The Effect of Certain Factors on the Effectiveness (Cont.)

horizon occurs (Fig. 1). The author contends that the porosity and permeability of the horizon deteriorate as its depth increases, and for that reason the effectiveness of hydraulic fracturing increases. The fourth factor which should be taken into account in the selection of wells for hydraulic fracturing is the total quantity of oil recovered from each individual well. If the recovery of oil from a given well during its entire period of production is less than the average total recovery per well, such a well should be selected for hydraulic fracturing and a large increase in production should be expected. Figure 2 shows the effectiveness of hydraulic fracturing as a function of the total recovery of oil from the Sulu-Tepe and Umbaki wells. The fifth factor is the thickness of the formation. As a rule, hydraulic fracturing in one horizontal crevice is more effective in thin formations, although poor reservoir properties may nullify its effect. Production experience at the Siazan' oil fields shows that in compact low-permeability formations hydraulic fracturing is very effective in thick formations. The fact that a formation is thick should not be a discouraging factor in hydraulic fracturing.

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Card 3/3

DENISOV, F.I.; KARAPETOV, K.A.; MELIKBEKOV, A.S.

Hydraulic fracturing of sands in the Siazan'field. Neft khoz. 35 no.2:31-34 F '57. (MLRA 10:3)
(Siazan'--Oil wells) (Petroleum engineering)

DENISOV, F.I.

DENISOV, F.I.; KARAPETOV, K.A.; MELIKBEKOV, A.S.

Effectiveness of repeated hydraulic fracturing of strata. Azerb. neft. khoz. 36 no.9:20-22 S '57. (MIRA 11:2)
(Azerbaijan--Petroleum engineering)

92-58-5-10/30

AUTHOR: Denisov, F. I., Senior Engineer

TITLE: Combating the Formation of Clogs in Oil Wells (Opyt bor'by s probkoobrazovaniyem v neftyanykh skvazhinakh)

PERIODICAL: Neftyanik, 1958, Nr 5, pp 11-12 (USSR)

ABSTRACT: Since the injection of viscous fluid with sand during the hydraulic fracturing, performed in some wells of the Baku oil fields, helped to reduce the formation of clogs in bore-holes without raising wellhead pressure, this practice was adopted to combat oil well clogging. The author briefly describes the results of injecting coarse sand into wells exploited by the NPU Leninneft'. He states that the introduction of coarse sand into wells produces good results when the formation pressure is low and the permeability is high. For example, the output of well No. 2374 substantially increased after the injection of fluid with sand, while the thickness of sand clogs considerably decreased. During 13 months following the introduction of sand, the oil well in question produced 1000 additional tons of crude. It took much less time to remove clogs from this well and to complete cleaning operations. The injection of sand into the bore-hole bottom zone was repeated by the NPU Leninneft'

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Combating the Formation (Cont.) 92-58-5-10/30

16 times. A mixture of sand and crude oil was injected. The crude oil had a specific gravityof 0.956 and a viscosity of 72-88 centipoises. It was mixed with 5.2 tons of sand for each well. The author uses graphs to show the results of oil well operations and to prove that the injection of sand reduces oil well clogging, increases or stabilizes oil well output, and extends the operational cycle of the well. It is clear, therefore, that under certain geological conditions the injection of sand is a highly advisable measure in combating oil well clogging. There is 1 drawing.

ASSOCIATION: AzNKI po dobyche nefti (AzNKI for Petroleum Production)

AVAILABLE: Library of Congress

1. Drilling operations—USSR 2. Holes--Stoppage

Card 2/2

Sov/93-58-7-10/17

AUTHOR: Deniaov, F.I.

TITLE: Coefficients of Drop in Oil Well Yields Following the Hydraulic Fracturing of Formations (Koeffitsiyenty padeniya debitov v skvazhinakh posle provedeniya gidrorazryva plasta)

PERIODICAL: Neftyanoye khozyaystvo, 1958, Nr 7, pp. 52-55 (USSR)

ABSTRACT: This is a study of the hydraulic fracturing effect on yield increase at the oilfields of Leninneft', Karadagneft', Kirovneft', and Siazan'neft in the Azerbaydzhan SSR. The author compared the output of the oilfields before fracturing with their output after fracturing (Table 1), and estimated the drop in oil yield occurring during operation prior to fracturing and after fracturing. On the basis of this data he constructed yield drop curves for the oilfields of Umbaki (Karadagneft'), Sulu-Tepe Kirovneft'), and Siazan'neft'). These curves are shown in Figs. 1,2,and 3 respectively. The author arrives at the following conclusions: 1) the drop in yield following hydraulic fracturing is similar to the initial behavior of wells after the completion of their drilling and indicates that the hydraulic fracturing shortened the development period of the formations; 3) the number of fractures and the depth of their penetration can to a certain extent be determined by the nature of the yield drop curves, i.e., the flatter the slope of the curve the deeper the penetration of the fractures, and the steeper the slope of the curve the greater the number of fractures and

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the less deep their penetration; and 3) the yield drop curves can be used for estimating the yield increase due to the hydraulic fracturing of wells. There are 3 figures and 1 table.

Card 2/2 1. Petroleum--Production

DENISOV, F.I.; MELIKBEKOV, A.S.

Using nomographs for calculating the incremental oil production in hydraulic fracturing of strata . Azerb.neft.khoz. 38 no.11: 28-31 N '59. (MIRA 13:5)
(Oil wells--Hydraulic fracturing)

DENISOV, F.I.; NABIYEV, N.N.

