NAZARENKO, Ustin Petrovich; AFANAS'YEV, N.A., red.; BUL'DYAYEV, N.A., tekhn. red.

[Operation of piston-type air compressors] Ekspluatatsiia vozdushnykh porshnevykh kompressorov. Moskva, Gosenergoizdat, 1963. 63 p. (Biblioteka elektromontera, no.99)
(MIRA 16:10)

(Air compressors)

NAZARENKO, V.A.

21 (7), 21 (8)

AUTHOR: Rudakov, V. P. SOV/89-[illegible]-18/25

TITLE: IX All-Union Conference on Nuclear Spectroscopy
(IX Vsesoyuznoye soveshchaniye po yadernoy spektroskopii)

PERIODICAL: Atomnaya energiya, 1959, Vol 7, Nr [illegible], pp [illegible] (USSR)

ABSTRACT: The IX All-Union Conference was held from January 26 to February 2, 1959 at Khar'kov. More than 300 participants heard 100 lectures, the most important of which dealt with the following fields. Nuclear Theory. General problems of β-decay. A. S. Davydov (MGU): Theoretical classification of low-energy excited nuclear states. L. K. Peker: Deformed nuclei. [illegible] Birbrair, L. K. Peker, L. A. Sliv (LFTI): Quadrupole oscillations of deformed nuclei. Ye. V. [illegible], V. [illegible], S. P. Taytko (KhFTI): Calculation of the ft-values and matrix elements for β-transitions by means of the generalized nuclear model. S. T. Belyayev (IAE): Consideration of pair-correlation in nuclei. A. B. Migdal (IAE): The application of the superconductivity model to nuclei for the purpose of calculating their moments of inertia. P. E. Nemirovskiy (IAE): Problems of the neutron stability of nuclei. [illegible] (IAE): The present stage in the theory of β-decay. [illegible], V. K. Grigor'yev, [illegible], [illegible] (ITEF): Measurement of the angular correlation between electron and neutrino in the decay of the neutron. [illegible], V. A. Nazarenko, [illegible] (LFTI): Measurement of the correlation between the transversal electron polarization and circular polarization of γ-quanta occurring in the decay of Sc^{46} and Co^{60}. Decay Schemes. γ-radiation of Nuclei. [illegible] Amufriyev, A. K. Val'ter, Yu. V. Gonchar, Ye. [illegible], A. N. L'vov, P. M. Tsipkin, S. P. Tsytko, [illegible], A. [illegible], A. Ya. [illegible], [illegible] (Fiziko-tekhnicheskiy Khar'kovskiy institut (Physico-technical Institute, Khar'kov)): The $Si^{28,29,30}(p,\gamma)$, $Ne^{20}(p,\gamma)$, $S^{32,34}(p,\gamma)$, $Ar^{40}(p,\gamma)$ and [illegible] (p,γ) reactions. D. G. Alkhazov, A. P. Grinberg, G. M. [illegible], I. Kh. Lemberg, V. V. Rozhdestvenskiy, [illegible] (of the Leningradskiy fiziko-tekhnicheskiy institut (Leningrad Physico-technical Institute)). Investigation of the Coulomb excitation of the lower levels of some nuclei during their bombardment by multiply charged ions (C, N, O, and Ne). [illegible], A. N. Murin, V. N. Pokrovskiy, [illegible] (RIAN): New isotopes Tm^{161}, Ho^{153}, Ho^{155} and Ho^{157}. B. S. Dzhelepov, [illegible] Sergiyenko (LGU): Decay schemes of some neutron-deficient isotopes, set up on the basis of measurements of the coincidence of the internal conversion electrons. Spectroscopy Engineering. B. S. Dzhelepov, [illegible], [illegible], V. G. Chumin (RIAN): β-spectrometer with double focusing. V. A. [illegible], [illegible], A. [illegible], A. [illegible], N. Ya. Shashkin (IAE): Improved β-spectrometer. [illegible] Marchuk, [illegible], V. I. [illegible], [illegible] (FTAN UkrSSR): Magnetic spectrograph for heavy charged particles. The representatives of the Ministerstvo radiotekhnicheskoy promyshlennosti (Ministry of the Radio-engineering Industry) gave a report about new multipliers. The Conference was closed by B. S. Dzhelepov who stressed the fact that nuclear tables and reference works ought to be published much more quickly in order to be of real use to the experimenter.

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Card 3/3

24.6200,24.6400,24.6500,
24.6600,24.6700,24.6510

77001
SOV/56-37-6-41/55

AUTHORS: Lobashev, V. M., Nazarenko, V. A. and Rusinov, L. I.

TITLE: Letter to the Editor. The Polarizational β-γ-Correlation in the β-Decay of Co^{60}

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 6, pp 1810-1811 (USSR)

ABSTRACT: As was predicted by A. Z. Dolginov (cf., Zhur. Eksp. i Teoret. Fiz., 35, 178, 1958) and H. A. Tolhock (cf., Rev. Mod. Phys., 28, 277, 1956), a transverse polarization of β-electrons escaping in a plane perpendicular to the nuclear spin, takes place during the β-decay of polarized nuclei. The authors have investigated the correlation between the transversely polarized electrons and circularly polarized γ-quanta formed in the β-decay of Co^{60} ($\sim$100 μ Cu). A case was studied where the electron momentum $\vec{p}$ lies in the plane perpendicular to the momentum $\vec{k}$ of γ-quantum, which possesses circular polarization σ. The spin of electron s was anti-parallel to $\vec{k}$. Measurements

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Letter to the Editor. The Polarizational β-γ-Correlation in the β-Decay of Co^{60}

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were made of the degree of the circular polarization of γ-quanta, which coincide with β-electrons. The circular polarization of γ-quanta was determined from the compton scattering forward on magnetized iron. The substitution of the results in the equation

$$\Delta = 2(I_1 - I_2)/(I_1 + I_2), \quad I_{1,2} = R_c/R_\beta R_\gamma;$$

gave $\Delta = (0.50 \pm 0.18)\%$. The calculation with the aid of the equation

$$W(\sigma) = 1 + A\sigma. \quad (1)$$

yielded A = 0.32 ± 12. The theoretical value for A is 0.24 (cf., A. Z. Dolginov, loc. cit.). This work was performed under the guidance of A. Z. Dolginov;

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Letter to the Editor. The Polarizational β-γ-Correlation in the β-Decay of Co^{60}

77001
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O. V. Saltykovskiy, V. S. Andryukevich and A. V. Kurakin participated in the experimental part of this study. There is a schematic diagram of the setup; and 6 references, 1 Soviet, 1 German, 4 U.S. The U.S. references are: H. A. Tolhock, Rev. Mod. Phys., 28, 277 (1956); H. Schopper, Phil. Mag., 2, 710 (1957); F. Bohem, A. H. Wapstra, Phys. Rev, 109, 456 (1958); N. Sherman, Phys. Rev., 103, 1601 (1956).

ASSOCIATION: Leningrad Phys.-Tech. Inst. Acad. Sciences USSR, (Leningradskiy fiziko-tekhnicheskiy institut, Akademii nauk SSSR)

SUBMITTED: August 14, 1959

Card 3/3

89197

S/056/61/040/001/002/037
B102/B204

24.6810

AUTHORS: Lobashov, V. M., Nazarenko, V. A., and Rusinov, L. I. (Deceased)

TITLE: βγ-Polarization correlation in the β-decay of Sc^{46}

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 1, 1961, 10-12

TEXT: Within the framework of experiments made for the purpose of verifying the T-invariance of the β-decay, the βγ-correlation in the decay of polarized neutrons and the βγ-correlations in the decay of orientated nuclei has already been measured, and it was found that (with an accuracy of 15-30%) no imaginary part occurs in the β-interaction Hamiltonian. The amount of this correlation in these experiments depends on the imaginary part of the interference VA terms; as, however, an S- and T-admixture could hitherto not be excluded, this should also be taken into account. This was the purpose of the present paper. By trying to estimac the amount of Im(VT, SA), the correlation between the transverse polarization of the electron and the circular polarization of the gamma quantum were experimentally determined.

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89197

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βγ-Polarization correlation ...

The experimental arrangement is shown in Fig. 2. A theoretical study of the correlation coefficient K for allowed transitions (according to A. Z. Dolginov) shows that K depends on the degree of interference of the Gamow-Teller and the Fermi matrix elements. Thus, Sc^{46} was chosen as a source owing to its high degree of interference of the matrix elements. The electrons coming from the source (S) are collimated on a bismuth film (0.5 mg/cm^2), scattered through ~135°, and recorded by means of a scintillator, which is connected with the photomultiplier via a light pipe. Owing to the azimuthal asymmetry, which is connected with Mott scattering, the beam of the scattered electrons is polarized in the direction $[\vec{p}_1\vec{p}_2]$, ($\vec{p}_1$ is the momentum of the electron before, and $\vec{p}_2$ that after scattering). In order to increase counting intensity, circular geometry was used. The circular polarization of the γ-quanta was measured by means of the method of the Compton forward scattering on magnetized iron. The outputs of the photomultiplier of the β- and γ-detectors were connected in fast-slow coincidence with $2\tau = 1.8\cdot 10^{-8}$ sec. From the measured results $\Delta = 2(I_1-I_2)/(I_1+I_2)$, $I_{1,2} = R_{coinc}/R_\beta R_\gamma$ was calculated, and thus $K = \Delta/P_\gamma P_\beta$ was determined, where

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βγ-Polarization correlation ...

P_γ, and P_β are the efficiency of the γ and β-polarimeters. One obtained: $\Delta = (+0.15 \pm 0.11)\%$, and herefrom the correlation coefficient was found to be $K = 0.08 \pm 0.06$. The experiments were repeated by means of a thick scatterer ($\sim 5 mg/cm^2$), from which it followed that the experimental arrangement had no asymmetry. Thus, it was found that, as

$$K = +0.04 \text{ with } Im(VT,AS) = 0$$

$$K = \begin{cases} +0.23 \\ -0.15 \end{cases} \text{ with a maximum } Im(VT,AS)$$

is $Im(VT,AS) = 0$ with a statistical accuracy of ~30%. For the purpose of checking the experimental method, also βγ correlation experiments were carried out on Sc^{46} and Co^{60}, and results were obtained, which showed good agreement with those obtained by other authors. The authors finally thank A. Z. Dolginov for discussions and for his interest, O. M. Saltykovskiy, V. V. Andryukevich, and A. V. Kurakin for the experimental assistance. There are 2 figures and 5 references: 2 Soviet-bloc and 2 non-Soviet-bloc.

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βγ-Polarization correlation ...

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Institute of Physics and Technology of the Academy of Sciences USSR)

SUBMITTED: June 22, 1960

Legend to Fig. 2: S - source; 1) electron scatterer, 2) plastics scintillator, 3) light pipes, 4) vacuum chamber, 5) outlet window for γ-quanta, 6) magnet of the γ-polarimeter, 7) photomultipliers.

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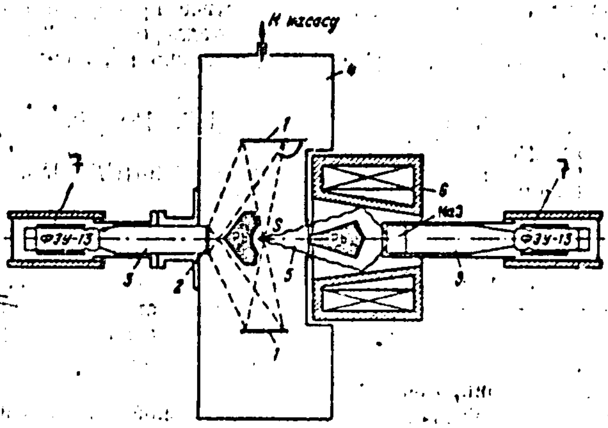
Fig. 2



Card 5/5

LOBASHOV, V.M.; NAZARENKO, V.A.

Studying the decay of Pr^{144} by the $\beta\gamma$-correlation method.
Zhur. eksp. i teor. fiz. 41 no.5:1433-1437 N '61. (MIRA 14:12)

1. Leningradskiy fiziko-tekhnicheskiy institut AN SSSR.
(Praseodymium—Decay)
(Quantum theory)

34635 S/056/62/042/002/008/
B10[illegible]/B[illegible]

26.2541

AUTHORS: Lobanov, V. [illegible], Nazarenko, V. A.

TITLE: Investigation of the dependence of βγ correlation on the electron velocity in the β decay of Co^{60} and Au^{198}

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. [illegible], no. [illegible], 1962, 358 - 365

TEXT: The dependence of the βγ correlation coefficient of circularly polarized gamma quanta on the electron v/c value was measured with Co^{60} and Au^{198} gamma quanta. The purpose was to find out whether it is dependent on v/c. Page et al. (Phys. Rev. 112, 893, 1958) have found that it is not, whether it is ~v/c as found by P. Ye. Spivak et al (ZhETF 35, [illegible], or ~ v/3c (e.g. Phys. Rev. 106, 1364, 1957; 109, [illegible], 1958) or if it deviates from v/c by an energy-dependent amount (A. I. Alikhanov, G. P. Yeliseyev, V. A. Lyubimov (ZhETF, 39, 587, 1960) found a 20% deviation in the [illegible] kev range). An arrangement (Fig. 1) with carefully shielded photomultipliers was used. The pulses from these multipliers were fed into a fast-slow coincidence circuit with a time resolution of [illegible]. A [illegible]

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B[illegible]/B[illegible]

Investigation of the dependence...

count rate of the β-channel was [illegible] pulses/sec, [illegible] with the pulse-selection method using a [illegible]-channel pulse-height analyzer. The [illegible] source was prepared by electrolytic precipitation of [illegible] μg/cm² on a Al base with [illegible]0 μg/cm² copper on top. Activity was [illegible] μ[illegible]. The coefficient was calculated from Δ = [illegible](1 - [illegible]) [illegible], [illegible] where the N are count rates, δβ is the correction for the influence of magnetic field on the β-channel and is less than 0.05%. Due to multiple scattering effects, it was found that for E < 50 kev the function Δ [illegible] is somewhat steeper than the straight line [illegible]. For Au^{198} (~100 μc), on an Al, (0 - 80) μc, the values measured fit the straight line [illegible] which confirms the data obtained by R. M. Steffen and agrees with the assumption that the Au^{198} β-decay is a Coulomb transition. V. V. Andr[illegible]akevich, V. P. [illegible], G. D. [illegible] and L. F. [illegible] are thanked for assistance. There are [illegible] figures and 18 references: 5 Soviet and [illegible] non-Soviet. The four most recent references to English-language publications read as follows: R. M. Steffen Phys. Rev. 118, [illegible], [illegible]; H. App[illegible] Phys. Rev., 109, [illegible], [illegible]; R. M. Steffen. Phys. Rev. [illegible], [illegible] and [illegible]

S/056/62/042/002/008/05
B102/B138

Investigation of the dependence...

Morita. Nucl. Phys. 14, 106, 1959.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Physicotechnical Institute of the Academy of Sciences, USSR)

SUBMITTED: July 21, 1961

Legend to Fig. 1: (1) Source, (2) stilbene crystal, (3) NaI(Tl) crystal, (4) light pipe, (5) lead collimator, (6) lead shield, (7) dispersing magnet, (8) jacket of Armco iron, (9) Permalloy jacket.

