AUTHORS: Chernyak, N. Ya., Bubnov, N. N., Voyevodskiy, V. V., Polak, L. S., Tsvetkov, Yu. D. SOV/20-120-2-34/63

TITLE: The Formation of Free Radicals and of Atoms in the Radiolysis of Hydrocarbons at a Temperature of 77°K (Ob obrazovanii svobodnykh radikalov i atomov pri radioliize uglevodorodov pri temperature 77°K)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 120, Nr 2, pp. 346 - 348 (USSR)

ABSTRACT: References are made in publications to free radicals formed during the action of ionizing radiation, as by X-rays, γ-radiation, fast electrons etc. This is caused by a rupture of C - C and of C - H bindings. When fluid hydrocarbons are radiolysed, the life of the free radicals is very short. The main products of radiolysis, apart from liquid products with one or two conjugated double bindings, are H_2 and $C_{14}H_{30}$. The latter compound is considered to be a dimer of the heptyl radical. The method of determining the radical is shortly described. The following hydrocarbons were investigated: hexane,

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heptane, octane, dodecane, cetane, isooctane, cyclohexane, benzene and toluene. In all cases intensive signals of paramagnetic electron resonance with a g-factor of ~ 2,0 are observed. In paraffin-type hydrocarbons and in cyclohexane a hyperfine structure was very clearly observed. According to the attached photographs the hyperfine structure is considerably changed if the structural properties of the initial molecule change. Another peculiarity of the spectra pf paramagnetic electron resonance of the hydrocarbons which are irradiated in a frozen state is the existence of considerable concentrations of hydrogen atoms. This is also indicated by two narrow signals which are located symmetrically at a distance of about 250 Oersted (Ersted) from the signals of the alkyl radical. The hydrogen atoms probably do not become stabilized in the volume of the frozen hydrocarbons but on the internal surface of the quartz ampoule. In a table the quantitative measurements performed on the basis of the example of heptane concerning the concentration of the free radicals with a dose of ~ 10^7r are compared with the data of the chemical analysis of a sample irradiated under absolutely identical conditions. The results

The Formation of Free Radicals and of Atoms in the Radiolysis of Hydrocarbons at a Temperature of 77°K SOV/20-120-2-34/63

obtained by both measurements agree in a satisfactory manner. There are 2 figures, 1 table, and 4 references, 2 of which are Soviet.

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

SUBMITTED: January 11, 1958

1. Hydrocarbons--Temperature factors 2. Free radicals --Production 3. Atoms--Production 4. Hydrocarbons --Test results

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SOV/51-6-4-26/29

24(7), 5(3)

AUTHORS: Chernyak, N. Ya., Bubnov, N.N., Polyak, L.S., Tsvetkov, Yu. D. and Voyevodskiy, V.V.

TITLE: On Certain Regularities in the Electron Paramagnetic Resonance Spectra of Alkyl Radicals (O nekotorykh zakonomernostyakh v spektrakh elektronnogo paramagnitnogo rezonansa alkil'nykh radikalov)

PERIODICAL: Optika i Spektroskopiya, 1959, Vol 6, Nr 4, pp 564-565 (USSR)

ABSTRACT: In the study of the electron paramagnetic resonance (e.p.r.) spectra of radicals formed on γ-irradiation or frozen hydrocarbons (at 77°K), it was found that the hyperfine structure (h.f.s.) varies with the position of the hydrocarbon in its homologous series. Fig 1 shows the spectra of radicals of normal paraffin hydrocarbons from $C_{11}H_{23}$ to $C_{16}H_{33}$ obtained under conditions described earlier (Ref 1). The samples were of 97-98% purity. Fig 1 shows that h.f.s. of the even ($C_{12}H_{25}$, $C_{14}H_{29}$, $C_{16}H_{33}$) and odd ($C_{11}H_{23}$, $C_{13}H_{27}$, $C_{15}H_{31}$) hydrocarbons differ considerably. In odd hydrocarbons the h.f.s. is well resolved and the intensities of the central components differ only slightly from one another. In even hydrocarbons the resolution is much poorer and the intensity distribution is close to binomial. In paraffin hydrocarbons from n-C_5 to n-C_{10} the spectra are more complex and more similar to

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On Certain Regularities in the Electron Paramagnetic Resonance Spectra of Alkyl Radicals

one another. Two of them are shown in Fig 2, where curves 1 and 2 represent the e.p.r. spectra of C_6H_{13} and C_7H_{15} respectively. The spectra of radicals of cyclic hydrocarbons (with five or six C atoms, shown in Fig 3) are in many respects similar to the corresponding spectra of the odd and even terms of the series C_{11}-C_{16}. The simplest spectrum is that of cyclo-C_6. The hyperfine splitting and component intensities may be explained by assuming that the spectrum is a triplet (with 37 oersted splitting and 1:2:1 ratio of intensities of the components) and each components of the triplet is split into two lines (20 oersted separation). Such a spectrum occurs in the radical cyclo-C_6H_{11}. Following Ingram (Ref 3) it is assumed here that of four hydrogen atoms in the β-position, the free valence, only two take part in the hyperfine splitting. This produces a triplet. Interaction with a hydrogen atom in the α-position produces the doublet splitting of each triplet component. In the case of cyclo-C_5H_{10} the molecule is almost planar and both hydrogen atoms of the β-groups CH_2 in the radical should be equivalent with respect to free valance and the number of h.f.s. components should increase. The spectra shown in Fig 3 confirm these deductions. The authors conclude by pointing out that the e.p.r. spectra

On Certain Regularities in the Electron Paramagnetic Resonance Spectra of Alkyl Radicals

can be used in molecular structure studies and in chemical analysis. There are 3 figures and 3 references, 2 of which are Soviet and 1 English.

SUBMITTED: August 28, 1958

5 (3)

AUTHORS: Sergiyenko, S. R., Chernyak, N. Ya. SOV/62-59-7-20/38

TITLE: Kinetics and Mechanism of the Oxidation of Dibenzyl in Liquid Phase (Kinetika i mekhanizm zhidkofaznogo okisleniya dibenzila)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 7, pp 1294 - 1303 (USSR)

ABSTRACT: The present paper deals with the oxidation of hydrocarbons which contain aromatic and aliphatic ingredients, and the resin formation. Dibenzyl serves as an example; it contains two aromatic rings which are combined by an aliphatic bridge. Furthermore, only a small number of oxidation products is possible in the case of dibenzyl. The kinetic rules governing the oxidation and its reaction scheme are investigated. The experiments were carried out in a closed system with circulating oxygen. The scheme of the apparatus is represented in figure 1. The absorption of the oxygen was determined from the drop in pressure. Moreover, the intervals were determined within which the oxygen content decreases to such an extent that new oxygen has to be introduced in order to guarantee an uninhibited reaction course. From these intervals the curve ΔV_{O_2} versus t was obtained

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(Fig 2). Furthermore, the time of the consumption of dibenzyl and the accumulation of intermediate- and final oxidation products were determined from the change of the functional groups. The content of dibenzyl in the reaction products was determined from the adsorption of the oxidized products in fine-grained silica gel. The content of peroxides and acids was determined potentiometrically, the aldehydes polarographically. The experimental temperatures were changed for the investigation of the reaction kinetics (110, 130, 140, and 150°). It was found that the oxidation proceeds at all temperatures autocatalytically. The reaction begins without induction period, accelerates, reaches a maximum, and dies down. The reaction is subjected to an exponential law. The polarographic anamorphoses of the absorption curves of O_2 show that the reaction proceeds in the chain mechanism. The curves of the kinetics of the consumption of initial dibenzyl and the accumulation of intermediate products are represented in figures 3a and b. From these follows that the process is inhibited in the further stage of the reaction under the influence of produced inhibiting

Kinetics and Mechanism of the Oxidation of Dibenzyl in Liquid Phase SOV/62-59-7-20/39

resin products. The activation energy of the beginning oxidation (29 kcal/mol) was determined from the experimental data and from it the activation energy of the reaction of peroxyradical with dibenzyl = 13 kcal computed according to the given reaction scheme. The reaction scheme which is based upon the radical-chain mechanism reproduces all experimental rules governing the reaction mechanism observed and takes into account the autoinhibiting effect caused by the destruction of the peroxyradicals. The hydroperoxide of dibenzyl and benzaldehyde were found as intermediate products. The influence of additions on the different reaction stages (resinous intermediate products etc.) are represented in figures 4,5, and 6. There are 6 figures, 4 tables, and 9 references, 8 of which are Soviet.

ASSOCIATION: Institut nefti AN SSSR (Institute of Petroleum of the AS USSR)

SUBMITTED: September 11, 1957

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24 (7), 5 (4)

AUTHORS: Kachkurova, I. Ya., Polak, L. S., Topchiyev, A. V., Chernyak, N. Ya.

SOV/48-23-10-32/39

TITLE: Investigation of the Radiolysis of Alkanes by Means of the Ultraviolet- and Infrared Spectra

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 10, pp 1253 - 1255 (USSR)

ABSTRACT: In the radiolysis of alkanes the bonds C-C and C-H break off; in the gaseous phase hydrogen (80-85%) is liberated, as well as various hydrocarbon gases (CH_4, C_2H_6, etc); radicals of the type C_nH_{2n+1} are formed when atomic hydrogen is broken off, the breaking off of H_2 leads to the formation of olefins and of $2H_2$ to formation of dienes and polyenes. The chemical analysis of the liquid radiolysis products (0.1 - 1.0%) is so difficult that the only possible method of determining them is that of the absorption spectra. The authors chose heptane and other normal hydrocarbons as objects for their investigation. The irradiation of the liquid and gaseous samples was carried out with Co^{60}-γ-rays in evacuated glass ampoules. Measurement of

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the absorption spectra was carried out at the Opticheskaya laboratoriya INEOS (Optical Laboratory of the INEOS): The uv-spectra by means of the spectrovisor (an automatically recording spectrophotometer), the ir-spectra by means of an automatically recording VIKS-11-spectrometer. The liquid radiolysis products were investigated in the ranges 25,000 - 45,000 and 700 - 2,000 cm^{-1}. Figure 1 shows the uv-spectra recorded in irradiated normal hydrocarbons: Hexane, heptane, octane, dodecane, cetane. The thickness of the absorbing layer was d = 0.5 cm. The curves are shown by a diagram $D/d : \nu$; the results obtained are briefly discussed. The absorption intensities in the uv-range increase linearly with an increase in the irradiation dose. The maximum doses were about 150.10^6 r. Figure 2a shows the dependence of absorption intensity on the molecular composition of the irradiated hydrocarbon, figure 2b shows the dependence of intensity on the irradiation dose for heptane. Figure 3 shows the uv-absorption spectrum of cetane, which was irradiated at various temperatures (dose 1.10^7r).