Resuming exploitation of wells with a plunger lift. Azerb. neft. khoz. 39 no.12:32-34 D '60. (MIRA 14:9)
(Oil fields—Production methods)

[illegible]NISOV, Fedor Ivanovich; [illegible]AYTSEV, Yu.V., red.

[Factors determining the efficiency of hydraulic fracturing] Faktory, opredeliaiushchie effektivnost' gidrorazryva plastov. Baku, Azerneshr, 1964. 93 p. (MIRA 17:8)

DENISOV, F.N., inzh.; KLAMENT'YEV, K.P., inzh.

New machines of the Gomel' Agricultural Machinery Plant. Mekh. i elek.sots.sel'khoz. 17 no.6:45-48 '59. (MIRA 13:4)

1. Gomel'skiy zavod sel'skokhozyaystvennogo mashinostroyeniya.
(Gomel'--Agricultural machinery industry)

DEMISOV, F. P. and CHERENKOV, P. A.

"Parcours des Noyaux de Recul de $^{27}_{28}$Ni et Mechanisme des Reactions Photonucleaires ^{27}Al (γ ,2pn), ^{28}Si (γ, 3pn) ^{31}P (γ,4p3n) et ^{32}S(γ,5p3n) dans le demaine d'energie des gamma jusqu'a 260Mev.

report presented at the Intl. Congress for Nuclear Interactions (Low Energy) and Nuclear Structure, Paris, 7-12 July 1958.

DENISOV, E.P., red.; LAZAREVA, L.Ye., red.; LEYKIN, Ye.M., red.; ROZHANSKIY, I.D., red.; FRANK, I.M., red.; SHAPIRO, I.S., red.; SHAPIRO, F.L., red.; POLENOVA, T.P., tekhn. red.

[Low and intermediate energy nuclear reactions; transactions of the conference] IAdernye reaktsii pri malykh i srednikh energiiakh; trudy konferentsii. Moskva, Izd-vo Akad. nauk SSSR, 1958. 614 p. (MIRA 11:12)

1. Vsesoyuznaya konferentsiya po yadernym reaktsiyam pri malykh i srednikh energiyakh. Moscow, 1957.
(Nuclear reactions)

SOV-120-58-3-6/33

AUTHORS: Denisov, F. P. and Kolesov, V. Ye.

TITLE: Measurement of Angular and Energy Distributions of Radioactive Recoil Nuclei (Izmereniye uglovykh i energeticheskikh raspredeleniy radioaktivnykh yader otdachi)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1958, Nr 3, pp 34-36 (USSR)

ABSTRACT: Nuclear reactions may be studied by the method of "induced radioactivity". However, the region of applicability of the method has so far been limited to the dependence of effective cross-sections for nuclear reactions on the energy of the bombarding particles. Other applications involve the measurement of momenta of fragments of light nuclei and fission fragments. The present work has shown that this method may also be used in studying angular and energy distributions of radioactive recoil nuclei which are formed during the splitting of light and medium nuclei when they are bombarded by particles whose energy is greater than 30 Mev. The principle of the method is as follows. Recoil nuclei emitted from the target at a given angle are collected on a plate whose activity is then determined by the usual beta-counting system. From the recorded number of disintegrations of the recoil nuclei it is possible to calculate the differential cross-

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Measurement of Angular and Energy Distributions of Radioactive Recoil Nuclei

section for the production of the recoil nuclei at the given angle. By varying the angle one obtains the angular distribution. P. A. Cherenkov is thanked for his interest in this work. There are 2 figures and 8 references, all of which are English.

ASSOCIATION: Fizicheskiy institut AN SSSR (Physics Institute of the Academy of Sciences of the USSR)

SUBMITTED: August 23, 1957.

1. Nuclei--Energy 2. Nuclei--Bombardment 3. Nuclear reactions--Analysis

21(7) SOV/56-35-2-48/60

AUTHORS: Volkova, L. V., Denisov, F. P.

TITLE: The Ranges of the Recoil Nuclei Na^{24} and the Mechanism of the Reactions Al^{27} (p, 3pn), Si^{28} (p, 4pn) and P^{31} (p, 5p 3n) for the Proton Energy 660 MeV (Probegi yader otdachi Na^{24} i mekhanizm yadernykh reaktsiy Al^{27} (p, 3pn), Si^{28} (p, 4pn) i P^{31} (p, 5p 3n) pri energii protonov 660 MeV)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 2(8), pp 538-539 (USSR)

ABSTRACT: According to Serber's model of the nuclear reactions at high energies, the products of the "deep disintegrations of the nuclei" are the result of 2 successive processes, viz. a nucleon cascade and an evaporation. In order to verify this model, the authors measured the average ranges of the recoil nuclei Na^{24} which are generated by the irradiation of Al, Si, and P by 660 MeV-protons. The experiment was carried out on the external proton beam of the synchrocyclotron of the OIYaI (=Ob"yedinennyy institut yadernykh issledovaniy =

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The Ranges of the Recoil Nuclei Na^{24} and the Mechanism of the Reactions Al^{27} (p, 3pn), Si^{28} (p, 4pn) and P^{31} (p, 5p 3n) for the Proton Energy 660 MeV