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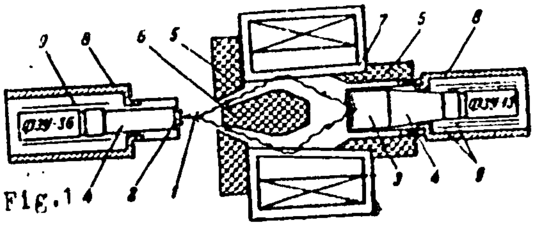

Fig.1

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S/056/62/042/002/010/05
B102/B138

AUTHORS: Lobashov, V. M., Nazarenko, V. A.

TITLE: βγ-correlation in Mn^{56} and F^{20} β-decays

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki v. 4
no. 2, 1962, 370-374

TEXT: From the well-known $Mn^{56} \to Fe^{56}$ decay the β-transition with limiting spectrum energy of 2.86 Mev was studied in detail. This transition takes place to the first excited level of Fe^{56} which goes over to the ground state with emission of an 845-kev gamma quantum. ($3^+ \xrightarrow{\beta} 2^+ \xrightarrow{\gamma} 0^+$; log ft = 7.2). The angular correlation of this (allowed) transition was measured with an apparatus similar to that described by Steffen (see ref w The source was obtained by irradiating $Mn^{55}F_2$, on an Al backing, with $\sim 10^{13}$ neutrons/$cm^{-2}sec^{-1}$. The β-electrons were detected with a stilbene crystal and an ФЭУ-36 (FEU-36) photomultiplier, the gamma quanta with an NaI(Tl) crystal and an ФЭУ-13 (FEU-13) multiplier. Both multipliers had Armco and Permalloy housings. The NaI(Tl) crystal was lead shielded.
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βγ-correlation in Mn^{56} and

against scattered gamma rays. The multipliers were connected in a fast-slow coincidence circuit with a time resolution of $6\cdot10^{-9}$ sec, the random coincidence background was 3-6%. An anisotropy of the angular γβ correlation was observed, $W(\theta) = 1 + A_2\cos^2\theta$, the anisotropy factor was $A_2 = +(0.022 \pm 0.003)$; θ is the angle between β-electron and gamma quantum momenta. Inner bremsstrahlung and multiple scattering are neglected, the correction for asymmetry due to γγ-coincidences was ~0.2%. The correlation between β-electron emission and circular polarization of the gamma quantum was determined for the same β-decay component. The correlation factor for the Gamow-Teller transition was found to be ~ $-v/3c$ for this sequence of spin levels, the numerical value was $-(0.80 \pm 0.06)v/3c$. The angular anisotropy and the anomalous magnitude of the polarization correlation can be explained from estimates of the second forbidden matrix elements. Measurements were also made of the polarization γβγ correlation in the F^{20} β-decay. For the F^{20} ground state, spin and parity were found to be the correlation factor was calculated as $-0.12^{+0.2}_{-0.10}$, its measured value was 0.14 ± 0.07. Professor D. M. Kaminker is thanked for interest. V V

Card 2/3

Andryukevich, G. D. Chuklin and V. B. Belyakov, N. V. Timofeyev and V. I. L'vova for help. There are 1 table and 15 references: 2 Soviet and 13 non-Soviet. The four most recent references to English-language publications read as follows R. M. Steffen. Phys. Rev. Lett., 3, 277, 1959. J. H. Hamilton, B. G. Petterson. Bull. Am. Phys. Soc., 5, 9, 1959. M. Morita. Nucl. Phys., 14, 106, 1959. P. Dagley, M. A. Grace, J. M. Gregory, J. S. Hill. Proc. Roy. Soc., 250, 550, 1959.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Physicotechnical Institute of the Academy of Sciences, USSR)

SUBMITTED: August 8, 1961 (initially), February 5, 1962 (after revision)

Card 3/3

S/056/62/043/005/005/058
B163/B186

AUTHORS: Lobashov, V. M., Nazarenko, V. A., Sayenko, L. P.

TITLE: Determination of the spin of Eu^{152m}

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 5(11), 1962, 1579-1581

TEXT: The β-γ correlation between the momentum of the β-electron and the circular polarization of the 1.327 Mev γ quantum in the allowed branch of the Eu^{152m} β-decay with a β-electron end-point energy of 560 kev is measured. This β-decay, whose frequency of occurrence among all decays of Eu^{152m} is 1.2%, leads to the 1.315 Mev excited 1^- state of Gd^{152}. The measurements were made with an apparatus described earlier (V. M. Lobashov et al., ZhETF 41, 1433, 1961), then used for investigating the similar Pr^{144} decay by an analogous experimental procedure. The Eu^{152m} source was made of about 100μg/cm^2 europium oxide on an Al backing foil, irradiated in the FTI AN SSSR reactor. The value of $\Delta = 2(I_1 - I_2)/(I_1+I_2)$

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Determination of the spin of Eu^{152m}

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is found to be $+(1.6 \pm 0.4)\%$ where $I_{1,2} = R_{coinc}/R_{\gamma} \cdot \theta_{\beta}$; R_{coinc} and R_{γ} denote the counting rates for coincidences and single pulses of the γ channel respectively, and θ_{β} is a correction factor for the influence of the magnetic field on the β-channel (0.03%). The subscripts 1 and 2 respectively correspond to different magnetization directions in the γ polarimeter. From this, the correlation coefficient A_1 is calculated taking into account the background of casual coincidences; also the geometry and the efficiency of the γ polarimeter; $A_1 = +(0.40 \pm 0.10)$. For the transitions $0^- \xrightarrow{\beta} 1^- \xrightarrow{\gamma} 0^+$ a correlation coefficient of +1.00 is to be expected, but for the transitions $1^- \xrightarrow{\beta} 1^- \xrightarrow{\gamma} 0^+$ a correlation coefficient of the observed magnitude is possible. It is concluded that spin and parity of the Eu^{152m} isomeric state are 1^- instead of the previously accepted value 0^-. The reliability of the applied experimental procedure is confirmed by the fact that $\beta\gamma$-correlation measurements in the β decays of Co^{60} and Au^{198} (V. M. Lobashov et al., ZhETF 42, 358, 1962)

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Determination of the spin of Eu^{152m} S/056/62/043/005/003/058
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have given results in good agreement with those of other authors. It is important to know the spin and parity of the Eu^{152m} isomeric state in connection with the experiment of Goldhaber et al. (Phys. Rev. 109, 1015, 1958) whereby the polarization of the neutrino from the K decay was measured. Goldhaber's main result i. e. his conclusion on the chirality of the neutrino, is not affected, but the expected greater accuracy from further such experiments with Eu^{152m} to determine the polarization of the neutrino is diminished. There is 1 figure.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe Akademii nauk SSSR (Physicotechnical Institute imeni A. F. Ioffe of the Academy of Sciences USSR)

SUBMITTED: April 28, 1962

Card 3/3

NAZARENKO, V.A.; FLYANTIKOVA, G.V.

Color reactions of germanium with organic reagents of the orthodiphenol type. Zhur. anal. khim. 18 no.2:172-177 F '63.
(MIRA 17:10)

1. Institute of General and Inorganic Chemistry, Academy of Sciences, Ukrainian S.S.R., Laboratories in Odessa.

KA[illegible], D. M.; LOBASHOV, V. M.; NAZARENKO, V. A.; SAYENKO, L. F.; KHARKEVICH, [illegible];
YEGOROV, A. I.

"Relative Measurements of the Longitudinal Polorization of Electrons in Beta Decay of P^{32} and Zn^{114}, Ho^{156} and Re^{186}."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, 14-22 Feb 64.

FTI (Physico Technical Inst)

NAZARENKO, V.A.; ANDRIANOV, A.M.

Alkalimetric determination of germanium as tridiphenolgermanic acids.
Ukr. khim. zhur. 30 no.6:[illegible] '64. (MIRA 18:5)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR, laboratorii v Odesse.

NAZARENKO, V.A.; RAVITSKAYA, R.V.

Trihydroxyfluorones as photometric reagents for indium. Ukr. khim. zhur. 30 no.6:[illegible] '64. (MIRA 18:5)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR, laboratorii v Odesse.

NAZARENKO, V.A.; FLYANTIKOVA, G.V.

Volumetric determination of germanium in the form of dipolyolgermanic acids. Ukr. khim. zhur. 30 no.7:762-768 '64 (MIRA 18:1)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR, laboratorii v Odesse.

L 16097-65 EWT(m) DIAAP/ESD(c)/ESD(gs)/ESD(t)/SSD/AFWL/ASD(a)-5/RAEM(a)
ACCESSION NR. AP5000311 S/0056/64/047/005/1668/1670

AUTHORS: Kaminker, D. M.; Lobashov, V. M.; Nazarenko, V. A.;
[illegible], L. F.; Kharke [illegible]

TITLE: Relative measurement of the longitudinal polarization of electrons in Beta decay

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47, no. 5, 1964, 1668-1670

TOPIC TAGS: beta decay, electron polarization, electron energy, circular polarization, bremsstrahlung, nuclear structure

ABSTRACT: To check on the hypothesis advanced to explain some anomalies in the longitudinal polarization of electrons, namely that the internal structure of the nucleus gives rise to higher-order corrections, the authors attempted to ascertain the dependence of these anomalies on the electron energy. To this end, relative

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ACCESSION NR: AP5000311

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measurements of the longitudinal polarization of electrons were measured in β decay of P^{32}, In^{114}, Pr^{142}, Ho^{166}, and Re^{188} at energy $E\beta \approx 1250$ keV. The experiments consisted of measuring the circular polarization of the bremsstrahlung produced by deceleration of the β electrons in a lead target, using the setup shown in Fig. 1 of the enclosure. The circular polarization of the bremsstrahlung γ quanta of the β electrons of In^{114}, Pr^{142}, Ho^{166}, and Re^{188} was compared with the circular polarization of the bremsstrahlung γ quanta of P^{32} β electrons. The electron energy was determined with the aid of a magnetic lens spectrometer. The values obtained for the longitudinal polarization relative to that of P^{32} were 0.960 ± 0.0015, 0.934 ± 0.015, 0.942 ± 0.015, and 1.005 ± 0.016 for In^{114}, Pr^{142}, Ho^{166}, and Re^{188} respectively. The observed increase in the deviation of the longitudinal polarization of the electrons from -v/c [illegible] increasing total [illegible] does not contradict [illegible] ternal structure of the nucleus. The observed de[illegible]

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ACCESSION NR: AP5000311

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longitudinal polarization do not correlate with available data on the form of the β spectra of the corresponding transitions. "The authors thank V. A. Knyaz'kov, V. B. Belyakov, V. P. Lapin, and D. Chuklin for help in preparing the apparatus and measurements, and also A. N. Timokhin for participating in preparation of the P and In^{114} sources." Orig. art. has: 1 figure.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe Akademii nauk SSSR (Physicotechnical Institute, Academy of Sciences SSSR)

SUBMITTED: 23May64

ENCL: 01

SUB CODE: NP

NR REF SOV: 004

OTHER: 002

Card 3/4

L 16096-65
ACCESSION NR: AP5000311

ENCLOSURE: 01

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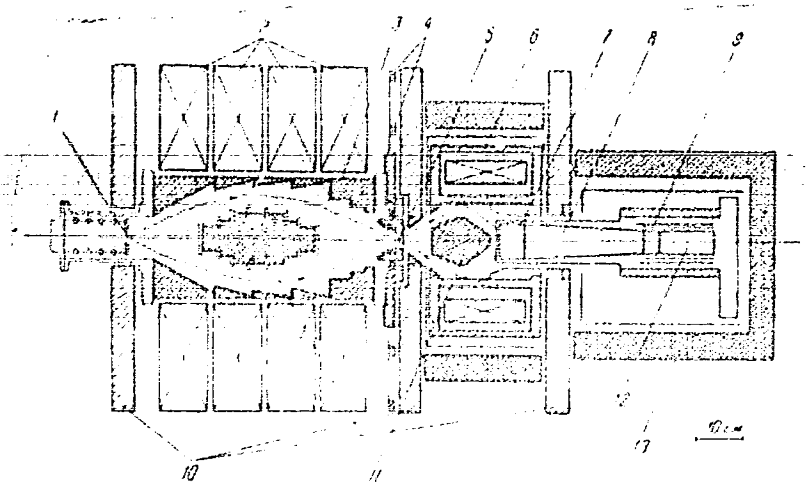


Fig. 1. Schematic diagram of installation. 1 - Source, 2 - magnetic-spectrometer coil, 3 - vacuum chamber, 4— compensation coils, 5 - lead target, 6 - gamma polarimeter, 7 - NaI(Tl) crystal, 8 - light pipe, 9 - permalloy screens, 10 - [illegible] screens, 11 - lead screens, 12 - photomultiplier, 13 - lead shield

Card 4/4

L 53573-65 EWT(1)/EPF(c)/EPA(w)-2/T/EWA(m)-2 Pr-4/Pab-10 IJP(e)

[illegible]/004/0861/0863

TOPIC TAGS: water, ionization, [illegible]

[illegible] platinum, and cold point

Card 1/3

the number of deuterium atoms. [illegible] lines as well as line [illegible] calculated from this formula agree with the mass spectra taken for a 1:1 mixture of H_2O and D_2O. Formation of "metastable" ions (according to the first formula above) is reflected in the appearance of $j(k-j+2)$ lines instead of one line corresponding to pure H_2O. Distribution of intensities of these lines follows from [illegible] formula

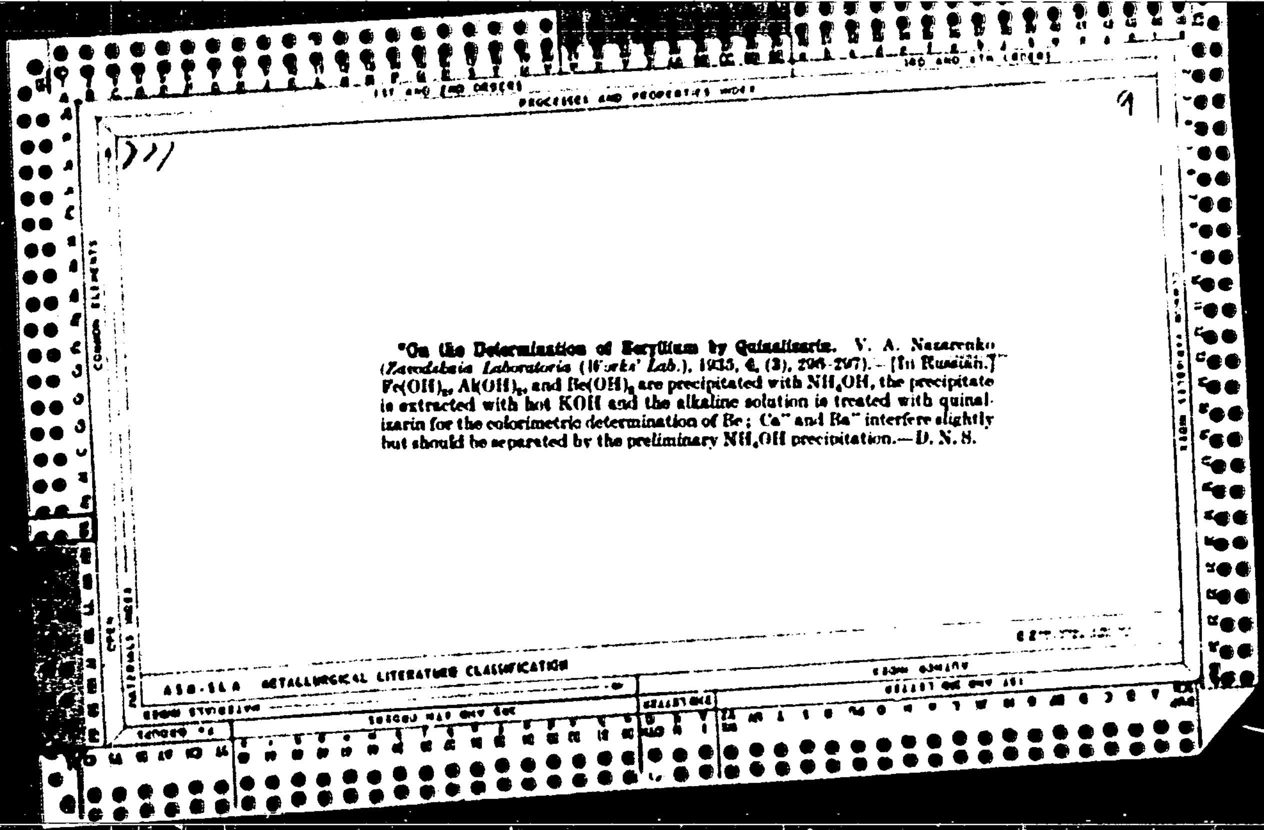
Card 2/3

[illegible]

