SOV/25-59-7-21/53

Pro or Con? (A Letter to the Editor)

this publication with anti-clerical footnotes and an appendix to give it an atheistic touch.

ASSOCIATION: Vsesoyuznoye obshchestvo po rasprostraneniyu politicheskikh i nauchnykh znaniy (All-Union Society for Dissemination of Political and Scientific Knowledge)

Card 2/2

L 00163-66 EPF(c)/EWP(j)/EWT(m)/T RPL JAJ/RM/WW
ACCESSION NR: AP5025550

BU/0011/65/018/002/0121/0124

AUTHOR: Mihailov, M.; 44,55 Boudevska, H.; 44,55 Korolev, G.; 44,55 Zhiltsova, L. 44,55

43
37

TITLE: Polymerization 44,55 kinetics in blocks of polyestermethacrylates based on terephthalic and furane-2, 5-dicarboxylic acid B

SOURCE: Bulgarska akademiya na naukite. Doklady, v. 18, no. 2, 1965, 121-124

TOPIC TAGS: methacrylate plastic, polyester plastic, carboxylic acid, polymerization, polymerization kinetics

ABSTRACT:

G. V. Korolev et al. (see, e.g., Vysokomol. soyedineniya, 4, 1962, No 11, 1663) have discovered a number of important laws of steric polymerization while investigating the polyestermethacrylates (PEM) synthesized by them by means of the thermometric method. A further development of notions about the relation between the structure of the polymerizing polyfunctional oligoesters and their responsiveness and properties makes it necessary to study the character of steric polymerization with new PEM types and other oligomers. In this connection the authors investigated the polymerization kinetics of PEM of terephthalic and furane-2,5-dicarboxylic acid (M. Mihailov, H. Boudevska, Compt. rend. Acad. bulg. Sci., 18, No 1, 1965)

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Card 2/2

SOV/120-58-5-30/32

AUTHORS: Korolev, G. A. and Kocharov, G. Ye.

TITLE: Thin Large Area α-Active Sources (Tonkiye α-Aktivnyye istochniki bol'shoy ploshchadi)

PERIODICAL: Pribory i tekhnika eksperimenta, 1958, Nr 5, pp 108-109 (USSR)

ABSTRACT: A new method is described for the preparation of thin plane α-active sources of large area and good homogeneity. The sources are prepared by electron deposition of the α-active substances on aluminium-coated zapon films. The total thickness of the films is less than 50 μg per cm^2. The method is simple and does not require any special apparatus. There is 1 figure and 3 references, 2 of which are English and 1 French.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR (Physico-Technical Institute of the Academy of Sciences, USSR)

SUBMITTED: October 25, 1957.

Card 1/1

SOV/48-22-7-13/26

AUTHORS: Komar, A. P., Korolev, G. A., Kocharov, G. Ye.

TITLE: Investigation of the Lower Excited Th^{230} Levels by Means of α-e_K Coincidences (Izucheniye nizhnikh vozbuzhdennykh urovney Th^{230} putem α-e_K-sovpadeniy)

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya fizicheskaya, 1958, Vol. 22, Nr 7, pp. 824-826 (USSR)

ABSTRACT: An apparatus for recording the α-e_K coincidences was built by the authors. It consists of a pulse ionization chamber into which a proportional counter for recording the conversion electrons is placed. With this equipment the α-spectrum of U_{234} was examined with respect to coincidences with the conversion electrons. The apparatus is described. Suppression of noise from random α-α coincidences is provided for in the radio unit. During 24 hours the instability of the whole radio unit was less than 0,2 %. - As was expected, there were no main groups of α-particles of U^{234} and U^{235} in the α-spectrum of U^{234}. The α_1 group corresponds to the transition to the 2^+ level of the daughter nucleus. From an analysis of

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SOV/48-22-7-13/26

Investigation of the Lower Excited Th^{230} Levels by Means of α-e_K Coincidences

the curve obtained, the intensity of the transition to the 4^+ level can be determined. It is (0,35 ± 0,15 %)(the intensity of the α_1 group being considered as known). The level energy is 170 keV, as results also from the generalized nuclear model. It can be assumed that the 53 keV γ-quanta correspond to the transition from the 2^+ to the ground level, while those having 118 keV correspond to one from the 4^+ to the 2^+ level. The transition from the 4^+ to the ground level has not been observed until now although it is not impossible. With the use of the theoretical values of the conversion coefficient for the K and L shells (Refs 10, 11), and of the experimental values for the ratio $N_{\gamma-53}/N_{\gamma-118} = 2,5$, the intensity of the transition to the 4^+ level can be determined. Its value coincides with the experimental value of 0,35 %. - The authors acknowledge the advice of B. A. Bochagov and S. N. Nikolayev. There are 3 figures and 11 references, 8 of which are Soviet.

SOV/48-22-7-13/26

Investigation of the Lower Excited Th^{230} Levels by Means of α-e_K Coincidences

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR
(Physics and Engineering Institute,AS USSR)

SOV/56-34-5-54/61

AUTHORS: Komar, A. P., Korolev, G. A.,
Kocharov, G. Ye.

TITLE: Inferior Excited (Rotation-)Levels of Th^{234} (O nizhnikh vozbuzhdennykh (rotatsionnykh) urovnyakh Th^{234})

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr 5, pp. 1345 - 1346 (USSR)

ABSTRACT: By means of an ionisation chamber with a grid (Ref 1) the authors investigated the energy spectrum of the α-particles from U^{238}. The spectrum obtained this way is given in a figure. In this figure α_0 denotes the main group of the α-particles from U^{238} with an energy of 4,182 MeV. According to the opinion of the authors the group α_2 corresponds with the transition to the second level of Th^{234}. The intensity of this transition is 0,25 + 0,1%. The level is located at ~ 160 KeV. The ratio of the energies of the first and second level agrees with the theoretical value obtained on the basis of the simplified nuclear model. This level probably is the +4 one. The group α_1 corresponds

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Inferior Excited (Rotation-)Levels of Th^{234}

SOV/56-34-5-54/61

with the transition to the level + 2 of the daughter nucleus. The transition to the level +2 occurs with an intensity of 23%. This value of the intensity well agrees with the results of various previous works (Refs 2-5). The scheme of the U^{238}-decay, constructed on the basis of the results of this paper, is given in a diagram. At present more measurements concerning a better separation of the group α_2 are performed which will render possible a more accurate precision of the results obtained here. There are 2 figures and 5 references, 1 of which is Soviet.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Institute of Physics and Technology, AS USSR)

SUBMITTED: February 20, 1958

Card 2/3

24(7) SOV/48-23-7-15/31

AUTHORS: Kocharov, G. Ye., Komar, A. P., Korolev, G. A., Marov, I. N., Surkov, Yu. A.

TITLE: The Fine Structure of the α-Spectrum of Th^{229} (Tonkaya struktura α-spektra Th^{229})

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 7, pp 855-858 (USSR)

ABSTRACT: The radioactive isotope Th^{229} is obtained by the α-decay of U^{233}; as the half-life of the latter is $1.62 \cdot 10^5$, that of Th^{229}, however, only 7,000 years, a large quantity of U^{233} is necessary for the exact determination of the activity of the isotope Th^{229}. A paper (Ref 1) is mentioned in which the α-decay of this isotope was investigated, but it did not deliver satisfactory results due to a poor resolving power. The present investigation was carried out with an ionization-α-spectrometer of high resolving power, and the chemical production of the isotope from oxides of the isotope U^{233} is described in detail. The isotope U^{233} investigated by the authors contains -

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The Fine Structure of the α-Spectrum of Th^{229} SOV/48-23-7-15/31

besides the isotope Th^{229} - also Th^{228}; the energies of the unknown α-lines were determined from the well-known α-lines of Th^{228} and its daughter nuclei. The energy of the principal group of the α-particles was determined by several measurements at 5040 kev, the determination of the energy of the other α-groups was carried out by electric collimation. A table contains the energies determined by the authors and the relative intensities of the lines of the isotope Th^{229}, and figure 5 shows a scheme of its decay. The authors thank Ye. A. Damaskinskiy of the LPI imeni Kalinin for his help in this work. There are 5 figures, 1 table, and 8 references, 6 of which are Soviet.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR (Physico-technical Institute of the Academy of Sciences, USSR)

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21(8)

AUTHOR: Kocharov, G. Ye., Komar, A. P., Korolev, G. A. SOV/56-36-1-11/62

TITLE: Energy Spectra of α-Particles of Long Life Th^{232} and U^{238} Isotopes (Energeticheskiye spektry α-chastits dolgozhivushchikh izotopov Th^{232} i U^{238})

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 1, pp 68-75 (USSR)

ABSTRACT: Investigation of α-spectra fine structure makes it possible to investigate the weakly excited states of heavy nuclei as well as the determination of several parameters of nuclear structure. As the magnetic spectrometers otherwise used are not suited for fine-structure investigations of α-spectra of long-life isotopes because of their low light intensity, and as the usual ionization chambers furnish a half-width of lines of only ~50 keV, the authors endeavored to produce a device having a better resolving power. In 1955 and 1956 they developed an ionization chamber in their laboratory, which had a grid for an α-line half-width of 30 keV (Refs 1-4), with the help of which it was possible to carry out an investigation of the fine structure of the α-spectra of Th^{232} and U^{238}. The present

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Energy Spectra of α-Particles of Long-Life Th^{232} and U^{238} Isotopes SOV/56-36-1-11/62

paper gives a very detailed description of the device and of its mode of operation. The following was investigated:
1) The α-transition to the first excited level of the daughter-nuclei of Ra^{228} and Th^{234}. Figure 4 shows the α-spectrum of Th^{232} (measuring time 25 hours), and figure 5 shows that of U^{238} (1.5 hours). For the former an α_1-intensity of (23 ± 3) % is given, as well as an energy of the first level of (60 ± 5) keV, for U^{238} an α_1-intensity of (23 ± 4) % and an energy of the corresponding level of (48 ± 5) keV.
2) Transition to the second level of the daughter nuclei of Ra^{228} and Th^{234}. Figure 6 shows N(E) for Th^{232} (measuring time 90 hours). Owing to the great light intensity and the good resolving power of the ionization chamber, the spectrum shows distinct peaks for $\alpha_1(2^+)$ and $\alpha_2(4^+)$. Figure 7 shows a similar spectrum for U^{238} (30 h). The following data are given: Energy of the second level (185 ± 5) keV, intensity (0.2 ± 0.08) % and (160 ± 5) keV intensity (0.23 ± 0.07) % respectively.
A comparison between experimental data and those calculated by Nosov (Ref 17) and Komar et al (Ref18) shows good agreement

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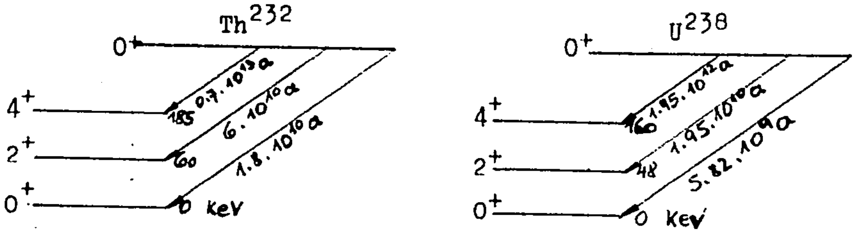
(see table). In conclusion, the following decay schemes are suggested for Th^{232} and U^{238}:



In conclusion, the authors thank Yu. A. Surkov for placing the thorium sources at their disposal, V. G. Nosov for discussions and for placing the manuscript of his paper at their disposal, and they further express their gratitude to

Energy Spectra of α-Particles of Long-Life Th^{232} and U^{238} Isotopes SOV/56-36-1-11/62

Ye. A. Damaskinskiy for his assistance and to V. A. Kireyev and S. N. Nikolayev for their advice. There are 8 figures, 1 table, and 21 references, 10 of which are Soviet.

