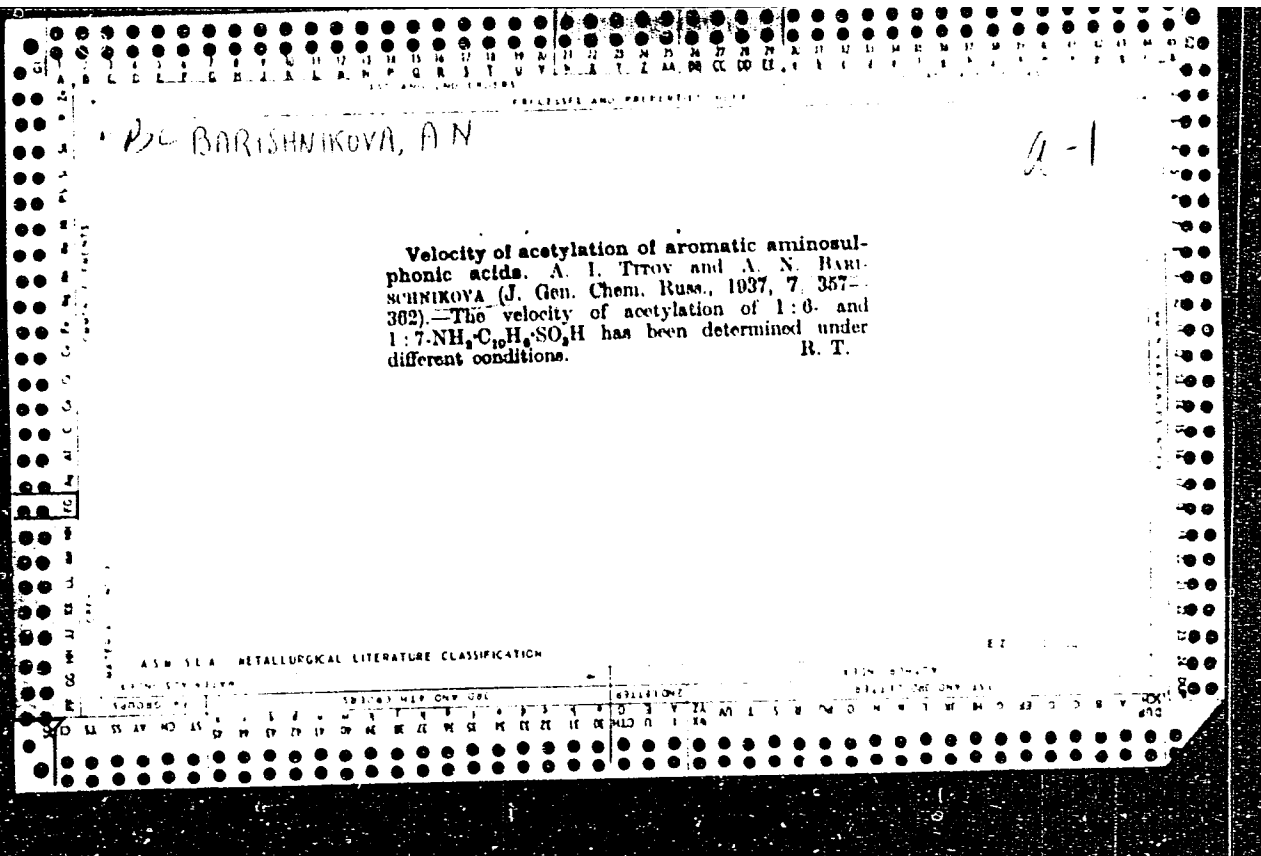
Action of nitrogen peroxide on benzene, toluene, and chlorobenzene. I. Nitration in presence of sulphuric and phosphoric acids. A. I. Titov and A. N. BARISHNIKOVA. II. A. I. Titov (J. Gen. Chem. Russ., 1936, 6, 1801—1805, 1855—1862).—I. PhNO₂ is obtained in 98.4% yield, and of high purity, by adding a solution of 35 g. of N₂O₄ in 100 g. of 94% H₂SO₄ to C₆H₆ at 40—50°. The reaction proceeds with explosive velocity in presence of Hg. PhMe is nitrated similarly, at 0—15°, whilst PhCl is nitrated with saturated NO-HSO₄, adding oleum during the reaction.

II. The products of reaction of PhMe with gaseous N₂O₄ in diffused daylight, sunlight, or ultra-violet light were CH₃Ph·NO₂, CHPh(NO₂)₂, PhCHO, Br₂OH, and C₆H₄Me·NO₂. R. T.

ASSOCIATED METALLURGICAL LITERATURE CLASSIFICATION

RESEARCH REPORT

RESEARCH REPORT



BARISHNIKOVA, N.V.