[illegible]

spond to the starting "metastable" ion. Similar results were obtained with the [illegible] In the [illegible] of a

Card 3/3


1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

9

271

*On the Determination of Beryllium by Quinalizarin. V. A. Nazarenko (*Zavodskaia Laboratoria* (*Works' Lab.*), 1935, 4, (3), 296-297).—[In Russian.] $Fe(OH)_3$, $Al(OH)_3$, and $Be(OH)_2$ are precipitated with NH_4OH, the precipitate is extracted with hot KOH and the alkaline solution is treated with quinalizarin for the colorimetric determination of Be; Ca'' and Ba'' interfere slightly but should be separated by the preliminary NH_4OH precipitation.—D. N. S.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

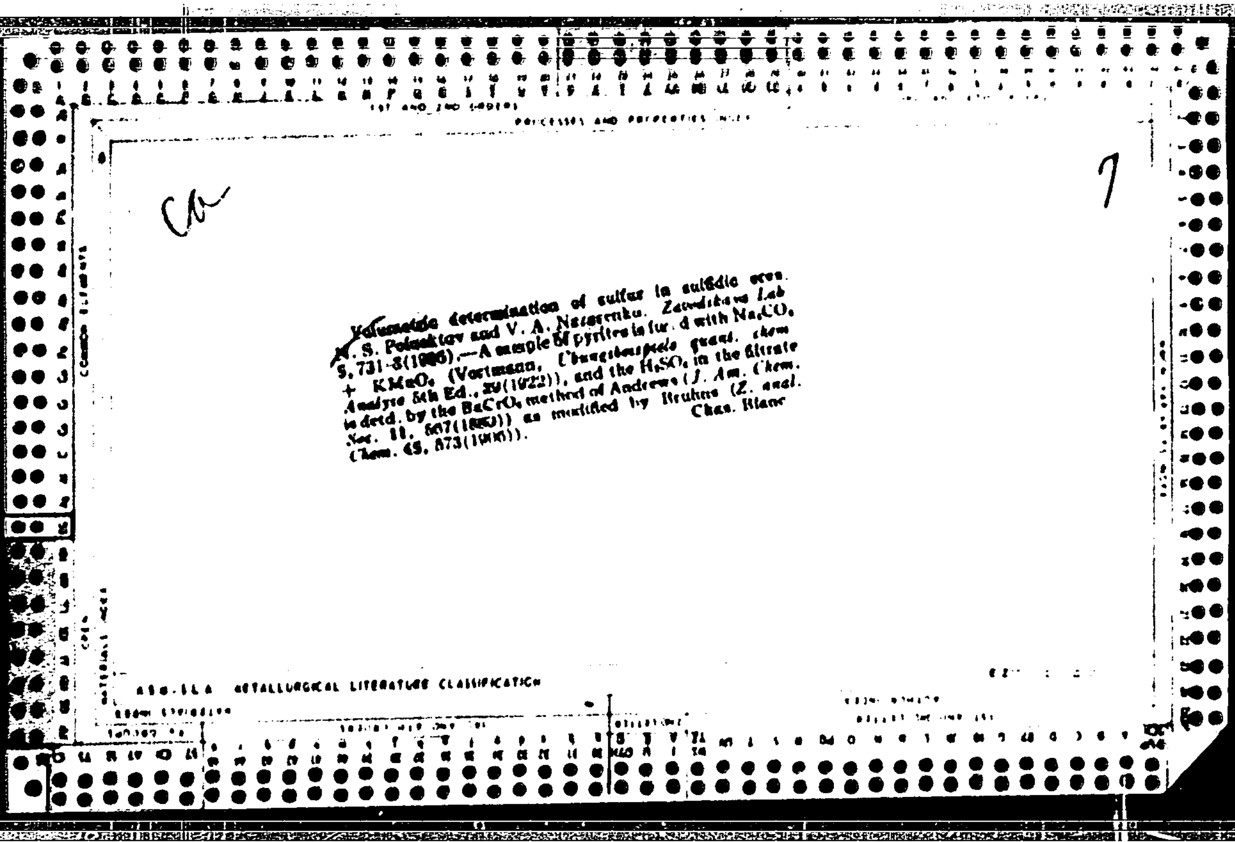
PROCESSES AND PROPERTIES INDEX

CA

7

Titration of barium salts and sulfate ion with potassium chromate. V. A. Nazarenko. *Zavodskaya Lab.* 4, 515-18(1935); cf. Vinogradov and Solov'eva *C. A.* 28, 4303⁹.—A sharp change in color of the indicator with an accuracy of the detn. to 0.5% is obtained in the titration of $BaCl_2$ with K_2CrO_4 in the presence of rosolic acid by adding 1 vol. of 96% EtOH to 2 vols. of the soln. Similar improvement enables detn. of sulfate by pptg. with $BaCl_2$ and titrating the excess of $BaCl_2$ as above. Alk. and acid solns. of Ba salts are preferably neutralized with 0.1 *N* HCl or NaOH, resp., before titration with K_2CrO_4. To det. Ba in $BaSO_4$, ignite a mixt. of 0.2 g. $BaSO_4$, 0.2 g. of powd. charcoal and 0.6 g. of anhyd. $CaCl_2$ at 900° for 1 hr., leach out the melt with H_2O, filter, and titrate the soln. first with 0.1 *N* HCl in the presence of rosolic acid to a yellow and then with the addn. of more rosolic acid and alc. with K_2CrO_4. Chas. Blanc

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION



1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

Ca

7

Volumetric determination of sulfur in sulfidic ores. N. S. Poluektov and V. A. Nazarenko. *Zavodskaya Lab.* 5, 731-3(1936).—A sample of pyrites is fused with Na_2CO_3 + $KMnO_4$ (Vortmann, *Übungsbeispiele quant. chem. Analyse* 5th Ed., 29(1922)), and the H_2SO_4 in the filtrate is detd. by the $BaCrO_4$ method of Andrews (*J. Am. Chem. Soc.* 11, 567(1889)) as modified by Bruhns (*Z. anal. Chem.* 45, 573(1906)). Chas. Blanc

ASO-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

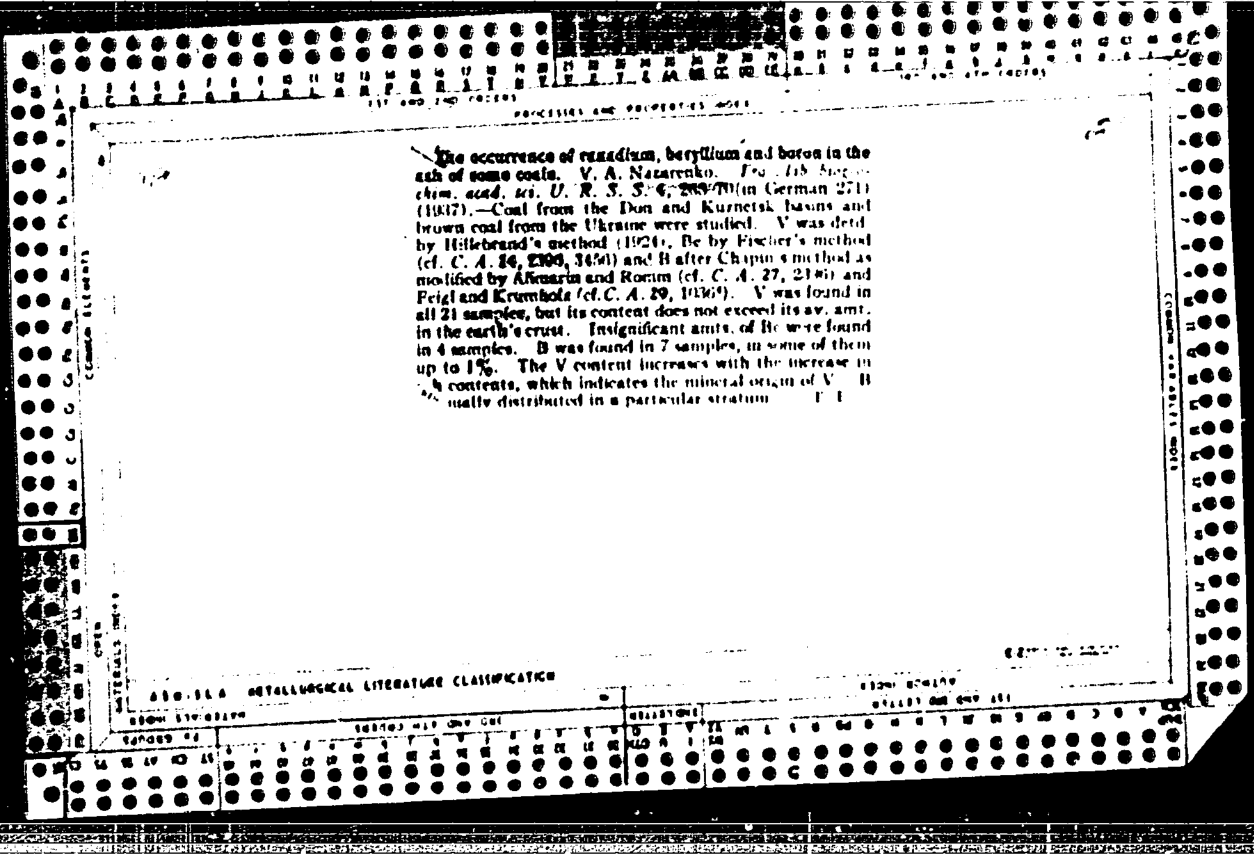
PROCESSES AND PROPERTIES INDEX

B C

B-T-8

Bismuth in Cottrell dust of sulphuric acid factories. V. A. Nazarenko and A. M. Gramitskaja (J. Chem. Ind. Russ., 1936, 13, 463—464).—The dust contains 0·004—0·014% of Bi. R. T.

METALLURGICAL LITERATURE CLASSIFICATION

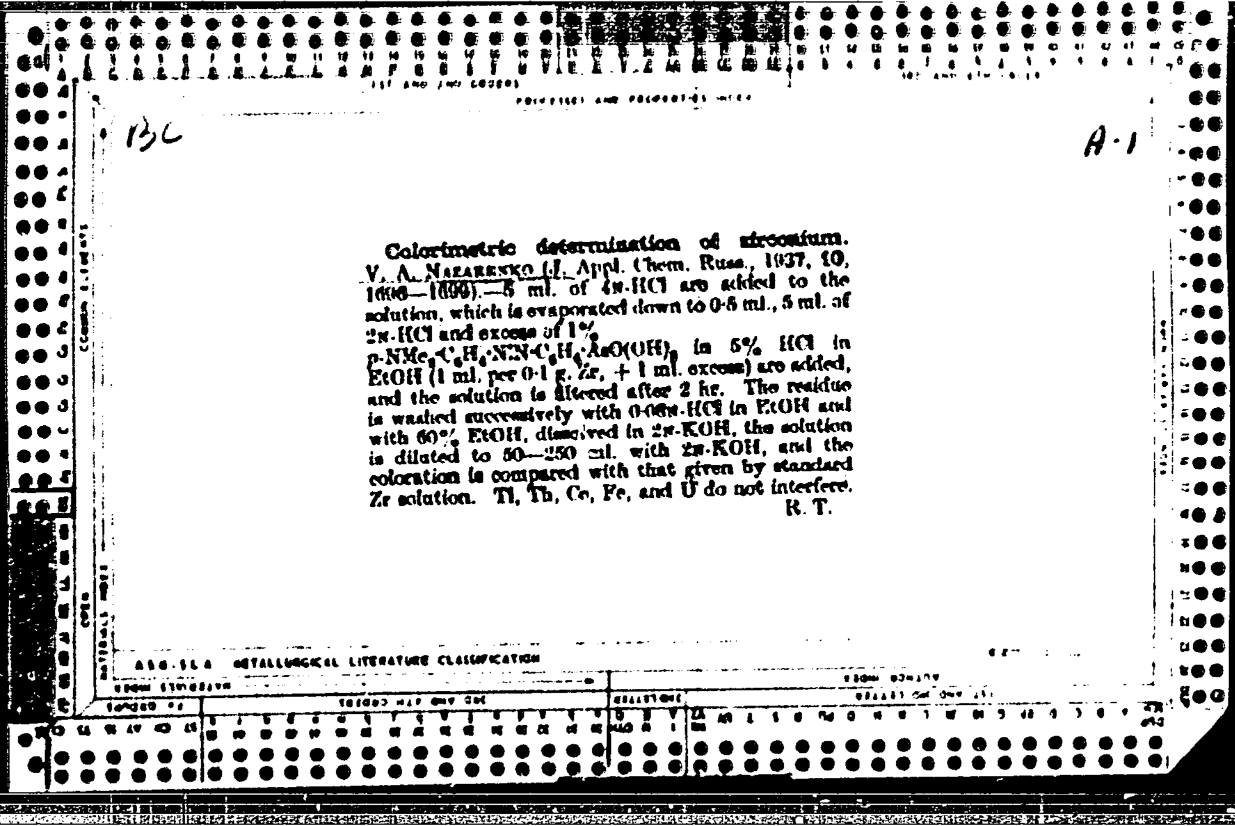


1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

The occurrence of vanadium, beryllium and boron in the ash of some coals. V. A. Nazarenko. *Trav. lab. biogeo-chim. acad. sci. U. R. S. S.* 4, 269-70 (in German 271) (1937).—Coal from the Don and Kuznetsk basins and brown coal from the Ukraine were studied. V was detd. by Hillebrand's method (1921), Be by Fischer's method (cf. *C. A.* **24**, 2396, 3450) and B after Chapin's method as modified by Alimarin and Romm (cf. *C. A.* 27, 2190) and Feigl and Krumholz (cf. *C. A.* **29**, 1036). V was found in all 21 samples, but its content does not exceed its av. amt. in the earth's crust. Insignificant amts. of Be were found in 4 samples. B was found in 7 samples, in some of them up to 1%. The V content increases with the increase in ash contents, which indicates the mineral origin of V. B is usually distributed in a particular stratum. F. I.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