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

SUBMITTED: August 8, 1958

Card 4/4

56344

S/048/60/024/03/15/019
B006/B014

21.5200

AUTHORS: Korolev, G. A., Kocharov, G. Ye.

TITLE: Investigation of Pulses Occurring on the Grid of an Ionization Chamber 19

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 3, pp. 357-364

TEXT: The article under review was read at the Tenth All-Union Conference on Nuclear Spectroscopy (Moscow, January 19 - 27, 1960). The use of shielding grids in pulsed ionization chambers makes it necessary to study the grid pulses. The problem of the shape of pulses from the collecting and from the high-voltage electrode and the proper choice of the amplifier transmission band have already been studied in Refs. 3 and 4. A maximum signal-to-noise ratio was given as basic criterion for the selection of transmission bands. In the present paper, the authors show that in the case of grid pulses the most favorable transmission band is primarily determined by the condition of conservation of the angular distribution function. First, the authors investigate an

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Investigation of Pulses Occurring on the
Grid of an Ionization Chamber

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B006/B014

ionization chamber with two grids, and the shape of voltage pulses is studied on the first grid. It is assumed that no diffusion of the "electron track" takes place, that the density of ionization along the alpha track is constant, and that no electronegative impurities exist in the gas of the chamber. The chamber is schematically represented in Fig. 1, and Fig. 2 shows grid pulses. A number of formulas representing the grid potentials as functions of different variables are then derived. Next, the authors describe a theoretical study of the proper selection of transmission bands for operations with negative grid pulses. They investigate the effect of diffusion upon negative grid pulses, and the last section briefly deals with positive grid pulses (due to positive ions). In conclusion, it is stated that the following conditions must be satisfied for the use of negative grid pulses for angular measurements: The chamber must be filled with a gas having a small diffusion coefficient. It is necessary to use transmission bands by which the angular distribution is not distorted. In order to guarantee exact angular distribution in the case of positive grid pulses, it is necessary to use a chamber gas in which the electron drift

S/056/60/038/005/052/057/XX
B006/B070

24.6600
26.2222

AUTHORS: Komar, A. P., Korolev, G. A., Kocharov, G. Ye.

TITLE: Study of the Alpha Decay of U^{236} 19

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 5, pp. 1436 - 1438

TEXT: The alpha spectrum of U^{236} was studied by means of a high resolution ionization chamber with grid. This chamber permits to determine the number of ion pairs formed by the alpha particles in the chamber. The ion pair number N and the alpha particle energy E are related by the equation $E = Nw$, where w is the energy required for the formation of an ion pair. w depends on the gas filling of the chamber and on the energy of the alpha particles. To separate the two effects, E is set equal to $Nw_0 + \varepsilon_0$, where w_0 is the mean pair formation energy for $E > 4$ Mev, and ε_0 is a parameter depending on the nature of the gas. ($\varepsilon_0 = 83$ kev for a mixture of argon and methane). The energy of alpha particles was determined from the

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Рис. 3

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Study of the Alpha Decay of U^{236}

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B006/B070

Fig. 2 shows the alpha spectrum taken for a channel width of 13.9 kev. The three alpha groups correspond to the transitions to 0^+, 2^+, and 4^+ level, respectively, of the Th^{232} nucleus. The distance of the α_2 group from the ground level is 160 kev; the intensity of this group is (0.26 ± 0.1)%. Professor S. A. Baranov is thanked for having supplied the U^{236} samples. There are 3 figures and 8 references: 2 Soviet and 6 US.

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

SUBMITTED: December 15, 1959

X

Card 3/3

DAMASKINSKIY, Ye.A.; KOROLEV, G.A.; KOCHAROV, G.Ye.

Effect of the sticking of electrons in an ionization chamber.
Prib.i tekh.eksp. 6 no.5:51-54 S-O '61. (MIRA 14:10)

1. Fiziko-tekhnicheskiy institut AN SSSR.
(Ionization chambers)

S/048/61/025/002/008/016
B117/B212

AUTHORS: Kocharov, G. Ye., Korolev, G. A.

TITLE: Ionization alpha spectrometer with high resolution

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, v. 25, no. 2, 1961, 237-256

TEXT: The present paper was read at the 11th Annual Conference on Nuclear Spectroscopy (Riga, January 25 to February 2, 1961). The authors describe the ionization alpha spectrometer developed by them. It has a high resolution (half-width of the alpha lines: 25÷35 kev) and a high light intensity (the solid angle used was 20÷30% of 4π). The spectrometer is schematically shown in Fig. 10. It consists of: 1) ionization chamber with grid; 2) radiotechnical system (which, in turn consists of: 1) preamplifier; 2) amplifier; 3) limiter; 4) one-channel analyser; 5) 28-channel analyser; 6) pulse generator; and 7) amplitude indicator); and 3) gas pump unit. The main part is the ionization chamber, a brass cylinder with a capacity of 22 liters. The collector electrode is mounted on the bottom of the chamber. The grid and the high-voltage electrode are fastened to a special slide, which makes it

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Ionization alpha spectrometer ...

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B117/B212

possible to change the distance between the electrode. 4-mm thick brass discs are used as electrodes. The diameter of the high-voltage electrode measures 220 mm, that of the collector electrode 120 mm. The grid consists of nichrome wire (diameter 0.1 mm) and was welded to a stainless steel ring. The distances between the wires are 1.5 mm. High-voltage wires are inserted in the chamber wall, and wires for pulse transmission. The whole system has been evacuated to 10^{-2} mm Hg, and then filled with a mixture of argon and 3% methane. The operating pressure is 1.5-1.8 atm. The electrode potentials have been selected such that a recombination and deposition of electrons on the grid is excluded. The electrode pulses are passed through a noiseless preamplifier (Fig. 11) and then fed to an amplifier that has an amplification coefficient of 10^3. The amplifiers are modified models of the type Elmor-100. The use of a limiter reduces the analyser channel. The channel-width may be varied from 5 to 50 kev by changing the amplification coefficient. The one-channel differential discriminator has been used for electric collimation. The 28-channel analyser, designed and constructed after plans of the laboratory of the Physicotechnical Institute (Ref. 14) is to be used for amplitude analysis. The electron pulses provide a means to calculate the alpha-particle energy and their angle of emergence. In order

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to obtain a high resolution, the authors have thoroughly studied all reasons that might influence the former. These reasons are divided into two groups with respect to their influence upon the alpha spectrum: 1) Fluctuation of ion pairs and radio noises which lead to a Gaussian amplitude distribution of pulses without shifting the maximum, and 2) thickness of the radiation source, sticking of electrons to electronegative additives, no screening of the grid and the end front of the pulses cause an expansion of the alpha line, and also a shift of the maximum towards smaller energies. An investigation of these factors made it possible to find formulas for determining the half-width of the alpha line and the shift of the maximum. By a proper choice of the amplifying tube and its operation conditions (plate potential 50÷60 v, filament voltage 4÷6 v) it was possible to cut down the radio noises and reduce their half-width to 16 kev. The use of an argon-methane mixture completely reduces the sticking of electrons to electronegative additives (Figs. 12 and 13). A considerable increase in drift velocity added to improve the energy and time resolution. Application of electric collimation (Fig. 9) improved the resolution of the ionization chamber without influencing the light intensity of the instrument. The novel ionization alpha spectrometer has been used to study the fine structure of alpha spectra of uranium and thorium isotopes (Tables 2-4). By strict observation of the corrections, and due to the high resolution it was possible to measure the alpha-line energy with an accuracy of 0.05÷0.1%. The energy of the main group of alpha particles from U^{236} was measured with an accuracy of ± 3% (Ref. 18). Laboratory experiments have shown that a use of the electrode pulse reduces the background. By a specific adjustment it was possible to obtain 0.1 to 0.2 pulses per hr on the spectral region that corresponds to an alpha line. Thus it was possible to separate the alpha line with an intensity of up to one pulse per hr from the spectrum, i.e., also with sufficient accuracy. At a surface of 200 cm^2 and a thickness of 20÷30 $\mu g\ cm^{-2}$ this corresponds to a half-life of 10^{15}÷10^{16} years. Combined with a 48-channel time analyzer, the ionization alpha spectrometer has been used to measure short half-lives. Thus, half-lives down to 10^{-4}-10 sec have been measured. The results are more accurate than those obtained after other methods (Ref. 32). In order to determine the energy of α particles and the corrections caused by electric collimation (distortion of the intensities of α lines), it is necessary to know for argon the dependence of the distance of the ionic center of mass on the start of the alpha particles. This dependence has been determined experimentally and mathematically (Figs. 15

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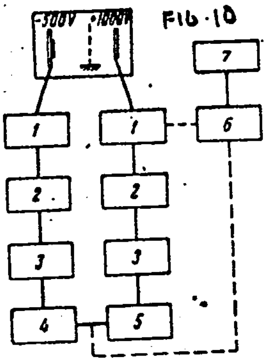
B117/B212

Ionization alpha spectrometer ...

and 16). The calculations have been made by the degree student Ye. A. Damaskinskiy of the LPI. There are 16 figures, 4 tables, and 32 references: 21 Soviet-bloc.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk (Institute of Physics and Technology of the Academy of Sciences)



FIG·10

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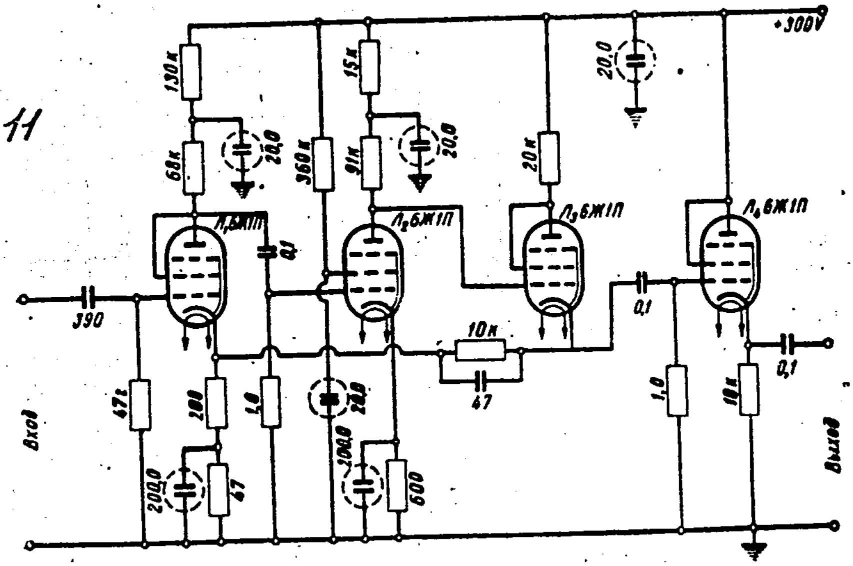
Ionization alpha spectrometer ...

Fig. 11



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26440
S/048/61/025/007/002/005
B108/B209

9.6150

AUTHORS: Korolev, G. A., and Kocharov, G. Ye.

