ACCESSION NR: AP4015302

theory of polynomial equations is suggested. The new, "most general" method permits determining the optimum transfer function which minimizes the mean-square error. The methods are compared and assessed. Orig. art. has: 4 figures and 71 formulas.

ASSOCIATION: none

SUBMITTED: 27Jun63 DATE ACQ: 12Mar64 ENCL: 00

SUB CODE: CG, IE NO REF SOV: 004 OTHER: 004

Card 2/2

L 04947-67 EWT(d)/EWP(v)/EWP(k)/EWT(h)/EWP(1)

ACC NR: AP6025412 SOURCE CODE: UR/0103/66/000/007/0080/0085

AUTHOR: Chkhartishvili, L. P. (Moscow)

ORG: none

TITLE: The calculation of a realizable transfer function of a correcting circuit based on the minimum root-mean square error criterion

SOURCE: Avtomatika i telemekhanika, no. 7, 1966, 80-85

TOPIC TAGS: automatic control design, error correction, transfer function, polynomial equation, mean square error

ABSTRACT: The determination of the transfer function of the correcting circuit securing the minimum of the root mean square error and having a remainder larger than or equal to zero (the Wiener problem) has been carried out for the case of automatic control systems with an arbitrary given part (minimal phase, nonminimal phase, or unstable). The proposed method for the solution of the problem takes into account the realizability of the correcting circuit and employs the polynomial equation approach. By means of a special program for numerical calculations on the Minsk-2 computer the author investigated an example of a system accepting

Card 1/2 UDC: 62-501

L 04947-67

ACC NR: AP6025412

simultaneously the useful signal and perturbations of a given spectral density. The author thanks Prof. Ya. Z. Tsypkin for his interest in the work. Orig. art. has: 37 formulas and 1 figure.

SUB CODE: 09,12/ SUBM DATE: 24Nov65/ ORIG REF: 006

Card 2/2

IOSELIANI, G.D.; BURDZHANADZE, O.I.; CHKHARTISHVILI, N.S.

Use of ethyl chloride for artificial cardiac arrest. Soob. AN Gr. z. SSR. 37 no.3:725-728 Mr '65. (MIRA 18:5)

1. Institut eksperimental'noy i klinicheskoy khirurgii i gematologii AN GruzSSR. Submitted August 27, 1964.

CHKHARTISHVILI, N.V.

New method of joining plywood with the help of glued tape.
Der.prom. 4 no.4:26 Ap '55. (MLRA 8:6)
(Plywood)

CHKHARTISHVILI, N. S. Cand Agr Sci -- (diss) "Study of the agrobiological properties of the Chkhaveri variety and [redacted] establishment of certain methods of Agricultural Engineering." Tbilisi, 1959. 27 pp (Min of Agr GSSR. Georgian Order of Labor Red Banner Agr Inst), 100 copies (KL, 46-59, 139)

CHKHARTISHVILI, Sh.N.

Connection between teaching, training and development. Trudy Inst. psikhol. AN Gruz.SSR 14:175-194 '63.

(MIRA 18:4)

CHKHARTISHVILI, Sh. N.

CHKHARTISHVILI, Sh. N. -- "The Problem of Motivation of Volitional Behavior." Academy Science Georgian SSR. Institute of Psychology imeni D. N. Uznadze, Kutaisi, 1955. (Dissertation for the Degree of Doctor in Pedagogical Sciences.)

So; Knizhaya Letopis' No 3, 1956

CHKHARTISHVILI, Sh.N.

Nature of volitional behavior. Trudy Inst.psikhol. AN Gruz. SSR 11: 83-107 '57. (MIRA 12:3)

(Will)

CHKHARTISHVILI, Sh.N.

Nature of the illusion of the object. Eksp. issl. po psikhol. ust. 1:329-345 '58. (MIRA 13:12)

(Hallucinations and illusions)
(Attitude (Psychology))

CHKHARTISHVILI, Sh.N.

Place of necessity and will in the psychology of the personality. Vop. psikhol. 4 no.2:116-123 Mr-Ap '58. (MIRA 11:5)

1. Kafedra pedagogiki i psikhologii Kutaisskogo pedagogicheskogo instituta.

(Necessity (Psychology))

CHKHARTISHVILI, Sh.N. (Tbilisi)

Will of a first grader. Vop.psikhol. 9 no.2:109-116 Mr-Ap '63. (MIRA 16:4)

(Child study) (Will)

CHKHARTISHVILI, Sh.N.

Critical situation and set. Eksp.issl.po psikhol.ust. 2:195-214 '63. (MIRA 16:12)

CHKHARTISHVILI, Sh.N.; TABIDZE, O.I.

Integrated nature of set. Eksp.issl.po psikhol.ust. 2:215-228 '63. (MIRA 16:12)

CHKHARTISHVILI, Sh.N.

Localization of the optic illusions of set., Vop. psikhol. no.5: 94-102 S-O '64 (MIRA 18:1)

1. Institut psikhologii AN Gruzinskoy SSR, Tbilisi.

Name: CHKHARTISHVILI, Shalva Yeremeyevich

Dissertation: Blocking /zakladka/ and further Development of the Oviducts of Agr Animals (Cows, Buffaloes, Ewes, Sows, and Rabbits) and Changes in the Structure of the Mucous Membrane of Oviducts during Heat and Pregnancy

Degree: Doc Biol Sci

Affiliation: Georgian Zootech Vet Inst

Defense Date, Place: 24 Jan 56, Council of Moscow Vet Acad

Certification Date: 28 Apr 56

Source: BMVO 4/57

CHKHATARASHVILI, T.I.

Study of pathological changes in the organs of the oral cavity of pregnant women. Soob. AN Gruz. SSR 29 no.5:627-632 N '62. (MIRA 18:3)

1. Tbilisskiy gosudarstvennyy meditsinskiy institut. Submitted September 26, 1961.

CHKHARTISHVILI, Yu.

On the theory of F centers in pure alkali metal halide crystals. Trudy Tbil. GU no.62:53-59 '57. (MIRA 11:7)

1. Tbilisskiy gosudarstvennyy universitet imeni Stalina, kafedra teoreticheskoy fiziki.
(Alkali metal halides) (Crystallography, Mathematical)

CHKHAETISHVILI, Yu. V., Cand Phys-Math Sci --(diss) "On the theory of F-centers in alkali-halogen crystals." Tbilisi, 1959. 10 pp (Tbilisi State Univ im Stalin). 100 copies (KL, 20-59, 93)

S/058/62/000/005/049/119
A001/A101

AUTHOR: Chkhartishvili, Yu. U

TITLE: Electron spin resonance on F-centers in KCl + NaCl crystals

PERIODICAL: Referativnyy zhurnal, Fizika, no. 5, 1962, 55, abstract 5V371 ("Tr. Tbilissk. un-ta", 1960, v. 86, 171-177, Georgian; Russian summary)

TEXT: The author calculated the spectrum of electron spin resonance of F-centers in KCl + NaCl crystals. Superfine interaction of electron spin with nuclear spin is taken into account by means of the theory of perturbations. According to calculations, Zeeman line should split into 208 lines of different intensities. 16 lines are of maximum intensity. Separation between the spectrum extreme lines amounts to 106 oe.

[Abstracter's note: Complete translation]

Card 1/1

S/058/62/000/004/092/160
A061/A101

AUTHORS: Tsertsvadze, A., Chkhartishvili, Yu., Kachlishvili, Z.

TITLE: Components of ionic and atomic bonds in the AlN semiconductor

PERIODICAL: Referativnyy zhurnal, Fizika, no. 4, 1962, 4, abstract 4E30 (Tbilisis universitetis shromebi, Tr. Tbilissk. un-ta, 1960, 86, 313-320, Georgian; Russian summary)

TEXT: The variation method was applied to calculate the ionic and atomic components of the $Al^- - N^+$ bond in AlN crystals. The common wave function of the two electrons of the Al^-, N^+ ion system (one electron from each ion), describing both the ionic and the atomic bond, was devised. The components of the respective bonds were determined from the condition of minimum energy in the system. The fractions of ionic and atomic components in the common wave function were found to be 80% and 20%, respectively.

[Abstracter's note: Complete translation]

Card 1/1

S/181/62/004/007/006/037
B102/B104

AUTHORS: Tsertsvadze, A. A., Chkhartishvili, Yu. V., and Kachlishvili, Z. S.