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A reduction of temperature exercises no influence upon the character of the spectrum, but absorption intensity increases. Several details of this temperature effect are discussed. The absorption coefficient of heptadiene at 44,000 cm^{-1} was determined as amounting to 26,000 and the molar diene concentration occurring in a γ-irradiation ($\sim 10^8$ r) in heptane was calculated. $3.5 \cdot 10^{-4}$ g mol/liter was the result obtained. There are 3 figures.

ASSOCIATION: Institut neftekhimicheskogo sinteza Akademii nauk SSSR (Institute for Petroleum-chemical Synthesis of the Academy of Sciences, USSR). INEOS Akademii nauk SSSR (INEOS of the Academy of Sciences, USSR)

Card 3/3

Chernyak, N. Ya.

5.4500 (0)

AUTHORS: Rerkin, E. G., Kustanovich, I. M., Polak, L. S., Topchiyev, A. V., Academician, Chernyak, N. Ya.

TITLE: Low-temperature Radiolysis of Hydrocarbons

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 5, pp 1042 - 1045 (USSR)

ABSTRACT: The authors investigated the influence exerted by low temperatures and by the phase condition on the yield of various products of hydrocarbon radiolysis. The methods of preparation and irradiation were described in reference 1. The composition of the radiolysis products was determined by chromatographic measurement. The concentration of the free radicals was measured by the instrument type EPR. The spectra were taken by the spectrograph type IKS-14 (infrared spectrum) and SF-4 (ultraviolet spectrum). Table 1 supplies data concerning hydrogen and methane yields from heptane, cyclohexane, and isooctane. It may be observed therefrom that the hydrogen yield drops by about 10-15% with heptane- and cyclohexane irradiation in the transition from room temperature to 195°K. A further temperature drop has no noticeable effect

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yield from isooctane on the temperature is particularly striking. On the transition from room temperature to 195°K the H_2-yield drops somewhat, but rises at 77°K. The result of CH_4 drops markedly with dropping temperature. Atomic hydrogen effects the formation of H_2-molecules in two ways: $H + H \rightarrow H_2$ (1), and $R+H \rightarrow R'+H_2$ (2), in which connection reaction (2) requires a certain activation energy. Nonetheless, the major part of H_2 is bound to develop with reaction (2) at 300°K due to the great difference in the concentrations of R and H. Reaction (2) is rendered more difficult at 77°K. This would be expected to cause the yield of the H_2 part, which is formed by way of the radical, to drop by a maximum 50%. In reality, this decrease is 15% only. In the case of isooctane the H_2 yield even increases. Two causes may account for it: 1) Reaction (2) is not entirely suppressed, because the resulting tertiary R may be "hot". 2) The lower yield of fragments from the burst of the C-C-bond may partially compensate the resulting H_2-yield. Any increase in the yield of fragment radicals is bound to effect a drop in the molecular hydrogen

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yield and vice versa. This may be observed particularly on isooctane. Not only the drop of the H_2-yield is compensated here but furthermore, this yield is strongly reduced. Table 2 shows the yield of individual hydrocarbons from C_1 to C_5, which were obtained from heptane by radiolysis at 300, 195, and 77°K. It may be seen therefrom that both the light saturated radiolysis products and the light unsaturated ones decrease somewhat on the transition from room temperature to 195°K. Afterwards, their amount drops to 5/9. Table 3 shows the change in composition and amount of the unsaturated products. At all mentioned temperatures (dosage 2-4.10²¹ ev) trans-olefins, α-olefins and vinylidene structures are formed. The olefins may be assumed to be brought on the basis of a molecular mechanism, as their formation is independent of temperature. The amount of vinylidene structures rapidly drops with temperature. This may be explained by a secondary character of their formation. Nicholaire no doubt radiolysis-primary reaction products (Ref 4). Their yield is multiplied with temperature drop. Figure 2 shows the dependence of the

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yield of the heavy residue on the irradiation temperature of heptane. It may be observed from table 4 that the total amount of the heavy residue (compounds $\geq C_{10}$) drops to almost 2/3 on the transition from 300 to 77°K. To conclude, the authors state that at 300°K the molecular formation way of H_2 is about 50%, and at 77°K it rises to 60% on the expense of the radical way. A verbal communication made by B. A. Dolgoplosk is mentioned in the text. There are 2 figures, 4 tables, and 4 references, 3 of which are Soviet.

ASSOCIATION: Institut neftekhimicheskogo sinteza Akademii nauk SSSR (Institute of Petroleum-chemical Synthesis of the Academy of Sciences, USSR)

SUBMITTED: August 1, 1959

CHERNYAK, N. YA.

PHASE I BOOK EXPLOITATION SOV/5084

International Conference on the Peaceful Uses of Atomic Energy. 2d, Geneva, 1958.

Doklady sovetskikh uchenykh. [t.4] Khimiya radioelementov i radiatsionnykh prevrashcheniy (Reports of Soviet Scientists. v. 4.: Chemistry of Radio-elements and Radiation Transformations) Moscow, Atomizdat, 1959. 323 p. 8,000 copies printed. (Series: Its: Trudy)

Ed. (Title page): A. P. Vinogradov, Academician; Ed.: V. I. Labaznov; Tech. Ed.: Ye. I. Mazel'.

PURPOSE: This collection of articles is intended for scientists and engineers interested in the applications of radioactive materials in science and industry.

COVERAGE: The book contains 26 separate studies concerning various aspects of the chemistry of certain radioactive elements and the processes of radiation effect on matter. These reports discuss present-day methods of reprocessing irradiated nuclear fuel, research in the chemistry of mercury, thorium, uranium, plutonium, and americium, problems related to the sorption and bury-

ing of radioactive wastes, the radiolysis of aqueous solutions and of organic compounds, the mechanism of polymer chain grafting, and the effect of radiation on natural and synthetic rubbers. V. N. Prusakov edited the present volume. Most of the reports are accompanied by references. Contributors to individual investigations are mentioned in annotations to the Table of Contents.

TABLE OF CONTENTS:

POLAK, L.S.; CHERNYAK, N.Ya.; SHAKHRAY, V.A.; SHCHERBAKOVA, A.S.

γ-Radiolysis of hexane in the presence of small amounts of benzene. Neftekhimiia 1 no.5:695-699 S-O '61. (MIRA 15:2)

1. Institut neftekhimicheskogo sinteza AN SSSR.
(Hexane) (Radiation)

38624
S/081/62/000/009/019/075
B158/B101

5.4600

AUTHORS: Topchiyev, A. V., Polak, L. S., Chernyak, N. Ya., Glushnev, V. Ye., Glazunov, P. Ya., Vereshchinskiy, I. V., Syrkus, N. P., Breger, A. Kh., Vaynshteyn, B. I.

TITLE: Radiation-heat cracking of hydrocarbons

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 9, 1962, 74 - 75, abstract 9B513 (Sb. "Radioakt. izotopy i yadern. izlucheniya v nar. kh-ve SSSR. v. I". M., Gostoptekhizdat, 1961, 206-210)

TEXT: The low overall yield of radiolysis products from hydrocarbons at room temperature points to the absence of a chain reaction at that temperature. To examine the possibilities of a chain reaction in radiation cracking, n-heptane was irradiated by Co^{60} γ-rays at high temperatures. The samples were irradiated in 15 ml bulbs made of molybdenum glass with a wall thickness of ~1 mm. The amount of liquid heptane was 0.25 ml and the pressure in the ampoules on vaporization 2.5 T/273 atm. To prevent local preheating of the walls, the bulb was rotated twice a second. The

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Radiation-heat cracking of hydrocarbons

radiation dose output calculated on 1 ml of liquid n-heptane was $2 \cdot 10^{13}$ Mev/sec. It is shown that radiation-heat cracking of n-heptane occurs at considerably lower temperatures than purely thermal cracking which needs a temperature of $\sim 500^{\circ}C$. The yield of liquid unsaturated hydrocarbons from radiation-heat cracking increases from 1.8 at room temperature to 340 at 450°C. The total radiation-chemical yield of low molecular hydrocarbons is 2000 at 400°C, being therefore $\sim 10^3$ times as great compared with the radiation-chemical yield of the same products at 20°C. By combining the radiation effect with temperature it is possible to obtain products which offer industrial interest at levels of yield which would be acceptable in practice. Possible sources of radiation for radiation-heat cracking are considered. [Abstracter's note: Complete translation.]

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S/204/61/001/005/008/008
E075/E484

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11.1210

AUTHORS: Polak, L.S., Chernyak, N.Ya., Shakhray, V.A., Shcherbakova, A.S.

TITLE: γ-radiolysis of n-hexane in the presence of small admixtures of benzene

PERIODICAL: Neftekhimiya, v.1, no.5, 1961, 695-699

TEXT: The authors investigated the composition of the main products of radiolysis of hexane in the liquid phase at 20°C in the presence of small additions of benzene. Great care was taken to purify the hexane before radiolysis. It was washed with oleum, alkaline solution and water, dried with $CaCl_2$, passed through silica gel and distilled. Benzene used was of cryoscopic grade and thiophane free. Solutions of benzene in hexane (10^{-4} to 10^{-1} mole/litre) were placed in special ampules. Before sealing, air was removed from the solutions by repeated freezing to -196°C and melting in high vacuum (5×10^{-3} mm Hg). After sealing, all ampules were irradiated simultaneously with γ-rays for 80 h using Co^{60}. Radiation dosage was 4×10^{15} eV/sec cm^3. It is shown that yields of products resulting from the rupture of C - H bonds,

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i.e. H_2, C_6H_{12}, $C_8H_{18} - C_{12}H_{26}$ and C_2-C_4 fractions, begin to decrease for the solutions containing 10^{-4} mole/litre of benzene. Practically no further changes in the yields occur for benzene concentrations of about 10^{-3} mole/litre and upwards. Thus the solutions become "saturated" with the radiation inhibitor, the maximum decrease in the yields of hydrogen being about 20%. The yields of heavy radiolysis products and hexane are also decreased by about 20% irrespective of the chemical mechanism in which they were formed. The constancy of composition of the heavy residue was checked by mass spectroscopy. For the products forming when C-C bonds are ruptured, i.e. $C_2 - C_4$ fractions, the yields are lowered only by 14%. In this case benzene shows less inhibiting action. Since the percentage of various fractions is approximately the same for all $C_2 - C_4$ fractions, it is inferred that the inhibition affects equally odd and even carbon numbered hydrocarbons. The authors explain the fact that the inhibiting action does not depend on differences in chemical mechanisms of product formation, by postulating that the inhibitor accepts at least a part of excitation energy from molecules, radicals or ions

directly from excited electronic levels before the energy is transmitted to vibrational levels, which establishes conditions for chemical reactions. Further process of decomposition of excited species does not depend on the presence of small amounts of inhibitors. Consequently the composition of stable radiolysis products h a r d l y c h anges. Acknowledgments are expressed to N.M.Rytova for her assistance. There are 2 figures, 2 tables and 12 references: 5 Soviet-bloc and 7 non-Soviet-bloc. The four most recent references to English language publications read as follows: Ref.4: F.H.Krenz. Nature, v.176, 1955, 1113; Ref.5: M. Burton, S. Lipsky, M.P.Reddy. J. Chem. Phys., v.26, 1957, 1337; Ref.6: G. Freeman. J. Chem. Phys., v.33, 1960, 71; Ref.7: D.R.Kalkwarf. Nucleonics, v.18, no.5, 1960, 76.