United Institute of Nuclear Research). The scheme of the experiment and of the processing of the experimental data was described in detail in a previous paper (Ref 3). The average ranges of the recoil nuclei Na^{24} are given in a table. For the interpretation of the results obtained, it is necessary to know the relation between range and energy for Na^{24}. The authors determined this relation by comparing the experimental data concerning the relation between range and velocity for a large number of ions from light nuclei up to the fission fragments. In a diagram, the experimental values of the range are plotted against the velocity and the energy (in Al) for some nuclei. Also the corresponding curves for Na^{24} are given in this diagram. A table gives the theoretically calculated effective thicknesses for the recoil nuclei which fly away from the specimen parallel to the proton beam. There is a rather high difference between the experimental and the theoretical values of these thicknesses. This difference may be eliminated by assuming that the incident high-energy nucleon interacts with nucleon groups (contained in the nucleus), the momenta of which are correlated. It is hitherto not known

The Ranges of the Recoil Nuclei Na^{24} and the Mechanism of the Reactions Al^{27} (p, 3pn), Si^{28} (p, 4pn) and P^{31} (p, 5p 3n) for the Proton Energy 660 MeV

whether the interaction of the incident nucleon with a group of such nucleons may be reduced to a pair interaction or the interaction with this group as a whole plays an essential part. The authors thank Professor P. A. Cherenkov for his interest in this paper, Professor V. P. Dzhelepov for arranging the experiments on the synchrophasotron of the OIYaI, and they also thank G. A. Leksin for a useful discussion. There are 1 figure, 1 table, and 10 references, 2 of which are Soviet.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute imeni P. N. Lebedev, AS USSR)

SUBMITTED: May 21, 1958

21(7) SOV/56-35-2-51/60

AUTHORS: Denisov, F. P., Cherenkov, P. A.

TITLE: The Ranges of the Recoil Nuclei Na^{24} and the Mechanism of Some Photonuclear Reactions (Probegi yader otdachi Na^{24} i mekhanizm nekotorykh fotoyadernykh reaktsiy)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 2(8), pp 544-546 (USSR)

ABSTRACT: Usually, the so-called "quasideuteron model" is used for the description of the photonuclear reactions at highphoton energies. According to this model, the reaction is represented by 3 successive processes: 1) absorption of the γ-quantum by a nucleon pair of the nucleus, 2) intranuclear nucleon cascade which is generated by these nucleons, 3) evaporation of particles from an excited nucleus which was generated after the cascade. One of the most direct methods of verifying this model is by the measurement of the ranges of the recoil nuclei. The authors measured the effective thickness t of the specimen (which is proportional to the range) for the recoil nuclei Na^{24} which were generated by photonuclear

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The Ranges of the Recoil Nuclei Na^{24} and the Mechanism of Some Photonuclear Reactions

reactions on Al, Si, P, and S. t is defined by $t = N/a_o$, where N denotes the number of the recoil nuclei flying away from 1 cm^2 of the specimen surface (the thickness of which is greater than the maximum range of the recoil nuclei) a_o denotes the total number of the recoil nuclei generated in the unit mass of the specimen. In order to determine N, the specimens were interlaid with triacetate films (thickness 20 μ) which collected the recoil nuclei Na^{24}. The piles consisting of specimens and films were placed in a 260 MeV bremsstrahlung beam of the synchrotron of the FIAN (=Fizicheskiy institut Akademii nauk) (Physics Institute, AS USSR) and were irradiated for 10 - 15 hours. 10 - 15 hours after the end of the irradiation only the characteristic activity of Na^{24} was observed in the films and specimens. The ratio N/a_o was calculated from the measured activities. The results of these calculations are demonstrated in a table and in a diagram, and are also compared with the results of the calculations according to the model of the compound nucleus and according to the "quasideuteron" model. A model that assumes the formation of a compound nucleus with subsequent evaporation of nucleons does not explain the above-

The Ranges of the Recoil Nuclei Na^{24} and the Mechanism of Some Photonuclear Reactions

mentioned reactions. Only further experiments and more precise calculations can solve the problem as to whether the above-mentioned discrepancies can be eliminated by an appropriate modification of the "quasideuteron" model, or it is necessary to introduce an essentially new mechanism of the interaction. There are 2 figures, 1 table, and 4 references, 0 of which is Soviet.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute imeni P. N. Lebedev, AS USSR)

SUBMITTED: May 21, 1958

33092

S/638/61/001/000/015/056
B101/B102

24.6300

AUTHORS: Denisov, F. P., Kosareva, K. V., Cherenkov, P. A.

TITLE: Mechanism of emission of nuclear fragments

SOURCE: Tashkentskaya konferentsiya po mirnomy ispol'zovaniyu atomnoy energii. Tashkent, 1959. Trudy. v. 1. Tashkent, 1961, 117-126

TEXT: A mechanism of the separation of a fragment from the nucleus in the process of a nucleonic cascade is suggested. The nucleus is assumed to be structured and to contain nucleon groups connected with the nuclear residue by few nucleons. In the nucleonic cascade these binding nucleons can be knocked out, and the fragment is emitted. The probability of fragment separation from the nucleus is given by

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$$P(n_1, n_2, n_3, N_1, N_2, N_3, P_1, P_2, P_3) =$$

$$= \frac{(1+a)\,n!}{n_1!\,n_2!\,n_3!}\, P_1^{n_1}(n)\left[1-\frac{n_1-1}{2N_1}\right]^{n_1}\prod_{i=1}^{N_2} P_2(n)\left[P_2(n)-\right. \tag{1}$$

$$\left.-\sum_{k=1}^{i} p(k_2, n)\right] P_3^{n_2}(n)\left[1-\frac{n_2-1}{2N_2}\right]^{n_1}\left[1-\frac{n-1}{2N}\right]^{-n}.$$