TITLE: Calculation of ionic and atomic contributions in the silicon carbide crystal bond

PERIODICAL: Fizika tverdogo tela, v. 4, no. 7, 1962, 1743 - 1747

TEXT: The atomic and ionic contributions to the bond in SiC crystals are calculated by a variational method, assuming a tetrahedral structure and an Si-C distance of 1.89 Å. The bond between two neighboring Si and C atoms is considered to be caused by two electrons so that the wave function of this system is assumed to have the form:

$$\Psi = u\Psi^a_{(1)}\Psi^a_{(2)} + v\Psi^b_{(1)}\Psi^b_{(2)} + \omega\left[\Psi^a_{(1)}\Psi^b_{(2)} + \Psi^b_{(1)}\Psi^a_{(2)}\right]. \quad (2)$$

where the states are characterized by u, v, ω. Then u=v=0 describes a purely atomic state, ω = 0 a purely ionic state. With a and b standing for Si and C, respectively, (1) and (2) number the electrons. u, v, and ω are determined by three linear equations the coefficients of which are calculated numerically. If both electrons are

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at the Si atom then this state has 3% of the total bond energy, if both are at the C-atom, it has 9% (according to Pauling 12%) and with a purely homopolar bond it has 78%. The remaining 10% belong to mixed states. The energy necessary for breaking the Si-C bond is 0.209 atomic units. This value is in accordance with data obtained by other authors. $\Delta E = 0.21$ atomic units was obtained experimentally for $SiC \rightarrow Si + C$ (Phys. Rev. 92, 1373, 1953).

ASSOCIATION: Tbilisskiy gosudarstvennyy universitet (Tbilisi State University)

SUBMITTED: January 24, 1962

S/081/62/000/011/003/057
E073/E192

AUTHORS: Tsertsvadze, A., Chkhartishvili, Yu., and Kachlishvili, Z.

TITLE: Proportions of ionic and atomic bonds in semiconductor AlN

PERIODICAL: Referativnyy zhurnal, Khimiya, no.11, 1962, 12-13, abstract 11 B39. (Tbilisis universitetis shromebi, Tr. Tbilissk. un-ta, v.86, 1960, 313-320. (Georgian, abstract in Russian)).

TEXT: The ionic and atomic components of the bond $Al^- - N^+$ in AlN crystals were calculated with the aid of the variational method. The general wave function of two electrons of the system of Al^-, N^+ ions (one electron from each ion), describing the ionic as well as the atomic bonds, was constructed. The proportions of the corresponding bonds are determined from the condition of minimum energy of the system. The following ratio between the ionic and the atomic components in the general wave function was obtained: ionic, 80%; atomic, 20%. Consequently

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it can be assumed that in AlN crystals the forbidden zone is somewhat broader.

[Abstractor's note: Complete translation.]

TSERTSVADZE, A.A.; CHKHARTISHVILI, Yu.V.; KACHLISHVILI, Z.S.

Calculating the fractions of ionic and atomic bonds in silicon carbide crystals. Fiz.tver.tela 4 no.7:1743-1747 Jl '62. (MIRA 16:6)

1. Tbilisskiy gosudarstvennyy universitet.
(Chemical bonds) (Silicon carbide crystals)

CHKHARTISHVILI, Yu.V.

Spin-resonance on F_2-centers in alkali halide crystals. Fiz. tver. tela 5 no.8:2378-2380 Ag '63. (MIRA 16:9)

1. Tbilisskiy gosudarstvennyy universitet.
(Alkali metal halide crystals)
(Electrons)

CHKHATARASHVILI, L. Ye.

USSR/Chemistry - Alkaloids. Pharmaceuticals Mar/Apr 52

"One-Year-Old Cinchona Trees as a Crude Material for the Production of Quinetum," L.Ye. Chkhatarashvili

"Aptechnoye Delo" No 2, p 73

The alkaloid content of one-year old cinchona trees grown on the Black Sea Coast (Adzhar ASSR and Abkhaz ASSR) was found to be 2.5% and 15.2% in the stems. Report was originally presented as a dissertation for the degree of Cand Pharm Sci, Tbilisi State Med Inst, 1950-51, (abstracted in this periodical by A.Ye.Mshvidobadze).

221T11

Chkhaidze, Ye. M.

4

8 (0)

AUTHORS: Ananiashvili, G. D., Gabashvili, N. V., Gertinskiy, S. M., Kurdiani, I. S., Mimikonyants, L. G., Syromyatnikov, I. A., Ter-Khachaturov, A. Ya., Chkheidze, D. M., Ebin, L. Ye. SOV/105-59-11-31/32

TITLE: Ye. M. Chkhaidze (Deceased)

PERIODICAL: Elektrichestvo, 1959, Nr 11, p 95 (USSR)

ABSTRACT: Yegor [illegible] Chkhaidze died on August 9, 1959, 45 years old. After having completed his studies at the elektrotekhnicheskiy fakul'tet Gruzinskogo industrial'nogo instituta (Department of Electrical Engineering of the Georgian Industrial Institute) Ye. M. Chkhaidze worked in Sevastopol' and Tbilisi in the central laboratories of the Gruzenergo. In 1948 he assisted in the organization of the Tbilisskiy filial Vsesoyuznogo nauchno-issledovatel'skogo instituta elektrifikatsii sel'skogo khozyaystva (Tbilisi Branch of the All-Union Scientific Research Institute for the Electrification of Agriculture) which was later reorganized into the Gruzinskiy nauchno-issledovatel'skiy institut mekhanizatsii i elektrifikatsii sel'skogo khozyaystva (Georgian Scientific Research Institute for the Mechanization and Electrification of Agriculture).

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Since 1944 he worked at the Kafedra Tsentral'nykh elektricheskikh stantsiy i setey Gruzinskogo politekhnicheskogo instituta (Chair of the Central Electric Power Plants and Networks of the Georgian Polytechnic Institute). There is 1 figure.

Card 2/2

SHKHEIDZE, B.

The budget in the service of the economic and cultural development of the Georgian S.S.R. Fin.SSSR 22 no.6:56-60 Je '61. (MIRA 14:6)

1. Ministr finansov Gruzinskoy SSR.
(Georgia--Budget)

CHKHEIDZE, D. V.: Master Geolog-Mineralog Sci (diss) -- "The hydrogeological and engineering-geological characteristics of the Akhaltsikhe brown-coal deposit". Tbilisi, 1958. (Min Higher Educ USSR, Georgian Order of Labor Red Banner Polytech Inst im S. M. Kirov), 150 copies (KL, No 8, 1959, 135)

CHKHEIDZE, D.V.

Engineering geological characteristics of the interaction of Akhaltsikhe clayey coal-bearing rocks with water. Soob. AN Gruz.SSR 20 no.5:557-560 My '58. (MIRA 11:10)

1. AN GruzSSR, Geologicheskiy institut, Tbilisi. Predstavleno chlenom-korrespondentom Akademii P.D.Gamkrelidze.
(Akhaltsikhe--Clay)

CHKHEIDZE, G.

Pile supports for partitions. Stroitel' 9 no.10:11 O '63.

[redacted] task is labor management. 30 (MIRA 16:11)

1. Zamestitel' nauchal'nika otdela stroitel'stva khimicheskikh i neftepererabatyvayushchikh predpriyatiy Gosstroya RSFSR.

ROVENSKIY, Semen Yakovlevich; CHKHEIDZE, Grigoriy Davidovich; PETROV, Viktor Konstantinovich; LIBKIND, Azariy Samuilovich; BALIKHIN, M.I., nauchn. red.; SHITOVA, L.N., red.