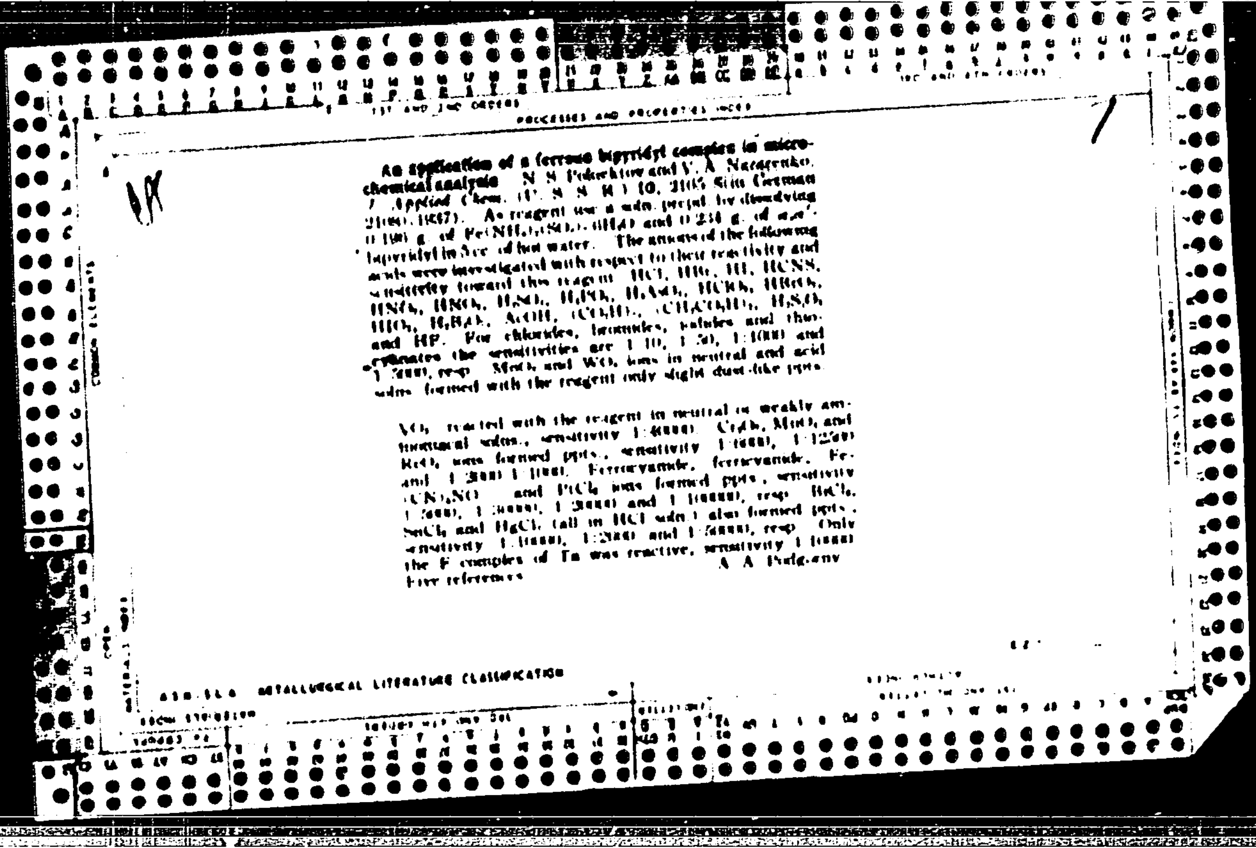
BC

A-1

Colorimetric determination of zirconium. V. A. Nazarenko (J. Appl. Chem. Russ., 1937, 10, 1696—1699).—5 ml. of 4N-HCl are added to the solution, which is evaporated down to 0·5 ml., 5 ml. of 2N-HCl and excess of 1% p-NMe_2·C_6H_4·N:N·C_6H_4·$AsO(OH)_2$ in 5% HCl in EtOH (1 ml. per 0·1 g. Zr, + 1 ml. excess) are added, and the solution is filtered after 2 hr. The residue is washed successively with 0·06N-HCl in EtOH and with 60% EtOH, dissolved in 2N-KOH, the solution is diluted to 50—250 ml. with 2N-KOH, and the coloration is compared with that given by standard Zr solution. Tl, Th, Co, Fe, and U do not interfere.

R. T.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

1A

1

An application of a ferrous bipyridyl complex in microchemical analysis. N. S. Poluektov and V. A. Nazarenko. *J. Applied Chem.* (U. S. S. R.) 10, 2105 (in German 2106)(1937). As reagent use a soln. prepd. by dissolving 0.190 g. of $Fe(NH_4)_2(SO_4)_2 \cdot 6H_2O$ and 0.234 g. of α,α'-bipyridyl in 5 cc. of hot water. The anions of the following acids were investigated with respect to their reactivity and sensitivity toward this reagent: HCl, HBr, HI, HCNS, [illegible], HNO₂, HNO₃, H_2SO_4, H_3PO_4, H_3AsO_4, HClO₄, HBrO₃, HIO₃, H_3BO_3, AcOH, $(COOH)_2$, $(CH_2COOH)_2$, H_2SO_3 and HF. For chlorides, bromides, iodides and thiocyanates the sensitivities are 1:10, 1:20, 1:1000 and 1:2000, resp. MoO_4 and WO_4 ions in neutral and acid solns. formed with the reagent only slight dust-like ppts. VO_3 reacted with the reagent in neutral or weakly ammoniacal solns., sensitivity 1:4000. CrO_4, MnO_4 and ReO_4 ions formed ppts., sensitivity 1:1000, 1:12500 and 1:2000, 1:1000. Ferricyanide, ferrocyanide, $Fe(CN)_5NO$ and $PtCl_6$ ions formed ppts., sensitivity 1:5000, 1:3000, 1:2000 and 1:10000, resp. $HgCl_4$, $SnCl_6$ and $HgCl_4$ (all in HCl soln.) also formed ppts., sensitivity 1:10000, 1:2500 and 1:5000, resp. Only the F complex of Ta was reactive, sensitivity 1:1000. A. A. Podgorny

Five references

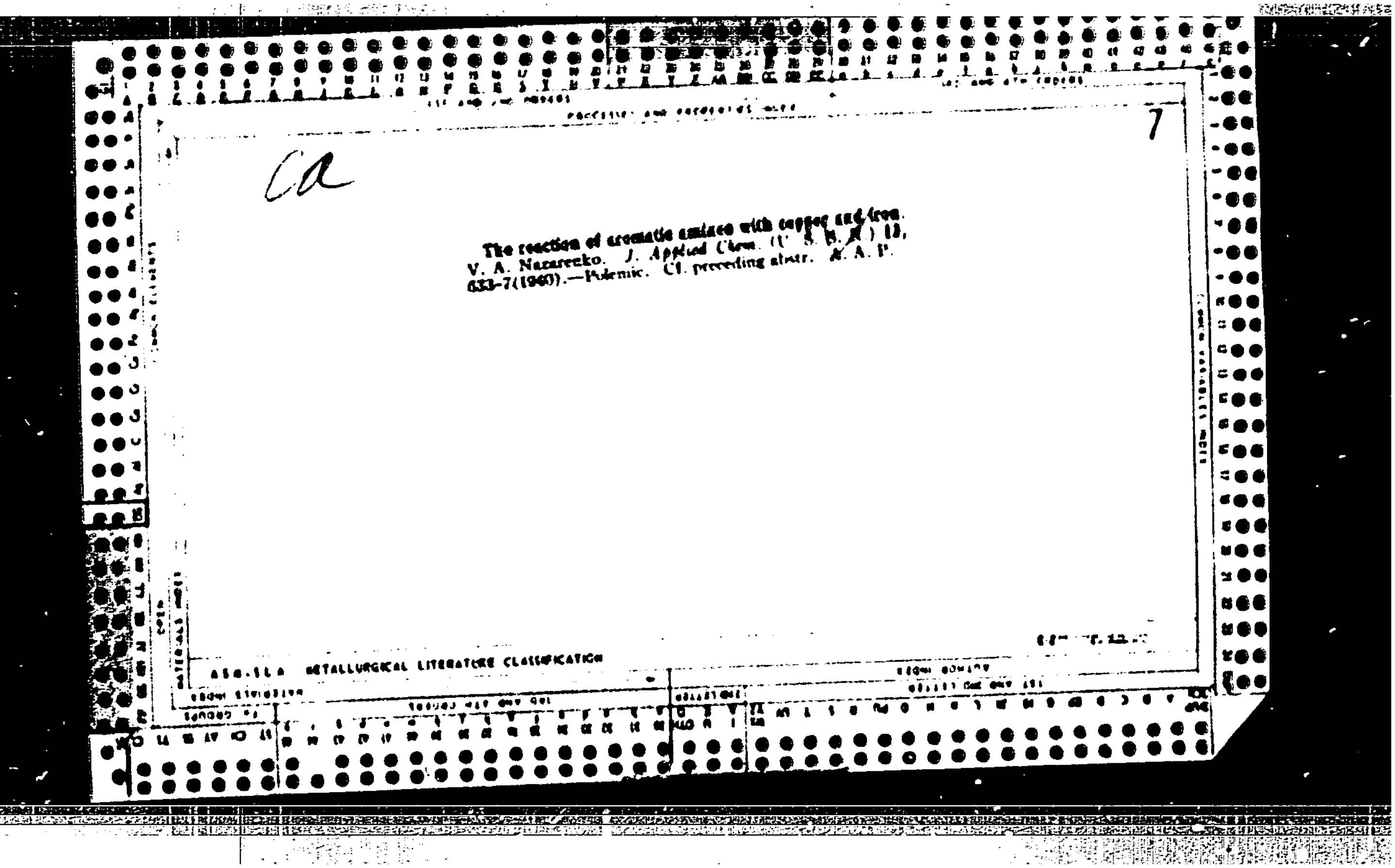
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

BC

Reactions of aminophenols with copper and iron. V. A. K[illegible] (J. Appl. Chem. Russ., 1939, 12, 7[illegible]).—p-Aminophenol and its derivatives give intense colorations with Cu^{II} or Fe^{III} salts. The reactions are [illegible] by addition of [illegible] Cl' > Br' > CNS' > I', [illegible] oxidation of aminophenol, followed by [illegible] of the oxidation [illegible] or Cr. The [illegible] sensitive reagent for [illegible] Cu is 2 : 6-[illegible]phenol in presence of [illegible] of Cu). R. T.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

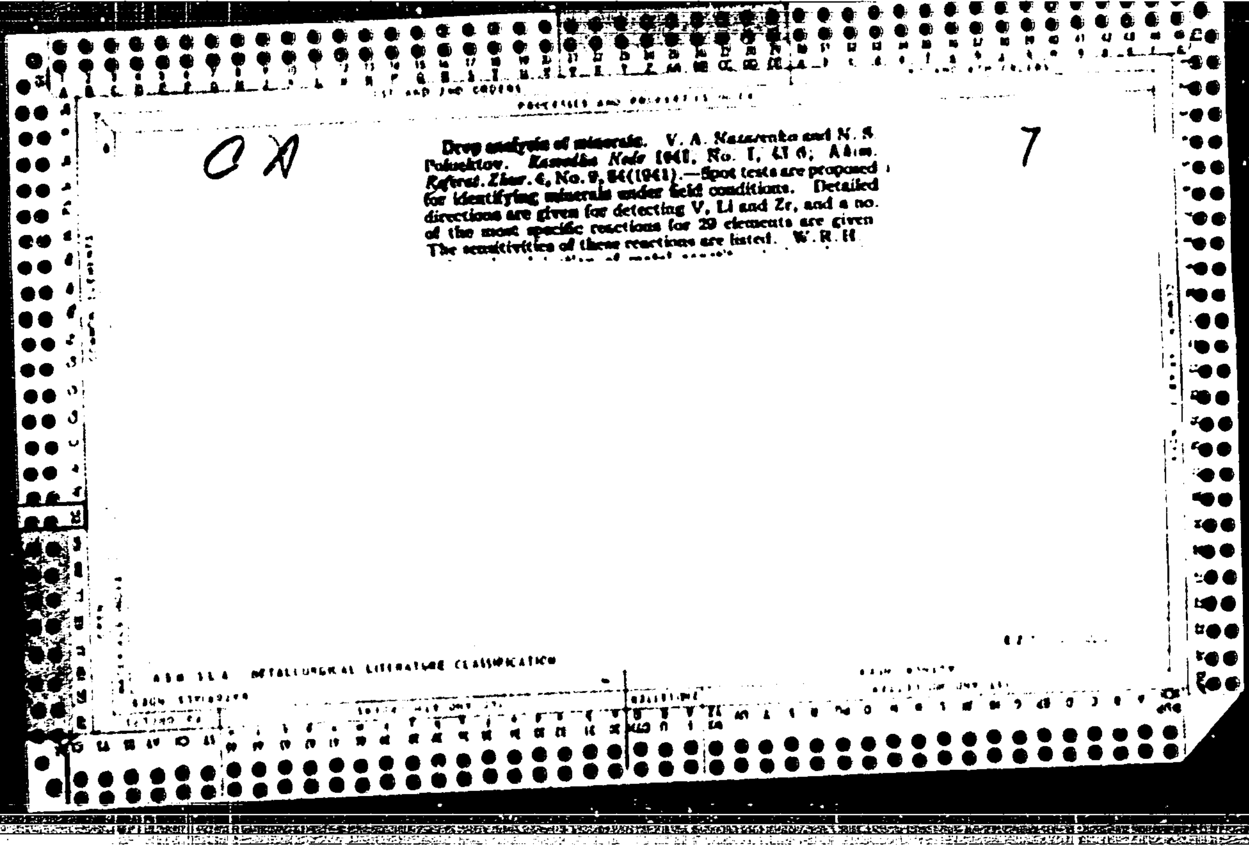


Ca

7

The reaction of aromatic amines with copper and iron. V. A. Nazarenko. J. Applied Chem. (U. S. S. R.) 13, 633-7(1940).—Polemic. Cf. preceding abstr. A. A. P.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



PROCESSES AND PROPERTIES INDEX

OA

7

Drop analysis of minerals. V. A. Nazarenko and N. S. Poluektov. *Razvedka Nedr* 1941, No. 1, 43-6; *Khim. Referat. Zhur.* 4, No. 9, 84(1941).—Spot tests are proposed for identifying minerals under field conditions. Detailed directions are given for detecting V, Li and Zr, and a no. of the most specific reactions for 29 elements are given. The sensitivities of these reactions are listed. W. R. H.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

8c

A-1

Microchemical reaction for quadrivalent tin. V. A. Nazarenko (*J. Appl. Chem. Russ.*, 1941, 14, 418—420; cf. A., 1938, I, 265).—0·001 μg. Sn^{IV} in 0·001 ml. of solution can be detected by "bridging" with 0·0008 ml. of 0·1M-$[Fe(dipyridyl)_3]SO_4$ (I) solution in presence of excess of NaCl and HCl. Dark red, stellar crystals and aggregates (15—20 μ.), easily distinguishable from the rose-coloured, tabular or acicular crystals of $[Fe(dipyridyl)_3]Cl_2$ (700—800 μ.), are formed. Zn and Cd also react with (I), but the sensitivity of the reaction is less, and the crystals are of different sizes and shapes. As^V and Sb^V do not react with (I). N. G.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