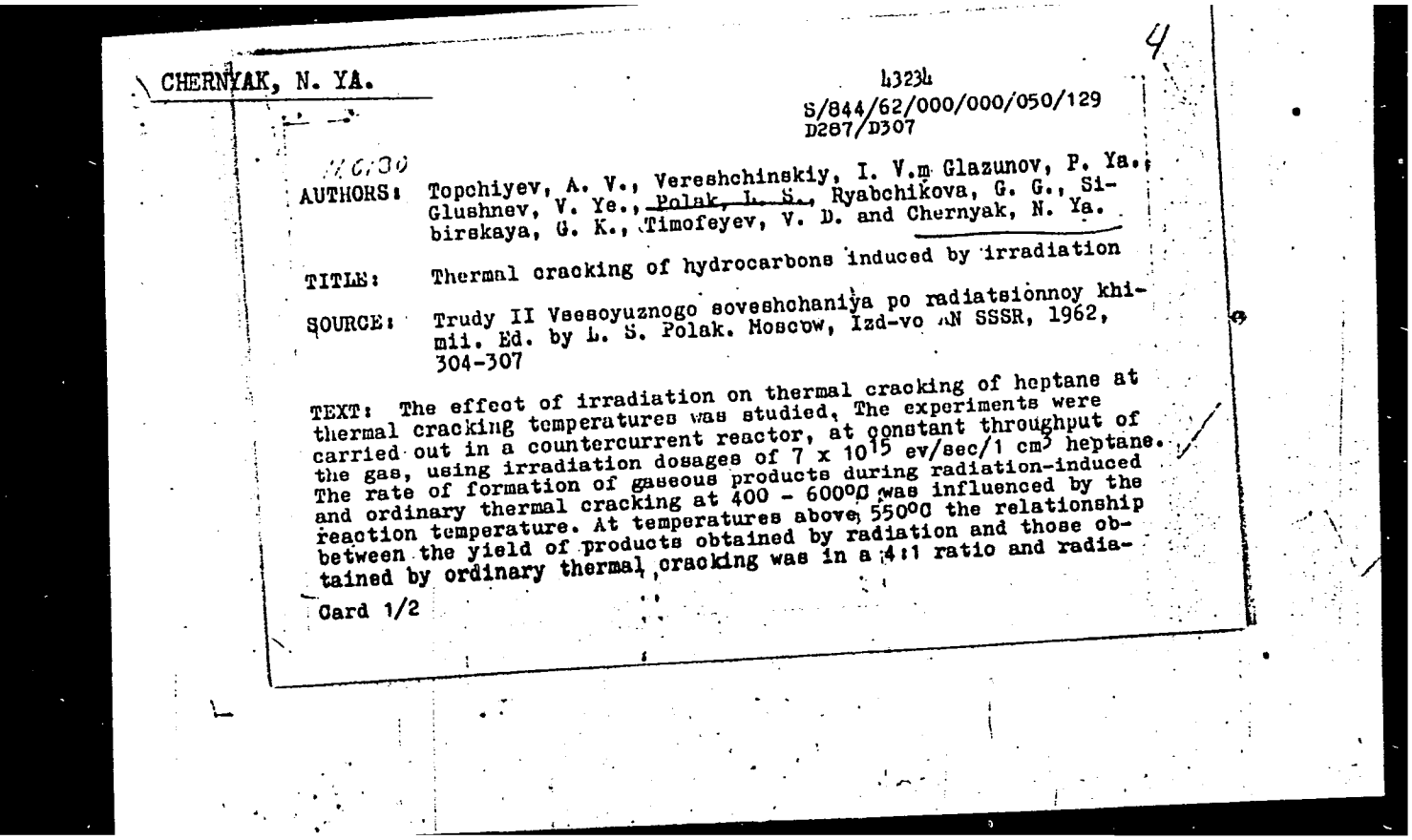
ASSOCIATION: Institut neftekhimicheskogo sinteza AN SSSR
(Institute of Petrochemical Synthesis AS USSR)

SUBMITTED: September 5, 1961

POLAK, L.S.; KHMEL'NITSKIY, R.A.; CHERNYAK, N.Ya.

Mass spectra of some dodecane isomers. Neftekhimia 2 no.1:9-13 Ja-F '62. (MIRA 15:5)

1. Institut neftekhimicheskogo sinteza AN SSSR.
(Dodecane—Spectra)



CHERNYAK, N. YA.

4

14234
S/844/62/000/000/050/129
D287/D307

AUTHORS: Topchiyev, A. V., Vereshchinskiy, I. V., Glazunov, P. Ya., Glushnev, V. Ye., Polak, L. S., Ryabchikova, G. G., Sibirskaya, G. K., Timofeyev, V. D. and Chernyak, N. Ya.

TITLE: Thermal cracking of hydrocarbons induced by irradiation

SOURCE: Trudy II Vsesoyuznogo soveshchaniya po radiatsionnoy khimii. Ed. by L. S. Polak. Moscow, Izd-vo AN SSSR, 1962, 304-307

TEXT: The effect of irradiation on thermal cracking of heptane at thermal cracking temperatures was studied. The experiments were carried out in a countercurrent reactor, at constant throughput of the gas, using irradiation dosages of 7×10^{15} ev/sec/1 cm^3 heptane. The rate of formation of gaseous products during radiation-induced and ordinary thermal cracking at 400 - 600°C was influenced by the reaction temperature. At temperatures above 550°C the relationship between the yield of products obtained by radiation and those obtained by ordinary thermal cracking was in a 4:1 ratio and radia-

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Thermal cracking of ...

tion-induced processes could therefore be carried out at much lower temperatures (150 - 220°C) than ordinary thermal cracking processes (550 - 600°C). Activation energy requirements also compared favorably (21 kcal/mole as against ~60 kcal/mole for thermal cracking). The yield of gaseous and liquid unsaturated compounds increased sharply with temperature and reached ~15,000 mol/100 ev at ~600°C. At temperatures ~600°C the radiation yield became lower. The yield of unsaturated compounds increased sharply with temperature and reached 80% (as against 50 - 55% during ordinary thermal cracking). Optimum conditions for the above process were high dosage irradiation and short contact times. There are 3 figures.

ASSOCIATION: Institut neftekhimicheskogo sinteza, AN SSSR (Institute of Petrochemical Synthesis, AS USSR); Institut fizicheskoy khimii, AN SSSR (Institute of Physical Chemistry, AS USSR)

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D'YAKOVA, T.V.; PETROV, Al.A.; POLAK, L.S.; CHERNYAK, N.Ya.

Mass spectra of isomeric tetradecanes. Neftekhimiia 3 no.2: 169-172 Mr-Ap '63. (MIRA 16:5)

1. Institut neftekhimicheskogo sinteza AN SSSR imeni A.V.Topchiyeva.
(Tetradecane--Spectra)

BOGYAYETS,O.T. [Bohaiets', O.T.]; CHERNYAK, N.Yu.

Paleogeography of the Sivash Valley, northwestern region of the Sea of Azov and adjacent areas in the Lower Cretaceous epoch. Geol. zhur. 23 no.5:85-91 '63. (MIRA 16:12)

1. Ukrainskiy nauchno-issledovatel'skiy gornorudnyy institut.

MANSUROV, Aleksandr Matveyevich; KUNITSA, S.S., inzh., retsenzent; REBEL'SKIY, A.V., kand.tekhn.nauk, red.; CHERNYAK, O.V., red.izd-va; POPOVA, S.N., tekhn.red.; GORDEYEVA, L.P., tekhn. red.

[Drop forging operations] Tekhnologiia goriachei shtampovki. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1960. 324 p. (MIRA 13:5)

(Forging)

TITOV, Nikolay Dmitriyevich; SANKOV, I.I., inzh., retsenzent; CHERNYAK, O.V., inzh., red.; TIKHANOV, A.Ya., tekhn.red.

[Continuous flow system for the mass production of castings] Potochno-massovoe proizvodstvo otlivok. Moskva, Gos.nauchno-tekhn. izd-vo mashinostroit.lit-ry, 1960. 527 p. (MIRA 13:10)
(Founding) (Assembly-line methods)

NESVIZHSKIY, Oskar Abramovich, kand.tekhn.nauk; KHRUSHCHOV, M.M., prof., doktor tekhn.nauk, retsenzent; CHERNYAK, O.V., inzh., red.; DOBRITSYNA, R.I., tekhn.red.

[Manufacture of balls for ball mills] Proizvodstvo meliushchikh tel dlia sharovykh mel'nits. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1961. 151 p. (MIRA 14:6)
(Crushing machinery)

SILIN, Lev Leonidovich; BALANDIN, Gennadiy Fedorovich; KOGAN, Moisey Grigor'yevich; KHRENOV, K.K., retsenzent; OSHCHEPKOV, P.K., doktor tekhn.nauk, retsenzent; RYKALIN, N.N., red.; CHERNYAK, O.V., red.; MODEL', B.I., tekhn.red.

[Ultrasonic welding; joining metals in the solid state and improving the quality of weld joints] Ul'trazvukovaia svarka; soedinenie metallov v tverdom sostoianii i uluchshenie kachestva svarnykh shvov. Pod red. N.N.Rykalina. Moskva, Mashgiz, 1962. 251 p. (MIRA 15:4)
(Ultrasonic welding)

BALANDIN, Gennadiy Fedorovich; KOTSYUBINSKIY, O.Yu., kand. tekhn. nauk, retsenzent; CHERNYAK, O.V., inzh., red.; CHERNOVA, Z.I., tekhn. red.

[Chill casting] Lit'e namorazhivaniem. Moskva, Mashgiz, 1962. 261 p. (MIRA 15:3)
(Founding)

RYZHIKOV, Anton Abramovich, doktor tekhn. nauk, prof.; VASIL'YEVSKIY, P.F., kand. tekhn. nauk, retsenzent; CHERNYAK, O.V., inzh., red.; RAGAZINA, M.F., inzh., red.; EL'KIND, V.D., tekhn. red.

[Technological principles of foundry practice] Tekhnologicheskie osnovy liteinogo proizvodstva. Moskva, Mashgiz, 1962. 527 p. (MIRA 15:3)

(Founding)

KLOCHNEV, Nikolay Ivanovich, kand. tekhn. nauk; Prinimal uchastiye TSYPIN, I.O., kand. tekhn. nauk; VASHCHENKO, K.I., doktor tekhn. nauk, prof., retsenzent; CHERNYAK, O.V., inzh., red. SMIRNOVA, G.V., tekhn. red.