[Operational planning in construction by stages and complexes] Operativnoe planirovanie v stroitel'stve po etapam i kompleksam. [By] S.IA.Rovenskii i dr. Moskva, Stroiizdat, 1964. 115 p. (MIRA 17:6)

CHKHEIDZE, G. M. Cand Med Sci -- "Changes in the blood system in tuberculous meningitis in children." Tbilisi, 1960 (Tbilisi State Med Inst). (KL, 1-61, 211)

5.3100
5.4500(B)
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67899

S/020/60/130/06/031/059
B004/B007

AUTHORS: Chkheidze, I. I., Molin, Yu. N., Buben, N. Ya., Voyevodskiy, V. V., Corresponding Member AS USSR

TITLE: The E.P.R.-Spectra and the Kinetics of the Accumulations of Radicals in the Radiolysis of Some Aromatic Compounds

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 130, Nr 6, pp 1291 - 1293 (USSR)

ABSTRACT: It was the aim of the present paper to determine the nature of the radicals formed in the radiolytical decomposition of aromatic hydrocarbons, as well as to investigate the influence exerted by structure upon the yield of radicals. The electron paramagnetic resonance (e.p.r.) - spectra of the radicals were recorded which are formed under the influence of fast electrons (1.6 Mev), and the kinetics of their accumulation was measured. Irradiation was carried out at -124 and at +33°. Chemically pure benzene was used. The other compounds: diphenyl, p-ditolyl, o-ditolyl, m-terphenyl, and p-terphenyl were supplied by the laboratory of K. P. Lavrovskiy of the Institut neftekhimicheskogo sinteza (Institute of Petroleum-chemical Synthesis). Figure 1 shows the e.p.r. spectra at -124°. The e.p.r. spectrum

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The E.P.R.-Spectra and the Kinetics of the Accumulations of Radicals in the Radiolysis of Some Aromatic Compounds

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B004/B007

of benzene shows a well resolved triplet, the central component of which is, however, considerably more intense than corresponds to the binomial law. This is explained by the superposition of the triplet and a single line. The triplet is ascribed to the radical C_6H_5, the unpaired electron of which enters into interaction with the adjacent H-atoms. The low yield in molecular hydrogen leads to the conclusion that the H-atoms mostly join the benzene ring, forming the radical C_6H_7, which produces the single line. The superfine structure of the e.p.r. spectrum of benzene becomes more distinct with rising temperature. This is explained by the quickening of the inhibited rotation round the axis of the sixth order, the existence of which was detected in the course of the investigation of nuclear resonance. The components of the e.p.r. spectra of terphenyls and ditolyls are also triplets, but they are not so distinctly resolved. These spectra are explained by the detachment of hydrogen atoms or CH_3-groups in paraposition to

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The E.P.R.-Spectra and the Kinetics of the Accumulations of Radicals in the Radiolysis of Some Aromatic Compounds

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the phenyl substituent, where the detached H or CH_3 again joins on the benzene ring, similar to the case of the radical C_6H_7. The low resolution of the polyphenyl spectra is explained by delocalization of the unpaired electron. Table 1 shows the radical yields, figure 2, the kinetics of the accumulation of radicals. The low radical yields of ditolyls and terphenyls as against benzene agree with published data on the greater stability of polyphenyls (Ref 9). As regards the isomer yields, the differences found are within the error limits. The authors thank A. M. Brodskiy and V. B. Titov for the polyphenyls placed at their disposal and for discussing the results obtained, and they further thank V. N. Shamshev for taking part in the experiments. There are 2 figures, 1 table, and 13 references, 4 of which are Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences, USSR). Institut khimicheskoy kinetiki i goreniya Sibirskogo otdeleniya

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67899

The E.P.R.-Spectra and the Kinetics of the Accumulations of Radicals in the Radiolysis of Some Aromatic Compounds

S/020/60/130/06/031/059
B004/B007

Akademii nauk SSSR (Institute of Chemical Kinetics and Combustion of the Siberian Department of the Academy of Sciences, USSR)

SUBMITTED: November 13, 1959

Card 4/4

5.4500(B)

68820

AUTHORS: Molin, Yu. N., Chkheidze, I. I., Petrov, Al. A., Buben, N. Ya., Voyevodskiy, V. V., Corresponding Member AS USSR

S/020/60/131/01/035/060
B004/B011

TITLE: Investigation of Processes of Energy Transfer in the Radiolysis of Certain Frozen Hydrocarbons by the E.P.R. Method

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 131, Nr 1, pp 125 - 128 (USSR)

ABSTRACT: The authors investigated the energy transfer in the compounds 1,1-dicyclohexyl dodecane (I), 1,1-diphenyl dodecane (II), 1-phenyl-1-cyclohexyl dodecane (III), which were irradiated with fast electrons (1.6 Mev), mixtures from I and II (1 : 1), as well as cyclohexane and benzene at -120°. The points of rupture in the chemical bonds were determined by taking the spectrum of electron paramagnetic resonance (E.P.R.). Furthermore, the energy transfer to the aromatic ring in compounds II and III was to manifest itself in a decrease of the yield in radicals due to the protective effect of the aromatic ring. Apparatus, method, and synthesis of compounds I - III had already been described in references 8 - 9. Figures 1,2 show the E.P.R. spectra taken at ~ 9400 megacycles. In the benzene ring

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Investigation of Processes of Energy Transfer in the Radiolysis of Certain Frozen Hydrocarbons by the E.P.R. Method

S/020/60/131/01/035/060
B004/B011

alone, a rupture of the chemical bond occurred in the case of the molecules of compounds II and III. As a consequence, there occurred an energy transfer to the ring. Figure 3 shows the kinetics of the accumulation of radicals. Compounds with benzene ring exhibited no deviation from linearity up to 100 Mrad, whereas in the case of I and cyclohexane, deviations occurred already with a radiation dose of 10 - 30 Mrad. The yield G_R on radicals is shown in table 1. G_R is lower in the case of compounds with benzene ring. The lower value of G_R in the case of a mixture of I and II indicates energy transfer from I to II. The almost trebled value of G_R for II and III as compared to benzene gives evidence of the lower stability of the substituted benzene ring. The authors thank G. K. Voronova for her cooperation. There are 3 figures, 1 table, and 11 references, 6 of which are Soviet.

Card 2/3

68820

Investigation of Processes of Energy Transfer in the Radiolysis of Certain Frozen Hydrocarbons by the E.P.R. Method

S/020/60/131/01/035/060
B004/B011

ASSOCIATION: Institut khimicheskoy kinetiki i goreniya Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Chemical Kinetics and Combustion of the Siberian Department of the Academy of Sciences, USSR). Institut khimicheskoy fiziki (Institute of Chemical Physics). Institut geologii i razrabotki goryuchikh iskopayemykh Akademii nauk SSSR (Institute of Geology and Mining of Combustible Minerals of the Academy of Sciences, USSR)

SUBMITTED: November 4, 1959

Card 3/3

33101
S/638/61/001/000/026/056
B104/B138

5.4600

AUTHORS: Molin, Yu. N., Chkheidze, I. I., Petrov, A. A., Buben, N. Ya., Voyevodskiy, V. V.

TITLE: Investigation of energy transfer processes during the radiolysis of congealed hydrocarbons, by the paramagnetic electron resonance method

SOURCE: Tashkentskaya konferentsiya po mirnomy ispol'zovaniyu atomnoy energii. Tashkent, 1959. Trudy, v. 1. Tashkent, 1961, 178 - 181

TEXT: The following compounds were investigated: (I) 1,1-dicyclohexyl dodecane; (II) 1,1-diphenyl dodecane; (III) 1-phenyl 1-cyclohexyl dodecane. The energy transfer during radiolysis was determined by means of paramagnetic electron resonance, and from the total radiation yield. Paramagnetic electron resonance spectra were taken of compounds I - III, and of benzene and cyclohexane. The substances were irradiated with 1.6-Mev electrons at -120°C. The spectra were taken during irradiation with electrons. The cyclohexyl radical, RC_6H_{10}, was primarily formed when

X

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irradiating compound I. Radicals are also formed by breaking C-H bonds. The spectra of the irradiated compounds II and III are equal, and similar to that of benzene. Two radicals are formed: the first by the removal of an H atom from the benzene ring, the second by addition of an H atom to a benzene ring. When irradiating a mixture of compounds I and II, radicals are mainly formed from molecules of compound II. In molecules of compounds II and III, it is mainly the bonds in the benzene rings which are broken. In compound I, the first rupture of C-H bonds may be accompanied by a reaction of the H atom, which then permits the formation of radicals. The production of radicals is linearly dependant on irradiation. The yield of radicals in compounds II and III is one order of magnitude smaller than that of compound I. The nearly equal yields of radicals of compounds II and III prove that the energy is transferred to the benzene ring. The yield of radicals in compounds II and III is almost three times that in benzene. This decrease in stability is explained by rapture of the symmetry of the benzene ring. There are 3 figures, 1 table, and 9 references: 4 Soviet and 5 non-Soviet. The four most recent references to English-language publications read as follows: Smaller B., Matheson M. S., J. Chem. Phys., 28, 1169, 1958; Alger R. S.

33101
S/638/61/001/000/026/056
B104/B138

Investigation of energy transfer...

Anderson T. H., Webb L. A. J. Chem. Phys., 30, 695, 1959; Rad. Res. 3, 1, 1955; Andrew E. R., Eades R. G. Proc. Roy. Soc., 216A, 398, 1953.