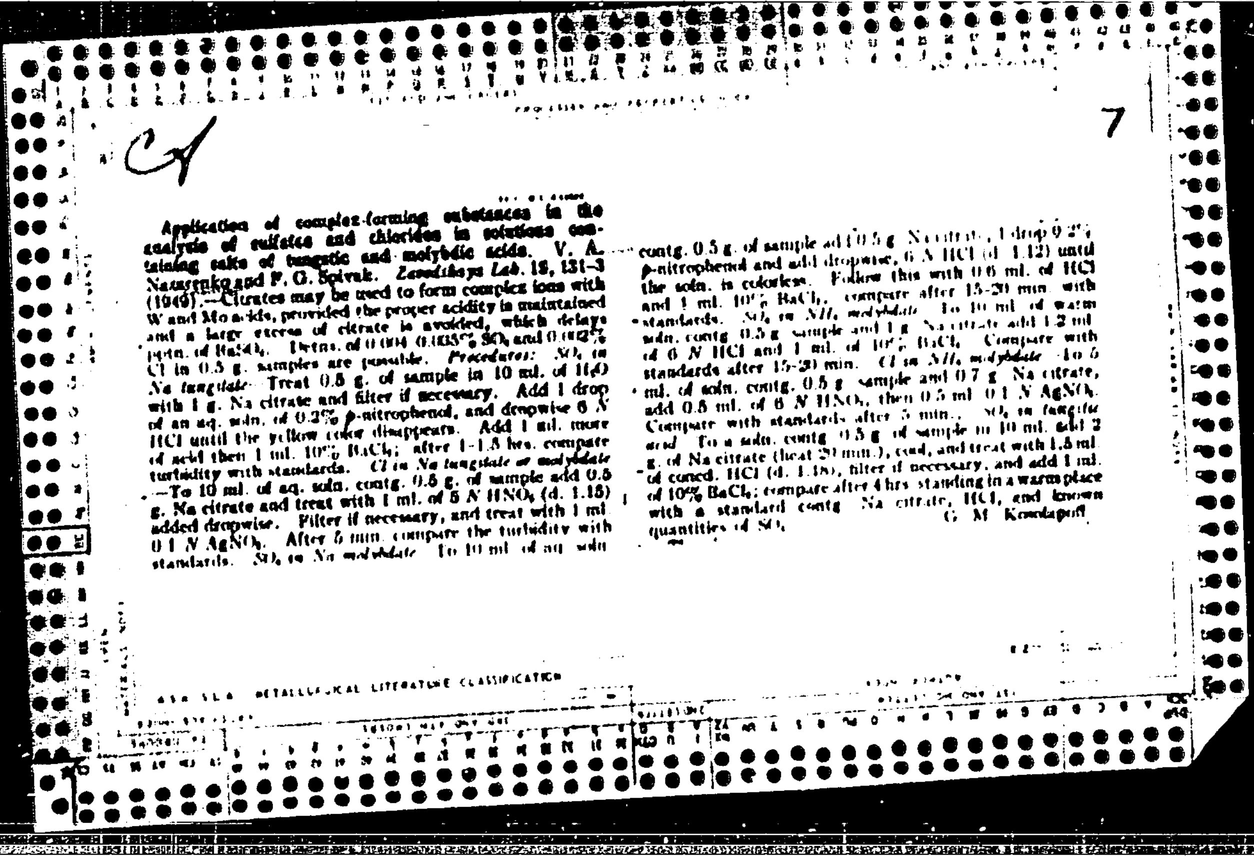
NAZARENKO, V. A.

Odessa

Ukr. Branch, Inst. of Rare Metals, Odessa, (-1946-)

"A New Colour Reaction for Mercury."

Zhur. Analt. Khim., No. 5-6, 1946



CA

7

Application of complex-forming substances in the
analysis of sulfates and chlorides in solutions con-
taining salts of tungstic and molybdic acids. V. A.
Nazarenko and P. G. Spivak. *Zavodskaya Lab.* 15, 131-3
(1949).—Citrates may be used to form complex ions with
W and Mo acids, provided the proper acidity is maintained
and a large excess of citrate is avoided, which delays
pptn. of $BaSO_4$. Detns. of 0.004-0.005% SO_4 and 0.002%
Cl in 0.5 g. samples are possible. *Procedures:* SO_4 in
Na tungstate. Treat 0.5 g. of sample in 10 ml. of H_2O
with 1 g. Na citrate and filter if necessary. Add 1 drop
of an aq. soln. of 0.2% *p*-nitrophenol, and dropwise 6 *N*
HCl until the yellow color disappears. Add 1 ml. more
of acid then 1 ml. 10% $BaCl_2$; after 1-1.5 hrs. compare
turbidity with standards. *Cl in Na tungstate or molybdate*
—To 10 ml. of aq. soln. contg. 0.5 g. of sample add 0.5
g. Na citrate and treat with 1 ml. of 5 *N* HNO_3 (d. 1.15)
added dropwise. Filter if necessary, and treat with 1 ml.
0.1 *N* $AgNO_3$. After 5 min. compare the turbidity with
standards. SO_4 *in Na molybdate.* To 10 ml. of aq. soln.
contg. 0.5 g. of sample add 0.5 g. Na citrate, 1 drop 0.2%
p-nitrophenol and add dropwise, 6 *N* HCl (d. 1.12) until
the soln. is colorless. Follow this with 0.6 ml. of HCl
and 1 ml. 10% $BaCl_2$, compare after 15-20 min. with
standards. SO_4 *in* NH_4 *molybdate.* To 10 ml. of warm
soln. contg. 0.5 g. sample and 1 g. Na citrate add 1.2 ml.
of 6 *N* HCl and 1 ml. of 10% $BaCl_2$. Compare with
standards after 15-20 min. *Cl in* NH_4 *molybdate.* To 5
ml. of soln. contg. 0.5 g. sample and 0.7 g. Na citrate,
add 0.5 ml. of 6 *N* HNO_3, then 0.5 ml. 0.1 *N* $AgNO_3$.
Compare with standards after 5 min. SO_4 *in tungstic*
acid. To a soln. contg. 0.5 g. of sample in 10 ml. add 2
g. of Na citrate (heat 20 min.), cool, and treat with 1.5 ml.
of concd. HCl (d. 1.18), filter if necessary, and add 1 ml.
of 10% $BaCl_2$; compare after 4 hrs. standing in a warm place
with a standard contg. Na citrate, HCl, and known
quantities of SO_4. G. M. Kosolapoff

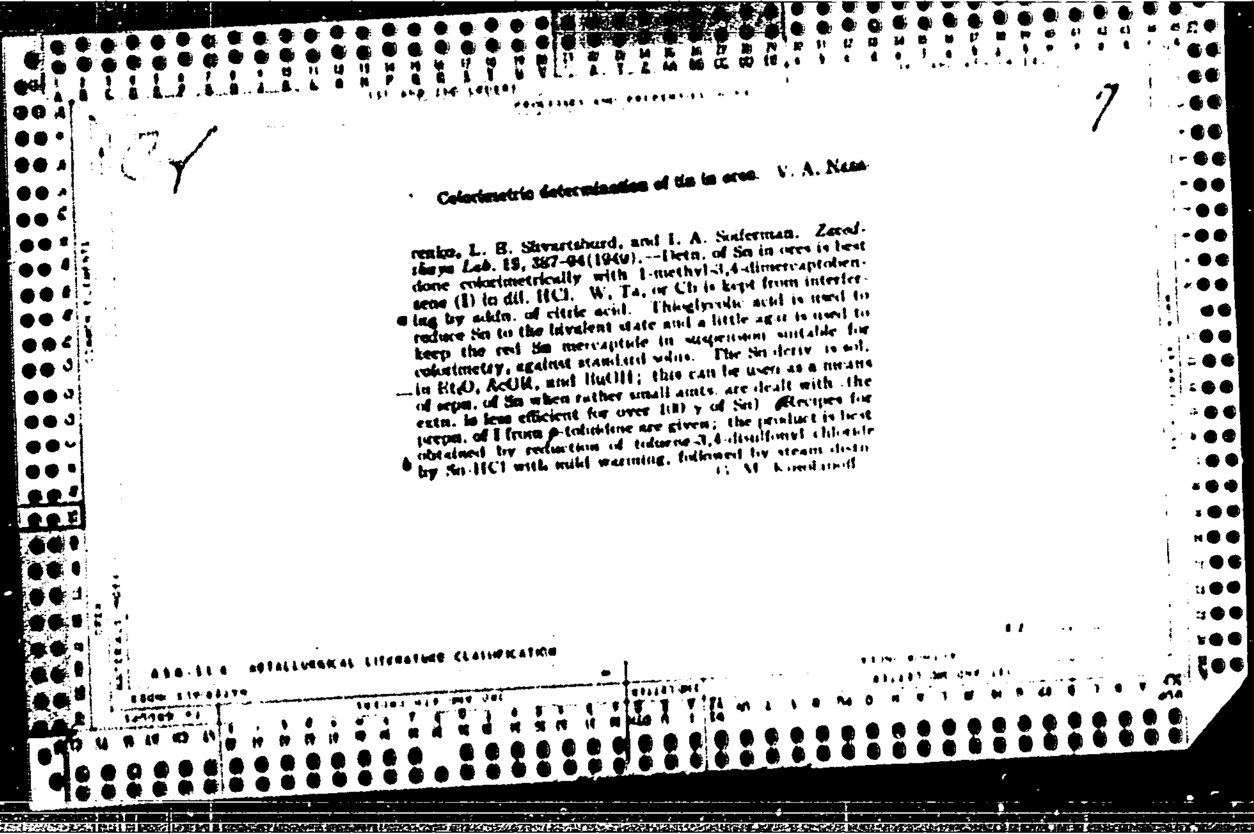
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

9

M

*Determination of Small Amounts of Antimony in Mercury. V. A. Nazarenko (*Zavod. Lab.*, 1949, 15, (2), 240).—[In Russian]. 10 g. of specimen are dissolved in conc. HNO_3 and the solution evaporated. Large quantities of Hg interfere with the analysis and must be eliminated by heating; loss of volatile Sb is prevented by adding a non-volatile oxide such as MgO. Heating is carried out at first gently in a gas flame and subsequently in a muffle furnace for 1-2 hr. at 500°-600° C. The residue is dissolved in 5 ml. H_2SO_4 (1 : 1) and made up with distilled H_2O to 20 c.c. 2 c.c. of this solution are taken, and to them are added 8 ml. of a mixture made up of 10 ml. 0·5% KI solution, 1 ml. 10% pyridine solution, 1 ml. H_2SO_3 (saturated solution, diluted 10 times), and 63 ml. H_2SO_4 (4 parts acid to 11 parts H_2O). The yellow solution is compared with standards in a colorimeter.—T. O. L.

Jan., 1951



7

Colorimetric determination of tin in ores. V. A. Nazarenko, L. B. Shvartsburd, and I. A. Suferman. *Zavodskaya Lab.* 15, 387-94(1949).—Detn. of Sn in ores is best done colorimetrically with 1-methyl-3,4-dimercaptobenzene (I) in dil. HCl. W, Ta, or Cb is kept from interfering by addn. of citric acid. Thioglycolic acid is used to reduce Sn to the bivalent state and a little agar is used to keep the red Sn mercaptide in suspension suitable for colorimetry, against standard solns. The Sn deriv. is sol. in Et_2O, AcOH, and BuOH; this can be used as a means of sepn. of Sn when rather small amts. are dealt with (the extn. is less efficient for over 100 γ of Sn). Recipes for prepn. of I from *p*-toluidine are given; the product is best obtained by reduction of toluene-3,4-disulfonyl chloride by Sn-HCl with mild warming, followed by steam distn.

G. M. Kosolapoff

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

NAZARENKO, V.A.

Semi-michochemical analysis of minerals and ores Moskva, Gos. nauchno-tekhn. izd-vo khim. lit-ry , 1950. 189 p. (51-24966)

CA

7

Rapid semimicro colorimetric determination of lithium in minerals and ores. V. A. Nazarenko and V. Ya. Filatova. *Zhur. Anal. Khim.* 5, 234-8(1950).—The method is based on pptg. $LiKFeIO_6$, dissolving the ppt. in acid, and detg. colorimetrically Fe as thiocyanate. The amt. of Li is found by multiplying the Fe content by 0.124 (cf. Pročke and Šlouf, *C.A.* 30, 1271^9; Rogers and Caley, *C.A.* 37, 2226^9). To prep. the reagent dissolve 2.3 g. of KIO_4 in 50 ml. of 0.5 *N* KOH, add 12 ml. of 0.1 *M* $FeCl_3$ in 0.2 *N* HCl while stirring, and dil. with 2 *N* KOH to 100 ml. To det. Li in silicates fuse 5-25 mg. of finely ground sample with 100-150 mg. of powd. KOH in a Ag crucible. Dissolve the melt in 6-10 drops of H_2O, transfer to a 5-ml. porcelain crucible, add 0.5-0.6 g. of powd. oxalic acid, evap. carefully, and heat slowly to complete decompn. of oxalic acid. Moisten with a few drops of 5% $(NH_4)_2CO_3$, transfer to a centrifuge tube, make up to 2 ml., and centrifuge. Transfer (dry pipet) 1 ml. of the clear soln. to a 5-ml. porcelain crucible, evap. to dryness, add 5-8 drops of concd. HCl, evap., and ignite slightly. Add 0.2 ml. of concd. HCl, 0.5 ml. of 96% alc., keep for 5 min., stirring from time to time, and filter into a similar crucible. Wash residue in the crucible and on the filter with a mixt. of alc. and HCl (2:1). Evap., filter, ignite slightly, and dissolve in 1-2 drops of H_2O. Add 1 ml. of *N* KOH, heat to near boiling, and add 2 ml. of equally hot reagent. Heat for 5 min., and cool in cold H_2O. Filter with suction, wash 4 times, each with 0.75 ml. of *N* KOH, and dissolve in 10 ml. of *N* HCl. Dil. to 25 ml., take 0.5-2 ml., add 0.2 ml. of 20% KCNS, dil. to 3 ml., and det. Fe colorimetrically by the diln. method. Multiply the quantity of Fe found by 0.124 to find the Li. In the case of phosphate minerals fuse as before, dissolve in 8-10 drops of H_2O, transfer into a microcrucible, add 6 *N* HCl to strong acid reaction, add 0.5 ml. of 5% $ZrOCl_2$, evap. to dryness, ignite slightly, treat with 3-5 drops of H_2O, add oxalic acid, and proceed as above. By this method up to 0.02% of Li can be detd. in a 50-mg. sample with an accuracy of ±10-20%.

M. Hošek

7

cA

Use of benzidine in the analysis of phosphotungstates. V. A. Nazarenko and L. B. Shvartsburd. *Zavodskaya Lab.* 16, 357-8(1950).—Benzidine ppts. not only the tungstate but also the phosphotungstate and leads to errors in sepg. W from small amts. of P. In solns. already contg. phosphotungstate, its pptn. is quant. To det. phosphotungstic anhydride and WO_3 (by calcn.) in Na phosphotungstate: Treat 0.5 g. of sample with 100 ml. of 0.1 *N* HCl and add 30 ml. of boiling 3% benzidine-HCl soln: Let stand 2 hrs. and filter, wash (0.5% benzidine-HCl soln.), dry and ash. Heat at 650-700° to const. wt. to form $Na_4H_3P(W_2O_7)_6$ contg. 2.35% P_2O_5.
O. M. Kosolapoff

NAZARENKO, V.A.

New reaction for ethylene glycol in aqueous solutions. Ukrain. Khim. Zhur.
16, 536-8 '50. (MLRA 6:4)
(CA 47 no.21:11079 '53)

CA

7

Detection of ethylene glycol in forensic analysis. N. B. Lapkina and V. A. Nazarenko (Odessa Regional Forensic Med. Lab.). *Zhur. Anal. Khim.* 6, 262-4(1951).—Grind 10 g. of liver (or stomach fluid if death occurred soon after intake of ethylene glycol) with 5 g. of cryst. oxalic acid. Transfer into 100-ml. flask, add 60 ml. benzene, connect upright condenser provided with a calibrated H_2O trap, and heat on water bath. Heat for 12-15 hrs. until H_2O in trap does not increase. Transfer 5 ml. of distillate to a test tube, add 5 ml. of 1:8 H_2SO_4, add 5 drops of 5% $NaIO_4$ or KIO_4 in 5% H_2SO_4; after 5 min. add dropwise a satd. soln. of H_2SO_3 to decolorize I, add 4 drops of fuchsin sulfonic acid, and stopper test tube. After 3-30 min. intense red-violet or pink color indicates the presence of ethylene glycol.