[Technology of casting high-strength iron with spheroidal graphite] Tekhnologiia proizvodstva otlivok iz vysokoprochnogo chuguna s sharovidnym grafitom. Moskva, Mashgiz, 1962. 170 p. (MIRA 15:6)

(Iron founding)

AKSENOV, P.N., doktor tekhn.nauk, prof.; PRONOV, A.P., kand. tekhn. nauk, retsenzent; CHERNYAK, O.V., inzh., red.; UVAROVA, A.F., tekhn. red.

[Mold making] Formovochnoe proizvodstvo. Izd.4. Moskva, Mashgiz, 1963. 287 p. (MIRA 16:7)
(Molding (Founding))

VALISOVSKIY, I.V., kand. tekhn. nauk; MEDVEDEV, Ya.I., kand. tekhn. nauk; TKACHENKO, K.M., kand. tekhn. nauk, retsenzent; CHERNYAK, O.V., inzh., red.; MAKAROVA, L.A., tekhn. red.

[Technological testing of molding materials] Tekhnologicheskie ispytaniia formovochnykh materialov. Moskva, Mashgiz, 1963. 222 p. (MIRA 16:7)

(Sand, Foundry—Testing)

LEVI, L.I., doktor tekhn. nauk; KUNIN, L.L., kand. khim. nauk, retsenzent; CHERNYAK, O.V., inzh., red.; UVAROVA, A.F., tekhn. red.; DEMKINA, N.F., tekhn. red.

[Nitrogen in cast iron for castings] Azot v chugune dlia otlivok. Moskva, Izd-vo "Mashinostroenie," 1964. 229 p. (MIRA 17:4)

ORLOV, N.D.; OSOKIN, N.Ye., kand. tekhn.nauk, retsenzent;
CHERNYAK, O.V., inzh., red.

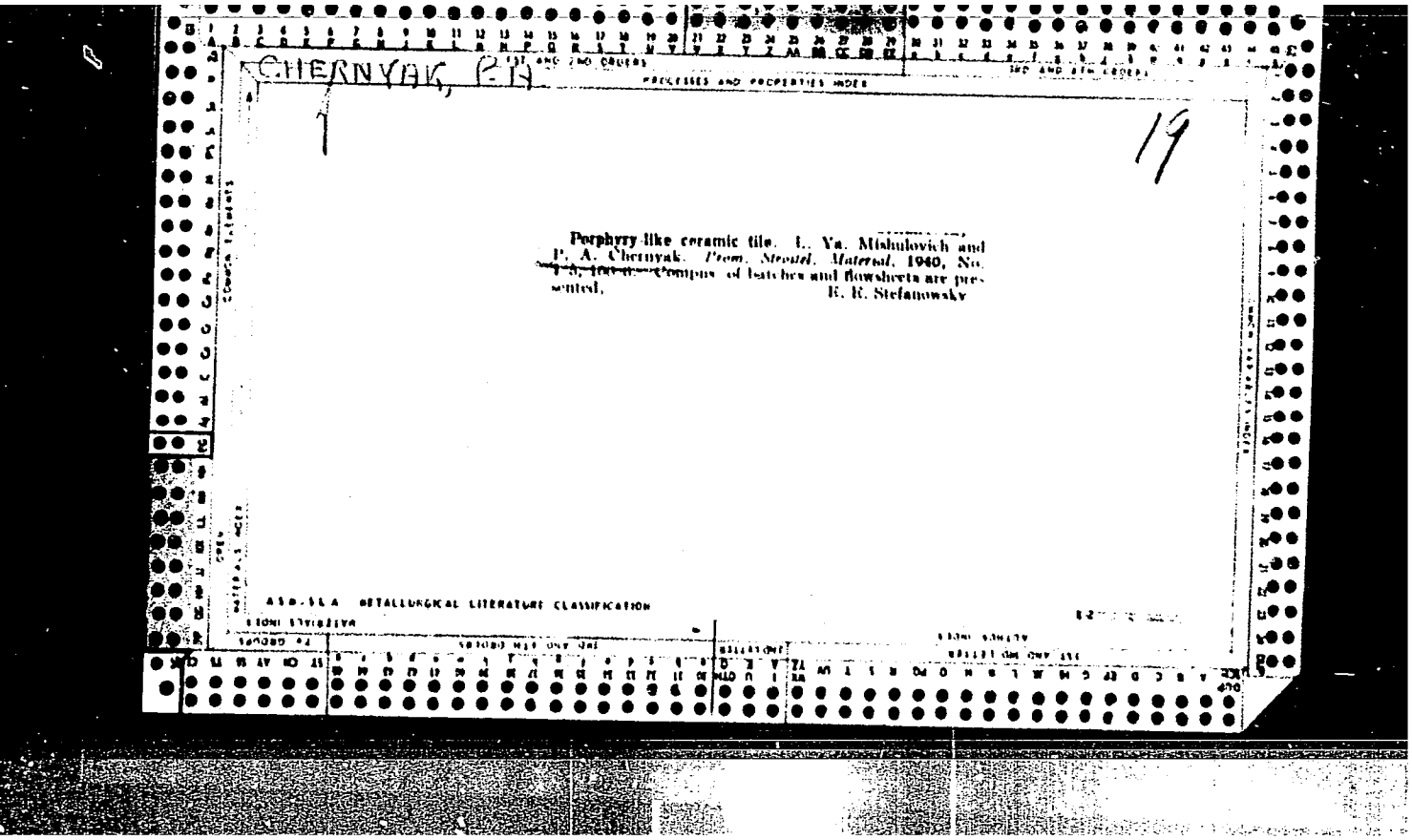
[Short course in foundry practice] Kratkii kurs liteinogo proizvodstva. Moskva, Mashinostroenie, 1964. 220 p.
(MIRA 18:2)

CHERNYAK, P.A.

BABAK,N.; CHERNYAK,P., glavnyy inzhener

Burning glazed clay pipes in rotary kilns. Stroi.mat., izdel. i konstr. 1 no.4:33-34 Ap'55. (MLRA 8:10)

1. Direktor Khar'kovskogo zavodoupravleniya stroymaterialov (for Babak). 2. Glavkeramika Ministerstva promyshlennosti stroitel' nykh materialov USSR (for Chernyak)
(Pipe, Clay)



AUTHORS: Chernyak, P. A., Vorob'yeva, Yu. I. SOV/72-58-7-14/19

TITLE: The Saggerless Burning of Faience Products for Sanitary-Technical Installations in Furnaces With Periodical Operation (Beskapsel'nyy obzhig sanitarno--tekhnicheskikh fayansovykh izdeliy v pechakh periodicheskogo deystviya)

PERIODICAL: Steklo i keramika, 1958, Nr 7, pp. 43-44 (USSR)

ABSTRACT: During the years 1952 - 1955 the burning cycle (Fig 1) in the Slavutskiy works was reduced by increasing the temperatures, thus the duration of burning being reduced to 21 hours. The use of saggers was, however, a bottleneck, since the furnace volume could not be exploited by more than 0,6 - 0,65 in the case of burning with saggers. The collective of the works introduced the saggerless burning in the years 1957 - 1958, fire clay plates and struts were used in this case instead of saggers (Fig 2). Cell niches were formed in the furnace chamber by these plates and struts. The dimensions of these niches were adjusted to those of the products (Fig 3). By this method of burning the duration of burning was

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reduced to 17 hours, and the furnace volume increased by 30%. This was achieved by the intensivation of the temperature rise (Fig 4). The output per hand was increased by 25%, the prime cost of the products was reduced by 12%. The fire-clay consumption was reduced by the fivefold, and the number of the workers occupied in this sector was reduced as well. The important technical and economic characteristic factors of the plant are given in a table. The collective of the works is working out a further perfection of the technology of saggerless burning, and the solution of other problems. There are 4 figures and 1 table.

ASSOCIATION: Slavutskiy zavod "Stroyfayans" (Slavutskiy works "Stroyfayans")

1. Ceramic materials--Processing 2. Furnaces--Performance
3. Furnaces--Equipment 4. Industrial production--Costs

CHERNYAK, P. K.

"Association of Theory and Practice in the Physics Course of Secondary Schools." Cand Ped Sci, Kiev State Pedagogical Inst, Kiev, 1954. (RZhFiz, Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (12)
SO: Sum. No. 556, 24 Jun 55

CHERNYAK, P.K.; RACHEK, I.M. (Kiyev)

Teaching the topic "Alternating current." Fiz. v shkole 14 no.6:50-59 N-D '54. (MLRA 7:12)
(Electric currents, Alternating)

USSR/Medicine - Collodion Dec 1947
Medicine - Membrane

"A New Collodion," P. O. Chernyak, ½ p

"Fel'dsher i Akusherka" No 12

Presents formula for new-type collodion for wounds. Collodion elastic and water-resistant, and solves many problems of the old-type collodions. Formula: Rp. Zinci oxydati 1.0 + Ol. Ribini gtt. V + Ol. Vaselini gtt. III + Misce add. in vitro + cum collodio 20.0 + DS. glue for bonding.

IC 50T68

CHERNYAK, P.O.

"Aseptic Surgical Elastic Band" Khirurgiya, No. 8, 1949. Doc.

[redacted], K.I. Cand. Biolog. Sci.

Dissertation: "The Effect of a Synestrol Injection on the Early Stages of Gonad Differentiation in Orf." Moscow State Pedagogical Inst imeni V. I. Lenin, 23 Jun 47.

SO: Vechernyaya Moskva, Jun, 1947 (Project #17836)

COUNTRY : USSR
CATEGORY : Human and Animal Physiology, Sensory Organs

ABS. JOUR. : RZhBiol., No. 5 1959, No. 22573

AUTHOR : Chernyak, R.
INST. : Academy of Sciences, USSR
TITLE : The Effect of Phenamine on the Activity of the Auditory Analyzer During its Adaptation to Various Acoustic Conditions.

ORIG. PUB. : V sb.: Vospriyatie zvukovykh signalov v razlichn. akust. usloviyakh. M., AN SSSR, 1956, 40--48

ABSTRACT : After the mean auditory thresholds were determined among a group of men in relative silence, they received phenamine. Then auditory threshold was again determined in the presence of a 120 db noise of a wide frequency-range for 60 minutes, and after the noise had ceased (every minute for the first 5 minutes). Auditory thresholds in the presence of the noise did not change after the phenamine was taken. In 3 individuals the elevation of thresholds following the noise was significantly less than in control experiments (the threshold shift decreased by 4 to 13 decibels).