N_1 is the number of nucleons in the fragment, N_2 is the number of nucleons binding the fragment to the nucleus, N_3 is the number of the remaining nuclear nucleons. n_1, $n_2 = N_2$, and n_3 are the numbers of nucleons knocked out of the fragment, from the bonds, and from the nucleus, respectively. $P_m(n) = N_m p_m(n) = \sum_{i_m} p(i_m,n)/n$, where $p(i_m,n)$ is

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the probability of the nucleon i_m being knocked out in a cascade during which n nucleons are knocked out of the nucleus ($n = n_1 + n_2 + n_3$), and $m = 1, 2, 3$. The correction coefficient α is negligibly small. The experiments were conducted at 660 Mev with target nuclei of N = 95, $R = 3 \cdot 10^{-13}$ cm. 15 cascades with 5 - 15 knocked-out nucleons were examined. A rise at $\theta = 180^\circ$ and a dip at $\theta = 0^\circ$ are characteristic of the reduced probability. The capture of a fragment by a nucleus is examined on the basis of drop models: assumption of a bond between fragment and nucleus (variant A); assumption of the fragment forming a surface wave on the nucleus (variant B). The probability, $P_2(p_{10}, \vec{p}_2)$, of the emission of a fragment drops with an increase of θ (Fig. 4). The model provides good agreement with the experiment regarding angular distribution and energy spectrum of the fragments with an energy near the Coulomb barrier, but does not explain the emission of fragments with higher energies. The N(Z) distribution of the emitted fragments calculated from Eq. (1), provides agreement with the experiment, excepting

Card 3/[illegible]

Mechanism of emission of nuclear ...

$Z \geqslant 8$ (Fig. 8). The total fragmentation cross section was calculated from $\sigma_f = \sum_{N_1} \sum_{n_r} \nu(N_1) P(N_1, N_2, n_r) \sigma(n_r)$. $\nu(N_1)$ is the number of N_1 fragments coexisting in the nucleus; $P(N_1, N_2, n_r)$ is the probability for the emission of an N_1 fragment with N_2 bonds in an n_r radiant star; $\sigma(n_r)$ is the effective cross section for the formation of an n_r pronged star. The calculation of $\nu(N_1)$ yields good agreement with experiment at $N_2 \leqslant 2$ and $N_1 = 10 - 12$. It is concluded that the cascade model will provide further data on the steric structure of the nucleus. O. V. Lozhkin and N. A. Perfilov (ZhETF, 1956, 31, 913) are mentioned. There are 9 figures, 1 table, and 19 references: 8 Soviet and 11 non-Soviet. The four most recent references to English-language publications read as follows: Nakagawa S. et al., Journ. of Phys. Soc. Japan, 12, 7, 747, 1957; Goldsack S. I. et al. Phil. Mag., 2, 14, 149, 1957; Metropolis N. et al., Phys. Rev., 110, 185, 1958; Hofstadter R., Phys. Rev., 28, 214, 1956.

Card 4/5

Mechanism of emission of nuclear ...

ASSOCIATION: Leningradskiy fizicheskiy institut im. P. N. Lebedeva AN SSSR (Leningrad Physics Institute P. N. Lebedev, AS USSR)

Fig. 4. Probability of emission of a fragment as a function of the separating angle θ, for a fragment with $N_1 = 9$, $N_2 = 2$. (1) $p_{10} = 7$ Mev$^{1/2}$, variant A; (2) idem, variant B; (3) $p_{10} = 5$ Mev$^{1/2}$, variant A; (4) idem, variant B. (4) in absolute units, (1) to (3) normalized between 0 and 30°.

Fig. 8. Distribution N(Z) of emitted fragments as a function of Z. (I) according to Eq. (1); (II) N(Z)/Z.

Card 5/6

83716
S/056/60/038/004/009/048
B019/B070

24.6600

AUTHORS: Gorbunov, A. N., Denisov, F. P., Kolotukhin, V. A.

TITLE: Reactions $_{13}Al^{27} \longrightarrow Na^{24}$, $Co^{59} \longrightarrow Mn^{56}$, $P^{31} \longrightarrow Na^{24}$ in the γ-Quantum Energy Range up to 260 Mev

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 4, pp. 1084-1087

TEXT: The three photonuclear reactions mentioned in the title were studied with a view to obtaining information on the interaction of photons in the energy range 30-260 Mev with nuclei. The experiments were carried out with the 260 Mev synchrotron at the Institute mentioned under association. The maximum energy of the synchrotron could be determined with an accuracy of ±2%. The targets were prepared from high-purity materials. The activity of the samples was measured with three equal 4π assemblies of β counters. During the experiment, the measuring apparatus was checked by radium standards. Fig. 1 shows the dependence of the yield from the three reactions investigated on the energies of the photons. Their differential cross section was calculated from this.

Card 1/2

83716

Reactions $Al^{27} \longrightarrow Na^{24}$, $Co^{59} \longrightarrow Mn^{56}$, $P^{31} \longrightarrow Na^{24}$ in the γ-Quantum Energy Range up to 260 Mev

S/056/60/038/004/009/048
B019/B070

The results are shown diagrammatically in Figs. 2-4. From the discussion of the results obtained here, the conclusion is drawn that for photon energies above 60-80 Mev the interaction of the photons with the nuclei takes place without the formation of a compound nucleus. The authors thank Professor P. A. Cherenkov for his interest in the work. They also thank the staff of the synchrotron. There are 4 figures and 7 references: 2 Soviet, 4 US, and 1 Canadian.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Institute of Physics imeni P. N. Lebedev of the Academy of Sciences, USSR)

SUBMITTED: November 4, 1959

Card 2/2

24.6600

39114
S/058/62/000/006/015/136
A061/A101

AUTHORS: Denisov, F. P., Kosareva, K. V., Cherenkov, P. A.