TITLE: Operation of proportional counters

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 25, no. 7, 1961, 866 - 870

TEXT: This paper was read at the XI Annual Conference on Nuclear Spectroscopy in Riga, January 25 - February 2, 1961. V. Veksler et al. (Ref. 1: Ionizatsionnyye metody issledovaniya izlucheniy. GITTL, M., 1949) and S. Korff (Ref. 2: Schetchiki elektronov i yadernykh chastits. IL. M., 1947) showed that the stability of a counter may be increased by adding multi-atomic impurities to the inert gas in this counter. In order to study the effect of such impurities one has to observe the variation of the gas amplification factor which can be done the better, the better the energy resolution of the counter. This resolution which down to a certain A_{cr} (critical gas amplification factor, given by $EA_{cr} \approx 10^8$ ev) is independent of the gas amplification factor is interrelated with the primary ionization by the relation $\frac{\Delta E}{E} \approx \frac{2.36}{\sqrt{m_0}}$, where m_0 indicates the number of ion

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pairs. The most important items affecting the line half-width are discussed. With a gas amplification factor equal to 5, the author obtained relative half-widths of 1.7 and 1.9% for the alpha-lines of U^{238} and U^{234}, respectively, at an argon pressure of 1.3 atm. The biggest share to the half-width is contributed by end-effects and by the effect of the space charge. The gas amplification factor was found to be higher for argon containing a small quantity of methane (up to about 6.2%) than for pure argon. The theory of M. E. Rose and S. A. Korff (Ref. 6: Phys. Rev., 59, 850 (1941)) is shown to be not applicable to gas mixtures on account of electrons forming in second-kind collisions. The gas amplification factor is given by the expression $A = e \int_{r_0}^{r_a} \alpha dr$, where r_0 denotes the radius of the counter wire, r_a the distance at which the avalanche arises, α the number of ion pairs formed by one electron per unit length. The authors give the formula $A = \exp (aN \int_{r_0}^{r_a} \varepsilon(r)dr)$, which represents A as depending

26440
S/048/61/025/007/002/005
Operation of proportional... B108/B209

on gas pressure (N - number of atoms or molecules per unit volume), the kind of gas ($a = \sigma/\varepsilon$, where σ denotes the ionization cross section and ε the mean energy of electrons), and on the counter characteristics. A rise in A on account of impurities in the counter gas is due to the excitation of part of the atoms of the inert gas. This rise may appear in all such cases where the work function of the impurity is smaller than the excitation energy of the atoms of the base gas. A. P. Komar is thanked for discussions. [Abstracter's note: The formula for A given in the first place should, most probably, read $A = \exp(\int....)$.] There are 2 figures and 8 references: 6 Soviet-bloc and 2 non-Soviet-bloc.

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

Card 3/3

VOLKOV, Yu.M.; KOMAR, A.P.; KOROLEV, G.A.; KOCHAROV, G.Ye.

Application of an ionization α-spectrometer with a time analyzer for half-life determinations. Izv. AN SSSR. Ser. fiz. 25 no.9:1188-1196 '61. (MIRA 14:8)

1. Fiziko-tekhnicheskiy institut im. A.F. Ioffe AN SSSR.
(Spectrometry)
(Radioactive substances—Decay)

34171
S/048/62/026/002/012/032
B101/B102

21.2541

AUTHORS: Korolev, G. A., and Kocharov, G. Ye.

TITLE: Measurement of the alpha-particle energy of the long-lived isotopes Th^{232} and Bi^{210*}

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 2, 1962, 235 - 236

TEXT: The main alpha line of Th^{232} and the alpha lines of Bi^{210*} were measured with an ionization alpha spectrometer. The method was described previously (A. P. Komar, G. A., Korolev, G. Ye. Kocharov, Zh. eksperim. i teor. fiz., 38, 1436 (1960)). The Th source was prepared by electrodeposition onto a stainless steel disk and radiographically examined for homogeneity. The alpha line of Ra^{224} (5681 kev) was used as reference line. It was found that $E_\alpha = 4009 \pm 5$ kev. An ionization alpha spectrometer with a better resolution permitted a more precise determination of the energy and intensity of the alpha lines of Bi^{210*}:

Card 1/2

KOCHAROV, G.Ye.; KOROLEV, G.A.

Theory of the action of a proportional counter. Izv.AN SSSR. Ser.fiz. 27 no.2:301-307 F '63. (MIRA 16:2)

1. Fiziko-tekhnicheskiy institut AN SSSR im. A.F.Ioffe.
(Nuclear counters)

ACC NR: AP6034223 (N) SOURCE CODE: UR/0120/66/000/005/0085/0089

AUTHOR: Vorob'yev, A. A.; Korolev, G. A.; Lebedev, A. K.

ORG: Physico-Technical Institute, AN SSSR, Leningrad (Fiziko-tekhnicheskiy institut AN SSSR)

TITLE: Secondary emission shf detector of heavy charged particles

SOURCE: Pribory i tekhnika eksperimenta, no. 5, 1966, 85-89

TOPIC TAGS: secondary emission, particle detector, ~~nuclear~~ heavy particle, charged particle

ABSTRACT: A time detector of heavy charged particles based on the use of secondary emission is described. The charged particle passes through thin aluminum foil and knocks out secondary electrons which are directed to a shf cavity. The shf field generated in the cavity modulates the energy of passing particles. An electrostatic spectrometer analyses particles in respect to their energies. This permits separation of particles which passed through the cavity at the fixed phase of the shf field. A secondary emission multiplier was used as an electron detector. The combination consisting of the electrostatic spectrometer and the secondary emission multiplier provides the energetic resolution of 10%. The equipment has been tested using α-particles with 5 Mev for energy. Time resolution was about 2×10^{-11} sec.; recording effectiveness was 8%. The equipment was designed to measure the life time of nuclear levels which develop during α-particles disintegration. Orig. art. has: 8 figures.

SUB CODE: 09/ SUBM DATE: 02Oct65/ ORIG REF: 001/ OTH REF: 006

Card 1/1 UDC: 539.1.074

TIMOSHENKO, V.V.; MARTYNISHKIN, A.M.; TSUKANOV, V.P.; GANGO, Ya.V.;
SHIKOV, I.P.; NIKONOV, A.V.; POSTNIKOV, V.P.; KOROLEV, G.D.;
ARTAMONOV, A.M.; TEMNIKOV, S.N.; KABLUKOVSKIY, A.F.; MAKHOV, A.Kh.;
KOTIKOV, A.Kh.; ZNAMENSKIY, B.A.; ZUYEV, T.I.; POZDNYAKOV, A.P.;
BALASHOV, S.A.; YERMOKHIN, I.P.

New design of electrode holders for electric-arc smelting furnaces.
Prom. energ. 15 no.8:13-14 Ag '60. (MIRA 15:1)
(Electric furnaces)

KOROLEV, G. F.

Inland Water Transportation-Accounting.

Planning and computation of accountable operations on each trip. Rech. transp. 12 no. 4, 1952.

9. Monthly List of Russian Accessions, Library of Congress, October 195~~3~~, Unclassified.
2

KOROLEV, G.F.

Include all transportation expenses in transportation costs. Rech. transp. 16 no.5:17 My '57. (MLRA 10:5)

1.Nachal'nik planovo-ekonomicheskogo otdela parokhodstva.
(Inland water transportation--Costs)

KOROLEV, G.G.

3

Increasing the frost resistance of steamed concrete for face plates. V. M. Medvedev, N. A. Vtorov, and G. G. Korolev. [illegible] Stroitel. 25, No. 3, 16-20(1956). Steamed con[illegible] the addn. of sulfite cellulose wash water [illegible] microcracks which have little effect on strength but which reduce frost resistance at an early age owing to penetration and freezing of water. Addn. of $CaCl_2$ does not improve the quality of steamed concrete. Addn. of sulfite alc. wash water eliminates microcracks and raises frost resistance. Optimum steaming conditions are storage at 15-20° for 4 hours, uniform rise in temp. during 6 hours, steaming at 75 ± 5° for 6-8 hours, and uniform cooling in a moist medium to 20° in 4 hours.

R. Z. Kamich

KOROLEV, G. G.

PHASE I BOOK EXPLOITATION SOV/1558

Moscow. Dom nauchno-tekhnicheskoy propagandy im. F.E. Dzerzhinskogo

Sovremennyye splavy i ikh termicheskaya obrabotka (Contemporary Alloys and Their Heat Treatment) Moscow, Mashgiz, 1958. 389 p. 12,000 copies printed.

Additional Sponsoring Agency: Obshchestvo po rasprostraneniyu politicheskikh i nauchnykh znaniy RSFSR.

Ed. (Title page): Yu. A. Geller, Doctor of Technical Sciences; Ed. (Inside book): V.V. Rzhevinskiy, Engineer; Tech. Ed.: B.I. Model'; Managing Ed. for Literature on Metal Working and Tool Making: R.D. Beyzel'man, Engineer.

PURPOSE: The book is intended for engineering and technical personnel of heat-treatment shops and test laboratories of machine-building plants.

COVERAGE: This collection of 28 articles, compiled by 33 authors, aims to acquaint the reader with modern practice in the heat treatment of steels. The authors are primarily concerned with the development of various types of structural, tool, and heat-resistant steels and with the use of their alloying elements. Materials-handling equipment is described at some length. The treatment of alloys, particularly those of titanium, also comes within the scope of the collection. The book is thoroughly diagrammed, and a good deal of the material is shown in graphical form. Among the problems dealt with are the minimization of deformations, the introduction of the automatic control of heat-treating equipment, together with fully mechanized tool manufacture, and the optimum proportions of different alloying elements. There are numerous tables and drawings. Bibliographic listings placed at the end of chapters are predominantly Soviet. The articles comprising this collection are reports delivered at a conference held in the Scientific and Technical Propaganda House imeni F.E. Dzerzhinskiy in Moscow.

Contemporary Alloys and Their Heat Treatment SOV/1558

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KOROLEV, G.G.

SOV/129-58-11-7/13

AUTHORS: Gulyayev, A. P., Doctor of Technical Sciences, Professor, Luneva, Z.S., Korolev, G. G. and Samoylov, V.V., Engineers

TITLE: Heat Treatment of Tools Made of High Speed Steel in a Steam Atmosphere (Termicheskaya obrabotka instrumentov iz bystrorezhushchey stali v atmosfere para)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, Nr 11, pp 39-44 (USSR)

ABSTRACT: According to data of various authors, the service life of tools made of high speed steel is increased by 50 to 100% if they are heat treated in steam after being finish — machined and ground. In order to establish the effectiveness of such heat treatment, the authors carried out experiments with specimens and drills made of the steels R9 and R18 which, prior to treatment with steam, were hardened, tempered, sharpened and ground. The treatment with steam was effected in a hermetically closed electric furnace, a sketch of which is shown in Fig.2, in which the temperature was maintained automatically within ± 5°C. The steam pressure was maintained at 0.1-0.2 atm. To prevent the formation of Fe_2O_3 on the machined surfaces, the steam has to be introduced in the super-heated state.

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SOV/129-58-11-7/13

Heat Treatment of Tools Made of High Speed Steel in a Steam Atmosphere

Only then will a film form consisting of magnetic iron oxides which is the reason for the high corrosion stability and the good appearance of the thus treated tools. The treatment procedure is graphed in Fig.1. Prior to introducing steam, the temperature is raised to 350-370°C and the tools are held at that temperature for 20 to 30 mins. Then, steam is introduced and the temperature is maintained at the same level for a further 30 mins. Following that, the temperature is raised to 540-550°C, maintained constant at that temperature for 30-60 mins and, finally, cooled in air and quenched in oil. The graph, Fig.3, shows the measured thickness of the oxide film on the steel R9 treated in a steam atmosphere at various temperatures with a holding time of 30 mins; in Fig.4 the thickness is graphed of the oxide film on the steel R9 treated in a steam atmosphere at 550°C as a function of the holding time. It was found that the oxide film produced by steaming is considerably denser than that produced by alkali oxidation. The corrosion stability and the

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Heat Treatment of Tools Made of High Speed Steel in a Steam Atmosphere

resistance to seizure was also measured as well as the service life. On the basis of the obtained results a heat treatment regime in a steam atmosphere was developed for tools made of high speed steels. The steam treatment is recommended as an additional treatment of sharpened and ground tools for the purpose of improving their resistance to corrosion and their cutting performance. Steam is also recommended as an atmosphere in the furnace during tempering for the purpose of preventing erosion of the tool surface; in this case no inter-cycle chemical treatment is necessary. After steam treatment at 500 to 600°C a dense film of the magnetic oxide Fe_3O_4 forms, the thickness of which is 1-4μ. The presence on the surface of such a film leads to an increase of the adhesion temperature (build up of machined metal onto the high speed steel) by 100-150°C and this explains the improved cutting properties; furthermore, steam treatment does not bring about a drop in the surface quality during heating in saltpetre and in air, which is also important from the

SOV/129-58-11-7/13

Heat Treatment of Tools Made of High Speed Steel in a Steam Atmosphere

point of view of improving the service life of the tool. Steam treatment is at present applied by numerous Works and should be used on a larger scale.
There are 9 figures, 1 table and 4 references, 3 of which are English, 1 French.