ASSOCIATION: Institut khimicheskoy kinetiki i goreniya Sibirskogo otdeleniya AN SSSR (Institute of Chemical Kinetics and Burning of the Siberian Department AS USSR)

X

Card 3/3

5.4300 1273, 1320 also 1138, 1160

21768
S/195/61/002/002/002/004
B101/B208

AUTHORS: Molin, Yu. N., Chkheidze, I. I., Buben, N. Ya., Voyevodskiy, V. V.

TITLE: Study of energy transfer to aromatic groups by epr in the radiolysis of organic compounds

PERIODICAL: Kinetika i kataliz, v. 2, no. 2, 1961, 192-196

TEXT: In Ref. 1 (Dokl. AN SSSR, 131, 125, 1960) the authors have shown by means of epr that in the radiolysis of phenyl-substituted saturated hydrocarbons an energy transfer takes place from the saturated groups to the benzene ring. The present paper gives a preliminary survey on studies carried out on different molecules of the A-D type (A = aromatic energy acceptor, D = radiation-unstable substituent). The compounds studied were synthesized in the laboratory of A. D. Petrov, Corresponding Member AS USSR. Measurements were made on an ЭПР-2 (EPR-2) apparatus of the first association, by means of 1.6 Mev electrons. The radiochemical yield G of radicals was determined from the linear initial section of the accumulation curve. The accumulation of radicals was linear up to a concentration $\sim 10^{20}$ g^{-1}.

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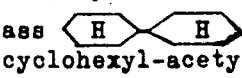
The integral dose was varied from 10 to 200 Mrad, the dose rate from 0.03-0.3 Mrad/sec. Irradiation and measurement were performed at 90-160°K. In some cases, "foreign" epr signals were observed at lower doses, whose intensity was $\sim 10^{18}$ spins/g. This is exemplified in Fig. 1 on the epr spectrum and the accumulation curve for o-ditolyl. The foreign signals are attributed to impurities. Their appearance may give rise to considerable discrepancy of the experimental data at different doses. The G values of several compounds are given in a table:

Compound	G, 1/100 ev	
Paraffin, polyethylene, cyclohexane,		
compounds of the class 	~5	
Cyclohexyl-hexine, cyclohexyl-acetylene	~4	
benzene	0.23	0.04
phenyl acetylene	0.09	
diphenyl	0.045	
p-terphenyl	0.045	

The following conclusions may be drawn: 1) For saturated hydrocarbons and

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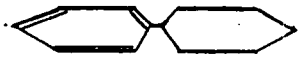
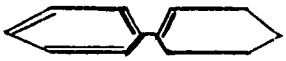
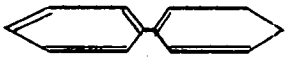
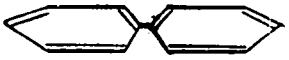
B101/B208

Study of ...

hydrocarbons with a double or triple bond the G values differ little and amount to several radicals per 100 ev of energy absorbed. 2) In aromatic hydrocarbons without saturated substituents G is by 1-2 orders of magnitude smaller than in saturated hydrocarbons. 3) The radiation stability of aromatic hydrocarbons increases with the degree of conjunction and seems to approach a limit. This also results from G for the following series:

Compound	G, 1/100 ev
	0.55
	0.2
	0.07
	0.045

The difference of G for aromatic and non-aromatic hydrocarbons permits to

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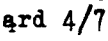
estimate the probability of energy transfer in a complicated AD molecule by measuring the G_{AD}: $G_{AD} = G_A(\gamma_A + \alpha\gamma_D) + G_D\gamma_D(1 - \alpha)$ (1), where G_A, G_D is the radiation yield of the radicals from the groups A and D, γ_A, γ_D are the electron parts of these groups, α the probability of energy transfer from D to A. At $\alpha = 0$, additivity occurs: $G = G_A\gamma_A + G_D\gamma_D$ (2). The probability of energy transfer is calculated from equation (1):
$\alpha = \left[(G_A\gamma_A + G_D\gamma_D) - G_{AD}\right]/(G_D - G_A)\gamma_D$ (3). The following classes of compounds were studied:

I.  -R; R = CH_3, C_2H_5, cycl-C_6H_{11}; II. -$(CH_2)_nSiR_3$; R = CH_3, n = 0,1,2,3; R = C_2H_5, n = 0 and 3. III: -R and R'--R, where R,R' denotes a saturated hydrocarbon chain, a chain with a double bond, or with a CO group (number of C atoms up to 8). α, calculated by Eq. (3) was between 0.65-0.95. No systematic difference of α was found for the three classes. Fig. 2 shows their epr spectra. Classes I and II (Figs. 2б, 2в) mainly show lines corresponding to a cleavage of C-H bonds in the benzene ring. Class III (Fig. 2г) shows a more complicated spectrum. In the case of long chains of

the substituent lines predominate which are assigned to a bond cleavage in the substituent.. This may be explained by the fact that at $\alpha < 1$ a C-H bond cleavage in the ring becomes less probable than in the radical in spite of energy transfer, owing to a larger stability of the diphenyl group. The small difference between the spectra of I and II and that of benzene (Fig. 2a) is presumably due to the fact that a) the broad spectra of the alkyl radicals form only a background, or b) the stability of the C_6H_6 ring decreases on substitution. This problem has still to be clarified. The authors express their gratitude to Ye. D. Kaplan, Ye. A. Chernyshev, V. F. Mironovich, of the Institut organicheskoy khimii AN SSSR (Institute of Organic Chemistry, AS USSR) for the synthesis of compounds, to G. K. Voronova for her cooperation. There are 2 figures, 1 table, and 5 references: 3 Soviet-bloc and 2 non-Soviet-bloc. The reference to English language publication reads as follows: N. K. Bridge, Nature, 185, 30, 1960.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics, AS USSR) Institut khimicheskoy kinetiki i goreniya SO AN SSSR (Institute of Chemical Kinetics and Burning of the Siberian Department, AS USSR)

TOLKACHEV, V.A.; MOLIN, Yu.N.; CHKHEIDZE, I.I.; BUBEN, N.Ya.; VOYEVODSKIY, V.V.

Electron paramagnetic resonance spectrum of frozen irradiated benzene. Dokl. AN SSSR 141 no.4:911-912 D '61. (MIRA 14:11)

1. Institut khimicheskoy fiziki AN SSSR i Institut khimicheskoy kinetiki i goreniya Sibirskogo otdeleniya AN SSSR. 2. Chlen-korrespondent AN SSSR (for Voyevodskiy).

(Benzene—Spectra)

MOLIN, Yu.N.; CHKHEIDZE, I.I.; BUBEN, N.Ya.; VOYEVODSKIY, V.V.

Electron paramagnetic resonance spectra of irradiated dicarboxylic acids. Zhur.strukt.khim. 2 no.3:293-300 My-Je '61. (MIRA 15:1)

1. Institut khimicheskoy fiziki AN SSSR i Institut khimicheskoy kinetiki i goreniya Sibirskogo otdeleniya AN SSSR.
(Acids, Organic--Spectra)

CHKHEIDZE, I. I.

S/844/62/000/000/055/129
D204/D307

AUTHORS: Molin, Yu. N., Chkheidze, I. I., Buben, N. Ya. and Voyevodskiy, V. V.

TITLE: A study of the transfer of energy to aromatic groups during the radiolysis of some organic compounds, by the EPR method

SOURCE: Trudy II Vsesoyuznogo soveshchaniya po radiatsionnoy khimii. Ed. by L. S. Polak. Moscow, Izd-vo AN SSSR, 1962, 326-330

TEXT: The present work is a continuation of an earlier study in which the energy transfers in compounds of type A - D (where A is an aromatic and D an irradiation-unstable substituent) were investigated, D and A behaving respectively as donors and acceptors of energy, to allow a quantitative assessment of such energy transfers. The ЭПР-2 (EPR-2) apparatus was used, under a beam of 1.6 Mev electrons, the rate of irradiation being 0.03 - 0.3 Mrads/sec. The production of radicals (at 90 - 160°K) increased linearly with increasing doses of irradiation, up to a concentration of $\sim 10^{20}$ per g.