M *18*

***The Time Factor in the Heat-Treatment of Cast Alloys of the Silumin Type.**
 A. M. Korol'kov and N. V. Barishnikova (*Izv. Akad. Nauk S.S.S.R.*, 1943, [Tekhn.], (8), 57-61; *Brd. Abs.*, 1945, [B1], 39).—[In Russian.] Samples of the alloy (containing silicon 10-90, iron 0-04, manganese 0-40, magnesium 0-30%, remainder aluminium) were heated at $535 \pm 5^\circ\text{C}$. for t_1 hr., quenched, and annealed at $175 \pm 5^\circ\text{C}$. for t_2 hr. When t_1 increased from 0 to 3, the ultimate tensile strength of the samples rose and their total elongation decreased. A change of t_1 between 3 and 10 had no effect; after $t_1 = 20$ the alloy weakened slightly. Variation of t_1 between 0-5 and 12 had no effect on the mechanical properties of the annealed alloys. For very small samples $t_1 = 0-1$ was sufficient. Samples heated in a salt bath did not differ from those heated in air. The larger t_1 was, the larger were the silicon crystals in the alloy. When the annealed alloy was slowly heated (1-2 min.), it expanded irreversibly between 200° and 300°C .; the degree of expansion was the smaller the longer were t_1 and t_2 , but the effect of t_1 was less distinct.

ASME-SLA METALLURGICAL LITERATURE CLASSIFICATION

62

ACC NR: AP7004150 (M) SOURCE CODE: UR/0375/67/000/001/0029/0037

AUTHOR: Zubkov, N. A. (Candidate of military science; Colonel); Barishpolets, V. A. (Engineer; Captain 3d rank)

ORG: none

TITLE: Programmed evaluation and review technique PERT as a tool of scientific research

SOURCE: Morskoy sbornik, no. 1, 1967, 29-37

TOPIC TAGS: stochastic process, mathematic method, planning, scientific research, PERT, programming, programmed evaluation

ABSTRACT: The authors analyze conditions under which mathematical methods of PERT may be applicable, specifically when investigating stochastic processes. The use of these methods may be a time-saving factor in nuclear warfare, and may be used to investigate the operational efficiency of control of naval forces and facilities. The complexity of the construction of network models and the methods to be used in this connection are analyzed. The authors stress the value of the PERT method in obtaining quantitative indices characterizing the operational capability

Card 1/2

ACC NR: AP7004150

of the control system and to streamline the operations of electric computers.

Orig. art. has: 8 figures and 7 formulas.

[GC]

SUB CODE: 09, 12, 15/SUBM DATE: none/ORIG REF: 003/

Card 2/2

BARISHCULETS, V. T., Cand Tech Sci -- (diss) "An Investigation of the Operation of the Centrifugal Foam Remover During the Airlift-Centrifugal Flotation Method." Dnepropetrovsk, 1960, 20 pp with illustrations (Dnepropetrovsk Order of Labor Red Banner Mining Institute in Artem) 150 copies, no price given (KL, 21-50, 122)

BARISHPOLETS, V.T.

Use of a centrifugal field for intensifying the evolution of
meneralized air bubbles from the flotation pulp. Koks i khim.
no.4:6-10 '60. (MIRA 13:6)

1. Dnepropetrovskiy gornyy institut.
(Coal preparation) (Flotation)

LIVSHITS, G.L., inzh.; RAYVICH, I.D., inzh.; BARISHPOLETS, V.T., kand.tekhn.
nauk; KORYAKOV-SAVOYSKIY, B.A., kand.tekhn.nauk

Increasing the number of flotation cells in the existing industrial
areas of coal preparation plants. Ugl' Ukr. 5 no.5:19-21 My '61.
(MIRA 14:5)

1. Nikitovskaya tsentral'naya ugleobogatitel'naya fabrika.
(Flotation) (Coal preparation plants)

BARISHPOLETS, V.T., kand. tekhn. nauk:

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1. Kamyshburunskiy zhelezorudnyy kombinat.
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(Kerch Peninsula--Iron ores) (Ore dressing)

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YUGOSLAVIA / Chemical Technology. Chemical Products. H
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Abs Jour: Ref Zhur-Khimiya, 1958, No 20, 69559.

Author : Barisic J.
Inst : Not given.
Title : Glueing of Rubber Soles to Leather.

Orig Pub: Kosha i obucha, 1957, 6, No 7, 247-249.