ASSOCIATIONS: VNII, Zavod "Frezer" ("Frezer" Works) and ZIL

1. Tools--Heat treatment 2. Tool steel--Properties
3. Steam--Metallurgical effects

Card 4/4

80492
S/121/59/000/11/003/005

18.7100

AUTHORS: Korolev, G.G., Aleksandrovich, B.L., Gol'dvasser, M.I.
[redacted]

TITLE: The Annealing of Blanks in a Superheated Steam Atmosphere

PERIODICAL: Stanki i Instrument, 1959, No 11, pp 38 - 39

TEXT: The authors point out that the annealing of blanks and articles of high-speed and alloyed steel in a water vapor atmosphere is the most simple, inexpensive and available method, compared with the annealing in drums with the aid of cast iron chips or in electric furnaces with the aid of kerosene. During the passing of the steam through the furnace, a magnetic film of Fe_3O_4 ferric oxide is formed on the surface of the article and prevents the steel from decarbonizing. In order to check the quality and the possibilities of obtaining a protective medium during the annealing process, tests were carried out at the "Frezer" Plant with the annealing of specimens (9KhS grade silver steel of 12.5 mm in diameter and R9 grade steel of 10.7 mm in diameter) in the steam atmosphere at temperatures of 700, 750, 800 and 850°C. The annealing process was effected in a Ts-75 furnace with special equipment for treatment in the steam atmosphere. The operating conditions were the following: 1) heating

at 380 - 400°C for 30 minutes; 2) letting in steam at the given temperature in the course of 20 minutes. The steam, preliminarily preheated, was supplied to the furnace with a pressure of 0.3 - 0.5 at; 3) increasing the temperature to 700 - 850°C; 4) holding at operation temperature for 1 hour; 5) cooling in the furnace down to 450 - 500°C with continuous steam supply; 6) removing the specimens from the furnace. The graphs show the annealing conditions at various temperatures. The specimens were investigated as to hardness, microstructure and depth of decarbonized layer. The investigation of the latter was, for the 9KhS grade steel, carried out according to the method developed by the Ural Polytechnic Institute im. Kirov, while the R9 grade steel was tested by the Sadovskiy method (GOST 5952-51). The test results of the specimens are given in a table. The microstructure of the R9 grade steel specimens represented that of sorbitic pearlite and carbides, that of 9KhS grade steel showed a granular pearlite and carbide structure. Because of the protective effect of the Fe_3O_4 ferric oxide film which formed in the steam atmosphere, no decarbonization was taking place. The authors give a description of the

KLYUYEVA, A.G.; ALEKSANDROVICH, B.L.; KOROLEV, G.G.

New grade of steel for round dies. Stan.i instr. 31 no.3:24-26 Mr '60. (MIRA 13:6)
(Tool steel)

KOROLEV, G.G.

New data on the stratigraphy and tectonics of the Mesozoic of the Udsk trough (Far East). Dokl. AN SSSR 159 no.2:330-332 N '64. (MIRA 17:12)

1. Geologicheskiy institut AN SSSR. Predstavleno akademikom A.L. Yanshinym.

KOROLEV, G.I.; MARATAYEV, A.M.; MILOVZOROV, V.P.

Introducing stabilized magnetic voltage regulators. Biul. tekh.-ekon. inform. Gos. nauch.-issl. inst. nauch. i tekh. inform. 18 no. 12:37-38 D '65 (MIRA 19:1)

KOROLEV, G.K.

Raschet Poperechno-Strogal'nykh Stankov (Calculations For Transverse Planing Machines) Kiyev, Mashgiz, 1952.

99p. Diagrs., Tables.

"Literatura": p. (101)

S/241/63/008/001/006/006
D296/D307

AUTHOR: Korolev, G.K.

TITLE: Changes in the cardiovascular system of dogs suffering from radiation sickness induced by the fission products of uranium

PERIODICAL: Meditsinskaya radiologiya, v. 8, no. 1, 1963, 64-70

TEXT: Cardiovascular changes which accompany radiation sickness have a considerable influence upon the course and outcome of that illness. In earlier experiments the authors studied this question mainly with exposure to X-rays. In the present paper the author studied the influence of uranium fission products (Sr^{89}, Sr^{80}, Cs^{137}, Y^{90}, Ce^{144}, Zr^{45}, Ru^{106} and others) upon the cardiovascular system. Solutions of these products were administered to dogs in doses between 1 and 4 mc/kg, either by inhalation in the shape of aerosols, or with the food. The ensuing changes in the cardiovascular dynamics were studied by the usual clinical methods such as measuring the blood pressure, pulse rate, by auscultation, etc. Elec-

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S/241/63/008/001/006/006
D296/D307

Changes in the cardiovascular ...

trocardiography was also used. These investigations were repeated 3 times at intervals of 3-5 days. For a short initial period the dogs' normal pulse of 108-124/min slowed to 60-92/min. This was followed by a period of tachycardia of 150-180/min. The volume and pressure of the pulse decreased. The pattern of respiration characteristic of normal healthy dogs was altered. The heart sounds were dull and occasional systolic murmurs could be heard. The ECG changes mainly consisted of high Q, R and T waves and depression of the S-T segment. These changes were more marked in the last stages of the illness. The changes were essentially the same whether the radioactive substance had been inhaled or ingested. The degree of changes in the cardiovascular system was closely related to the degree of the general radiation sickness. The authors regard the described changes as evidence for profound biochemical changes in the myocardium which lead to a poor circulation. There are 4 figures and 2 tables.

SUBMITTED: June 20, 1962

Card 2/2

L 34933-65
ACCESSION NR: AT5006100 S/0000/64/000/000/0015/0022

6
b41

AUTHOR: Korolev, G. K.

TITLE: Distribution of cerium-144 in rats after intratracheal administration

SOURCE: Raspredeleniye, biologicheskoye deystviye, uskoreniye vyvedeniya radioaktivnykh izotopov (Distribution, biological effect, acceleration of the excretion of radioactive isotopes); sbornik rabot. Moscow, Izd-vo Meditsina, 1964, 15-22

TOPIC TAGS: cerium, radioisotope, lung, liver, bone, pneumonia, radioactivity

ABSTRACT: Ce^{144} was absorbed from the lungs slowly. Half of the element administered was eliminated within 24 hours. The maximum amount of absorbed activity was 41% (sixth day). The isotope was deposited mostly in the liver (27 ± 2.4%) and skeleton (15 ± 0.79%). Radiocerium was absorbed from the lungs exponentially. The first exponent for 48% of cerium activity in relation to the amount of isotope administered covered the period up to 24 hours ($T_{1\ eff} = 6$ hours) while the second exponent for 50% covered the period from 24 hours to 2 months ($T_{2\ eff} = 16$ days). Intratracheal administration of 0.4 μ c/g of Ce^{144} produced foci of catarrhal serous-hemorrhagic pneumonia in the lungs within 24 hours. The symptoms were most pronounced by the tenth day. Signs of emphysema and destruction became dominant

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L 34933-65

ACCESSION NR: AT5006100

after 6 months. Histoautograms of the lungs revealed that Ce^{144} accumulated in the alveoli and interalveolar septa the first few days after administration. During the next 30 days it concentrated mainly in the interalveolar septa. Orig. art. has: 5 figures and 3 tables.

ASSOCIATION: none

SUBMITTED: 10Apr64 ENCL: 00 SUB CODE: LS

NO REF SOV: 000 OTHER: 000

Card 2/2

ACCESSION NR: AT5006099 S/0000/64/000/000/0009/0014

AUTHOR: Korolev, G. K.

TITLE: Distribution of Strontium-90 in rats after intratracheal administration

SOURCE: Raspredeleniye, biologicheskoye deystviye, uskoreniye vyvedeniya radioaktivnykh izotopov (Distribution, biological effect, acceleration of the excretion of radioactive isotopes); sbornik rabot. Moscow, Izd-vo Meditsina, 1964, 9-14

TOPIC TAGS: strontium-90, lung, radioisotope, bone, blood, radioactivity

ABSTRACT: Sr^{90} was rapidly absorbed from the lungs. Five minutes after intratracheal administration, the organ contained 33.3% of the amount administered as compared with 0.39% after 24 hours. Judging by the amount of strontium accumulatingin the bones, the intratracheal route is very similar to the intravenous and intraperitoneal routes (the rat skeleton contained 76% after the first route was used and 81% after the second and third). Elimination of strontium from the skeleton may be characterized by two exponents. The first exponent for 14.27% of the content of the element in relation to the amount administered covered the first to third days ($T_{1\ eff} = 2$ days), while the second exponent for 61.9% covered the third to sixtieth days ($T_{2\ eff} = 101$ days). Regression analysis of the Sr^{90} content of

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ACCESSION NR: AT5006099

various organs and tissues showed that there was a correlation between the amount of Sr^{90} in the blood, the total amount in the soft tissues and blood, the amount in the skeleton, and the time from administration of the substance during the period of maximum growth of the isotope in the skeleton. Orig. art. has: 1 figure, 2 tables.

ASSOCIATION: none

SUBMITTED: 10Apr64 ENCL: 00 SUB CODE: LS

NO REF SOV: 000 OTHER: 000

Card 2/2

L 3199-66

ACCESSION NR: AP5009201 S/0241/65/010/003/0061/0066

/2

AUTHOR: Korolev, G. K.

TITLE: Cesium 137 distribution with intratracheal administration

SOURCE: Meditsinskaya radiologiya, v. 10, no. 3, 1965, 61-66, and insert between pp. 66-67

TOPIC TAGS: rat, radioactive isotope, cesium 137, lung, muscle, liver, kidney, heart, beta counter, effective half life, trachea

ABSTRACT: In experiments on 60 albino rats weighing 160-200 g, cesium 137 (0.4 microcurie/g) was injected into the trachea in the form of a sodium chloride solution (0.4-0.5 ml). Following cesium 137 administration the animals were killed in groups of four at periods from 5 min to 60 days. Cesium 137 accumulation in the bones, blood, and internal organs was measured on a beta unit with an end-window counter. Findings show that 90% of the cesium 137 absorbed by the lungs escapes during the first 24 hrs. Absorption of the isotope from the lungs follows an exponential curve with an effective half life of 43 min for 84% of the isotope, an effective

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L 3199-66

ACCESSION NR: AP5009201

6

half life of 2 days for 15.5% of the isotope, and an effective half life of 30 days for the remaining 0.5%. The highest cesium 137 accumulation was found in the muscles (about 46% of the introduced amount) and the second highest accumulation was found in the liver (10%). During the first 24 hrs the highest cesium 137 concentrations are found in the kidneys, liver, and heart. On the 10th day morphological examinations of the lungs disclosed the development of massive hemorrhages, perivascular edema and degenerative changes. At a later date the degenerative changes are replaced by proliferative processes, but complete restoration did not take place even by the 60th day. In comparing study findings with literature data, no marked differences in cesium 137 distribution are found between subcutaneous and intratracheal methods of administration. Orig. art. has: 2 tables and 1 figure.

ASSOCIATION: None.

SUBMITTED: 02Mar64 ENCL: 00 SUB CODE: LS

NR REF SOV: 008 OTHER: 000

Card 2/2

KOROLEV, G.K.

Characteristics of the behavior of Te^{132} and I^{132} in the organism. Med. rad. 10 no.10:33-34 O '65.
(MIRA 18:12)

1. Submitted July 19, 1964.

L 14149-66 EWT(m)
ACC NR: AP6001320 SOURCE CODE: UR/0248/65/000/009/0058/0065

AUTHOR: Korolev, G. K.