TITLE: The mechanism of nuclear fragment emission

PERIODICAL: Referativnyy zhurnal, Fizika, no. 6, 1962, 50, abstract 6B354 ("Tr. Tashkentsk. konferentsii po mirn. ispol'zovaniyu atomn. energii, 1959. T. I". Tashkent, AN UzSSR, 1961, 117 - 126)

TEXT: The emission of light nuclei with $Z \geqslant 3$ (fragmentation) is observed on bombardment of nuclei by high-energy particles. The angular fragment distributions display considerable anisotropy, the fragment being prevalently emitted in the direction of motion of the primary particle. When the fragment charge is changed from 4 to 10, the probability of fragment emission is reduced by $\sim$20 times. The energy spectra of the fragments display a maximum in the energy range of Coulomb repulsion and are little dependent on the energy of the incident particle. The phenomenon of fragmentation is not explained satisfactorily by the models of evaporation and of the direct knocking out of the fragments. A model is suggested for the rough explanation of some main characteristics of

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S/058/62/000/006/015/136
A061/A101

The mechanism of nuclear fragment emission

fragmentation. According to this model, the nucleus includes spatially correlated groups of nucleons which are linked to the main nucleus by a small number (say, two) of nucleons. As the nucleonic cascade produced by the primary fast particle develops in the nucleus, the linking nucleons can be knocked out and the given group is separated from the nucleus. The Coulomb forces will tend to remove the group from the residual nucleus, and if it is not recaptured by the nucleus, it escapes in the form of a fragment. Calculations based on this model, regardless of their approximate character, provide a good explanation for a number of characteristics of fragmentation, such as the probability of fragment emission in the n-ray star, the full cross section of fragmentation, its dependence on energy, the probability of emission of two fragments, and others.

L. Landsberg

[Abstracter's note: Complete translation]

Card 2/2

S/903/62/000/000/031/044
B102/B234

AUTHORS: Balitskiy, V. A., Denisov, F. P.

TITLE: Angular distribution and energy spectra of the recoil nuclei of $Al^{27}(\gamma,2pn)Na^{24}$ reactions

SOURCE: Yadernyye reaktsii pri malykh i srednikh energiyakh; trudy Vtoroy Vsesoyuznoy konferentsii, iyul' 1960 g. Ed. by A. S. Davydov and others. Moscow, Izd-vo AN SSSR, 1962, 450-457

TEXT: The present article is an immediate continuation of the previous investigations by the authors (Paris Conference on Nuclear Reactions, 1958; ZhETF, 35, 454, 1958) in which the mean ranges and the averaged angular distributions in photonuclear reactions were determined. Here a special method is applied (TTE, No. 3, 34, 1958) for measuring the differential angular distributions and the integral energy spectra of the recoil nuclei of the $Al^{27} \rightarrow Na^{24}$ reactions. The measurements were made at the synchrotron of the FIAN in the 260-Mev range. The target was an Al-film (80 $\mu g/cm^2$) deposited on a triacetate backing. All Na^{24} recoil nuclei were absorbed in

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collecting films. In order to increase the yields a total of 30-40 cassettes were exposed to bremsstrahlung irradiation during a period of 30-40 hrs. Then the activity of the collecting and the control films was measured in a β-counter assembly and Na^{24} was identified by its 15-hrs activity. Detailed calculations are made on the basis of the evaporation model but, as a comparison with the experimental energy and angular distributions shows, the curves obtained with this model yield only qualitative agreement and lie in both cases too high. Somewhat better agreement is obtained with the quasideuteron model. Neither models, however, is satisfying. The deviations may partly be explained by assuming the γ-quantum to interact with correlated nucleon groups consisting of e.g. three nucleons. There are 4 figures.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Physics Institute imeni P. N. Lebedev AS USSR)

S/903/62/000/000/032/044
B102/B234

AUTHORS: ~~Denisov, F. P.,~~ Kosareva, K. V., Tel'nov, Yu. Ya., Cherenkov, P. A.

TITLE: Angular distribution and energy spectrum of the C^{11} nuclei of the $C^{12}(\gamma,n)C^{11}$ reaction

SOURCE: Yadernyye reaktsii pri malykh i srednikh energiyakh; trudy Vtoroy Vsesoyuznoy konferentsii, iyul' 1960 g. Ed. by A. S. Davydov and others. Moscow, Izd-vo AN SSSR, 1962, 474-478