Card: 1/3

COUNTRY : USSR
CATEGORY : T

ABS. JOUR. : RZhBiol., No. 5 1959, No. 22573

AUTHOR :
INST. :
TITLE :

ORIG. PUB. :

ABSTRACT : These data indicate facilitation of the process of adaptation of the auditory analyzer to a sudden change in the conditions of the acoustic medium. Among the remaining 3, the decrease in the threshold shift was noted only for perception of a 200-cycle tone; for tones of 800 and 2000 cycles, the response differed: changes were absent in one subject, there was a decrease in the shift in thresholds in the second, and an increase in the third. For a tone of 4500 cycles an increase in the threshold shift in comparison with the control

Card: 2/3

T-116

COUNTRY : USSR
CATEGORY :

T

ABS. JOUR. : RZhBiol., No. 5 1959, No. 22573

AUTHOR :
INST. :
TITLE :

ORIG. PUB. :

ABSTRACT :

was noted, apparently because of the development of inhibition. It seems that there is a stronger influence of the typological features of the individual on the perception of high-frequency tones.--M.A.Parkhomovskiy

Card: 3/3

Chernyak, R.I.

CHERNYAK, R.I.

Changes in auditory adaptation to silence as related to the duration of the preceding action of a loud noise [with summary in English]. Biofizika 3 no.1:75-86 '58. (MIRA 11:2)

1. Institut biologicheskoy fiziki AN SSSR, Moskva.
(HEARING)

24(1)

SOV/112-58-3-5093

Translation from: Referativnyy zhurnal. Elektrotekhnika, 1958, Nr 3, p 247 (USSR)

AUTHOR: Chernyak, R. I., Tumarkina, L. N., and Rozen, O. M.

TITLE: Investigation of Audibility-Threshold Variation Caused by Varying the Duration of Application of a Strong Acoustic Irritant
(Issledovaniye izmenchivosti porogov slyshimosti cheloveka v svyazi s razlichnoy dlitel'nost'yu deystviya sil'nogo razdrazhitelya)

PERIODICAL: V sb.: Vospriyatiye zvukovykh signalov v razlichn. akust. usloviyakh. M., AS USSR, 1956, pp 92-101

ABSTRACT: Audibility thresholds of 10 persons within 100-7,000-cps band during and after the application of a 120-db white noise were measured. It was found that in both cases (neglecting the period of sensitivity recovery) the spread of the thresholds measured at an interval of 1 min did not exceed 6 db, and was independent of the noise application duration or of the threshold absolute value. Bibliography: 6 items.

A.V.R.

Card 1/1

Country :USSR
Category :Human and Animal Physiology, Sensory Organs T

Abs. Jour. :Ref Zhur Biol, No. 2, 1959, No. 5834

Author :Chernyak R.I., Tumarkina L., Rozen O.
Institut. :45 USSR
Title :An Examination of the Variability in Human Auditory Thresholds with a Strong Sound Stimulus of Varying Duration.

Orig. Pub. :V sb.: Vospriyatiye svukovykh signalov v razlich. akust. usloviyakh. M., AN SSSR, 1956, 92--101

Abstract : The experiments (110) were performed on 10 healthy subjects between 20 and 25 years of age. By determining several times a minute the auditory threshold (in the 100--7000 cycle range), the differences between extreme values of threshold were established. The determination was performed before and 4--6 times during production of a wide-field noise of 120 decibels. In a second series of experiments thresholds were determined for the five-minute period immediately following cessation of the noise, which lasted from 10 to 60 minutes. In the

Card: 1/2

Country :USSR
Category :Human and Animal Physiology, Sensory Organs T

Abs. Jour. :Ref Zhur Biol, No. 2, 1959, No. 5834

Author :
Institut. :
Title :

Orig Pub. :

Abstract :presence of the noise the spread of the thresholds did not exceed 6 decibels, did not depend upon the duration of the noise nor on the absolute value of the threshold. For 5 minutes after cessation of the noise (regardless of its duration) the thresholds were restored; the value of the spread remained unchanged.

Card: 2/2

Country :USSR
Category= :Human and Animal Physiology, Sensory Organs T

Abs. Jour. :Ref Zhur Biol, No. 2, 1959, No. 8531

Author :Chernyak,R.I.
Institut. :--
Title :Changes in the Adaptation of Hearing to Silence in Relation to the Duration of a Preceding Loud Noise.
Orig. Pub. :Biofizika, 1958, 3, No. 1, 75--86

Abstract :no abstract

Card: 1/1

BABKIN, V.P.; ROZEN, O.M.; TUMARKINA, L.N.; CHERNYAK, R.I.

Study of vibration sensitivity and factors affecting it. Biofizika 6 no. 1:61-67 '61. (MIRA 14:2)

1. Akusticheskiy institut AN SSSR, Moskva.
(VIBRATION—PHYSIOLOGICAL EFFECT)

BABKIN, V.P.; ROZEN, O.M.; TUMARKINA, L.N.; CHERNYAK, R.I.

Study of the mechanism of vibration frequency discrimination using models of the cochlea and the cutaneous receptor. Biofizika 6 no. 2:191-197 '61. (MIRA 14:4)

1. Akusticheskiy institut AN SSSR, Moskva.
(HEARING)

TARUSOV, Vladimir Leonidovich; CHERNYAK, R.I., red.; POPOV, V.N., tekhn. red.

[Our experience with visual propaganda]Nash opyt nagliadnoi agitatsii]Nash opyt nagliadnoi agitatsii. Tambov, Tambovskoe knizhnoe izd-vo, 1961. 27 p. (MIRA 16:3)

1. Sekretar' Muchkapskogo rayonnogo komiteta Kommunisticheskoy partii Sovetskogo Soyuza (for Tarusov).
(Muchkap District--Agriculture--Audio-visual aids)

ZADOKHIN, Vladimir Fedorovich; CHERNYAK, R.I., red.; POPOV, V.N., tekhn. red.

[Let the ground burn under their feed]Pust' u nikh pod nogami gorit zemlia. Tambov, Tambovskoe knizhnoe izd-vo, 1961. 29 p. (MIRA 16:3)

(Labor discipline)

DUBROVSKIY, Ivan Ivanovich; CHERNYAK, R.I., red.; POPOV, V.N., tekhn. red.

Mariia Dmitrievna Trunova. Tambov, Tambovskoe knizhnoe izd-vo, 1960. 28 p. (MIRA 16:3)
(Trunova, Mariia Dmitrievna)
(Permomaiskiy District (Tambov Province))--Stock and stockbreeding)

55

24155
S/032/61/027/005/001/017
B119/B215

AUTHOR: Chernyak, R. S.

TITLE: Determination of sodium in aluminum alloys by means of a sodium glass electrode

PERIODICAL: Zavodskaya laboratoriya, v. 27, no. 5, 1961, 536-537

TEXT: A new method is described for the determination of Na in Al alloys, which is faster than the traditional method of uranyl acetate. It is based upon the measurement of the potential of a concentration chain which consists of an analytical solution containing sodium and a control solution of known concentration, likewise containing Na. The potential in this case depends, not on the absolute concentrations of the solutions, but on the concentration ratio between the two solutions. Glass electrode: A glass tube (glass composition: 25% Na_2O, 9% B_2O_3, 5% Al_2O_3, 61% SiO_2) ending in a small ball was filled with 0.1 N of NaCl into which a silver chloride electrode was dipped. A calomel electrode in a U-shaped vessel with a tap at its bottom served as reference. The contact between the two electrodes was due to a thin liquid layer on the tap. Furthermore, a valve amplifier with a

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Determination of sodium ...

6Ж-1ж (6Zh-1-zh) valve was used. After a calibration curve had been plotted, the Na content of the Al alloys nos. 2 and 3 (containing 0.0138 and 0.0166% of Na, respectively) was determined as follows: An exactly weighed amount of the finely powdered alloy in a quartz container was treated with small amounts of 0.3 to 0.5% $HgCl_2$ solution. Thus, aluminum was quickly converted into aluminum oxide. Sodium was separated from this solution by electrolysis or leaching out by water, and then determined in the solution. This method was checked by a parallel determination of sodium in the samples by the method of uranyl acetate and or by that of E. Scherer (Ref.7. Metallkunde, 25, 157, 239 (1933); 27, 83 (1935)). The accuracy of the method is sufficient for practical applications. There are 2 figures, 1 table, and 7 references: 5 Soviet-bloc and 2 non-Soviet-bloc.

ASSOCIATION: Moskovskiy aviatsionnyy tekhnologicheskiy institut
(Moscow Aviation Technologic Institute)

Card 2/2

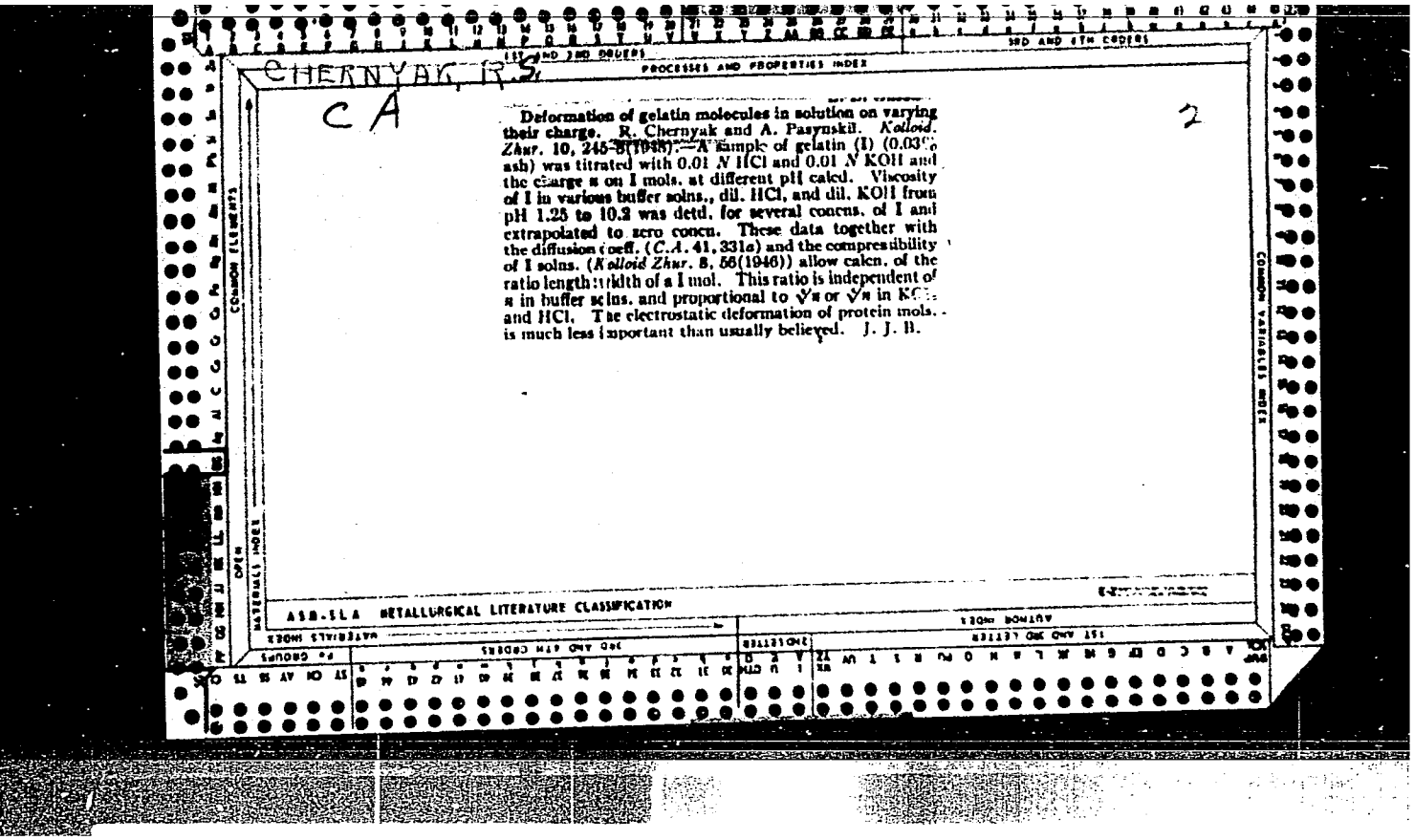
USSR/Chemistry - Gelatin May/Jun 1948
Chemistry - Deformation