63
B

ORG: Institute of Medical Radiology, AMN SSSR, Obninsk (Institut meditsinskoy radiologii AMN SSSR)

19

TITLE: Kinetics of accumulation and elimination of radioactive cesium (Cs^{137}) following penetration of the respiratory organs

SOURCE: AMN SSSR. Vestnik, no. 9, 1965, 58-65

TOPIC TAGS: cesium, radioisotope, radiation damage, pathogenesis, half life, lung injurant

ABSTRACT: Following intratracheal administration of 0.4 μc/g of weight, (absorbed dose 226 rads), radiometry revealed that the isotope is quickly absorbed in rats, almost 90% of the activity being eliminated from the lungs in 24 hours. Absorption from the lungs proceeds exponentially. The period of excretion of one half of the material from the lungs is 2 days. Cs^{137} is deposited mainly in the muscles (46% of the activity introduced) and liver (10%). The concentration of the isotope is

Card 1/2 UDC: 615.849.7-032 : 611.24]-033/-034

2

L 14149-66

ACC NR: AP6001320

0

highest during the first 24 hours in the kidneys, liver, and heart (it is more or less uniform in other organs), after which no significant differences occur in the Cs^{137} concentration in the viscera. Examination of the lungs 10 days after administration of the isotope revealed massive hemorrhages, perivascular edema, and degenerative changes in the vascular endothelium and bronchial and muscular epithelium. Regeneration began two weeks later. Thereafter the proliferation of connective tissue intensified. Orig. art. has: 2 figures, 2 tables.

SUB CODE: 06/ SUBM DATE: 05Jun65/ ORIG REF: 009/ OTH REF: 000

Card 2/2

KOROLEV, G.K.

Distribution of some inhaled radioactive substances.
Med. rad. 10 no.10:75-80 O '65. (MIRA 18:12)

1. Institut meditsinskoy radiologii AMN SSSR. Submitted July 19, 1964.

L 24236-66 EWT(m)/EWA(h)

ACC NR: AP6014672 SOURCE CODE: UR/0241/65/010/010/0075/0080

30
29
B

AUTHOR: Korolev, G. K.

ORG: Institute of Medical Radiology, AMN SSSR (Institut meditsinskoy radiologii AMN SSSR)

TITLE: Distribution of certain radioactive substances following their inhalation

SOURCE: Meditsinskaya radiologiya, v. 10, no. 10, 1965, 75-80

TOPIC TAGS: radioactive fallout, radioactive aerosol, radiology, radioisotope

ABSTRACT: A survey of the literature on the penetration of radioactive substances into the organism via the respiratory organs is presented. It is shown that the other principal pathway through which radioactive isotopes enter the organism during inhalation is the gastrointestinal tract. On inhalation of readily absorbed radioisotopes, such as Cr^{89}, C^{137}, I^{131}, Sr^{90}, Cs^{137}, the greater part of the amount inhaled is resorbed within the first 24 hours, whereas on inhalation of poorly absorbed radioisotopes, such as Ce^{144}, Y^{91}, Ru^{106}, Zr^{95}, Nb^{95}, Pu^{239}, U^{288}, etc., the amount of the radioactive substance present in the organism is entirely determined by the activity in the respiratory organs. A table of the rates of elimination of radioactive isotopes by the organism, and particularly from the respiratory organs, as a function of the biological half-life, is presented. On inhalation, Cs^{137} becomes normally distributed in the internal organs. Thus, the maximum content of activity in the rat muscles on the 4th day was 41.3%,

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UDC: 615.849.7-032:611.2]-033

L 24236-66

ACC NR: AP6014672

which is nearly the same as in the case of intravenous, peroral, intraperitoneal, and intratracheal administration of Cs^{137}. Investigations by Cohn et al. (Inhaled Particles and Vapors, Oxford, 1961, p 178), involving the inhalation by mice of radioactive isotopes simulating radioactive fallout from a surface atomic explosion revealed that, following the breathing of such aerosols for one hour, as much as 90% of their activity enters the gastrointestinal tract and the distribution of the isotopes in the internal organs within the same period is such that the liver was found to contain 2%; the thyroid gland, 0.2%; the tissues of the head, 9%; the bones, 1.2%; and the respiratory tract, 1.2% of the introduced activity. The study of the penetration of radioactive isotopes via the respiratory organs is an extremely important problem, since their absorbability via the lungs is very considerable and, for a majority of the isotopes, much higher than via the gastrointestinal tract. This pertains particularly to the radioactive isotopes in the group of rare-earth elements (Ce, La, Nb, Pm, etc.). The field for research into the problems of the entry of radioisotopes into the respiratory organs still remains largely unexplored. Orig. art. has: 1 figure and 2 tables. [JPRS]

19

SUB CODE: 06, 18 / SUBM DATE: 19Jul64 / ORIG REF: 011 / OTH REF: 011

Card 2/2dda

KOROLEV, G.K.

Kinetics of the accumulation and removal of radioactive cesium (Cs^{137}) introduced into the respiratory organs. Vest. AMN SSSR 20 no.9:58-65 '65.

(MIRA 18:11)

1. Institut meditsinskoy radiologii AMN SSSR, Obninsk.

BREGER, A.Kh.; Prinimali uchastiye: KARPOV, V.L., kand.khim.nauk;
BELYNSKIY, V.A.; OSIPOV, V.B., PROKUDIN, S.D.; TYURIKOV, G.S.,
kand.khim.nauk; GOL'DIN, V.A.; RYABUKHIN, Yu.S.; KOROLEV, G.N.;
AFONIN, V.P.; POKROVSKIY, V.S.; KULAKOV, S.I.; LEKAREV, P.V.;
FEDOROVA, T.P.; KOROTKOVA, M.A.; KHARLAMOV, M.T.; NIKOLENKO, G.D.;
LOPUKHIN, A.F.; YEVDOKUNIN, T.F.; KASATKIN, V.M.; RATOV, A.V.

Nuclear radiation sources for radiational-chemical studies.
Probl.fiz.khim. no.1:61-72 '58. (MIRA 15:11)

1. Nauchno-issledovatel'skiy fiziko-khimicheskiy institut
im. Karpova.
(Radiochemistry) (Radioisotopes)

KOROLEV, G. O.

454

Uzlovoy etod Yemonta Mash'mno-traktorno60
Parka. ravropol', kn. 12D. 1954. 20s. 20 sm. (U pr. s. - kh. propagandy Krayev.
Upr. Sel' skogo Khozyaystua). 3,000 Eks. 25K (54-55244) P 631.3-77

SO: Knizhanaya, Letopis, Vol. 1, 1955

KOROLEV, Georgiy Osipovich, glavnyy inzhener; PAVLOV, Mikhail Andreyevich; TOL'POVSKAYA, V.N., redaktor; PERESYPKINA, Z.D., tekhnicheskiy redaktor

[Over-all mechanization of harvesting; experience in Stavropol Territory] Kompleksnaia mekhanizatsiia uborki; opyt Stavropol'skogo kraia. Moskva, Gos. izd-vo selkhoz. lit-ry, 1956. 118 p. (MLRA 9:11)

1. Zamestitel' nachal'nika Stavropol'skogo krayevogo upravleniya (for Pavlov) 2. Stavropol'skoe krayevoye upravleniye (for Korolev)
(Stavropol' Territory--Harvesting machinery)

BAKHTIN, A.G., kandidat veterinarnykh nauk; KOROLEV, G.P., nauchny sotrudnik.

Prophylactic, therapeutic and recuperative measures in diseases of the respiratory and digestive organs in pigs. Veterinariia 32 no.1:46-49 Ja '55. (MLRA 8:2)

1. Nauchno-proizvodstvennaya laboratoriya po bor'be s boleznyami molodnyaka sel'skokhozyaystvennykh zhivotnykh. Ministerstva sel'skogo khozyaystva RSFSR.
(SWINE--DISEASES)(ALIMENTARY CANAL--DISEASES)(RESPIRATORY ORGANS--DISEASES)

RATNER, S.I., professor; KOROLEV, G.P.; GUBIN, G.N.; KOMOLOVA, R.P.

A case of foot-and-mouth disease of prolonged duration in man. Klin. med. 34 no.7:70-77 Jl '56. (MIRA 9:10)

1. Iz infektsionnogo otdeleniya Klinicheskoy ordena Lenina bol'nitsy imeni S.P.Botkina (nauchnyy rukovoditel' - prof. S.I.Ratner, glavnyy vrach - prof. A.N.Shabanov), Nauchno-proizvodstvennoy laboratorii Ministerstva sovkhozov RSFSR i Yashchurnoy laboratorii Vsesoyuznogo instituta eksperimental'noy veterinarii (dir. - prof. N.I.Leonov)
(FOOT-AND-MOUTH DISEASE, case reports
in man, prolonged duration)

TOBINSKIY-BERESNEV, V.M., podpolkovnik meditsinskoy sluzhby;
DEREVLEV, K.M., kapitan meditsinskoy sluzhby; KOROLEV, G.P.,
kapitan meditsinskoy sluzhby

Prevention and treatment of mycoses of the feet. Voen.-med.
zhur. no.4:78-79 Ap '61. (MIRA 15:6)
(DERMATOPHYTES) (FOOT--DISEASES)

KOROLEV, G.V.

USSR/Physical Chemistry - Kinetics, Combustion, Explosions, Topochemistry, Catalysis. B-9

Abs Jour: Referat. Zhurnal Khimiya, No 3, 1958, 7184.

Author : N.S. Yenikolopyan, G.V. Korolev, G.P. Savushkina.
Inst :
Title : Upon the Maximum Concentrations of Stable Intermediary Products in Composite Chain Reactions.

Orig Pub: Zh. fiz. khimii, 1957, 31, No 4, 865-873.

Abstract: It is shown for composite chain reactions of the type A -> B -> C proceeding in two stages (chain formation of a stable intermediary product B from the initial substances A and chain expenditure of B with the formation of final substances C) that there is a proportionality $n_i = \alpha_{ij} n_j$ (1) among the concentrations (n) of all active centers (AC) in the reaction system; in this equation, α_{ij} does not depend on the rates of AC generation (W), of their ramification (a) and of their destruction (g). Should a slowly re-

Card : 1/3

-1-

AUTHORS: Yenikolopyan, N. S., Korolev, G. V. 20-118-6-25/43

TITLE: Formaldehyde and Acetaldehyde Yields in the Oxidation of Ethane at High Temperatures (O vykhodakh formal'degida i atsetal'degida pri vysokotemperaturnom okislenii etana)

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol. 118, Nr 6, pp. 1138-1141 (USSR)

ABSTRACT: The conceptions which in complicated chain reactions lead to the existence of extreme yields of stable intermediate products were verified at the example of the oxidation of methane. As sample for the further verification of these conceptions the next more complicated representative of the homologous series of paraffin hydrocarbons, i.e. ethane, was chosen. The behavior of the yields of formaldehyde and acetaldehyde was investigated in the case of variation of the conditions of oxidation of C_2H_6 at high temperatures. The apparatus and the method were described already earlier. The experiments were carried out in two quartz reaction containers with a diameter of 45 mm and a volume of 250 ml, the walls of which were

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treated as follows: 1) by washing with H_2F_2 (H_2F_2-container) and 2) by washing with a one percent solution of $K_2B_4O_7$ ($K_2B_4O_7$-container). The results of these experiments at low pressures (25 mm of mercury column) are illustrated in a diagram for mixtures relatively rich in oxygen (C_2H_6:$2O_2$). The addition of an initiator for the radicals (NO_2) and the dilution of the reaction mixture with a rare gas (N_2) increase the concentration of the active centres in the reaction mixture to a great extent. The yield of CH_2O and CH_3CHO here remains practically unchanged, i.e. it does not differ from the extreme yields. The same experiments were repeated at a pressure of 53 mm torr. The yield of CH_2O remains unchanged as before in the case of a modification of the concentration of the active centres. However, the velocity of the accumulation of CH_3CHO increases considerably in the very last moments of transformation. The concentration reaches

Card 2/3

20-118-5-38/59

AUTHORS: Yenikolopyan, N. S. , Korolev, G. V.