TEXT: In view of the lack of data on the C^{12} photonuclear reaction at gamma energies above 23 Mev the authors measured the energy and angular distributions of the C^{11}_{6} recoil nuclei of such reactions induced by gammas with $E_{\gamma max}$ = 260 Mev. The recoil nuclei were recorded with the help of a method described in PTE, 3, 34, 1957 which is free from the disadvantages of the usual methods operating with cloud or bubble chambers or counters. The measurements were made with the FIAN synchrotron bremsstrahlung and a polystyrene film as target, collecting and control films used for recording

and or determining the background. The recoil nuclei were identified according to their 20.2-min β^+ activity. Corrections were made for selfabsorption and decay. The C^{11} yield was measured at the angles 30, 45, 60, 90, 120, 135 and 150° to the γ-ray at air pressures of 0, 1.7, 3.4, 4.7, and 9.5 mm Hg, what was in correspondence to C^{11} energies above 0.05, 0.28, 0.44 and 1.7 Mev. The recoil nucleus angular distribution measured was compared against theoretical curves calculated with different parameters for $\nu(\theta') = 1 + \alpha \sin^2\theta'$, a distribution satisfied both by quasideuteron and direct-photoeffect models. Agreement is best when the C^{11} nucleus is assumed in the ground state and $\alpha = 2$. The C^{11} yield at $E > 0.3$ Mev amounts to 30% of the total C^{11} yield, that with $E > 1.7$ Mev amounts to only 3 ± 2%. This disagrees with the calculations made by Barber et al. (Phys. Rev. 98, 73, 1951) but is, in its conclusions, in close agreement with results obtained by Bogdankevich et al. (ZhETF, 31, 3(9), 405, 1956). There is 1 figure.

ASSOCIATION: Institut fiziki im. P. N. Lebedeva AN SSSR (Institute of Physics imeni P. N. Lebedev AS USSR)

S/120/63/000/001/041/072
E032/E314

AUTHOR: Denisov, F.P.

TITLE: Activation method for determination of the thickness of thin films and foils

PERIODICAL: Pribory i tekhnika eksperimenta, no. 1, 1963, 155 - 157

TEXT: The method now described is suitable for measuring thicknesses in excess of 1 $\mu g/cm^2$ and may be used with thin films on a thick base. The film whose thickness has to be determined, and a control specimen of known thickness and the same material, are irradiated under identical conditions. The thickness of the film is determined from the ratio of the activities of the two films. The method depends largely on the statistical accuracy with which the activity of the film can be measured. When this activity is low, several films must be irradiated at the same time. In the case of high-energy particles, the recoil nuclei must be trapped in auxiliary foils placed on either side of the specimens. The method has been used to determine the thickness of thin Al films ($\sim$80 $\mu g/cm^2$) deposited on a triacetate base. The activating

Card 1/3

Activation method ....

radiation was the bremsstrahlung from the 260 MeV synchrotron of FIAN. The γ, 2pn reaction was used for calibrating the films. The activity of the deposited films was sufficient for the determination of the thickness to about 4%. The table summarizes possible reactions which may be used in typical cases. There are 2 figures and 1 table.

ASSOCIATION: Fizicheskiy institut AN SSSR (Physics Institute of the AS USSR)

SUBMITTED: March 7, 1962

S/120/63/000/001/041/072
E032/E314

Activation method for ....

Key to table: 1 - Material; 2 - reaction; 3 - final product; 4 - half-life; 5 - organic compounds; 6 - aluminum; 7 - nickel; 8 - copper

Материал пленки (1)	Ядерные реакции (2)	Конечный продукт (3)	Период полураспада (4)
Органические соединения (5)	$C^{12}(\gamma, n)$, $C^{13}(p, pn)$	C^{11}	20,2 мин
Алюминий (6)	$Al^{27}(\gamma, 2pn)$, $Al^{27}(p, 3pn)$	Na^{24}	15,01 ч
Никель (7)	$Ni^{58}(\gamma, n)$, $Ni^{58}(p, pn)$	Ni^{57}	36,4 ч
Медь (8)	$Cu^{65}(\gamma, n)$, $Cu^{65}(p, pn)$ $Cu^{63}(\gamma, n)$, $Cu^{63}(p, pn)$	Cu^{64} Cu^{62}	12,8 ч 9,7 мин

Card 3/3

DENISOV, F.P.

Cascade model of fragmentation. Trudy Fiz. inst. 22:129-154 '64. (MIRA 17:9)

ACCESSION NR: AP4029697 S/0089/64/016/004/0353/0354

AUTHOR: Belovintsev, K. A.; Denisov, F. P.

TITLE: The possibility of generating and accelerating positrons in a microtron

SOURCE: Atomnaya energiya, v. 16, no. 4, 1964, 353-354

TOPIC TAGS: positron, microtron, gamma radiation, storing device, electron positron beam, bremsstrahlung, electron positron pair, relativistic positron, annihilation radiation, electron cyclotron

ABSTRACT: The use of a microtron is proposed for the production of accelerated positrons. The latest achievements in the development of highly efficient microtrons justify the hope that the proposed method will facilitate production of much more intensive positron beams, compared to those in current production, and reduced overall equipment costs. Under the new scheme, the electrons emitted from an injector are accelerated by the electric field of a high-frequency resonator to the maximum energy level achievable in the given

ACCESSION NR: AP4029697

microtron. In view of the high intensity of the high-frequency electric field ($\mathcal{E} \approx 380$ kv/cm), a considerable portion of the positrons with an initial energy of about zero will be captured by the microtron acceleration system. A further acceleration of the positrons occurs simultaneously with the following bunches of electrons, and most of the orbits coincide spatially. In their last orbit the positrons are automatically deflected by a system of magnetic canals, and can be removed from the microtron for the purpose of generating monochromatic annihilation gamma-radiation or for accelerating to higher energy levels. The above outlined method of generating and accelerating positrons was experimentally tested at the photomeson laboratory of the SSSR Academy of Sciences. Orig. art. has: 1 figure and 1 formula.

ASSOCIATION: None

SUBMITTED: 08May63 ATD PRESS: 3048 ENCL: 00

SUB CODE: NP NO REF SOV: 004 OTHER: 003

Card: 2/2

DENISOV, F.P.; DUYSEBAYEV, A.; KOSAREVA, K.V.; CHERENKOV, P.A.