"The Deformation of Molecules of Gelatin in Solution During Changes in Their Charge," R. Chernyak, A. Pasynskiy, Lab of Structure of Albumins, Inst of Biochem, Acad Sci USSR, Moscow, 3 pp

"Kolloid Zhur" Vol X, No 3

Experimental studies of the relationship between the discharge and configuration of the gelatin molecule in buffer and nonbuffer solutions. Submitted 13 May 1947.

[redacted] 78T10



CHERNYAK, R.S.

CA

2

Deformation of gelatin molecules in solution on varying their charge. R. Chernyak and A. Pasynskii. *Kolloid. Zhur.* 10, 245-8(1948).—A sample of gelatin (I) (0.03% ash) was titrated with 0.01 *N* HCl and 0.01 *N* KOH and the charge *z* on I mols. at different pH calcd. Viscosity of I in various buffer solns., dil. HCl, and dil. KOH from pH 1.25 to 10.2 was detd. for several concns. of I and extrapolated to zero concn. These data together with the diffusion coeff. (*C.A.* 41, 331a) and the compressibility of I solns. (*Kolloid Zhur.* 8, 56(1946)) allow calcn. of the ratio length:width of a I mol. This ratio is independent of *z* in buffer solns. and proportional to $\sqrt{z}$ or $\sqrt{z}$ in KOH and HCl. The electrostatic deformation of protein mols. is much less important than usually believed. J. J. B.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

CHERNYAK R.S. AND PAGYNSKII A.G.

3929. Chernyak R'S. and Pagynskii A.G. Sorption of molecules of nonelectrolytes by proteins Doklady Akad. Nauk. S.S.S.R. 2[illegible]3, ([illegible])

The technique of equilibrium dialysis through collodion membrane was used to study the sorption of urea, guanidine nitrate, urethan, and H_2O on human serum albumin, γ-globulin and hair and wool keratins, at 3-4°. The equation suggested for nonelectrolyte sorption by Vilenskii and Pavlova (Coll. F. USSR. 1940, 6, 67; Chem. Abstr. 1941, 35, 742[9]) was used in calculations of true nonelectrolyte sorption. The results, given graphically, had the form of typical Langmuir isotherms with a clear zone of saturation which gave the values of maximum adsorption. The extent of hydration was: 0.11-0.09 for keratins, 0.5-0.65 for globulin, and 0.78 g./g. for albumin. Urea reaches, resp.; 0.08, 0.43, and 0.36; guanidine nitrate:-, 0.11 -0.27, and 0.13; urethan; 0.08, 0.28, and about 0.3. Calculation on molar basis shows sorption of 1 urea unit per 2 amino-acid residues, while other nonelectrolytes give a 1 : 3-4 ratio for soluble proteins and 1 : 8 -10 for insoluble ones.
Kosolapoff - (Chemical Abstracts)

SO. Excerpta Medica Section II Volume 4 Number 8

CHERNYAK, R. S. Acad Chemical Sci

"Reaction of Albumins With Denaturized Organic Substances." Sub 24 Dec 51, Order of Labor Red Banner Sci Res Physicochemical Inst imeni L. Ya. Karpov.

Dissertations presented for science and engineering degrees in Moscow during 1951.

SO: Sum. No. 480, 9 May 55

CHERNYAK, K.S.

USSR.

Change in the form of protein molecules in solutions of urea. A. G. Pasynskii and R. S. Chernyak. *Doklady Akad. Nauk S.S.S.R.* 79, 1001–4(1951).—The purpose of the investigation was to det. the proper value of n, the solvation correction factor, in the equation $(1 + \Delta s/s)^n$, which is used to compute the relative change in the vol. of globulin. For mols. having a loose structure, $n = 1$; for a spherical structure, $n = 1/2$; and, for the non-flowing ellipsoid form, $n = 1/3$. Data on the urea denaturation of serum albumin, egg albumin, horse serum globulin, and gelatin are presented as are data on the solvation correction and the "true" increase in asymmetry. Accuracy of the measurements is ±15%. Elongation of albumin during denaturation includes the effect of solvation. For globulins, the apparent effects of elongation are detd. by the solvation force of urea. For gelatin with high natural asymmetry, the solvation force of urea is very small. Actual elongation of serum albumin (after deduction of the solvation correction) even in comparatively concd. urea solns. is about 2.0 Serum globulin is very little changed at the same concn. These data indicate the high degree of stability of the protein globule even in strong denaturants. One can also expect comparatively small protein deformations during the usual physiol. conditions. This conclusion fully corresponds to the new x-ray data on structural analysis on the constancy of the sedimentation const. in the limits of the zone of stability. This stability of configuration is probably the basis of the stability of their biol. specificity. It is possible that the greater stability of the globulin configuration is tied up with the special role of this protein in the formation

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of antibodies during immune reactions where it is required. With gelatin, a fibrous protein, a double elongation was observed in *M* urea which is a far lower concn. than for albumins. The rigid parts of the gelatin mols. apparently possess considerably higher flexibility than the tightly curled part in the protein globules. It is concluded that for denaturation, 30–40 breaks of the several hundred H bonds which exist in a mol. of serum globulin with a mol. wt. of 68,000, are sufficient. Although the full unwinding of the mol. of protein during denaturation does not proceed unconditionally, the elongation of the protein mol. in the detn. of the degree of denaturation after the introduction of urea and the breaking of the minimal no. of bonds is greatly facilitated. The rate of the process is calcd. for horse serum albumin and shows clearly the "true" change in asymmetry of the protein mol. (after the solvation correction has been introduced) in varying concns. of urea. Up to 3*M* urea, the elongation is about 20% and, apparently, is not related to the breaking of the basic globulin structure. In greater concns. of urea, the elongation is significantly modified, although it does not attain complete unfolding of the chain. Data are presented which show the intermittent character of the basic denaturation process of the splitting of the structure of the protein mol. W. H. Fitzpatrick

CHERNYAK, R.

USSR/Chemistry - Proteins May/Jun 52

"Change of Form of Molecules of Proteins on Denaturation With Organic Substances," R. Chernyak, A. Pasynskiy, Biochem Inst imeni A. N. Bakh, Acad Sci USSR, Chair of Gen Chem, MATI (Moscow Avn Technol Inst), Moscow

"Kolloid Zhur" Vol XIV, No 3, pp 205-211

Calcn on the assymetry of horse serum albumin and serum globulin, human serum albumin, egg albumin and gelatin were carried out after denaturing the substances in solns of urea, guanidine, etc., and corrected by the magnitude of solvation detd formerly by the authors. Gives various methods for calcg solvation correction. In albumins, the apparent stretching of protein mols is caused to an equal extent by the effect of solvation and by actual stretching in globulin the effect of solvation is greater, and in highly elongated gelatin particles less than in albumins. Actual elongation of mols is as follows, in ascending order: serum globulin, serum and egg; albumin, gelatin.

217T18

217T18

Chemical Abst.
Vol. 48 No. 9
May 10, 1954
General and Physical Chemistry

(3)

Change of shape of protein molecules during denaturation by organic substances. R. S. Chernyak and A. G. Pasynskii (A. N. Bakh Biochem. Inst., Moscow). *Colloid J.* (U.S.S.R.) 14, 220-30(1952)(Engl. translation).—See C.A. 45, 8469b.

H. L. H.

CA

M. M

Oxidation of sulfhydryl groups in the presence of denaturant substances. A. G. Pasynskii and R. S. Chernyak (Acad. Sci., Moscow). *Biokhimiya* 17, 198-212(1952); cf. Anson, *C.A.* 40, 4751[8].—$CO(NH_2)_2$, a protein denaturant, does not affect the oxidation-reduction potential of sulfhydryl compds. The ease of oxidation of SH compds. is not dependent on the oxidation-reduction potential. Concd. solns. of $CO(NH_2)_2$ and analogous substances hasten the oxidation of simple SH compds. by air. H. P.

CHERNYAK, R.Ya., kand.tekhn.nauk; SAL'KOV, Yu.G.; PUSHENKO, A.I.

Universal magnetic drum. Avtom. i pribl no.1:72-74 Ja-Mr '63.
(MIRA 16:3)

1. Institut kibernetiki AN UkrSSR.
(Magnetic memory)

CHERNYAK, R. YA

PHASE I BOOK EXPLOITATION SOV/5421

Rabinovich, Zinoviy L'vovich, Yuriy Vladimirovich Blagoveshchenskiy, Rostislav Yakovlevich Chernyak, Anna Leonidovna Gladysh, Ivan Timofeyevich Parkhomenko, Ivetta Petrovna Okulova, Lidiya Aleksandrovna Mayboroda, and Stanislav Sergeyevich Zabara.

Spetsializirovannaya elektronnaya schetnaya mashina SESM (SESM Specialized Electronic Computing Machine) Kiyev, Izd-vo AN UKrSSR, 1961. 144 p. 5,500 copies printed.

Sponsoring Agency: Akademiya nauk Ukrainskoy SSR. Vychislitel'nyy tsentr.

Resp. Ed.: V.M. Glushkov, Corresponding Member of the Academy of Sciences of the Ukrainian SSR; Ed. of Publishing House: I.V. Kisina; Tech. Ed.: A.M. Lisovets.

PURPOSE: This book is intended for personnel engaged in the design and operation of computing machines and also for specialists in related branches of science who are acquainted with the fundamentals of computing technique and computing mathematics.