Abstract: A method of glueing rubber soles to leather with
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GUSEV, M.N., kand. tekhn. nauk, dotsent, retsenzent;
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(Ships--Maintenance and repair--Production standards)

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Gamma Rays
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An investigation of the selective absorption of gamma rays can give worth-while information on the plans of the atomic nucleus. Authors attempt to show that it is possible to study the selective absorption of gamma rays by the so-called self-indicator method,

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36T81

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Nuclear Physics - Ionization Chambers

"Statistical Theory of Errors in Measurements With
an Ionization Chamber," I. Ya. Barit, M. I.
Podgoretskiy, 13 pp

"Zhur Tekh Fiz" Vol XIX, No 6

Statistical regularities in an ionization chamber
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results of consecutive measurements. Studies
case when an inertial measuring instrument is

46/49150

USSR/Mathematics - Statistics (Contd) Jun 49

Included in the chamber circuit separately.
Submitted 18 Jun 48.

46/49150

PA 77 T4

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5/10/51
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Devices," I. Ya. Barit, M. I. Podgoretskiy, A. Ye.
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Derives formula to calculate errors in operations
with counting devices (Geiger counter) for various
assumptions relative to the "dead" time of the
registering unit. Gives corresponding curves.
Submitted 18 Jun 48.

46/4951

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Several studies have been conducted in the U.S. since 1960* (June 1960).

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"Some Statistical Relations Connected With the
Observation of Wide Atmospheric Showers," I. Ya. Barit,
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23 Jun 49.

2/50T97

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(Lebedev Physical Inst., Acad. Sci. USSR)

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BABIT, I. Ya.

JOLIOT-CURIE, Frederic; SKOBEL'TSYN, D.V., akademik, otvetstvennyy redaktor;
TAMM, I. Ye., redaktor; DZHELEPOV, B.S., redaktor; FRANK, I.M.,
redaktor; GROSHEV, L.V., redaktor; SMIRNOVA, G.N., redaktor; BARIT,
I. Ya, redaktor izdatel'stva; RYNDZYUNSKAYA, S.M., redaktor izdatel'stva;
ZELINKOVA, Ye.V., tekhnicheskii redaktor; NAZARYAN, L.V., tekhnicheskii
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[Selected works. Work written in collaboration with Irene Joliot-Curie]
Izbrannye trudy. Frederik i Iren Zholio-Kiuri. Sovmestnye trudy.
Moskva, Izd-vo Akademii nauk SSSR, 1957. 561 p. (MLRA 10:2)
(Radioactivity)

65946

SOV/58-59-4-7684

24.6600

Translation from: Referativnyy Zhurnal Fizika, 1959, Nr 4, p 60 (USSR)

AUTHORS: Balabanov, Ye.M., Barit, I.Ya., Katsaurov, L.N., Frank, I.M., Shtranikh,
I.V.

TITLE: Yield and Effective ¹⁹Cross-Section Measurements of $D(t,n)He^4$ and $D(d,p)T$ Reactions for a Thick Heavy-Ice Target

PERIODICAL: V sb.: Yadern. reaktsii na legkikh yadrakh. Moscow, Atomizdat, 1957, pp 48 - 56

ABSTRACT: The authors measured the yield and effective cross sections of $D(t,n)He^4$ and $D(d,p)T$ reactions for heavy ice in the 50 - 200 Kev deuteron energy range. A D_2^+ or HT^+ beam from an ion-accelerating tube was sorted in accordance with the different masses of the particles by means of a magnet and a system of diaphragms. The reaction yield was determined from the number of alpha-particles or protons registered at an angle of 90° to the beam with the aid of proportional counters. For the $D(t,n)He^4$ reaction a maximum was observed for 160 Kev tritons; the magnitude of the cross section at the maximum was equal to 4.34 barn. The yield and cross-section measurements of the $D(d,p)T$ reactions were carried out by way of a check,


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65916

SOV/58-59-4-7684

Yield and Effective Cross-Section Measurements of $D(t,n)He^4$ and $D(d,p)T$ Reactions for a Thick Heavy-Ice Target

since reliable results for this reaction using a gas target have been published (Sanders et al, Phys. Rev., 1950, Vol 77, p 1754, McNeill, K.G., et al, Phys. Rev., 1951, Vol 81, p 602). The results of the measurements showed that for a significant part of the energy range the obtained cross sections were 10 - 20% less than those obtained using a gas target. The authors assume that this is due to an inaccuracy in the values utilized for the energy losses in D_2O , or to some other systematic errors .

V.I.Ch. 

Card 2/2

Handwritten: 11.11.57

BALABANOV, Ye.M.; BARIT, I.Ya.; KATSAUROV, L.N.; FRANK, I.M.; SHTRANIKH, I.V.

Measurement of the effective cross section of the $D(t,n)He^4$ reaction
in the 40-730 Kev deuteron energy range. Atom. energ. suppl. no.5:57-
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(Nuclear reactions) (Deuterons)