M. Hosch

C-2

BA

8671. Identification reactions for dichloroethane. V. A. Nazarenko and N. B. Lapkina (*J. anal. Chem., USSR*, 1952, **7**, 62—66).—1 : 2-Dichloroethane can be detected by means of reactions giving ethylene glycol, acetylene, or ethylenediamine. The first two can be used for its detection in aq. solutions. 0·5 ml. of the solution is placed with 0·8 ml. of 10% NaOH in a 1 ml. ampoule and the sealed ampoule is heated at 100° for 1 hr. The contents are then transferred to a tube, 6—7 drops of 1 : 8 aq. H_2SO_4 are added and 2 drops of 5% KIO_4 in n-H_2SO_4. After 5 min. the liberated I is removed by dropwise addition of SO_2 solution and 2 drops of Schiff's reagent are added. A red colour indicates 1 : 2-dichloroethane. 0·4 mg. can be detected at a dilution of 1 : 1200. 1 : 2-Dibromoethane and allyl bromide interfere. For the formation of acetylene, 0·8 ml. of the 1 : 2-dichloroethane solution and 0·8 ml. of 30% NaOH are introduced into an ampoule with as little mixing as possible. The ampoule is sealed, the contents mixed, and the vessel heated at 100° for 30 min. The liquid is then transferred to a test-tube by means of a capillary pipette, 30% acetic acid is added dropwise to give an acid reaction to litmus, and the solution is treated with 2 drops of ammoniacal Cu solution. A red or cherry-red colour with gradual formation of a ppt. indicates 1 : 2-dichloroethane. The Cu solution is prepared by dissolving 1 g. of $Cu(NO_3)_2$ and 4 g. of hydroxylamine hydrochloride in a small amount of water, addition of 5 ml. of 20% aq. NH_3 and dilution to 50 ml. after decolorisation. 0·25 mg. can be detected at a dilution of 1 : 2000. 1 : 1-Dichloroethane, 1 : 2-dibromoethane, and 1 : 1 : 2-trichloroethane give similar colours, and 1 : 1 : 2 : 2-tetrachloro- and 1 : 1 : 2 : 2-tetrabromo-ethane, tribromoethylene, and acetylene dichloride interfere by giving a yellow cloudiness. For the formation of ethylenediamine 1 drop of 1 : 2-dichloroethane (0·001—0·005 ml.) is heated with 0·5 ml. of 25% aq. NH_3 in a closed ampoule for several hr. The liquid is evaporated to dryness and the residue is dissolved in 1—2 drops of water. One drop is treated with 1 drop of $KBiI_4$ solution. The characteristic crystals are observed. 1 : 2-Dibromoethane interferes. No interference occurs in any of the reactions in presence of $CHCl_3$, CCl_4, monochloroethane, 1 : 1 : 1-trichloroethane, 1 : 1 : 1 : 2-tetrachloroethane, pentabromoethane, or chloral.

G. S. Smith.

[illegible]

NAZARENKO, V.A

USSR.

2665 Colorimetric determination of sub-microgram quantities of magnesium. V. A. Nazarenko and E. A. Biryuk (Zavod. Lab., 1955, 21 (1), [illegible]). —The formation of a pink colour with Eriochrome blue-black B can be used to detect 0·01 to 0·03 µg of Mg in 2 ml of soln. To determine 0·05 to 0·30 µg of Mg, 2 ml of the solution in a small separating funnel are mixed with 0·20 ml of 0·5 per cent. Na diethyldithiocarbamate (I) soln. and the mixture is shaken with 1 ml of ethyl acetate. The ethyl acetate layer is rejected and the operation of adding I and extracting is repeated several times, until the ethyl acetate no longer shows the yellow colour due to the presence of Fe. The aq. solution is then evaporated to dryness, the residue is dissolved in 3 ml of water, and 0·20 ml of 0·02 per cent. of the Eriochrome blue-black B in ethanol together with 0·20 ml of 10 per cent. aq. NH_3 solution are added, and the extinction of the solution is measured at 600 mµ in a 10-mm cell. The concn. of Mg is determined from a calibration curve.

G. S. SMITH

CH

(1)

[illegible] reacts with phenylhydrazine in [illegible] acid [illegible] to give a colored [illegible]

Coprecipitation of microgram quantities of arsenic with magnesium ammonium phosphate. V. A. Nazarenko and G. I. Bik. *Ukrain. Khim. Zhur.* 22, 231-4(1956)(in Russian).— Arsenic (0.2-0γ) was detd. by coppt. it with $MgNH_4PO_4$. From the ppt. As was liberated as arsine, then oxidized to arsenic acid with a mixt. of $HgCl_2$ and MnO_4^-; molybdenum blue (I) in the presence of hydrazine was formed. I was extd. with isoamyl alc., and detd. colorimetrically. There was a direct relation between As and I.

M. Hosch

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Nazarenko, V.A

AUTHORS Nazarenko V.A.,Flyantikova,. G.V., Lebedeva N.V., 32-8-1/61

TITLE Analysis of Pure Metals. Determination of the Arsenic Content. (Analiz chistykh metallov. Opredeleniye primesi myshyaka - Russian)

PERIODICAL Zavodskaya Laboratoriya, 1957, Vol 23, Nr 8, pp 891-896(U.S.S.R.)

ABSTRACT

Two methods of the separation of arsenic from the bysic metal are described in the paper, for the purpose of its (i.e. of arsenic) chemical evaluation. In both cases is recommended the so-called "universal" type of the separation of microquantities of arsenic from pure metals on further extraction of the diethyldithiocarbamate complex from a strongly acid mixture by chloroform, as well as the final determination after the formation of arsenic-molybdenum-blue in all cases. Then the process of the separation of arsenic from antimony, vanadium, niobium and silicon is described and the use of a siutable apparatus is demonstrated. In the case of an analysis of antimony and niobium previous precipitation of arsenic is recommended is the form of magnesium-ammonium-arsenate with a phosphate carrier. In the case of vanadium and silicon the separation of arsenic from the corresponding solutions is directly performed.The process of the determination of arsenic after the extraction by diethyldithiocarbamate acid is described.In this case a freshly prepared solution of diethyldithiocarbamihic acid is used for the extraction of arsenic.In that connection it is pointed out that the application of a chloroform solution of diethylammonium -diethyldithiocarbamate would be more

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Analysis of Pure Metals.Determination of the Arsenic 32-8-1/61
Content.

convenient,but this reagent is at present difficult to obtain.This method is also applicable to the determination of the arsenic content of other metals which do not form any diethylcarbamates in strongly-acid solutions,neither in the presence nor in the absence of complex producers.
There are 2 tables and 1 illustration and 5 references.

AVAILABLE Library of Congress.
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AUTHOR: Nazarenko, V. A., Candidate of Chemical Sciences 32-10-3/32

TITLE: Analysis of Pure Metals (Analiz chistykh metallov)

PERIODICAL: Zavodskaya Laboratoriya, 1957, Vol 23, Nr 10, pp. 1162-1167(USSR)

ABSTRACT: Especially with respect to the use of semi-conductors in atomic energy, fire-proof alloys, and others, modern engineering often requires at the produced materials to be ideally pure. It is mentioned e. g. that in such cases the germanium semi-conductor must not even contain a ten millionth percent of the content of the secondary component (phosphorus, ammonia, copper, boron, and others). Antiquated conceptions with respect to "traces" have been surpassed since long. Outstanding elaborate studies in this field are those by Alimarin, I. P., as well as by S. L. Mandelstam, A. N. Zaidel, and A. P. Vinogradov. The methods according to Nazarenko, V. A., are reported to be especially sensitive with respect to the determination of the secondary component with germanium and silicon. An especially great number of methods of polarographic investigations of the secondary component of alloys are described here. The solution of a "difficult problem", the determination of the aluminum content in chrome-nickel-magnesium-alloys is attributed here to Kuznetsov, V. I., and R. B. Golubtsova, which for the first time applied "arsenazo" in this case.

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Spectral analyses are rarely applied (according to the opinion of the author) with respect to the investigation of pure metals. Preference is given in this case to the colorimetric methods, several of which are described here. Elaborate studies referring to this subject are mentioned in this context such as by Poluektov, N. S., Lur'ye, Yu. Yu., Minenko, A. N., Shafran, I. G., Gordeyeva, P. I., and Shatayeva, G. G. - The following question is raised in one of these investigations. Which kind of method. radioactivation, spectroscopic analysis, or chemical analysis should be preferred with pure metals. The first, viz. the method of radioactivation is characterized as quick and practical only in some special cases, the behaviour of radioisotopes, however, often exercises a disturbing effect by their secondary effects, or limited applicability. Spectroscopic analysis is rapid and simple for control organization of every day, it is, however, too little sensitive in too poor concentrations because of the necessity of investigating only small doses of the sample. Working up processes cannot also not always be applied. Concerning chemical methods, it is mentioned here that they can be applied with any quantities and concentrations whatsoever. They are simple, need no complicated outfit and are therefore recommended. Concluding, it is stated that the problems of determination of the content of both the micro- and submicro-component in

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pure metals have not yet definitely solved. For this reason the further development of investigation work in this field is recommended.

There are 44 references, 43 of which are Slavic.

AVAILABLE: Library of Congress

1. Metals-Pure-Analysis

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Nazarenko, V.A.

AUTHORS: Nazarenko, V.A., Shustova, M.B. 32-11-3/60

TITLE: Analysis of Pure Metals. Determination of the Tantalum Content in Zirconium and Niobium (Analiz chistykh metallov. Opredeleniye primesi tantala v tsirkonii i niobii)

PERIODICAL: Zavodskaya Laboratoriya, 1957, Vol. 23, Nr 11, pp. 1283-1286 (USSR)

ABSTRACT: For the purpose of determining the tantalum content by the calorimetric method the derivatives of 2, 3, 7-trioxide-6-fluorine are recommended and dimethyl fluoron is particularly recommended. Tantalum in connection with dimethyl fluoron results in a bright red coloring. Without a content of tantalum the solution is yellow. Determination of the tantalum content at its minimum 3γ is carried out from the 10 ml of the solution, which is decinormal with respect to hydrochloric acid, and 0.4% ammonium oxalate and contains 1 ml of the 1% gelatin solution. The following solutions are recommended for the processes of determination: 1. Mixtures of acids: a) 4-m nitric acid + 1- m hydrofluoric acid (70 ml of the 11-nitric acid + 118 ml water + 12 ml 40% hydrofluoric acid); b) 4-m with respect to hydrochloric acid + 2-m according to fluoric acid(70 ml of the 11-n nitric acid + 106 ml of water + 24 ml of 40% fluoric acid). 2. Dimethylfluoron:

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Analysis of Pure Metals. Determination of the Tantalum Content in Zirconium and Niobium

- 0.05% solution (50 mg + 0.5 ml of the 6-n nitric acid solution + 50 ml of 96% spirit). 3. Dilution solution: 10 g potassium pyrosulphate melt + 100 ml of the 4% solution of the ammonium oxalate + 250 ml water neutralized to slightly yellow by means of caustic potash. To this 50 ml of 2-n hydrochloric acid is added, and the entire mixture is dissolved in water up to 1000 ml. 4. Rinsing solution for extraction: 30 ml acid mixture as Ib + 20 ml ammonium sulphate solution + 20 ml isobutanol + 20 ml acetone. 5. Tantalum standard solution: 25 mg tantalum is dissolved in the mixture of fluoric- and nitric acid, after which 1 ml of sulphoric acid is added, and the whole is vaporized and then melted together with 2.5 g potassium pyrosulphate. The melt is dissolved in ammonium oxalate up to 250 ml. The paper then describes the process of determining the tantalum content in zirconium and in niobium. There are 4 tables.

AVAILABLE: Library of Congress

Card 2/2

AUTHORS: Nazarenko, V. A., Vinkovetskaya, S. Ya. 75-13-3-13/27

TITLE: A New Method for the Fluorimetric Determination of Gallium (Novyy metod fluorimetricheskogo opredeleniya galliya)

PERIODICAL: Zhurnal analiticheskoy khimii, 1958, Vol 13, Nr 3, pp 327--331 (USSR)

ABSTRACT: Many reagents for the fluorimetric determination of gallium have been described in publications (Refs 1-9). These methods, however, have a comparatively low sensitivity, besides iron the complete separation of which is not always simple mostly is disturbing. Seeking for more sensitive and specific methods for determining small amounts of gallium the authors investigated several reagents which were described by Poluektov and Kiseleva (Ref 10). A dye of the group of solochromes, resorcin-<4-azo-1'>-2'-naphthol-4'-sulfonic acid proved to be best suitable. In an alcoholic-aqueous solution at p_H 3 in the ultraviolet this compound yields a strong orange-colored fluorescence with gallium. In this manner 0,01γ gallium can still be proved. The intensity of fluorescence is proportional to the concentration of gallium. The specificity of this reaction is better than in the analogous determination with 8-hydroxyqui-

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A New Method for the Fluorimetric Determination of Gallium 75-13-3-13/27

noline. Thus large amounts of concomitant metals must not be separated in the quantitative determination of gallium according to this method in various natural objects. In many cases the separation of gallium by extraction of its trichloride with ether is sufficient. In the presence of tin, antimony, large amounts of copper and other heavy metals this separation is not sufficient, as these metals are to a certain degree co-extracted and later precipitated. In this case the heavy metals were first separated by cementation on metallic cadmium (Ref 1), where iron was simultaneously reduced to the bivalent stage. Then gallium was extracted. In this manner very satisfactory results were obtained. A method for the preparation of bauxites, silicates, sulfidic ores, products of the metallurgy of nonferrous metals and other substances prior to the gallium determination is given in detail. In the determination of gallium in stone coals these are prepared by heating with a mixture of calcium oxide and calcium nitrate, as the combustion method cannot be employed because of a partial volatilization of gallium. The described method of determination also proved suitable for the analysis of some metals, especially aluminum, zinc and lead. The respective metals must

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be present in a hydrochloric acid solution, nitric acid must be previously removed. The sensitivity of this determination is up to 10^{-5}% gallium. The performance of the analysis from the preparation until the determination of gallium is described in detail for all above-mentioned substances. There are 4 tables and 10 references, 3 of which are Soviet.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN USSR, laboratorii v g. Odesse (Odessa Laboratories of the Institute of General and Inorganic Chemistry, AS USSR)

SUBMITTED: May 16, 1957

1. Gallium--Determination

SOV/75-13-4-12/29

AUTHORS: Nazarenko, V. A., Biryuk, Ye. A., Ravitskaya, R. V.