TITLE: Formaldehyde Yields on Methane Oxidation, as Dependent Upon the Homogeneous Initiator Concentration, Inert Gas Admixtures and the Condition of the Reaction Vessel Walls (Zavisimost' vykhodov formal'degida pri okislenii metana ot kontsentratsii gomogennogo initsiatora, dobavok inertnogo gaza i ot sostoyaniya stenok reaktsionnogo sosuda)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 118, Nr 5, pp.983-986 (USSR)

ABSTRACT: The apparatus and the method of the measurings were described by the same authors already earlier (Ref 1). Experiments on the not initiated oxidation of CH_4 were carried out in 3 quartz reaction containers of the same diameter (45 mm) the surface of which was processed in different way: 1) No special processing ("pure" container); 2) washed out by means of hydrofluoric acid (H_2F_2 container); 3) washed out by means of a 1 % solution of $K_2B_4O_7$ ($K_2B_4O_7$ container). The results of

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20-118-5-38/59

Formaldehyde Yields on Methane Oxidation, as Dependent Upon the Homogeneous Initiator Concentration, Inert Gas Admixtures and the Condition of the Reaction Vessel Walls

these experiments are illustrated on a diagram and demonstrate that the yield of CH_2O depends on the state of the surface of the reaction container. Therefore, yield of CH_2O at given conditions of the oxidation of CH_4 has no maximum, i.e. velocity of molecular consumption of CH_2O is of the same order of magnitude as with the consumption in the chain reaction. The dependence of the yield of CH_2O on the nature of the surface of the reaction container observed here may have two reasons: 1) Destruction of the active centers on the surface of the reaction container takes place in the kinetic or diffusion-kinetic range. 2) Heterogeneous reaction of the consumption of CH_2O takes place in the kinetic or diffusion-kinetic range. A dilution of the reaction compound with nitrogen renders difficult the diffusion of the radicals and CH_2O molecules to the wall and therefore is bound to increase the yield of CH_2O. The admixture of materials which can produce active centers to the reaction compound is equally bound to increase the yield of CH_2O. A diagram illustrates the results of the experiments on the oxidation of methane under the presence of different amounts of NO_2. Thus, e.g.

Card 2/4

PAVLOV, B.V.; KOROLEV, G.V.

Kinetics of induced polymerization. Vysokom. soed. 1 no.6:869-877
Je '59. (MIRA 12:10)

1. Laboratoriya anizotropnykh struktur AN SSSR.
(Chemical reaction, Rate of) (Polymerization)

KOROLEV, G.V.; PAVLOV, B.V.; BERLIN, A.A.

Thermometry as a method of studying polymerization kinetics. Part 1: Principles of the method and the experimental setup. Vysokom. soed. 1 no.9:1396-1402 S '59. (MIRA 13:3)

1. Laboratoriya anizotropnykh struktur AN SSSR.
(Polymerization) (Chemical apparatus)

SOV/4982

International symposium on macromolecular chemistry, Moscow, 1960.

Mezhdunarodnyy simpozium po makromolekulyarnoy khimii SSSR, Moskva, 14-18 iyunya 1960 g.; doklady i avtoreferaty. Sektsiya I. (International Symposium on Macromolecular Chemistry Held in Moscow, June 14-18, 1960; Papers and Summaries. Section I.) [Moscow, Izd-vo AN SSSR, 1960] 346 p. 5,500 copies printed.

Sponsoring Agency: The International Union of Pure and Applied Chemistry, Commission on Macromolecular Chemistry

Tech. Ed.: T. V. Polyakova.

PURPOSE: This collection of articles is intended for chemists and researchers interested in macromolecular chemistry.

COVERAGE: This is Section I of a multivolume work containing scientific papers on macromolecular chemistry in Moscow. The material includes data on the synthesis and properties of polymers, and on the processes of polymerization, copolymerization, polycondensation, and polyrecombination. Each text is presented in full or summarized in French, English, and Russian. There are 47 papers, 28 of which were presented by Soviet, Rumanian, Hungarian, and Czechoslovakian scientists. No personalities are mentioned. References accompany individual articles.

Card 6/9

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KOROLEV, G. V.

KOROLEV, G.V.; MAKHONINA, L.I.; BERLIN, A.A.

Polymerization in highly viscous systems and three-dimensional polymerization. Part 1: Kinetic characteristics of the polymerization of some polyacrylates. Vysokom. soed. 3 no.2:198-204 F '61. (MIRA 14:5)

1. Institut khimicheskoy fiziki AN SSSR.
(Acrylic acid) (Polymerization)

S/190/62/004/010/008/010
B101/B186

AUTHORS: Korolev, G. V., Berlin, A. A., Kefeli, T. Ya.

TITLE: Polymerization in highly viscous media, and three-dimensional polymerization. II. Study of the initial polymerization stage of polyacrylate esters

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 10, 1962, 1520-1527

TEXT: The effect of the viscosity of the medium on the initial polymerization rate w_0 and on the constant k_t of chain termination in polyacrylate esters was studied. Polymerization took place at 50°C and 0.5% by weight of dicyclohexyl peroxy-dicarbonate (I) in bulk, in benzene solution and in highly viscous II; w_0 was measured by methods described previously (Author's certificate no. 137304, class 421, 335, Byulleten' izobreteniy, 1961, no. 7). The following data were found:

Oligomer or monomer	Viscosity at 25°, cst	$w_0 \cdot 10^{-2} \cdot min^{-1}$ in bulk	50% II	75% II	kt, 1/mole·sec in bulk
III	10	3	5	8	$2.3 \cdot 10^6$
IV	95	7	9.8		$3.6 \cdot 10^5$
V	60	4	4.3	8	$1.9 \cdot 10^6$
VI	1000	17.5	14		$1.4 \cdot 10^5$
VII	115	5	6	8	$6.4 \cdot 10^5$
VIII	55	3		7.5	$2.3 \cdot 10^6$
IX		0.75	1	1.2+)	$4.0 \cdot 10^7$

+) 80% II. II = IDF-2 dimer consisting of diethylene glycol, phthalic acid, and isobutyric acid, which is not capable of radical-chain polymerization and has a viscosity of 800-900 cst; III = TGM-3, dimethacrylate triethylene glycol; IV = MGF-9, dimethacrylate-(bis-tri-

KOROLEV, G.V.; kand.khim.nauk

"Glass-reinforced plastics, the material of the future" by B.L. Kiselev. "High-strength glass-reinforced plastics" by A.K. Burov, G.D. Andreevskaia. Reviewed by G.V. Korolev. Priroda 51 no.7:123-124 Jl '62. (MIRA 15:9)

1. Institut khimicheskoy fiziki AN SSSR, Moskva.
(Glass-reinforced plastics) (Kiselev, B.L.)
(Burov, A.K.) (Andreevskaia, G.D.)

S/191/62/000/011/002/019
B101/B186

AUTHORS: Novitskiy, E. G., Korolev, G. V.

TITLE: Use of nitrogen oxide as inhibitor of ω-polymerization in the gaseous phase

PERIODICAL: Plasticheskiye massy, no. 11, 1962, 6-7

TEXT: The spontaneous ω-polymerization of methacrylic acid and other unsaturated monomers occurring at high temperatures can be suppressed in the liquid phase by inhibitors such as tannin, hydroquinone, etc. (1-2% admixture). However, a spongy ω-polymer also forms in the gaseous phase in consequence of high concentration on the walls of the reaction vessel, changes into the liquid phase, and thereupon initiates a spontaneous polymerization, despite of the presence of the inhibitors mentioned. It is shown here that the spontaneous polymerization also occurs when argon is bubbled through methacrylic acid at 155-158°C, but is suppressed for at least one hour when 5% NO is added to the argon. Likewise the spontaneous polymerization of the reaction mixture of polydiethylene glycol phthalate and methacrylic acid heated to 200°C was suppressed

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Use of nitrogen oxide as ...

S/191/62/000/011/002/019
B101/B186

for 6 hrs when 2% NO had been added to the Ar. This allows of polyester acrylates being synthesized in the melt almost completely in the first stage of esterification, and of obtaining oligomers which can be rapidly cured by common radical initiators. There is 1 table.

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S/190/62/004/011/004/014
B119/B186

AUTHORS: Korolev, G. V., Berlin, A. A.

TITLE: Polymerization in highly viscous media and threedimensional polymerization. III. Mechanism of self-acceleration in the initial and intermediate stages of polymerization of polyacrylates

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 11, 1962, 1654 - 1659

TEXT: The mechanism that underlies threedimensional polymerization of polyacrylates is explained by studies of reaction systems and kinetics and by reference to published data. The formation of the intensely branched and crosslinked polymer structure in the initial and intermediate stages of the reaction is likewise explained. It is assumed that those of the primary polymer chains which are long enough become coiled, forming microregions within which the liquid monomer is immobilized and, therefore, polymerize much more quickly in all directions than when freely mobile in the pure liquid phase. Taking into account this effect, the kinetic equation $w/[M] = w_0 + a\Gamma$ (w_0 = initial rate of polymerization,

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Polymerization in highly... S/190/62/004/011/004/014
B119/B186

w = current rate of polymerization, $[M]$ = current concentration of oligomer, Γ = degree of conversion, a = constant) was derived which was in good agreement with the experimental results. Polymerization of dimethacrylate triethylene glycol in the form of 5 - 10% solutions in triethylene glycol, which proved to be a relatively active transfer agent, led to the production of weakly branched, soluble and fusible thermosetting β-polymers, m.p. 80 - 90°C, in a yield of 70 - 90%. There are 2 figures.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics AS USSR)

SUBMITTED: June 19, 1961

Card 2/2

S/190/62/004/011/005/014
B119/B186

AUTHORS: Korolev, G. V., Smirnov, B. R., Bolkhovitinov, A. B.

TITLE: Polymerization in highly viscous media and three-dimensional polymerization. IV. Study of free radical recombination in polyacrylate ester glasses by the electron paramagnetic resonance method

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 11, 1962, 1660 - 1664

TEXT: Recombination of macroradicals at 50 - 100°C by the e.p.r. method was studied with a view to determining the specific features of polymerization kinetics in a completely structurized three-dimensional polymerization system. The recombination rate constants k_t, the activation energies and the pre-exponential factors were determined for the following three types of polyacrylate esters: МГФ-9 (MGF-9), МДФ-1 (MDF-1), and ТГМ-3 (TGM-3). Macroradicals in these esters may be considered being some kind of polymer fragments of the three-dimensional structure with free valencies. It has been shown that, if all other conditions remain unchanged, k_t increases with the increasing length and resulting greater flexibility of the oligomeric chains that form the three-dimensional lattice of the glassy polymer. The autoacceleration in the curing of the polyacrylates has been found to be associated with a decrease to the 10^5th to 10^6th part of k_t during the course of the reaction, which takes place from near-zone degree of conversion to high degrees of conversion. There are 3 figures and 1 table.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics AS USSR)

SUBMITTED: June 19, 1961

BERLIN, A.A.; KEFELI, T.Ya.; KOROLEV, G.V.

Polymerizable oligomers. Khim.prom. no.12:870-880 D '62.
(MIRA 16:2)

(Esters)
(Polymerization)

S/191/63/000/003/015/022
B101/B186

AUTHOR: Korolev, G. V.