Angular and energy distributions of ^{238}U fission neutrons in the ^{238}U (γ,n) FNS reaction. Yad. fiz. 2 no.1:82-85 Jl '65. (MIRA 18:8)

1. Fiziko-energeticheskiy institut im. P.N.Lebedeva AN SSSR.

L 54710-65 EWT(m) Peb DIAAP DM
ACCESSION NR: AP5018136 UR/0089/65/018/004/0403/0404

AUTHOR: Denisov, F. P.; Milovanov, V. P. 11 B

TITLE: Calculations of the mean square of nuclear recoil momentum in evaporation

SOURCE: Atomnaya energiya, v. 18, no. 4, 1965, 403-404

TOPIC TAGS: particle motion, vaporization 19

ABSTRACT: Calculations of the mean square of nuclear recoil momentum in evaporation were made taking into account nuclear motion induced by evaporation of all previous particles in the nucleus. Orig. art. has: 4 formulas.

ASSOCIATION: none

SUBMITTED: 22May64 ENCL: 00 SUB CODE: NP, TD

NR REF SOV: 003 OTHER: 001 NA

Card 1/1

DENISOV, F.P.

Energy distribution of recoil nuclei in evaporation. IAd. fiz. 1 no.4:607-611 Ap '65. (MIRA 18:5)

1. Fizicheskiy institut im. P.N.Lebedeva AN SSSR.

L 23732-66 -- EWT(m)/EWA(h)

ACC NR: AP6014813 SOURCE CODE: UR/0367/65/001/002/0329/0337

AUTHOR: Denisov, F. P.; Latypova, R. A.--Latipova, R. A.; Milovanov, V. P.; Cherenkov, P. A.

ORG: Physics Institute im. P. N. Lebedev, AN SSSR (Fizicheskiy institut AN SSSR)

TITLE: Cascade mechanism of high-energy nuclear reactions. 1. Total inelastic cross sections, angular and energy distribution of fast particles

SOURCE: Yadernaya fizika, v. 1, no. 2, 1965, 329-337

TOPIC TAGS: inelastic resonance, nuclear reaction, angular distribution, proton, fast particle

ABSTRACT: The interactions of high-energy protons with nuclei have been calculated on the basis of the cascade theory of nuclear reactions. The nuclear reactions induced by protons with energies of 150, 340, and 660 MEV on Si^{28}, $(AgBr)_{41}^{95}$, and Au^{197} were considered. The nuclear diffusion surface and refraction and reflection of nucleons in the process of the escaping of the nucleus were taken into account. Comparison of the calculations with the experiment allows one to conclude that the initial principal suppositions of the cascade theory are valid. Orig. art. has: 11 figures and 1 table. [Based on authors' Eng. abst.] [JPRS]

SUB CODE: 20 / SUBM DATE: 28Jul64 / ORIG REF: 007 / OTH REF: 015

Card 1/1

L 39836-66 EWT(m)/T GD-2
ACC NR: AT6010851 SOURCE CODE: UR/0367/65/002/006/1042/1048

AUTHOR: Denisov, F. P.; Milovanov, V. P.; Latypova, R. A.; Cherenkov, P. A. 13

ORG: Physics Institute im. P. N. Lebedev, AN SSSR (Fizicheskiy institut AN SSSR)

TITLE: Distribution of knocked-out nucleons with respect to the nuclear volume and excitation energies and momentum distributions of nuclei in the cascade process [This paper was given at the 14th Annual Conference on Nuclear Spectroscopy, Tbilisi, February 1964]

SOURCE: Yadernaya fizika, v. 2, no. 6, 1965, 1042-1048

TOPIC TAGS: nucleon, excitation energy

ABSTRACT: The discussion of the results of calculations described in a previous paper (Journal of Nuclear Physics, Vol 1, p. 329, 1965) is continued. This discussion concerns the distribution of the knocked-out nucleons in the volume of the nucleus, the excitation energies of the residual nuclei, and the momentum distribution of the recoil nuclei. Orig. art. has: 7 figures and 3 tables. [Based on authors' Eng. abst.] [JPRS]

SUB CODE: 20 / SUBM DATE: 06Apr65 / ORIG REF: 006 / OTH REF: 002

Card 1/1 UDC 5

L 10359-67 EWP(j)/EWT(m) RM SOURCE CODE: UR/0079/66/036/007/1226/1230
ACC NR: AP7003107

AUTHOR: Kazimirchik, I. V.; Bebikh, G. F.; Denisov, F. S.; Kabachnik, M. I. 35

ORG: Moscow State University im. M. V. Lomonosov (Moskovskiy gosudarstvennyy universitet)

TITLE: Synthesis of amides of pyrocatecholphosphorous acid

SOURCE: Zhurnal obshchey khimii, v. 36, no. 7, 1966, 1226-1230

TOPIC TAGS: organic synthetic process, organic phosphorus compound, secondary amine

ABSTRACT: Stable cyclic amidophosphites were synthesized by the reaction of pyrocatechol chlorophosphite with aromatic amines. The reaction with primary or secondary aromatic amines in the presence of triethylamine proceeded readily with slight heating in 75-80% yields. The amidophosphites obtained were capable of adding sulfur and reacting with phenylazide, yielding the corresponding bis-thionophosphate and N-phenyl-amidophosphate. The amides obtained were tested as inhibitors of ozone, light, and thermal aging of rubbers based on natural rubber. The duration of resistance of the rubbers to ozone and light aging was found to be increased by 100-150% in the presence of amides of pyrocatechol-phosphorous acid. The synthesized amides were also inhibitors of thermal aging of the rubbers, permitting them to retain their physicomechanical properties for longer periods. The authors thank N. A. Otopkov for carrying out the research inhibiting activities. Orig. art. has: 3 tables. [JPRS: 38,970]