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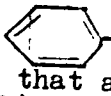
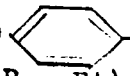
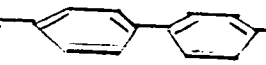
The radiation yields of radicals, G, were similar in saturated hydrocarbons, as well as in those containing multiple bonds, and were of the order of a few per 100 ev of absorbed energy; they were lower (by a factor of $10^1 - 10^2$) in unsubstituted aromatics than in saturated hydrocarbons and, in aromatic compounds, decreased up to a point with increasing degree of conjugation. In (A-D)-type compounds (I)  R, where R = Me, Et, cyclohexyl, G_{AD} was 0.1 - 1, showing that at $D \rightarrow A$ transfer of energy took place with a probability (α) of 65 - 95%. Energy transfers in (I) and in compounds (II)  $-(CH_2)_nSiR_3$ (where n = 0, 1, 2, 3 for R = Me and 0.3 for R = Et) led in most cases to the predominance, in the EPR spectra, of lines corresponding to a primary C-H fission in the benzene ring. In compounds (III)  R and R  R', the EPR spectra were more complex and, with long-chain substituents, lines corresponding to bond fission in the latter began to predo-

minate. The results are discussed, showing that D $\longrightarrow$ A energy transfers occur in all 3 classes of compounds, with high values of α. The assistance of G. K. Voronova and of Ye. D. Kaplan, Ye. A. Chernyshev and V. F. Mironova, members of the Institut organicheskoy khimii AN SSSR (Institute of Organic Chemistry, AS USSR), is acknowledged. There are 2 figures and 2 tables.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics, AS USSR); Institut khimicheskoy kinetiki i goreniya SO AN SSSR (Institute of Chemical Kinetics and Combustion, Siberian Branch of the AS USSR)

42168
S/195/62/003/005/002/007
E075/E436

11.9300 (also 4223)
11.0132

AUTHORS: Molin, Yu.N., Chkheidze, I.I., Kaplan, Ye.P., Buben, N.Ya., ~~Voyevodskiy, V.V.~~

TITLE: Formation of radicals during radiolysis of solid organic materials. Part I. Comparison of radical yields in various organic compounds

PERIODICAL: Kinetika i kataliz, v.3, no.5, 1962, 674-679

TEXT: The work was carried out to establish a connection between molecular structure and probability of its dissociation into radicals under the action of high energy radiation. A series of naphthenic and hydroaromatic hydrocarbons with non-conjugated unsaturated bonds were investigated as well as some aromatic compounds (di- and triphenyls and phenyl ethers). The purity of the compounds was 95 to 99%. The solids were irradiated with fast electrons, the dosage varying between 0.02 and 1 Mrads/sec. Maximum dosage reached 30 Mrads. The yields of free radicals were determined by electron paramagnetic resonance at -170 to -110°C using the initial linear part of the curves relating the numbers of radicals formed to time of

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irradiation. It was found that for naphthenic and hydroaromatic hydrocarbons the yields amounted to several radicals per 100 eV of absorbed energy. A large yield was also obtained for n-hexadecene-1. Thus the unsaturated bonds in these compounds do not inhibit the radical formation. This conclusion does not agree with that obtained by A. Charlesby and M.G.Ormerod (V. Intern. Symp. on Free Radicals, Uppsala, 1961, paper 11). For the aromatic compounds the yields are smaller by 1 to 2 orders of magnitude. The yields decrease with the increasing number of conjugated double bonds in aromatic molecules and with the increasing degree of substitution of benzene rings with groups containing unshared electron pairs or multiple bonds conjugated with the aromatic system of the molecule. It is concluded that the yield of radicals G_R decreases with the decreasing first excitation energy level E_1. Especially marked changes in the yield are observed when $E_1 \approx DCH$, where DCH is the energy of rupture of a C-H bond. There are 1 figure and 2 tables.

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

Formation of radicals ...

S/195/62/003/005/002/007
E075/E436

Institut khimicheskoy kinetiki i goreniya
SO AN SSSR (Institute of Chemical Kinetics and
Combustion SO AS USSR)
Institut organicheskoy khimii AN SSSR
(Institute of Organic Chemistry AS USSR)

SUBMITTED: May 9, 1962

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42651

S/062/62/000/011/016/021
B117/B101

11.1510

AUTHORS: Avramenko, L. I., Buben, N. Ya., Kolesnikova, R. V., Tolkachev, V. A., and Chkheidze, I. I.

TITLE: EPR study of radicals formed by hydrogen atoms reacting with benzene

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 11, 1962, 2079-2081

TEXT: The authors analyzed the epr spectra of free radicals formed by hydrogen atoms reacting with benzene in the gas phase at 20 and 200°C and frozen out with liquid nitrogen. Experimental conditions: silent discharge (6000 v, 150 ma), benzene concentration, $\sim 6 \cdot 10^{14}$ molecules per cm^3; hydrogen pressure, 14-15 mm Hg; linear flow rate, 160 cm/sec; duration, 12-18 min. The epr spectrum of the radicals formed at 20°C by the reaction $H^{\cdot} + C_6H_6$ is a triplet with a total splitting of 93 ± 5 oe. In addition each component of the triplet is split into four lines at a distance of 10 ± 1 oe. This spectrum was identified as the spectrum of

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the $C_6H_7^{\cdot}$ radical. When the reaction temperature is raised up to 200°C, not only the $C_6H_7^{\cdot}$ radical is formed, but also radicals of another type - obviously $C_6H_5^{\cdot}$ - which show a singlet. Their relative amount increases as the temperature is raised. Hence the two primary reactions may occur between hydrogen atoms and a benzene molecule::

$$H^{\cdot} + C_6H_6 \nearrow C_6H_7^{\cdot} \quad (1)$$

$$H^{\cdot} + C_6H_6 \searrow H_2 + C_6H_5^{\cdot} \quad (2)$$

it is assumed that at room temperature reaction (1) mainly occurs and at higher temperatures reaction (2) takes place. The weak lines detected on the edges of all spectra were attributed to the background, of which the spectrum analysis took no account and which therefore requires a separate investigation. There are 2 figures.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

SUBMITTED: June 15, 1962

Card 2/2

MOLIN, Yu.N.; CHKHEIDZE, I.I.; KAPLAN, Ya.F.; BUBEN, N.Ya.; VOYEVODSKIY, V.V.

Formation of radicals in the radiolysis of solid organic compounds. Part 1: Comparing radical yields in various organic compounds. Kin.i kat. 3 no.5:674-679 S-O '62. (MIRA 16:1)

1. Institut khimicheskoy fiziki AN SSSR, Institut khimicheskoy kinetiki i goreniya Sibirskogo otdeleniya AN SSSR i Institut organicheskoy khimii AN SSSR.
(Radicals (Chemistry)) (Radiation)

TOLKACHEV, V.A.; CHKHEIDZE, I.I.; BUBEN, N.Ya.

Electron paramagnetic resonance spectrum of benzyl radicals.
Dokl. AN SSSR 147 no.3:643-644 N '62. (MIRA 15:12)

1. Institut khimicheskoy fiziki AN SSSR. Predstavleno akademikom V.N. Kondrat'yevym.
(Toluene) (Radicals (Chemistry)—Spectra)

ACCESSION NR: AP3000135 S/0062/63/000/005/0954/0954

AUTHOR: Nikol'skiy, V. G.; Chkheidze, I. I.; Buben, N. Ya.

TITLE: Reaction of alkyl radicals with oxygen in solid phase

SOURCE: AN SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 5, 1963, 954

TOPIC TAGS: EPR-spectra, polyethylene, natural rubber, dicyclohexyl-4-decane

ABSTRACT: The authors studied the EPR spectra of samples of polyethylene, natural rubber, dicyclohexyl-4-decane, and some other amorphous organic compounds which were irradiated by fast electrons at 77K. When the temperature of the irradiated sample was raised, a formation of peroxide-type radicals was observed, which was due to the reaction of the alkyl radicals with the oxygen which was dissolved in the substance. In particular, in the case of the samples which were vitrified in air prior to irradiation, the stabilized alkyl radicals were oxidized completely if their concentration did not exceed 2 x 10 sup 17 to 1 x 10 sup 18 g sup -1. It was noted for all the compounds studied that the oxidation rate of the radicals sharply increases in the temperature interval from 80 to 50 degrees below the vitrification point. In the case of dicyclohexyl-4-decane (vitrification point

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ACCESSION NR: AP3000135

-195K), the oxidation rate of the radicals rises almost 1000 times when the temperature is changed from 120 to 140K. During oxidation, the summary concentration of the radicals in the samples undergoes no essential change. Rapid oxidation of the alkyl radicals during the heating of irradiated samples of polyethylene begins at Gamma-transition temperature, 150 to 155 K (releasing the mobility of the segments - CH sub 2 -). During the heating of hydrocarbons which had been irradiated in the crystalline state, an analogous oxidation of the radicals did not occur down to melting temperature. This is apparently associated with the fact that the equilibrium concentration of oxygen in the crystalline phase is much lower than in the amorphous state.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics, Academy of Sciences SSSR)

SUBMITTED: 22Jan63 DATE ACQ: 12Jun63 ENCL: 00

SUB CODE: CH;PH NO REF SOV: 000 OTHER: 000

Card 2/2

TOLKACHEV, V.A.; CHKHEIDZE, I.I.; BUHEN, N.Ya.