TITLE: Universal apparatus for determining the activity of monomers and oligomers

PERIODICAL: Plasticheskiye massy, no. 3, 1963, 51 - 54

TEXT: A simple apparatus for determining the activity of monomers yielding steric, insoluble, or nonmelting polymers is described. Two types of the apparatus are built. In type A, the reaction vessel consists of a flat round box filled with the moncmer initiator, and inhibitor. It rotates in a Dewar flask filled with water or a mixture of water and glycerol. Thermocouples measure the rise in temperature during polymerization. The quantity of heat supplied by rotation is tested in a blank test. In type B, polymerization takes place in the gap between a block of duraluminum and a cylindrical duraluminum insert. In A and B, the ratio monomer : coolant is so chosen that the temperature increases by no more than approximately $1^{\circ}C$ in all. a/a_o is suggested for measuring the relative activity. $a - \Gamma_{max}/\tau_{max}P$; Γ being the degree of conversion. a_o - the activity of a

standard sample (cal/mole), τ - time (min), P - polymer weight. If, however, monomers with different polymerization heats Q are to be compared, or if apparatus with different heat capacities and scales are used for measurement, then $a = \Gamma_{max}c/\tau_{max}P\alpha Q$ is valid; α - scaling factor, Γ is given in scale sections. The kinetic curves Γ versus τ for dimethacrylate triethylene glycol and polyester acrylate with different amounts of initiator and inhibitor are given as an example. Activity such as initial activity, mean activity, activity versus time of conversion, etc. can be determined with the above apparatus. There are 4 figures.

KOROLEV, G.V.; MOGILEVICH, M.M.; RADUGIN, V.S.

Apparatus for the thermometric measurement of the rate of film-formation. Lakokras.mat.i ikh prim. no.1:57-60 '63.
(MIRA 16:2)

(Films (Chemistry))
(Polymerization—Measurement)

NOVITSKIY, E. G.; KOROLEV, G. V.

Use of nitrogen oxide as an inhibitor of the gas phase ω
polymerisation. Plast. massy no.11:6-7 '62.
(MIRA 16:1)

(Polymerization) (Nitrogen oxide)

KOROLEV, G.V.; MOGILEVICH, M.M.

Investigating the film formation by some polyester acrylates. Lakokras. mat. i ikh prim. no.2:12-16 '63. (MIRA 16:4)

(Polymerization)

TVOROGOV, N.N.; KOROLEV, G.V.

Polymerization of highly viscous media and three-dimensional polymerization. Part 5: Apparatus for studying unsteady state kinetics (pre- and post-effect) in the case of the polymerization of polyester acrylates. Vysokom.soed. 6 no. 5:877-883 My '64.
(MIRA 17:6)

1. Institut khimicheskoy fiziki AN SSSR.

KOROLEV, G.V.; TVOROGOV, N.N.

Polymerization in highly viscous media and three-dimensional polymerization. Part 6. Vysokom. soed. 6 no.6:1006-1011 Je '64.
(MIRA 18:2)

1. Institut khimicheskoy fiziki AN SSSR.

[illegible], G.V.; SMIRNOV, P.R.

Polymerization in highly viscous media and three-dimensional polymerization. Part 7. Vysokom. soed. 6 no.6:1140-1144 Je '64
(MIRA 18:2)

1. Institut khimicheskoy fiziki AN SSSR.

L 19801-65 EWT(m)/EPF(c)/EPR/EWP(j)/T Pc-4/Pr-4/Ps-4 RPL/ASD(m)-3/AFETR WM/RM

ACCESSION NR: AP5003610 S/0190/64/006/007/1256/1260

AUTHOR: Korolev, G. V.; Smirnov, B. R.; Bashkirova, S. G.; Berlin, A. A.

TITLE: Polymerization in highly viscous media and three-dimensional polymerization. VIII. Determination of the rate constants of initiation of radical polymerization by certain peroxides and azo initiators in incompletely set dimethacrylatebutylene glycol

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 6, no. 7, 1964, 1256-1260

TOPIC TAGS: polymerization, organic azo compound, polyester plastic, acrylic plastic, organic oxide

ABSTRACT: The rate constants of initiation and decomposition in the thermal decomposition of benzoyl peroxide, dicyclohexyl peroxydicarbonate, and azo-bis-isobutyronitrile, in 1-4% by weight concentrations in dimethacrylatebutylene glycol, set to a degree of 40-70%, were measured. It was found that the values of the initiation rate did not depend on the initial concentration of the initiator. This independence inidicated that no chain decomposition occurred under the reaction conditions, and only a monomolecular process took place. The establishment that the initiation rate does not depend on the degree of conversion of the polyester acrylate was additional

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L 19801-65
ACCESSION NR: AP5003610

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evidence of the monomocular mechanism of the decomposition of initiators in incompletely set polyester acrylate glasses with residual double bonds. It was found that the activation energies of initiation by the investigated organic peroxides coincide with the activation energies of decomposition of the corresponding initiators in benzene; the preexponential factors of initiation were approximately 2.5 times lower than the preexponential factors of decomposition. The efficiency of initiation by peroxide initiators was ~ 0.3, which is only slightly less than the theoretical value of 0.5 for the liquid phase, calculated on the basis of the theory of the "cage effect." The efficiency of initiation by azo-bis-isobutyronitrile was approximately 10 times lower. Orig. art. has 2 forms., 1 graph and 4 tables.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics, AN SSSR)

SUBMITTED: 29Jul63 ENCL: 00 SUB CODE: OC, MT

NO REF SOV: 013 OTHER: 007 JPRS

Card 2/2

L 12423-65 EWT(m)/EPA(s)-2/EPF(c)/T/EWP(j) Pc-4/Pr-4/Pt-10 ASD(a)-5/AFWL/
ESD(dp)/ESD(t) RM

ACCESSION NR: AP4047213 S/0190/64/006/010/1838/1843

AUTHOR: Berlin, A. A.; Razvodovskiy, Ye. F.; Korolev, G. V.

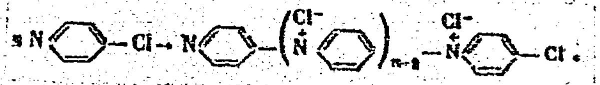
TITLE: Certain problems of 4-chloropyridine polymerization

B

SOURCE: Vy*sokomolekulyarny*ye soyedineniya, v. 6, no. 10, 1964, 1838-1843

TOPIC TAGS: organic semiconductor, semiconducting polymer, polymerization, polychloropyridine, polymerization kinetics, polymerization mechanism

ABSTRACT: A study has been made of the kinetics and mechanism of 4-chloropyridine polymerization to a conjugated polymer:



Because this reaction proceeds readily, it was considered a suitable model for studying the formation mechanism of conjugated polymers. The initiating effect of certain salts ($AlCl_3 \cdot 6H_2O$, $FeCl_2 \cdot 4H_2O$,

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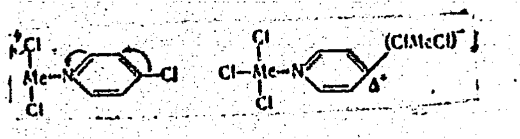
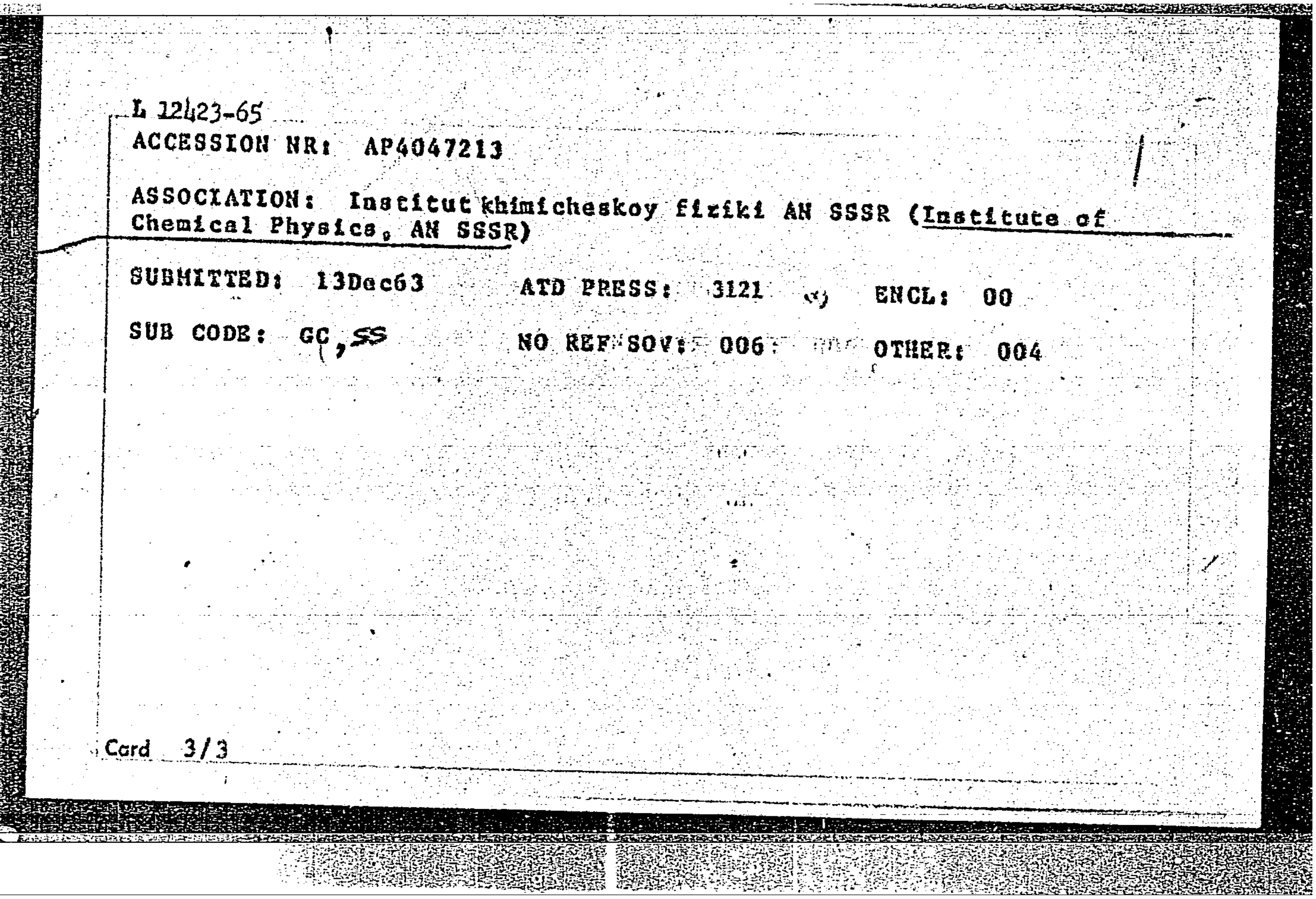
ACCESSION NR: AP4047213

$SnCl_2 \cdot 2H_2O$, $CoCl_2 \cdot 6H_2O$, $MnCl_2 \cdot 4H_2O$, $BaCl_2$, $Al(NO_3)_3 \cdot 9H_2O$, and $Co(NO_3)_2 \cdot 6H_2O$) and 1,4-dibromobutane, and the inhibiting effect of amines (pyridine and 4,4'-bipyridyl) and water were studied. The Al, Fe, and Sn salts catalyzed the reaction, and the following two-step initiation mechanism was proposed:



Ternary amines and water inhibited the reaction, which suggests that propagation occurs via the chlorine atom. The temperature dependence of the polymerization was studied, and a termination mechanism was proposed. On the basis of the kinetic data, it was suggested that the polymer has an autocatalytic effect on the reaction, and a catalytic mechanism involving the so-called local activation effect was suggested. Orig. art. has: 5 figures, 2 tables, and 3 formulas.