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SESM Specialized Electronic Computing Machine SOV/5421

COVERAGE: The book describes the SESM (specialized electronic computing machine), which is intended for the solution of systems of linear algebraic equations and the computation of correlation functions. The authors discuss the methods of linear algebra used in the machine, its operating principles and those of its assemblies, circuits, and components. The authors credit Academician S.A. Lebedev with the fundamental idea and outline for the machine. The book was prepared by a group of staff members of the Computing Center AS UKrSSR under the direction of Z.L. Rabinovich, Candidate of Technical Sciences, who also wrote Sections II, IV, VIII, and IX. Section I was written by Yu.V. Blagoveshchenskiy, Candidate of Physics and Mathematics; Sections III, V, and XI were written by R.Ya. Chernyak, Candidate of Technical Sciences; Sections IV, VIII, and X by I.T. Parkhomenko, Engineer; Sections IV and IX by A.L. Gladysh, Engineer; Section VII by I.P. Okulova, Engineer; and Section VI by L.A. Mayboroda and S.S. Zabara, Engineers. The authors thank L.N. Dashevskiy, Candidate of Technical Sciences, and V.V. Kraynitskiy, S.B. Pogrebinskiy, Ye.Ye. Dedeshko, A.Z. Libman, and K.V. Golovko, Engineers. No personalities are mentioned. There are no references.

Card 2/4

SESM Specialized Electronic Computing Machine SOV/5421

TABLE OF CONTENTS:

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AVAILABLE: Library of Congress

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AC/dwm/gmp
8-2-61

CHERNYAK, R.Ya. [Chernyak, R.IA.]; OKULOVA, I.P.

Control of magnetic recording heads without using electron tube components. Zbir. prats' z obchys. mat. i tekh. 2:96-101 '61. (MIRA 15:2)
(Magnetic memory(Calculating machines))

L 46289-65 EWT(d)/T IJP(c) GS

ACCESSION NR: AT5009054 S/0000/64/001/000/0171/0177

AUTHOR: Rabinovich, Z. L. (Kiev); Chernyak, R. Ya. (Kiev); Zlobina, G. I. (Kiev)

TITLE: Digital correlators of the Com[illegible] AN UkrSSR

SOURCE: Konferentsiya po avtomaticheskomu kontrolyu i metodam elektricheskikh izmereniy. 3d, Novosibirsk, 19[illegible]. Avtom[illegible] izmereniy; trudy konferentsii, t. 1: [illegible] sintez sistem upravleniya i kontrolya. Elementy ustroystv avtomaticheskogo kontrolya (Automatic control and electrical measuring techniques; transactions of the conference, v. 1: Electrical measuring techniques. Analysis and synthesis of regulation and control systems. Elements of automatic control devices). Novosibirsk, Redizdat Sib. otd. AN SSSR, 1964, 171-177

TOPIC TAGS: digital correlator, special purpose computer, correlation function, autocorrelation function

ABSTRACT: The article describes work done on the design of special correlators at the Computation Center of AN UkrSSR, simultaneously with mathematical research on questions of correlational analysis, under the guidance of V. S. [illegible]. Specifically, a special electronic computer (SEVM) is described, intended

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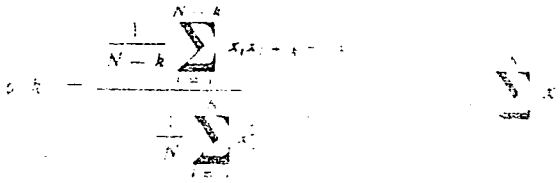
solution of systems of linear algebraic equations and for the calculation of correlation functions, and a computer specially developed for the calculation of correlation functions. Both types of machines calculate autocorrelation functions in the form



and correlation functions in the form

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$$r(k) = \frac{\frac{1}{N-k}\sum_{i=1}^{N-k} x_i y_{i+k} - \bar{x}\bar{y}}{\sqrt{\frac{1}{N}\sum_{i=1}^{N} x_i^2 - \bar{x}^2}\sqrt{\frac{1}{N}\sum_{i=1}^{N} y_i^2 - \bar{y}^2}}; \qquad \bar{x} = \frac{1}{N}\sum_{i=1}^{N} x_i; \qquad \bar{y} = \frac{1}{N}\sum_{i=1}^{N} y_i$$

A block diagram of the SESM is shown in Fig. 1 of the Enclosure. The second variant has already been described in the literature (Avtomatika i priborostroyeniye, No. 4, GNTK SM UkrSSR, 1960). The operation [illegible] computer and its individual units is described. The main characteristics [illegible] as follows: 1. Binary [illegible]. 2. Sequential system. 3. Binary calculation [illegible]. Fixed radix [illegible] - 30 digits, intermediate results - 30 digits [illegible] 4. Operating frequency - 200 kcs. 7. Operating [illegible] addition-multiplication [illegible] per second; time to produce 1000 sums [illegible] time to calculate the correlation coefficient [illegible] time 10 min. 8. Memory drum capacity - [illegible]

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per second. 10. Output rate - 1/number in 0.2 sec. The computer employs a total of 432 miniature lamps and 2500 semiconductor diodes. Orig. art. has: 2 figures and 4 formulas.

ASSOCIATION: None

SUBMITTED: 13Apr64 ENCL: 00 SUB CODE: DP, IE

NR REF SOV: 002 OTHER: 000

Card 4/5

ACC NR: AT6017035 SOURCE CODE: UR/0000/65/000/000/0111/0118

AUTHOR: Chernyak, R. Ya.; Sal'kov, Yu. G.; Zlobina, G. I.

ORG: None

TITLE: Principles of constructing a digital correlator

SOURCE: AN UkrSSR. Kiberneticheskaya tekhnika (Cybernetic techniques). Kiev, Naukova dumka, 1965, 111-118

TOPIC TAGS: digital computer system, data correlation, special purpose computer, computer design, computer program

ABSTRACT: Although general principles have been relatively well established for the construction of the structure of specialized computers with program control, those computers which have a fixed program control require the development of a specific structure for each specific problem. The large variety of solvable problems leads to the creation of many varieties of fixed program control computers which vary in their structure and design. In view of this, in order to create a theory of the construction of such machines, it seems highly desirable to accumulate, analyze, and generalize the principles underlying the construction of specialized machines or computing devices. The present authors present fundamental

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ACC NR: AT6017035

concepts on the construction of a computer for the calculation of the correlation function, i.e., a digital correlator. The question of the efficient separation of computing operations between the correlator and the computer is studied. The criteria in this case were the relative and the absolute work capacities of the computer on the one hand, and the quantity of equipment, and the dimensions and the complexity of the correlator on the other hand. The main characteristics of the digital correlator designed by the authors are given as follows: a binary system; a fixed point, the computed results have a whole and a fraction terms; the number of digits of the initial data fed in is 10, and the results of computation is 30; the operating frequency is 200 cps; the speed of response is 400 multiplications plus 400 additions per second; and the number of triodes is 860. Orig. art. has: 2 figures.

SUB CODE: 09/ SUBM DATE: 28Jul65/ ORIG REF: 000/ OTH REF: 000

ACC NR: AP6035737 SOURCE CODE: UR/0413/66/000/019/0101/0101

INVENTORS: Chernyak, R. Ya.; Kirilyuk, N. I.; Pushenko, A. I.; Oreshkin, Ye. S.; Strel'chenko, A. M.; Sal'kov, Yu. G.

ORG: none

TITLE: An information storage using magnetic cards. Class 42, No. 186762 [announced by Institute of Cybernetics, AN UkrSSR (Institut kibernetiki AN USSR)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 19, 1966, 101

TOPIC TAGS: information storage and retrieval, magnetic recording, storage device

ABSTRACT: This Author Certificate presents an information storage using magnetic cards. The storage unit includes an input keyboard, a vacuum drum for transferring the cards, and a buffer storage device (see Fig. 1). The design increases the

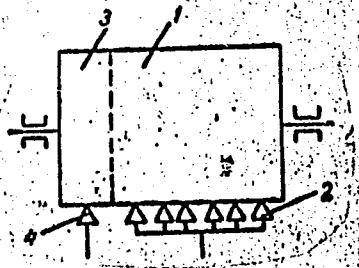

Fig. 1. 1 - vacuum drum; 2 - magnetic heads for recording the readout from the magnetic cards; 3 - surface of the vacuum drum, free from magnetic cards; 4 - magnetic heads of the buffer storage device

UDC: 681.142.07

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ACC NR: AP6035737

reliability and reduces the equipment requirement. The buffer storage device is made on the part of the vacuum drum surface free from magnetic cards. This part of the surface is coated with a nickel-cobalt film. Orig. art. has: 1 figure.

SUB CODE: 09/ SUBM DATE: 07Oct65

Card 2/2

CHERNYAK, S., inzh.

Transportation system of northeastern regions of the Far East and Sakhalin. Rech. transp. 20 no. 1:5-8 Ja '61. (MIRA 14:2)
(Soviet Far East—Shipping)

L 07486-67 EWT(d)/EWT(m)/EWP(l)/EWP(t)/ETI IJP(c) GG/BB/JD

ACC NR: AP6036068 SOURCE CODE: UR/0432/66/000/005/0049/0051

AUTHOR: Chernyak, R. Ya. (Candidate of technical sciences); Pushenko, A. I.; Sal'kov, Yu. G.

ORG: none

TITLE: A dual magnetic head

SOURCE: Mekhanizatsiya i avtomatizatsiya upravleniya, no. 5, 1966, 49-51

TOPIC TAGS: recording equipment, magnetic recording, magnetic drum

ABSTRACT: A new device consisting of magnetic read and write heads connected by a common shift mechanism has been developed. The heads are mounted on a moving carriage which permits independent transverse displacement of each head along the track of the magnetic drum. One revolution of one of the adjusting screws provided for displacement moves the corresponding head 500 μ. Linear displacement is achieved by means of micrometer screws; each revolution of a micrometer screw displaces a head 100 μ. Both heads have the same dimensions; the core material is 79 NM-type Permalloy with width, 2 mm; gap, 60 μ; and diameter, 2.5 mm. Output voltage of the read head is 300 mv at 40 m/sec linear speed of the magnetic carrier and at 350 mamp recording current. Special shielding reduces induced interferences to 4—6 mv, which is approximately 2% of the useful signal. Orig. art. has: 3 figures.

SUB CODE: 14 / SUBM DATE: none/ ATD PRESS: 5104

Card 1/1 UDC: 681.84.083.82

CHERNYAK, S., inzh.; ISAKOV, N., inzh.; GANGARDT, G., inzh.

Pressing problem; importance to the national economy in the building of the Kizi-Tabo Canal. Rech. transp. 22 no.11:14-15 N '63. (MIRA 16:12)

CHERNYAK, S. A.

CHERNIAK, S. A.

LANTSOVA, M. V. and CHERNIAK, S. A. "Phytopathological Work at the River Cnu Regional Station of the Institute for New Bast Fibers During 1932." in Diseases and Pests of New Bast Fiber crops, Library of the Institute of New Bast Fiber Raw Materials, Moscow, 1933, pp. 5-11. 4o4.04 M85

SO: SIRA SI 90-53, 15 December 1953

TSENIN, S.S., kand.ekon.nauk; CHERNYAK, S.A., inzh.