Electron paramagnetic resonance spectra of phenyl radicals. Zhur.strukt.khim. 3 no.6:709-711 '62. (MIRA 15:12)

1. Institut khimicheskoy fiziki AN SSSR.
(Benzene—Spectra)
(Radicals (Chemistry)—Spectra)

AVRAMENKO, L.I.; BORN, N.Ya.; KOLESNIKOVA, R.V.; TOLKACHEV, V.A.; GEKHKIDZE, I.I.

Electron paramagnetic resonance study of radicals formed in the reaction of hydrogen atoms with benzene. Izv.AN SSSR. Otd.khim. nauk no.11:2079-2081 N '62. (MIRA 15:12)

1. Institut khimicheskoy fiziki AN SSSR.
(Radicals (Chemistry)—Spectra) (Hydrogen) (Benzene)

L 12716-63 EWP(j)/EPF(c)/EWT(m)/BDS AFFTC/ASD Pc-4/Pr-4 RM/JFW/WW
ACCESSION NR: AP3002302 S/0062/63/000/006/1143/1144

AUTHOR: Buben, N. Ya.; Tolkachev, V. A.; Chkheidze, I. I. 70

TITLE: Peculiarities in the radiolysis of phenol and benzyl chloride

SOURCE: AN SSSR. Izv. Otdeleniye khimicheskikh nauk, no 6, 1963, 1143-1144

TOPIC TAGS: radiolysis, phenol, benzyl chloride, electron paramagnetic resonance, hydroquinone, phenoxy, phenyl radicals, benzyl

ABSTRACT: Electron paramagnetic resonance studies showed that whereas in the radiolysis of a series of aromatic compounds radicals of the cyclohexadienyl type are formed, irradiation of phenol, hydroquinone, and benzyl chloride does not give rise to such radicals. EPR spectra showed that irradiated phenol contained phenoxy and phenyl radicals, and benzyl chloride, benzyl and benzyl chloride radicals. The mechanism of radiolysis of these compounds must differ from that of alkyl benzenes and, for phenol, involve cleavage of O-H and C-OH bonds.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics, Academy of Sciences SSSR)

SUBMITTED: 06 Mar 63 DATE ACQ: 16 Jul 63 ENCL: 00
SUB CODE: 00 NO REF SOV: 002 OTHER: 001
Card 1/1

MOLIN, Yu.N.; CHKEIDZE, I.I.; KAPLAN, Ye.P.; BUBEN, N.Ya.; VOYEVODSKIY, V.V.

Formation of radicals in the radiolysis of solid organic substances. Part 2: Yield of radicals in benzene and biphenyl derivatives. Kin. i kat. 4 no.4:557-560 Jl-Ag '63. (MIRA 16:11)

1. Institut khimicheskoy fiziki AN SSSR, Institut khimicheskoy organicheskoy khimii AN SSSR.

BUBEN, N.Ya.; TOLKACHEV, V.A.; CHKHEIDZE, I.I.

Radicals formed in low-temperature radiolysis of toluene. Kin.i kat. 4 no.5:683-687 S-O '63. (MIRA 16:12)

1. Institut khimicheskoy fiziki AN SSSR.

CHKHEIDZE, I.I.; TROFIMOV, V.I.; BUBEN, N.Ya.

Radicals formed in the radiolysis of some benzene derivatives. Zhur. strukt. khim. 5 no.4:624-627 Ag '64. (MIRA 18:3)

1. Institut khimicheskoy fiziki AN SSSR.

TROFIMOV, V.I.; CHKHEIDZE, I.I.; BUBEN, N.Ya.

Radical concentration limit in the low-temperature radiolysis of aromatic compounds. Kin. i kat. 5 no.4:736-739 Jl-Ag '64. (MIRA 17:11)

1. Institut khimicheskoy fiziki AN SSSR.

L 18914-65 EWG(j)/EWT(m)/EWP(b)/EWP(j)/EWA(d)/EWA(h) Pc-4/Pr-4/Pab IJAAP/
AEDC(b)/ASD(a)-5/SSD/AS(mp)-2/AFWL/RAEM/RAEM(1)/ESD(gs)/ESD(t) RM

ACCESSION NR: AP4047835 S/0195/64/005/005/0802/0806

AUTHOR: Vasil'yev, G. K.; Chikaidze, I. I.

TITLE: Investigation of the low-temperature radiolysis of certain simple aromatic compounds by the methods of electron paramagnetic resonance (EPR) and mass spectrometry

SOURCE: Kinetika i kataliz, v. 5, no. 5, 1964, 802-806

TOPIC TAGS: radiolysis, electron paramagnetic resonance, mass spectrometer, aromatic hydrocarbon, radical yield, hydrogen yield, benzene, diphenyl

ABSTRACT: One characteristic of the radiation stability of organic substances may be both the radical yield and the yield of gaseous products, since it is known that for various classes of aliphatic compounds these values (G_R and G_{H_2}) are practically identical. It is also known that the radiation stability of aromatic compounds is considerably higher than that of aliphatic compounds, it having been demonstrated that the hydrogen and radical yield values differ substantially (G_{H_2} is 1 to 2 orders of magnitude less than G_R). This discrepancy is explained. In the present work, measurements were carried out on G_R and G_{H_2} for benzene and a number of its derivatives in order, by means of a comparison of these values and also of the results of an analysis of electron paramagnetic resonance (EPR) spectra,

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L 16912-65

ACCESSION NR: AP4047835

4

to bring to light the peculiarities of the low-temperature radiolysis of aromatic compounds. Since the radical yield constitutes a value which characterizes only the "radical" processes during radiolysis, while the gaseous product yield is a value dependent both on the radical reactions and the processes of molecular splitting, an effort was made to estimate the portion of hydrogen which forms as a result of molecular splitting by comparing the radical and hydrogen yields in the radiolysis of benzene, diphenyl and their alkyl derivatives. The work was conducted on an EPR-2 spectrometer and an MKh-1302 mass spectrometer, placed under an electron beam of 1.6 Mev energy, with the tests conducted in a temperature range of -140 to -170C. The intensity of the dose was on the order of 0.1 Mrad/sec, with the total dose not exceeding 100 - 150 Mrad. It was shown that for aromatic compounds the G_R value are significantly greater than the G_{H2} values. The discrepancy in the values of G_R and G_{H2} in the substances studied is explained by the occurrence of a secondary reaction of the hydrogen atoms which is characteristic for aromatic compounds - their double bond addition. "The authors wish to express their gratitude to G. K. Voronova for her assistance in the work, and to V. I. Trofimov for his participation in individual measurements. They are also indebted to D. L. Tal'roze for evaluating the results obtained."

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

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L 16912-65

ACCESSION NR: AP4047835

SUBMITTED: 12Nov63 ENCL: 00 SUB CODE: OC, NE

NO REF SOV: 009 OTHER: 005

Card 3/3

L 60983-65 EPF(c)/EWG(j)/EWA(h)/EWP(j)/EWT(m)/EWA(1) Pc-4/Pr-4 RM

ACCESSION NR: AP5019792 UR/0076/65/039/007/1662/1668

541.15:547.024

29

27

AUTHOR: Trofimov, V. I.; Chkheidze, I. I.; Buben, N. Ya.

TITLE: Limiting concentrations of radicals in simple aromatic compounds

SOURCE: Zhurnal fizicheskoy khimii, v. 39, no. 7, 1965, 1662-1668

TOPIC TAGS: free radical, electron spin resonance, aromatic compound radiolysis

ABSTRACT: The electron spin resonance method was used to determine the limiting radical concentrations N_{lim} during low-temperature radiolysis of a series of aromatic compounds. The measurements were made with an EPR-2 spectrometer mounted in the path of a beam of fast 1.5 Mev electrons. All N_{lim} values were independent of the dose rate (which ranged from 4 to 40 mrad/min). In all cases, the N_{lim} values decreased linearly with rising temperature. Calculation by the least squares method gave the following relations:

benzyl chloride $C_6H_5CH_2Cl$ $N_{lim} = 4.7 \cdot 10^{19} - 1.9 \cdot 10^{17}T$,

aniline C_6H_5Cl $N_{lim} = 2.6 \cdot 10^{19} - [illegible]$

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L 60983-65

chlorobenzene $C_6H_5NH_2$ $N_{lim} = 3.2 \cdot 10^{19}$

The [illegible] distribution of radicals [illegible] terms of the limiting radical concentrations, all the [illegible]

[illegible]

of [illegible] energy to the functional groups [illegible] linked [illegible] hydrogen bond. It is shown that none [illegible] hence none offered for the N_{lim} values satisfactorily [illegible] data. "The authors thank G. K. Voronova for assistance in the [illegible]

Card [illegible]

has: [illegible] figures, 1 table, and 4 formulas.