L 12423-65

ACCESSION NR: AP4047213

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics, AN SSSR)

SUBMITTED: 13Dec63 ATD PRESS: 3121 ENCL: 00

SUB CODE: GC, SS NO REF SOV: 006 OTHER: 004

Card 3/3

L 42425-65 EWT(m)/EPF(c)/EPR/EWP(j)/T Pc-4/Pr-4/Ps-4 RPL WW/RM
ACCESSION NR: AP5006555 S/0191/65/000/003/0009/0011

AUTHOR: Korolev, G. V.; Al'ter, Yu. M.; Zhil'tsova, L. A. 15 35 B

TITLE: Polymerization rate for some acrylic acid polyesters in the block as a function of initiator concentration and temperature

SOURCE: Plasticheskiye massy, no. 3, 1965, 9-11

TOPIC TAGS: acrylic acid polyesters, polymerization, synthesis, kinetics, initiator concentration

ABSTRACT: Polymerization of two acrylic acid polyesters, dimethacrylate of bistriethyleneglycolphthalate (MGF-9) and dimethacrylate of bisdiethylglycolphthalate (MDF-1) was studied in the presence of radical-chain initiators: azobisisobutylnitrile, benzoyl peroxide (BP) and bicyclohexylperoxide carbonate (BHC). The rate of polymerization of the acrylic acid polyesters under different conditions is shown in Fig. 1 of the Enclosure. For both polyesters the rate of polymerization proceeds according to the equation

$$w = A\sqrt{[I]}\exp(-E/RT) \qquad (1)$$

where E is a function of the depth of conversion, A is a constant which depends on

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L 42425-65
ACCESSION NR: AP5006555

0

the depth of conversion, the nature of the acrylic acid polyester and the initiator, [*I*] is the initiator concentration, *R* is the gas constant and *T* is the absolute temperature. Equations were derived which separate parameters dependent on the nature of the initiator from those which depend on the nature of the acrylic acid polyester. Orig. art. has: 5 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 01 SUB CODE: GC, OC

NO REF SOV: 016 OTHER: 002

Card 2/3

[illegible]

ACCESSION NR: AP5005898 S/0020/65/160/003/0646/0649

AUTHOR: Gol'danskiy, V. I. (Corresponding member AN SSSR); Gusakovskaya, I. G.; Yegorov, Ye. V.; Korolev, G. V.; Rapoport, V. B.

62
52
B

TITLE: Radiation polymerization of poly(alkyl acrylates)

SOURCE: AN SSSR. Doklady, v. 160, no. 3, 1965, 646-649

19

TOPIC TAGS: alkyl acrylate, alkyl methacrylate, polyalkylacrylate, polyalkylmethacrylate, radiation polymerization, free radical, hot radical theory, thermal polymerization, polymerization energy transfer

ABSTRACT: Because there is no published data on the subject, the authors studied the kinetics of radiation-induced polymerization of alkyl acrylates and compared the obtained relationships with those pertaining to the three-dimensional thermal polymerization of the same monomers. A method of direct measuring of the heat evolved in the polymerization, developed by the authors, was applied for the first time. Poly(alkyl methacrylate) oligomers (MB from butanediol methacrylate) and two condensation products of butanediol and methacrylic and phthalic acid (MBP-1 and MBP-2), differing in the length

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ACCESSION NR: AP5005898

of the oligomer chain, were used. The viscosity of the medium was increased by adding varying amounts of an inert, highly viscous solvent, IDP-2 (a condensation product of isobutyric acid, diethyleneglycol and phthalic acid). Irradiation was carried out either in a GUT-400 Co^{60} installation (dose rate 3—21 rad/sec) or in an electron accelerator (dose rate 10^4—10^5 rad/sec) at 20—25C. The results were recorded by a thermograph, which produced the heat evolution curve vs the time of irradiation. Analytical processing of the data gave the curves of the reduced polymerization rate vs dose rate and vs the degree of conversion. It was found that, as in thermal polymerization, oxygen inhibits the process of radiation-induced polymerization, and that the process has a chain-radical mechanism of conversion. However, two differences were noted: 1) In radiation polymerization "hot radical" recombination in the rigid three-dimensional structure was more difficult. Therefore, it was assumed that the dissipation and the transfer of energy necessary for the propagation of the polymerization took place along the polymer chains, which acquired a certain mobility, and that energy transfer was effected by a gradual excitation of the energy levels along the chains. The latter assumption was confirmed by the independence of the polymerization rate on the

L 27184-65

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ACCESSION NR: AP5005898

viscosity of the medium, which inhibits the direct diffusion of radicals. 2) Radiation polymerization produced complete conversion (up to 100%) whereas chemically induced polymerization cannot achieve such a high degree of conversion even at high temperatures. Energy transfer along the chains also explains the improvement in physical and mechanical properties of the polymers. For example, the heat stability of the radiation-induced poly(alkyl acrylates) is several times higher than that of chemically cured polymers. The increased energy of the separate elements of the three-dimensional structure apparently produces a relaxation of inner stresses, a kind of high-temperature "annealing" of the polymer. Orig. art. has: 3 figures and 1 table. [BN]

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics, AN SSSR)

SUBMITTED: 14Sep64 ENCL: 00 SUB CODE: OC, GC

NO REF SOV: 007 OTHER: 002 ATD PRESS: 3191

Card 3/3

KOROLEV, G.V.; SMIRNOV, B.R.; MAKHONINA, L.I.

Use of the electron paramagnetic resonance method for determining the rate constant of chain growth in the polymerization of polyacrylic esters. Vysokom. soed. 7 no.8:1417-1421 Ag '65. (MIRA 18:9)

1. Institut khimicheskoy fiziki AN SSSR.

L 16509-66 EWT(m)/EWP(j)/T/ETC(m)-6 WW/RM

ACC NR: AP6001492 (A) SOURCE CODE: UR/0191/65/000/012/0008/0010

AUTHORS: Berlin, A. A.; Korolev, G. V.; Makhonina, L. I.; Sel'skaya, O. G.; Belova, G. V.

53
52
B

ORG: none

44,55

TITLE: Effect of conjugated polymers upon polymerization of oligoesteracrylates and thermal stability of the produced polymers

SOURCE: Plasticheskiye massy, no. 12, 1965, 8-10

TOPIC TAGS: oligomer, thermal decomposition, stabilizer additive, conjugated polymer, polyester plastic, polymerization kinetics / ATV-2 thermal scales, ~~IKhF AN SSSR construction~~, MDF-2 polyesteracrylate, MBF-1 polyesteracrylate

ABSTRACT: Thermal stability 13 of three-dimensional polyesteracrylate 15 (I) was studied by using conjugated thermostabilizers: polyphenylene (II), polyazophenylene (III), polyphenylacetylene (IV), polytolane (V), anthracene (VI), and thermally treated (IV) and (VI). Kinetic study of polymerization of I was performed according to the method described by G. V. Korolev (Plast. massy, No. 3, 51, 1963). Kinetic curves of the thermal-oxidative decomposition of cured I were Z

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ACC NR: AP6001492

obtained by heating at 200C in air on automatic thermal scales ATV-2 constructed by IKhF AN SSSR. Specimens were 0.70 ± 0.02 mm thick and weighed 70 mg. The data obtained are summarized in Figs. 1 and 2.

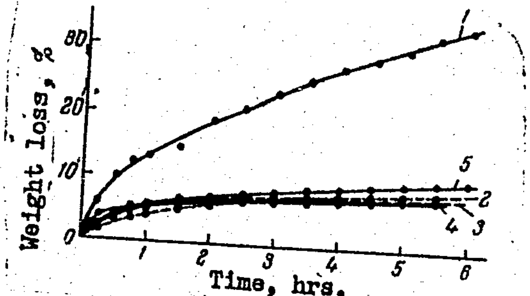

Fig. 1. Effect of the addition of thermal stabilizers 15 upon the thermo-oxidative decomposition of I, type MDF-2: 1 - no thermal stabilizer; 2 - thermally treated IV; 3 - yellow IV; 4 - IV, II; 5 - V.

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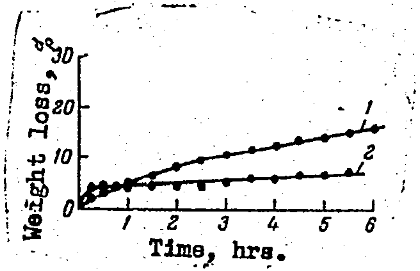


Fig. 2. Effect of the addition of thermally treated VI upon the thermo-oxidative decomposition of I, type MBF-1: 1 - no additive; 2 - 5% of VI.

It was established that addition of 5% of either of the tested thermal stabilizers completely retarded destruction of I. In lower concentrations (up to 1%), thermally treated IV was most effective. It is concluded that deactivating ability of this type of thermal stabilizers increases with temperature, which is in contrast to the behavior of other known stabilizers. Orig. art. has: 4 figures.

SUB CODE: 07/ SUBM DATE: none/ ORIG REF: 010/ OTH REF: 001

Card 3/3 SM

KOROLEV, G.V.; KARAPETYAN, Z.A.

Improved "UP-2" universal device for determining the activity of monomers and oligomers. Plast. massy no.11:51-53 '65.
(MIRA 18:12)

L 44589-66 EWT(m)/EWP(j)/T IJP(c) RM

ACC NR: AP6015679 (A) SOURCE CODE: UR/0413/66/000/009/0078/0078

32

INVENTOR: Korolev, G. V.; Smirnov, B. R.; Yarkina, V. V.; Berlin, A. A. B

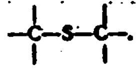
ORG: none

TITLE: Preparation of formulations which can be polymerized when exposed to light. Class 39, No. 181300 16

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 9, 1966, 78

TOPIC TAGS: photopolymerization, polymerization

ABSTRACT: This Author Certificate introduces a method of preparing formulations suitable for photopolymerization. The formulations contain a polymer base, a compound that can be polymerized and a polymerization initiator. To stabilize the material and to plasticize it temporarily during processing, the compound containing in its chain groups



$-\overset{|}{\underset{|}{C}}-S-\overset{|}{\underset{|}{C}}-$.

is suggested as suitable for polymerization. [LD] [Translation]

SUB CODE: 11/ SUBM DATE: 25Feb65/

Card 1/1 pom UDC: 771.531.678.745.6:66.095.265

[illegible] IJP(c) RM

ACC NR: AP6031246 SOURCE CODE: [illegible]

AUTHOR: Korolev, G. V.; Kondrat'yeva, A. G.; Berlin, A. A.

29
B

ORG: none

TITLE: Chemical regulation of inhibitor activity in the radical-chain polymerization of monomers and oligomers

SOURCE: Plasticheskiye massy, no. 7, 1966, 8-9

TOPIC TAGS: radical polymerization, chain reaction polymerization, iodine, ascorbic acid, hydroquinone, polymerization kinetics

ABSTRACT: The paper describes some methods for chemically regulating the activity of inhibitors of radical-chain polymerization by introducing into the polymerization system suitable admixtures which increase or decrease the effectiveness of quinone-type inhibitors. The effect of such admixtures on hydroquinone and benzoquinone was determined from the change in the polymerization kinetics of methacrylates (methyl methacrylate, polyester acrylates). Polyester acrylate of brand 7-20 was used in the experiments. The polymerization was carried out at 50°C in the presence of the initiator dicyclohexylperoxydicarbonate (DCP) and at 70°C in the presence of azoisobutyrodinitrile (AD). Iodine admixtures were found to increase the effectiveness of quinone-type inhibitors considerably, whereas ascorbic acid admixtures deactivate the inhibitors almost completely. By treating I_2 as an oxidant and ascorbic acid as a reductant,

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the interaction of these two agents with the inhibitors can be explained in terms of redox processes. In the case of I_2, its synergistic effect involves not only an oxidative process, but also the formation of a complex between I_2 and the inhibitor; the effectiveness of this complex is greater than that of the inhibitor alone. Orig. art. has: 3 figures.

SUB CODE: 07/ SUBM DATE: none/ ORIG REF: 005

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L 7880-66 EWT(m)/EPF(c)/EWP(j)/T RM

ACC NR: AP5025016 44,55 SOURCE CODE: UR/0286/65/000/016/0079/0079

AUTHORS: Korolev, G. V.; Kondrat'yeva, A. G. 44,55

ORG: none

TITLE: A method for increasing viability of compositions on the basis of polymerizing oligomers. Class 39, No. 173925 15

1 44,55

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 16, 1965, 79

TOPIC TAGS: oligomer, synergic agent, iodine, polymer

ABSTRACT: This Author Certificate presents a method for increasing the viability of compositions on the basis of polymerizing oligomers (containing a quinone type inhibitor) by introducing into the composition a synergic agent for the inhibitor. To increase the intensity of the method, iodine is used as the synergic agent.

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