TITLE: The Determination of Indium Admixtures in Germanium (Opredeleniye primesi indiya v germanii)

PERIODICAL: Zhurnal analiticheskoy khimii, 1958, Vol. 13, Nr 4, pp. 445-448 (USSR)

ABSTRACT: The authors of the present paper investigated various color reactions sensitive to indium. They found the reaction with diphenyl carbazone best suited for the quantitative determination of indium (Ref 2). Diphenyl carbazone with indium in a weakly acid solution yields a violet coloration; no precipitation takes place with larger amounts of indium. In the absence of indium the solution has a yellow-brown color. The optimum p_H-value for this determination is at $p_H 6$. At $p_H 5-6$ the foreign ions of Mg, Ca, Al, Cr(III), Ti, Mn(II), U(VI), Cd, Pb, Bi, Sn(IV), Sb, As, Ag, Ge, and Ta do not disturb the determination if their excess is not greater than 10-fold Gallium yields the same reaction as indium, however, with a considerably lower sensitivity. Fe(III) under the conditions

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The Determination of Indium Admixtures in Germanium SOV/75-13-4-12/29

of the determination does not show a reaction with diphenyl carbazone, it masks, however, indium almost completely. This disturbing influence can, however, be removed by thiourea There a p_H of 5,6 is necessary (hydrochloric acid-pyridine-buffer). At $p_H 6$ no means for the masking of iron could be found. Thiourea besides iron also masks copper and reduces the disturbing influence of zinc. In order to exclude the disturbing influence of iron it is useful to work at $p_H 5.6$. At this p_H the intensity of the color is by 50% weaker than at $p_H 6$, the specific character is, however, greater. The maximum of the absorption is at 530 mμ; at this wave length, however, also the reagent still absorbs noticeably. Therefore the indium is determined at 570 mμ, where the reagent does no longer absorb, while the absorption of the complex is only little below the normal value. Solutions with an indium content of 0.4 - 5γ follow Beer's law. The color of the solutions is constant only for 15 minutes as the complex then coagulates. Indium traces in germanium can be determined by means of this method when the germanium is evaporated in the form of tetrachloride Then indium is obtained as a quantitative residue. In the analysis

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of impurified GeO_2 and also of metallic germanium the residue does still contain disturbing metals; therefore the indium must be separated. This is achieved by the extraction with ether from hydrogen bromide acid solution. In order to prevent the iron being co-extracted $TiCl_3$ is added. Because of the low capacity of the hydrochloric acid-pyridine-buffer the solutions to be analyzed must be as neutral as possible. In order to prevent that in the boiling down of the acid solutions to dryness a hydrolysis of the indium salts takes place a little sodium chloride is added. Thereby the hydrolysis is prevented as natural chloroindate is formed. The plotting of the calibration curve, the preparation of the reagents as well as the carrying out of the determination of indium in germanium are described in all details. The sensitivity is then 2.10^{-5}%; this determination is well suited for the indium traces in germanium There are 4 figures, 3 tables, and 3 references, 2 of which are Soviet.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN USSR, laboratoriya v g. Odesse (Institute for General and Inorganic

The Determination of Indium Admixtures in Germanium SOV/75-13-4-12/29

Chemistry, AS Ukr SSR, Odessa Laboratory)

SUBMITTED: June 16, 1957

1. Indium--Determination 2. Germanium--Analysis 3. Diphenyl carbazone--Chemical reactions 4. Photometry

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NAZARENKO, V A

AUTHORS: Nazarenko, V.A., Lebedeva, N.V., Ravitskaya, R.V. 32-1-2/55

TITLE: The Method of Determining Germanium in Ores, Coals, and Industrial Waste (Metod opredeleniya germaniya v rudakh, uglyakh i promyshlennykh otkhodakh).

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 1, pp. 9-13 (USSR)

ABSTRACT: In the introduction to this work it is said that the best-known method for this purpose is the phenyl-fluoron colorimetric method. Phenylfluoron (9-phenyl-2,3, 7-trioxide-fluoron) forms a red precipitation with the tetravalent germanium in which to each germanium atom there correspond two molecules of the reagent. Various varieties of this method, in the first line such developed by foreign scientists like Cluley, Ladenbauer, Slama and Hecht,Luke and Campbell, Schneider and Sandell, as well as by the Soviet scientists Gillebrand and Lendel' and others are cited. It is further mentioned here that phenylfluoron reacts (like to germanium) also to many other elements of the groups IV, V and VI of the periodic system. In order to separate germanium from disturbing elements it is recommended to extract the germanium tetrachloride from the 6-n hydrochloric acid by distillation or by extraction with tetrachloride carbon from 8-9-n hydrochloric acid (examples). In conclusion it is recommended to apply the method

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The Method of Determining Germanium in Ores, Coals, and Industrial Waste 32-1-2/55

described uniformly to all materials. A difference in treatment is possible solely in the introductory work of separating elements. This generalized method consists in the extraction of the germanium with carbon tetrachloride from 9-n hydrochloric acid, with following re-extraction with water and colorimetric determination with phenylfluoron. A table of results is given with respect to pyrite-, copper-, zinc-, lead-, antimony-, and iron ores, coal, coke, and coal resin. The experimental part of the present work contains three chapters: "Separation of Samples", "Extraction and Determination of Germanium", and the "Construction of the Calibrating Curve". There are 11 references, 2 of which are Slavic.

ASSOCIATION: Ukrainian Branch of the State Institute for Rare Metals and Such as Occur in Small Quantities (Ukrainiskiy filial Gosudarstvennogo instituta redkikh i malykh metallov).

AVAILABLE: Library of Congress

Card 2/2 1. Germanium-Determination 2. Germanium-Separation

AUTHORS: Vinkovetskaya, S. Ya., Nazarenko, V. A. 32-3-5/52

TITLE: The Volumetric Vanadatometric Determination of Gallium (Ob"yemnoye vanadatometricheskoye opredeleniye galliya)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, nr 3, pp. 268-270 (USSR)

ABSTRACT:

A dibromoxyquinoline-method with vanadatometric final determination of gallium according to a method already suggested /Ref. 7/ is described. If iron, copper, zinc, tin etc. are present, gallium must be separated first. This may be accomplished in two ways, viz. by precipitation with pyridine with aluminum as collector, or by extracting the gallium tetrachloride with ether. Processes of analysis for both methods are given as well as two talbes showing the results obtained. Titanium can be removed by hydrogen peroxide, whereas aluminum, indium, lead, cadmium and manganese do not disturb the precipitation of gallium with 5,7-dibromoxyquinoline. For mass analysis the method with pyridine is the more favorable because of the repeated ether extraction necessary in the case of the other method. In this manner it is possible also to determine gallium in anode alloys. There are 4 tables, and 9 references, 5 of which are Slavic.

AUTHORS: ~~Nazarenko, V.A.,~~ Flyantikova, G.V. 32-24-6-2/44

TITLE: Analysis of Pure Metals (Analiz chistykh metallov), The Determination of Silicon Admixtures in Some Semiconductor Metals (Opredeleniye primesi kremniya v nekotorykh poluprovodnikovykh metallakh)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol 24, Nr 6, pp 663-666 (USSR)

ABSTRACT:

A method of determination is described which is not based upon the insulation of microquantities of silicon accompanied by the forming of silicon molybdenum-blue and a possible extraction, as suggested in some papers, but upon the formation of volatile compounds of the metals to be analyzed. For antimony: tribromide, for gallium: orthooxyquinolate, and for indium: trichloride and the oxide for thallium were selected. The boiling temperature of the tribromide of antimony is 280°, and by evaporation with hydrobromic acid a complete volatilization of antimony takes place because $SbBr_3$ has a high vapor pressure. The orthooxyquinolate of gallium sublimates already below 100°, and at 267° the surplus oxyquinoline is volatilized. Indium trichloride is volatilized already below 400° and is sublimated completely at 600°, whereas thallium is sublimated in form of the oxide during the melting of

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Analysis of Pure Metals. The Determination of Silicon Admixtures in Some Semiconductor Metals 32-24-6-2/44

its salts with caustic sodium; silicon can then be determined in the thallium-free alkaline smelt. In connection with the determination of gallium, indium, and thallium the silicon-molybdic acid must be extracted, as platinum from the vessel disturbs colorimetric determination, whereas possible disturbances by phosphorus, arsenic, or germanium are eliminated with the aid of citric acid. If the reagents used are purified from silicon and if the necessary precautionary measures are taken a correction to the blank test of 0.5-0.7γ Si in the antimony analysis and up to 1.5γ Si in gallium-, indium-, and thallium analyses can be attained, so that, by using a calibration curve when working with a photometer or a photocolorimeter, it is possible to determine silicon up to 0.5γ. With a weighed portion of 0.5 g of the metal a sensitivity of 1.10^{-4}% was attained. Detailed instructions concerning the production and application of reagents and detailed descriptions of the analyses carried out are given separately for each of the above mentioned metals. The results obtained are shown by a table. There are 1 table, and 7 references, 3 of which are Soviet.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii Akademii nauk USSR (Institute for General and Anorganic Chemistry, AS Ukrainian SSR)

Card 2/2 1. Silicon--Determination 2. Semiconductors--Analysis 3. Intermetallic compounds--Vaporization 4. Intermetallic compounds--Analysis

AUTHORS: Nazarenko, V. A., Flyantikova, G. V. SOV/32-24-7-6/65

TITLE: The Analysis of Pure Metals. The Determination of Cadmium Impurities in Indium and Thallium (Analiz chistykh metallov. Opredeleniye primesi kadmiya v indii i tallii)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 7, pp. 801 - 802 (USSR)

ABSTRACT: Numerous attempts to separate micro amounts of cadmium from greater amounts of indium and thallium showed that an extraction of the pyridine-thiocyanate complex of cadmium by chloroform is most favorably used. At pH=5 tartaric acid must be added in order to prevent a precipitation of indium hydroxide. The thallium thiocyanate, which is difficult to dissolve must be filtered out previous to the extraction. In doing this, the thallium salt solution must be poured into an excess of thiocyanate solution in order to prevent a coprecipitation of cadmium. The experiments showed that by this method 0,05 γ of cadmium can quantitatively be separated from 0,5g thallium. The disturbing influence of silver, mercury, copper, zinc, nickel and cobalt in the determination with dithizon was

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The Analysis of Pure Metals. The Determination of Cadmium Impurities in Indium and Thallium

removed by the application of cyanide. It is emphasized that the reactants must be purified from copper and that only pure reactants may be used. A procedure for the determination of cadmium in indium and in thallium is described. In order to find the sensitivity and the accuracy of the method, determinations with cadmium - free thallium samples were carried out, a known amount of cadmium being added and then determined. From the results of the analysis given in a table it may be seen that the method yields satisfactory results.
There are 1 table and 1 reference, which is Soviet.

ASSOCIATION: Laboratoriya Instituta obshchey i neorganicheskoy khimii Akademii nauk USSR (Laboratory of the Institute of General and Inorganic Chemistry, AS UkrSSR)

Card 2/2

AUTHORS: Nazarenko, V. A., Shitareva, G. G. SOV/32-24-8-6/4[illegible]

TITLE: The Analysis of Pure Metals. The Determination of Trace Amounts of Cobalt in Bismuth (Analiz chistykh metallov. Opredeleniye primesi kobal'ta v vismute)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 8, pp. 932-934 (USSR)

ABSTRACT: The determination of cobalt with nitroso-R salts cannot be carried out directly in the presence of bismuth. Extraction of the complex compound formed by cobalt with α-nitroso-β-naphthol into an organic solvent seemed to be a suitable means of separating these two metals. Experiments showed, however, that by masking the bismuth with citrate microgram quantities of cobalt could be determined starting from gram quantities of sample. A similar method has already been described for analysing biological materials. In this biological method the cobalt is determined by first extracting with nitroso-naphtholate and then complexing the cobalt with nitroso-R salt. In colorimetric and spectrophotometric determinations nitroso-R salts have been found to be as sensitive as α-nitroso-β-naphthol. The determinations with nitroso-R salts

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[illegible] Analysis of Pure Metals. SOV/32-24-8-6/45
[illegible] Determination of Trace Amounts of Cobalt in Bismuth

are usually carried out photometrically at 510-525 mμ, or visually. It was observed that at low concentrations of cobalt an excess of reagent adds to the color given by the complex, thus decreasing the sensitivity of the determination. To avoid this effect an attempt was made to destroy the excess reagent by adding bromate in weakly acidic solution. In doing so the stability of the color was markedly reduced, but this is not important as long as no prolonged determinations are carried out. The analytical procedure is given. The results obtained show that as little as 1.10^{-5} % cobalt in bismuth can be determined using this method.
There are 1 table and 4 references, 2 of which are Soviet.

[illegible] Instituta obshchey i neorganicheskoy [illegible]
[illegible] Laboratory of the Institute for General
[illegible] Academy of Sciences Ukrainian SSR)

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AUTHORS: Nazarenko, V. A., Shustova, M. B. SOV/32-24-11-9/37

TITLE: Fluorometric Determination of Sulfate Ions and Spectrophotometric Determination of Thorium Using Derivatives of Trioxyfluoron (Fluorometricheskoye opredeleniye sul'fat-ionov i spektrofotometricheskoye opredeleniye toriya s pomoshch'yu proizvodnykh trioksifluorona)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 11, pp 1344-1346 (USSR)

ABSTRACT: Compounds such as the 9-(o-oxy-phenyl), 9-trichloro-methyl, and 9-propyl-2,3,7-trioxyfluorons can be used as complex-forming reagents for barium, thorium, and zirconium. Solutions of the unreacted fluorons, however, exhibit a tendency to fluoresce. Among the various trioxyfluoron derivatives available for the determinations mentioned in the title the 9-(o-oxy-phenyl)-trioxyfluoron (Salicylfluoron) appears to be the most suitable. This compound forms a red complex with thorium in weakly acidic medium (pH $>$ 2). The maximum light absorption of this complex lies at 500-530 mμ (pH=4.4). The ratio of thorium to fluoron in the complex is 1:2. The measurements were carried

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Fluorometric Determination of Sulfate Ions and Spectrophotometric Determination of Thorium Using Derivatives of Trioxyfluoron

out on a Pulfrich (Pul'frikh) photometer after 24 hours on mixtures containing $0.4.10^{-5}$ to $3.6.10^{-5}$ moles Th and $3.6.10^{-5}$ to $0.4.10^{-5}$ moles salicylfluoron in 20% ethanol. The molar extinction coefficient of the salicylfluoron complex with thorium was found to be 26,000 at pH=4.4, 530 mμ and using $0.3-1.0.10^{-5}$ moles Th. The reaction obeys Beer's (Ber) Law. The determination of sulfate ion with salicylfluoronate is based on the formation of a sulfate complex which forms with the thorium complex, and according to the fluorescence of the free unreacted salicylfluoron the concentration of SO_4-ion can be determined. For the determination of microgram quantities of sulfate ion solutions of 2.10^{-4} molar thorium nitrate and 5.10^{-5} molar salicylfluoron are prepared. For quantitative determinations it is necessary to prepare a series of standard solutions, for example, with 0-0.25-0.5-1.0-1.5-2.0 γSO_4^{2-} sulfate ion. There are 2 figures and 5 references, 2 of which

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Fluorometric Determination of Sulfate Ions and Spectrophotometric Determination of Thorium Using Derivatives of Trioxyfluoron

are Soviet.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii Akademii nauk USSR (Institute of General and Inorganic Chemistry, AS UkrSSR)

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SOV/63-4-2-15/39

AUTHOR: Nazarenko, V.A., Candidate of Chemical Sciences

TITLE: The Determination of Micro-Impurities in Semiconductor Materials and Metals of High Purity

PERIODICAL: Khimicheskaya nauka i promyshlennost', 1959, Vol 4, Nr 2, pp 235-241 (USSR)

ABSTRACT: Impurities in semiconductor elements, like silicon and germanium, should not exceed a ten-millionth or a hundred-millionth part of a percent. It is necessary to determine admixtures in concentration of 1 : 10^6 to 1 : 10^{11} or even lower. For this purpose the analyzed mixture must be separated from other admixtures and the basic component. A quantity of 1 μg of the admixed element is the upper limit in analytic research. The reagents must be free of the analyzed substance and the vessels must be resistant to these reagents. In many cases the reagents must be purified. This is especially difficult if the analyzed elements are very common, like iron, calcium, silicon, etc. and the reagents are used in large quantities, e.g. water, acids, etc. Boiling water dissolves small quantities of quartz. Vessels made of plastics are often more resistant to acids and organic solvents. The laboratory atmosphere must also be free of the analyzed substances. The dis-

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The Determination of Micro-Impurities in Semiconductor Materials and Metals of High Purity

solution of the analyzed substance by preliminary grinding is another source of errors. There are several methods for separating the admixtures. Zone melting in combination with spectral or radioactivation methods is used for the analysis of very small quantities. Evaporation or sublimation at high temperature attains a sensitivity of 10-9%. It is carried out in high vacuum [Ref 4-11], or in a stream of air or inert gas [Ref 3, 12, 13]. Separation in the form of highly volatile chemical compounds is applied to sulfur, arsenic, and boron. The transformation of volatile compounds into non-volatile ones is also used. The volatilization of the basic component is used in the case of germanium [Ref 15-17] and other elements. Extraction by solvents not mixing with water is used in the group extraction of aluminum, titanium, zirconium and selenium [Ref 23]. Coprecipitation with collector is especially suitable for cases when spectral determination follows it. Organic coprecipitating agents are very selective [Ref 25]. Electrolysis is the method for the determination of light metals or non-metals in heavy metals. The mercury cathode is used for the group separation of heavy and non-ferrous metals from very diluted solutions. After separation the various admixtures are determined by different methods.