[illegible] Khimicheskoy fiziki A[illegible]

[illegible]

Card 3/3

L 26359-66 EWT(m)/EPF(n)-2/EWP(j)/EWA(h)/EWA(1) WW/JW/GG/RM

ACC NR: AP6013381 SOURCE CODE: UR/0195/66/007/002/0230/0236

AUTHOR: Chkheidze, I. I.; Molin, Yu. N.; Mironov, V. F.; Chernyshev, Ye. A.; Buben, N. Ya.; Voyevodskiy, V. V.

ORG: Institute of Chemical Physics AN SSSR (Institut khimicheskoy fiziki AN SSSR); Institute of Kinetics and Combustion, SO AN SSSR (Institut kinetiki i goreniya SO AN SSSR); Institute of Organic Chemistry im. N. D. Zelinskiy, AN SSSR (Institut organicheskoy khimii AN SSSR)

TITLE: Formation of radicals during the radiolysis of organic solids. Part 3: EPR spectra and radiation yields of radicals in certain organosilicon compounds

SOURCE: Kinetika i kataliz, v. 7, no. 2, 1966, 230-236

TOPIC TAGS: free radical, organosilicon compound, irradiation effect, EPR spectrum

ABSTRACT: The EPR method was used to investigate the radical processes involved in the low-temperature radiolysis of certain organosilicon compounds with a view to determining the effect of the silicon atom entering into the aliphatic chain on the effectiveness and direction of primary radiochemical processes. The radiation yields of the radicals (G_R) formed by irradiating the compounds with fast electrons at temperatures from -130 to -180°C were determined by the EPR method. It was found that G_R for saturated and aromatic substituted derivatives of tetramethylsilane did not

UDC: 541.15-16

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L 26359-66

ACC NR: AP6013381

differ from G_R for hydrocarbons of similar structure and amounted to 4-5 1/100 ev and 0.2-0.6 1/100 ev, respectively. For compounds of the general formula $(CH_3)_3Si(CH_2)_n CH{=}CH_2$ (n = 0, 1, 2), the radiation yield is G_R = 1 1/100 ev, which is approximately 4 times less than for hydrocarbons with double bond. Analysis of the EPR spectra showed that the introduction of a silicon atom in the aliphatic chain does not produce any appreciable changes in the radiolysis mechanism. Orig. art. has: 7 figures, 2 tables, 5 formulas.

SUB CODE: 07, 20/ SUBM DATE: 12Sep64/ ORIG REF: 008/ OTH REF: 005

Card 2/2

L 36966-66 EWT(m)/EWP(j) RM

ACC NR: AP6027806 SOURCE CODE: UR/0063/66/011/002/0228/0233

AUTHOR: Buben, N. Ya. (Candidate of physico-mathematical sciences); Chkheidze, I. I. (Candidate of chemical sciences)

ORG: none

TITLE: Mechanism of formation of radicals during radiolysis of aromatic compounds in the solid phase

SOURCE: Vsesoyuznoye khimicheskoye obshchestvo. Zhurnal, v. 11, no. 2, 1966, 228-233

TOPIC TAGS: reaction mechanism, free radical, free radical stabilization, chemical bonding

ABSTRACT: This is a review of research on free radicals during the low temperature radiolysis of a number of simple aromatic compounds conducted mainly at the Institute of Chemical Physics, Academy of Sciences USSR. Primary chemical reactions in solid organic substances, determined mostly by the possibility of stabilization of the radicals being formed, are not limited only to cleavage of light radicals (above all hydrogen) which are capable of leaving the Frank-Rabinovich "cage". In addition to this, reactions in which the terminal functional groups of certain neighboring molecules are simultaneously disrupted or some bonds in a complex molecule are broken to form molecular products and radicals, sufficiently removed from one another for stabilization in the matrix, can exert a substantial role. Investigation of the low-

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ACC NR: AP6027806

temperature radiolysis of organic substances indicated that the radiation yield of radicals in the solid phase can be used for the quantitative estimation of the radiation stability of the compound. To accomplish this it is only necessary to measure the radical yield at a sufficiently low temperature to exclude the recombination of heavy radicals. In fulfilling this condition, the decomposition of one molecule of the initial substance in relation to the radiolytic mechanism will result in the stabilization of either one or two radicals. Orig. art. has: 5 figures and 2 tables. [JPRS: 36,455]

SUB CODE: 07 / SUBM DATE: none / ORIG REF: 019 / OTH REF: 010

Card 2/2

L 04180-67 EWT(m)/EWP(j) JW/RM

ACC NR: AP6029226 SOURCE CODE: UR/0195/66/007/003/0540/0542

51
49
B

AUTHOR: Trofimov, V. I.; Belen'kiy, L. I.; Buben, N. Ya.; Chkheidze, I. I.

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

TITLE: Free radical formation during radiolysis of organic compounds in the solid state. IV. Radiative free radical yields in certain sulfur-containing compounds

SOURCE: Kinetika i kataliz, v. 7, no. 3, 1966, 540-542

TOPIC TAGS: free radical, radiation chemistry, EPR spectrum, radiation effect

ABSTRACT: Radiative free radical yields (G_R) for hexylmercaptan, dihexyldisulfide, thiophenol, and thiophene and its derivatives were determined by EPR technique. The EPR spectra of the various samples irradiated with electrons having an energy of 1.6 Mev at -115°C to -190°C were taken directly using an EPR-2-IKhF device. The radiative free radical yields were determined from the initial linear portion of the free radical build-up curve. The accuracy of the free radical yields determination was 40%. The radiative free radical yields were found to be equal to 0.4 for hexylmercaptane and dihexyldisulfide, 0.2 for thiophenol, 0.18 for thiophene, and 0.03 for 2-chloro- and 3-bromothiophene. This indicates that the presence of -S-H and -S-S- groups results in great radiation resistance. (For comparison, the radiative free radical yields re-

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ACC NR: AP6029226

ported in the literature for saturated hydrocarbons and alcohols are 4-5 and 5-8, respectively). The authors thank E. M. Nanobashvili for supplying certain samples and discussion of the results and M. V. Panchvidze for assistance in carrying out the experiments. Orig. art. has: 2 figures, 1 table.

SUB CODE: 07/ SUBM DATE: 13May65/ ORIG REF: 012/ OTH REF: 003

Card 2/2

Chkheidze, I. M.

82029
S/056/60/038/02/45/061
B006/B014

24.5600

AUTHORS: Tsakadze, D. S., Chkheidze, I. M.

TITLE: Measurement of the Logarithmic Decrement of Damping of a Hollow Cylinder in Rotating Helium II

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 2, pp. 637 - 638

TEXT: Superfluidity studies performed by E. L. Andronikashvili and one of the writers of the present "Letter to the Editor" have shown that the logarithmic decrement of damping δ of a disk moving in rotating helium II passes through a maximum. This phenomenon is ascribed to change in the elastoplastic properties of helium II. In accordance with this hypothesis the superfluid component of slowly rotating He II may be regarded as a system of a few not interacting vortex filaments or, in the case of high velocities, as a uniform rope. It was further assumed that the rotational He II must have different properties of fluidity, depending on whether the body surface therein moved perpendicular or parallel to the vortex filaments. In order to verify these assumptions, the authors made experiments

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Measurement of the Logarithmic Decrement of Damping of a Hollow Cylinder in Rotating Helium II

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with a cylinder of organic glass (24.06 mm wide, 49.80 mm high, and 0.49 mm thick) on which graduation lines were marked out in intervals of 5.0 mm each. The cylinder was immersed into the rotational He II to a different extent, and the experimental setup described in Refs. 4, 5, and 7 was used for the purpose. Measurements of the fluidity of He II furnished the same results as obtained by Andronikashvili with a disk (Ref. 8). Experiments performed by the authors at three different temperatures were in agreement with a formula (2) given by Yu. G. Mamaladze and S. G. Matinyan (Ref. 9) for the dependence of the decrement of damping on the depth of immersion, viz., agreement was found within the limits of error. The curve $\delta(\omega)$ showed a linear course, and the peak previously found was not observed. It is thus proved that the properties of fluidity of rotational He II depend on the direction in which the damping is measured. The authors thank the above-mentioned scientists for their interest and discussions. There are 1 figure and 10 references: 7 Soviet and 3 English.