Aspects of inland water transportation discussed at the conference on developing the productive resources of Eastern Siberia. Rech.transp. 17 no.11:23-25 N '58. (MIRA 11:12)
(Siberia, Eastern--Economic policy--Congresses)
(Siberia, Eastern--Inland water transportation)

CHERNYAK, S.A., inzh.

Intensify freight transportation in the Amur Basin. Rech.transp. 18 no.9:3-6 S '59. (MIRA 13:2)
(Amur Valley--Inland water transportation)

CHERNYAK, S.A.

Some observations on Dactylogyrus infestation of carp and the effect of ultrasonics on the causative agent. Uch. zap. Kursk. gos. ped. inst. no.11:25-32 '58. (MIRA 14:1)

1. Kafedra biologii Kurskogo gosudarstvennogo pedagogicheskogo instituta.
(Kursk Province--Trematoda) (Parasites--Carp)
(Ultrasonic waves--Therapeutic use)

CHERNYAK, S.I., kandidat tekhnicheskikh nauk.

Investigating complex pulse forms in currents. Sbor.trud.LONITOVT no.1:46-56 '54. (MLRA 10:5)
(Radio circuits) (Pulse techniques (Electronics))

RUBINSHTEYN, Yakov Moiseyevich [deceased]; STARIK, M.Ye., dotsent, retsenzent; BORODIN, N.I., dotsent, kand.tekhn.nauk, red.; FERSMAN, A.A., dotsent, kand.tekhn.nauk, red.; CHERNYAK, S.I., dotsent, kand.tekhn. nauk, red.; DENISOV, K.N., red.izd-va; DROZHZHINA, L.P., tekhn.red.

[Radio wave propagation and antenna feeding devices] Rasprostranenie radiovoln i antenno-fidernye ustroistva. Leningrad, Izd-vo "Morskoi transport," 1960. 387 p. (MIRA 13:7)
(Radio waves) (Antennas (Electronics))

CHERNYAK, S.M. 540b

AUTHORS: Rapoport, B.M., Milovidova, N.V. and Chernyak, S.M. (V.N.I.I. NP).

TITLE: On group-chemical composition of kerosene-gas oil fractions. (O gruppovom khimicheskom sostave kerosino-gazoylevykh fraktsiy).

PERIODICAL: "Khimiya i Tekhnologiya Topliva i Masel" (Chemistry and Technology of Fuels and Lubricants), 1957, No.2, pp. 3-11 (U.S.S.R.)

ABSTRACT: A method of determining group-chemical composition of kerosene-gas oil fractions using chromatographic separation is proposed. The analytical scheme is as follows:- 1) the determination of bromine number in the starting product by bromide-bromate electrometric titration method: 2) Separation of the product (4-5 g) on a small silica gel column (0.5 m) into the following groups: methane-naphthenes, aromatic (mono-, bi- and tri-cyclic) and resins: 3) The determination of bromine number in the methane naphthene group in order to obtain the proportion of unsaturated hydrocarbons of aliphatic and cyclic series: 4) Determination of the bromine number of aromatic hydrocarbons in order to obtain quantitatively the content of aromatic hydrocarbons with an unsaturated side chain. The method was demonstrated on three fractions of hydrogenated oils of

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On group-chemical composition of kerosene-gas oil fractions. (Cont.)

petroleum oil origin, containing from 25 to 38% of unsaturated compounds and boiling at 200 to 250°, 250 to 300° and 300 to 320° C respectively. Using alkaline permanganate oxidation at room temperature, the presence of alkene radicals in side chains of aromatic mono- and bi-cyclic hydrocarbons was established. The following acids were isolated from the oxidation products: formic, acetic, phthalic and naphthalene bicarbonic acids. Experimental results are given in tables. There are 11 references including 10 Russian. 10 tables.

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RAPOPORT, B.M. [deceased]; KHEYFETS, Ye.M.; LENTSNER, E.S.; CHERNYAK, S.M.; RAPOPORT, I.B.

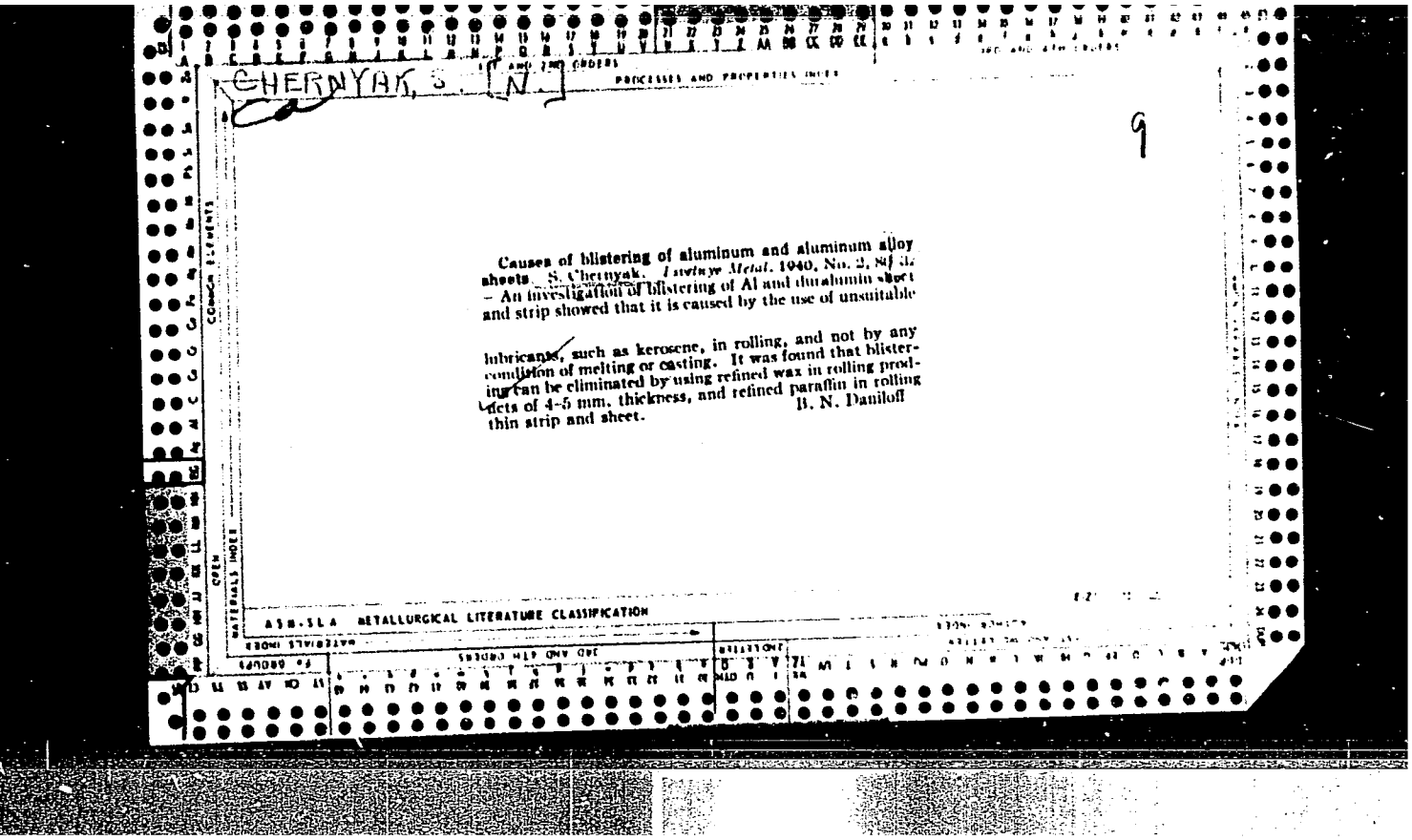
Separating oxygen-containing compounds from their mixtures with hydrocarbons. Trudy VNII NP no. 9:197-213 '63. (MIRA 17:6)

CHERNYAK, S.N., gvardii podpolkovnik meditsinskoy sluzhby [reviewer]; ARONOV, S.N. [author].

On S.N.Aronov's article "Certain problems in the organization of garrison hospital management" (Voen.-med.zhur. no.3, '47). S.N. Cherniak. Voen.-med.zhur. no.10:50 O '47. (MLRA 6:11)
(Hospitals, Military) (Aronov, S.N.)

CHERNYAK, S.N.

Role of the sanitary section of the 9th Army in the organization of the public health service and higher medical education in Kuban during the civil war years. Nauch. trudy Kub. gos. med. inst. 19:189-197 '62. (MIRA 17:8)



CHERNYAK, S. [N.]

9

Causes of blistering of aluminum and aluminum alloy sheets. S. Chernyak. *Tsvetnye Metal.* 1940, No. 2, 84[illegible]. — An investigation of blistering of Al and duralumin sheet and strip showed that it is caused by the use of unsuitable lubricants, such as kerosene, in rolling, and not by any condition of melting or casting. It was found that blistering can be eliminated by using refined wax in rolling products of 4–5 mm. thickness, and refined paraffin in rolling thin strip and sheet.
B. N. Daniloff

A58-SL4 METALLURGICAL LITERATURE CLASSIFICATION

CHERNYAK, S. N.

CHERNYAK, S. N. -- "Investigation of the Structure and Mechanical Properties of Aluminum Foil and Basic Factors in Its Production." Min Nonferrous Metals USSR, All-Union Aluminum-Magnesium Inst, Leningrad, 1955. (Dissertations for the Degree of Candidate in Technical Sciences)

SO: Knizhnaya Letopis': No. 39, 24 Sept 55

CHERNYAK, S.N.

AUTHOR: Voronov, I.A., Chernyak, S.N., Prikhodko, V.E. and Karasevich, V.I. 136-5-13/14

TITLE: Production of aluminium strip with micron tolerances. (Proizvodstvo alyuminievoy lenty s mikronnymi dopuskami.)

PERIODICAL: "Tsvetnye Metally" (Non-ferrous Metals) 1957, No.5, pp. 79 - 85 (U.S.S.R.)

ABSTRACT: This work, which was carried out in 1956 in participation in a competition organised by the Ministry and the Scientific and Technical Society of Non-ferrous Metallurgy of the U.S.S.R. had as additional authors V.P. Bekhelev, V.G. Pikrovskiy, N.A. Morozov and D.P. Kurbatov. The aims of the work were to study the rolling of aluminium strip to tolerances of ± 0.005 mm by rolling in various types of mills and the production of strip by drawing in special installations. Tables show the production technology used for producing strip 0.5 mm thick to the ordinary tolerances, results of thickness measurements on strip for various methods of rolling, the frequency with which measurements showed values within various tolerances for strip produced by the drawing method, results of thickness measurements along the whole length of coils, results of mechanical tests and the production technology for producing 0.5 mm strip with micron tolerances. The various types of

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