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The optical spectral method is broadly applied in production control. Its sensitivity is only 10^{-2}-10^{-4}% and can be increased only by using samples of several grams. The flame-photometric method is important for the determination of alkali and alkali earth metals. Its sensitivity is 10^{-4}%. Mass-spectroscopy has a high sensitivity only in combination with isotope dilution, in which case it attains 10^{-10}%. The radioactivation method is one of the most sensitive, but its sensitivity is not equal for all elements. Neutronic irradiation of the analyzed element produces sometimes isotopes of the element adjacent in the periodic system. It is the method mostly used for the simultaneous determination of several admixtures in metals of high purity [Ref 57, 58]. Many laboratories, however, have no source of neutrons. The method of isotope dilution determines the relation of isotopes or the specific activity of an element, on the base of which the concentrations are calculated [Ref 53, 60]. In some cases radioisotopes with a sufficient half-life are not available. Photometric methods are most sensitive when based on fluorescent and catalytic reactions. The sensitivity may be increased to 10^{-6} or 10^{-7}% if a microcolorimeter is used. Electrometric analysis is of low sensitivity in the case of zinc

SOV/63-4-2-15/39

The Determination of Micro-Impurities in Semiconductor Materials and Metals of High Purity

and titanium [Ref 65, 66]. In the polarographic determination of indium it reaches 10^{-6}%. Radiometric titration with the extraction of the reaction product by organic solvent permits the determination of 0.01 μg.
There are 71 references, 36 of which are Soviet, 21 English, 11 German and 3 Japanese.

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SOV/89-7-3-16/29

21(7)

AUTHORS: Sakharov, V. N., Kolesnikov-Svinarev, V. I., Nazarenko, V. A.,
Zabidarov, Ye. I.

TITLE: The Angular Distribution of the Radiation of Au^{198} Scattered in Air Above Ground

PERIODICAL: Atomnaya energiya, 1959, Vol 7, Nr 3, pp 266-267 (USSR)

ABSTRACT: From a ~ 10,000 c Au^{198}-source, which was located 1.5 m and 2.5 m above the ground, the total intensity of radiation in distances of up to 600 m from the source as well as the angular distribution of radiation in distances of 150, 250 and 400 mm from the source was measured. The total intensity was measured by means of a Geiger counter described in reference 1, in which the multiple scattered γ-quanta with energies of between 120 and 410 kev were recorded with the same sensitivity. Radiation with energies of between 60 and 120 kev were measured by means of a somewhat more sensitive counter. γ-quanta with energies below 50 kev were not recorded. Angular distribution was measured by means of a detector consisting of 4 counters connected in series, which was placed behind a thick lead disk (diameter 21 cm) in such a manner that the centers of this disk and of the detector were in one line with the center of the source. The following measuring results are graphically

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The Angular Distribution of the Radiation of Au^{198} Scattered in Air Above Ground

given: Dependence of the absorption coefficient and of the intensity of the non-scattered radiation on the distance between the source and the detector. Angular distribution of the scattered radiation. By placing source and detector near the ground, the radiation intensity at large distances becomes about twice as small as in homogeneous air. If the distance between source and the ground is increased, this difference becomes smaller and attains only the 1.5-fold and a height of about 25 m at the same distances as before. This is in agreement with the predictions made by reference 4. With respect to angular distribution it may be said that, from distances of 150 m onward, it practically undergoes no further change. The results obtained may be used in order more easily to calculate γ-shields. The problem was raised by O. I. Leypunskiy. V. A. Rogachkov, V. A. Shabashov and V. N. Rodionov assisted in working with the strong γ-preparation. There are 4 figures and 4 Soviet references.

SUBMITTED: February 18, 1959

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5(2)

AUTHORS: Biryuk, Yo. A., Nazarenko, V. A. SOV/75-14-3-7/29

TITLE: Use of Trioxyfluorone Derivatives in Photometric Analysis for the Determination of Scandium (Primeneniye proizvodnykh trioksifluorona v fotometricheskom analize opredeleniya skandiya)

PERIODICAL: Zhurnal analiticheskoy khimii, 1959, Vol 14, Nr 3, pp 298-302 (USSR)

ABSTRACT: The derivatives substituted in position 9 of the 2,3,7-trioxy-6-fluorone were investigated with respect to their applicability in photometric recording. The synthesis of the derivatives was carried out from triacetyl-oxy-hydroquinone and the corresponding aldehyde. Table 1 gives the color reactions of the derivatives obtained with scandium. Only the 9-propyl derivative proved to be suitable if acetyl acetone is added for masking germanium, lead, antimon etc. The determinations were carried out with the spectrophotometer SF-4. Figures 1 - 5 show the diagrams of the light absorption, color intensity, molar ratio, and optical density in dependence on the scandium concentration. Table 3 gives the equilibrium constants. The molar extinction coefficient was found to be 32 000 for 530 mμ. Table 4 presents the analysis results obtained in the

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Use of Trioxyfluorone Derivatives in Photometric Analysis for the Determination of Scandium SOV/75-14-3-7/29

presence of Al, Y, La, Ce and Th. 9-Propyl-trioxyfluorone permits the photometric determination of 0.04 - 2γ/ml scandium in a solution 1 : 5.10^7. The solutions of the scandium-complex compounds obey Beer's law. There are 5 figures, 4 tables, and 8 references, 2 of which are Soviet.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN USSR, laboratorii v Odesse (Institute of General and Inorganic Chemistry of the Academy of Sciences of the UkrSSR , Laboratories in Odessa)

SUBMITTED: January 25, 1958

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NAZARENKO, V. A.

AUTHOR: Bilimovich, G. N. SOV/75-14-4-30/30

TITLE: Section of Analytical Chemistry of the VIII Mendeleyev Congress on General and Applied Chemistry

PERIODICAL: Zhurnal analiticheskoy khimii, 1959, Vol 14, Nr 4, pp 511-512 (USSR)

ABSTRACT: Approximately 300 persons participated in the work of the Department of Analytical Chemistry, among them representatives of various scientific research institutes, higher schools and industrial enterprises in Russia, scientists from China, Bulgaria, the CSR, Poland, Hungary, and Italy. Approximately 70 reports were heard. In his opening speech I. P. Alimarin reported on the achieved results and on modern problems of analytical chemistry. I. V. Tananayev reported on the application of physico-chemical analysis in heterogeneous systems for the solution of a series of problems of analytical chemistry. V. I. Kuznetsov reported on modern aims in the use of organic reagents; A. K. Babko showed at the example of halide and thiocyanate complexes the correlation between the stability of complexes and the position of the corresponding central atoms in the periodic system. V. M. Peshkova and V. M. Bochkova lectured on the stability of oximates of Cu, Co, and Ni as depending on the structure of the oxime molecule. E. P. Tsyganova lectured on the double character of reaction of some compounds in the formation of complexes. The problem of the application of heteropolyacids in analytical chemistry was dealt with in the lectures of L. P. Shakhova and co-workers, and A. I. Kenerin and N. A. Tsitsishvili. A large number of lectures dealt with the use of new organic reagents in analysis: A. I. Busev and M. I. Ivanyutin reported on the application of dialkyl and diaryl dithiophosphoric acid for the separation of elements. A. I. Parinin used aryl arsonic acid and aryl phosphinic acid. R. P. Lastovskiy and his co-workers treated some properties of new complexons. The lectures of V. A. Nazarenko, G. G. Shitareva and A. I. Kononenko dealt with the photometric determination of a series of elements using fluorine derivates. A. I. Cherkesov lectured on the use of halochromation in analytical chemistry. D. M. Ivlaine and T. N. Malyutina lectured on the determination of tantalum using differential spectrophotometry. Yu. V. Morachevskiy and I. A. Stolyarova reported on new highly sensitive analysis methods using an ultraviolet microscope. Several lectures dealt with methodical and theoretical problems of spectrum analysis (N. F. Zakhariy and S. A. Borovik; L. Ya. Varshavskiy and co-workers). N. S. Poluektov and M. N. Nikonova treated the perfection of flame photometry. Several lectures dealt with the determination of elements by polarography (E. I. Ilyakova; E. N. Rozhdestvenskaya and I. A. Yarovoy; Ye. F. Gokhshteyn). New results in using fixed electrodes were reported by V. D. Omchenko and Yu. S. Lyalikov and co-workers. The lecture of E. I. Usal'tseva and V. N. Vasil'yev treated the use of amperometric titration with two electrodes in the chemistry of uranium and thorium. N. N. Senyavin showed possibilities of predicting the conditions of chromatographic separation of elements based on their position in the periodic system. T. A. Belyavskaya reported on the use of ion exchange in the investigation of the state of substances in solutions. A. D. Veraitsub and V. A. Petrashen' lectured on the chromatographic separation of a series of elements, B. G. Polyanskiy reported on adapting the properties of ion exchanger resins, V. N. Shemyakin and associates reported on the chromatographic proof of sulfanilamide preparations in liquids of the organism. G. L. Starobinets and associates treated the application of high polymers in chromatographic analysis. The lecture of A. A. Zhukhovitskiy and N. M. Turkel'taub, G. Shay dealt with gas chromatography. Several lectures treated the use of radioactive isotopes for the chromatographic investigation of complex formation (N. I. Kratchikov and associates), for the investigation of the co-precipitation mechanism of ions of rare metals with sulfides (M. A. Zaynev) and for determining rare elements by means of isotope dilution (I. P. Alimarin, G. N. Bilimovich). In the field of elementary organic microanalysis the lectures of M. O. Korshun, N. E. Gel'man and V. A. Klimova with associates have to be mentioned, who treated the elaboration of rapid micromethods for the simultaneous determination of several elements from one weighed portion of boron, fluorine and siliconorganic compounds.

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5(2)

AUTHORS: Nazarenko, V. A., Biryuk, Ye. A.

TITLE: Determination of Bismuth, Lead and Cadmium in Vanadium and Niobium (Opredeleniye vismuta, svintsa i kadmiya v vanadii i niobii)

PERIODICAL: Zavodskaya Laboratoriya, 1959, Vol 25, Nr 1, pp 28-30 (USSR)

ABSTRACT:

A method is described, which allows to analyze a pure metal on several admixtures simultaneously. It is based on the extraction of admixtures in the form of diethyl-dithio-carbamates. Bismuth is then determined according to the iodide-ketone method, lead and cadmium with diphenyl thiocarbazone. When treating chloroform extracts of carbamates from an alkaline medium with 0.2 n hydrochloric acid, lead and cadmium pass to the aqueous phase, while the bismuth compound remains in the chloroform. A new variant of the iodide method was devised for the bismuth determination; it is based on the extraction of the bismuth-iodide complex compound with methyl isobutyl ketone (Ref 3). Thiourea was used for the masking of copper, so that under the conditions given up to 100 γ copper and 10 γ antimony can be present in the determination of 1 - 5 γ bismuth.

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Determination of Bismuth, Lead and Cadmium in Vanadium and Niobium

If the blank test sample is corrected appropriately, lead or cadmium can be determined up to 0.2γ, and bismuth up to 1γ. In the niobium determination only lead and cadmium can be determined simultaneously, as niobium enters solution. The various analysis procedures are mentioned.
There are 1 table and 4 references, 2 of which are Soviet.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii Akademii nauk USSR (Institute of General and Inorganic Chemistry of the Academy of Sciences, UkrSSR)

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5 (2) SOV/32-25-8-2/44

AUTHORS: Nazarenko, V. A., Lebedeva, N. V.

TITLE: Application of Trioxyfluoron Derivates in Colorimetric Analysis

PERIODICAL: Zavodskaya laboratoriya, 1959, Vol 25, Nr 8, pp 899 - 903 (USSR)

ABSTRACT: The application of phenylfluoron (9-phenyl-2,3,7-trioxy-6-fluoron) (I) for the determination of germanium (II) has the disadvantage that the formed complex compound is colloidal. Therefore, (Refs 1,2) p-dimethyl-aminophenylfluoron (III) was recommended as a reagent, as (III) forms with (II) real solutions. It was established that different 2,3,7-trioxyfluoron (substituted in the 9 position) derivates can be more or less used as reagents for (II). To establish the suitability of the different trioxyfluoron derivates (TD) for the colorimetric (II)-determination the molar absorption coefficients of several complex compounds of (II) were investigated with synthesized (TD). The reaction occurred at the optimum acidity of 0.5 n HCl. The optical density was measured on a Pulfrich photometer at a wave length of 530 mμ. The measuring results (Table) proved that the sensitivity of the 2-nitro, 4-nitro, and 2,4-dinitro-phenylfluorons is greater than that of (I). Concerning spectrometric

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Application of Trioxyfluoron Derivates in Colorimetric Analysis SOV/32-25-8-2/44

sensitivity of the reaction disulfophenylfluoron (IV) surpasses that of (II) with the last-mentioned nitro compounds as well as that of (I). The advantage of (IV) is that the determinations can be made at a low acidity (from pH 5 to 0.2 n HCl). In case of strongly acid solutions the use of (I) is [illegible] preferable and there also is a possibility that insoluble compounds are formed with (II) which precipitate. Thus, (II) is most favorably determined by spectroscopy with (IV) in weakly acid solutions (0.02 - 0.05 n HCl) with the addition of gelatin, while for strongly acid solutions (above 0.1 n HCl) the (I) and the above mentioned nitro compounds are to be preferred as reagents. There is mention of the photometric determinations of Kazarinova and Vasil'yeva, reference 6, which appeared at the time the present paper was being printed, but which in principle is in accordance with the presented experimental results. There are 7 figures, 1 table, and 6 references, 3 of which are Soviet.

ASSOCIATION: Laboratoriya Instituta obshchey i neorganicheskoy khimii Akademii nauk Ukrainskoy SSR (Laboratory of the General and Inorganic Chemistry Institute of the Academy of Sciences, Ukrainskaya SSR)

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