ASSOCIATION: Tbilisskiy gosudarstvennyy universitet (Tbilisi State University)

Card 2/3

Measurement of the Logarithmic Decrement of Damping of a Hollow Cylinder in Rotating Helium II

82029
S/056/60/038/02/45/061
B006/B014

SUBMITTED: September 25, 1959

Card 3/3

S/194/61/000/012/038/097
D256/D303

9,7300

AUTHOR: Chkheidze, M. V.

TITLE: D.c. pulse amplitude converter to a number of pulses proportional to amplitude

PERIODICAL: Referativnyy zhurnal, Avtomatika i radioelektronika, no. 12, 1961, 13, abstract 12V103 (Tr. Gruz. politekhn. in-t, 1961, no. 1 (72), 71-79)

TEXT: A brief review is presented of the existing methods of converting continuous voltage values into discrete ones. The advantages and disadvantages are considered of the known methods of conversion e.g.: 1) Shaft angular-position indicators; 2) conversion of a parameter into a time interval; 3) methods of weighing (successive subtracting); 4) methods utilizing special electron-beam coding tubes. A wide frequency range conversion system is proposed consisting of the following basic elements: 1) Energy storing element - charged capacitor; 2) arrangement for addition of fixed energy portions of standard current pulses; 3) zero-arrangement

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with diodes and resistors. The capacitor is charged from the standard-pulse source until its voltage reaches the value of the measured voltage, and since the magnitude of the pulses stays constant in time the required number of pulses will depend solely upon the measured voltage. A high accuracy of conversion can be achieved if necessary by increasing the current- and frequency-stability of the charging pulses. The proposed system was tested with frequencies ranging from 1 to 100 kcs/sec using input voltage of 0 to 20 V and the output error was found to be within ± 1.5 to 2.5%. There are 5 figures. [Abstractor's note: Complete translation.]

MANUKYAN, Yu.S.; CHKHEIDZE, M.V.; KHRISTESASHVILI, V.G.; MACHAVARIANI, G.A.

Construction of Gray code counters. Soob. AN Gruz. SSR 31 no. 3:655-660 S '63. (MIRA 17:7)

1. Institut kibernetiki AN GruzSSR, Tbilisi. Predstavleno chlenom-korrespondentom AN GruzSSR N.V.Gabashvili.

CHKHEIDZE, M.V.; MANUKYAN, Yu.S.; MACHAVARIANI, G.A.

Comparison of numbers represented in the Gray code. Soob. AN Gruz. SSR 33 no.1:183-190 Ja '64. (MIRA 17:7)

1. Institut kibernetiki AN Gruzinskoy SSR. Predstavleno chlenom korrespondentom Akademii N.V. Gabashvili.

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V.; Sherazadze, A.

Sherazadze, A.

generator.

output is connected to a shaper-e

the shaper-extender to the

1 diagram.

ASSOCIATION: Institut kibernetiki, AN Gruzinskoy SSR (Cybern

ACCESSION NR: AP5010951 UR/0286/65/000/007/0118/0118

TITLE: Reversible counter in Grey code. Class 42, No. 169882

ABSTRACT: This Author Certificate presents a reversible counter in Grey code con-

L 42040-65

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000308920012-6"

L 27074-66 EWT(d)/FSS-2 GS/JXT(CZ)

ACC NR: AT6012356 SOURCE CODE: UR/0000/66/000/000/0249/0252

AUTHOR: Abesadze, T. B.; Melikadze, N. L.; Chkheidze, M. V.; Shekriladze, V. I.

ORG: none

TITLE: High-current converter of low voltage levels into a code

SOURCE: Nauchno-tekhnicheskaya konferentsiya po sredstvam promyshlennoy telemekhaniki. Moscow, 1963. Promyshlennaya telemekhanika (Industrial telemechanics); materialy konferentsii. Moscow, Izd-vo Energiya, 1966, 249-252

TOPIC TAGS: coding, binary code, analog digital encoder, optic communication, fiber optics

ABSTRACT: In view of the sensitivity of low-voltage levels to extraneous noise and the concomitant need for the use of amplification in each individual channel, the authors have developed a converter in which the level is measured by a deflecting-beam instrument, and in which the beam deflection is converted into a digital signal by means of a light-sensitive instrument (Fig. 1). The accuracy of such a converter depends both on the accuracy of the meter employed and on the minimum distance which separates two neighboring light-sensitive elements. If several light-sensitive elements are installed at each scale division, and if these elements are suitably arranged in columns, it is possible to code the results of the conversion in accordance with a prescribed law. A standard meter with sensitivity of several millivolts per scale division can be used. If an electrodynamic meter is used, it is possible to obtain in discrete code the amplitude of sinusoidal oscillations at any instant of time,

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L 27074-66

ACC NR: AT6012356

something which cannot be done with any other converter without the use of a rectifier. The code mask is placed on the surface of the focusing member of the instrument, and the scale can be printed photographically. Methods of eliminating the scale nonlinearity have been developed. The use of fiber optics can improve the resolution and the accuracy. Different types of optical fibers, with length of 30 cm, were tried. Types FEU-27 and FEU-31 photomultipliers were tested, and the latter turned out to be more sensitive. A scale of 100 divisions (10 binary digits) with measurement accuracy 0.1% calls for the use of an optical mask of 0.136 x 0.6 mm area, and a maximum width of the light beam of 136 μ. The actual width chosen was 80 μ. A signal of the order of 0.5 volts was obtained in all digits. Orig. art. has: 1 figure. [02]

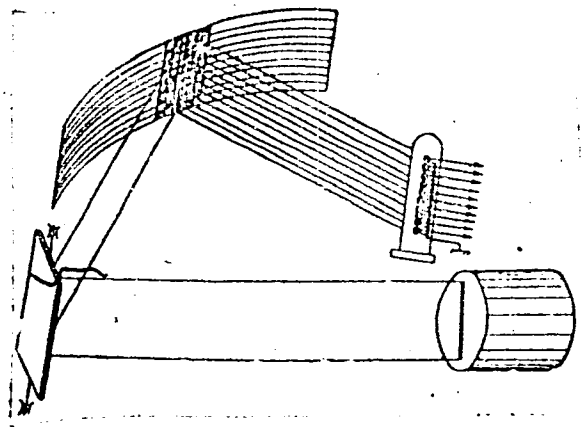

Fig. 1. Diagram of converter with focusing mirror.

SUB CODE: 09/ SUBM DATE: 08Jan66/ ATD PRESS: 4258

Card 2/2

CHKHEIDZE, M. Ya.

"Intestinal Pneumatosis and Signoid Volvulus in Ulcer," Khirurg., No.4, 1952

CHKHEIDZE, M.Ya.

Contralateral closed atelectasis upon injury. Khirurgiia no.10:81-82 O '53. (MLRA 6:11)

1. Iz khirurgicheskogo otdeleniya (zavedyushchiy M.Ya.Chkheidze) Potiyskoy gorodskoy bol'nitsy. (Lungs--Wounds and injuries)

CHKHEIDZE, M.Ya.,(g.Poti, Gruzinskaya SSR.)

Ligation of the pulmonary artery in total suppurating bronchiectasis performed in a district hospital. Khirurgiia no.8:78 Ag. '55.
(MLRA 9:2)

(PULMONARY ARTERY--LIGATURE) (BRONCHI--DILATION)

CHKHEIDZE, M.Ya

Retro-peritoneal lipoma of the small pelves erroneously diagnosed as an inoperable cancer of the rectum. Khirurgiia 32 no.3:84 Mr '56. (MLRA 9:7)

1. Iz Potiyskoy gorodskoy bol'nitsy
(PELVIS--TUMORS)

CHKHEIDZE, M.Ya. (gor. Poti, Gruzinskoy SSR)

Peridural anesthesia [with summary in English, p.160] Vest.khir. 77 no.7:96-99 Jl '56. (MIRA 9:10)

1. Iz khirurgicheskogo otdeleniya Potiyskoy gorodskoy bol'nitsy (zav. - M.Ya.Chkheidze)
(ANESTHESIA, SPINAL
peridural, methods & indic.)