SUB CODE: 07 / SUBM DATE: 26Jun65 / ORIG REF: 003
UDC: 547.565.2:546.183.325:546.171.1

Card 1/1 0925 2043

ACC NR: AP7013161 SOURCE CODE: UR/0062/66/000/012/2246/2246

AUTHOR: Nesmeyanov, A. N.; Anisimov, K. N.; Kolobova, N. Ye.; Denisov, F. S.

ORG: Institute of Heterorganic Compounds, AN SSSR (Institut elementoorganicheskikh soyedineniy AN SSSR)

TITLE: Synthesis of pi-Cyclopentadienyldicarbonylirontrichlorogermane and pi-Cyclopentadienyldicarbonylirondichlorogermane

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 12, 1966, 2246

TOPIC TAGS: germanium compound, chlorinated organic compound, organic chemical synthesis

SUB CODE: 07

ABSTRACT: pi-Cyclopentadienyldicarbonylirontrichlorogermane (I) was synthesized by the reaction of pi-cyclopentadienyldicarbonyliron chloride with $HGeCl_3$. Compound (I), an air-stable crystalline substance, was also produced in a mixture with pi-Cyclopentadienyldicarbonylirondichlorogermane (II) in low yield by the action of trichlorogermane upon dimer pi-cyclopentadienylirondicarboonyl. The compound (II) was also produced in 85% yield by the reaction of a complex of dioxane and germanium dichloride on dimer pi-cyclopentadienylirondicarbonyl.

UDC: 542.91 + 547.1'3

ACC NR: AP7013161

Compound (II) is an orange crystalline substance, stable in air. Both (I) and (II) were characterized, and their infrared and nuclear magnetic resonance spectra were taken. Orig. art. has: 1 formula. [JPRS: 40,422]

DENISOV, G., laureat Stalinskoy premii (Stalingrad).

"Moskvich" in the "Moskvich." Radio no.11:60-61 N '53. (MLRA 6:11)
(Radio--Installation in automobiles)

LEVINSKIY, L.G., glavnyy red.; DENISOV, G.A., red.; SEMENOVA, A.V., tekhn.red.

[Building materials and construction; collection of technical instructions] Stroimaterialy i stroitel'stvo; informatsionno-tekhnicheskii sbornik. Leningrad, TSentral'noe biuro tekhn. informatsii, 1959. 69 p. (MIRA 13:4)

1. Leningrad. Sovet narodnogo khozyaystva.
(Building materials) (Building)

DENISOV, Grigoriy Arsent'yevich; SOPOV, Grigoriy Khristoforovich; SHEREMET, Leonid Davidovich; DEVOCHKIN, N.I., red.

[The "Krep'" state farm] Sovkhoz "Krep'", Volgograd, Nizhne-Volzhskoe knizhnoe izd-vo, 1964. 39 p. (MIRA 18:2)

82459

S/141/60/003/03/014/014
E192/E382

9,4150

AUTHORS: Ashbel', N.I., Denisov, G.G. and Dozorov, V.A.

TITLE: An Instrument for the Display of Three-dimensional Phase Trajectories

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1960, Vol. 3, No. 3, pp. 540 - 543

TEXT: The development of the instrument was suggested by Andronov at Gor'kiy University (Ref.3). It was required to obtain simultaneously two displays of plane projections of the phase trajectories by means of two oscillographs.. Such an instrument was developed and described in a paper by Andronov and others (Ref. 4). Recently, it was found, however, that a simpler instrument is possible. The block diagram of this device is shown in Fig. 1. The device has three inputs for the quantities proportional to the coordinates x, y, z of the phase space and two outputs; one of the outputs is periodically scanned by means of an electronic or electromechanical switch and produces a voltage proportional to $y \pm kx$. This voltage signal is produced by a wideband amplifier Y, having a gain k, an inverter И and an adding circuit C. The resulting signal is applied to the

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An Instrument for the Display of Three-dimensional Phase Trajectories

horizontal plate of an oscillograph. The voltage proportional to the coordinate z is taken from the second output and applied to the vertical deflection plates of the oscillograph. In this manner two plane projections are simultaneously obtained on the screen of a single oscillograph and these can be immediately observed stereoscopically. A detailed circuit diagram of the instrument is shown in Fig. 2. The amplifier and the inverter are based on a triode. The anode and cathode of the triode are connected to a relay P , which is driven by a multivibrator based on a double triode. The adding circuit is in the form of an amplifier provided with negative feedback; the anode load of this amplifier is in the form of a triode. The output voltage of the adding circuit is applied to the grid of a cathode follower, whose output terminals are connected to the horizontal deflection

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An Instrument for the Display of Three-dimensional Phase Trajectories

plates of the oscillograph. The display circuit was employed to observe the limit cycles of the oscillator shown in Fig. 3. The projections of the limit cycle for this circuit are shown in the photograph of Fig. 4.
There are 4 figures and 6 references: 5 Soviet and 1 English.

ASSOCIATION: Gor'kovskiy gosudarstvennyy universitet
(Gor'kiy State University)

SUBMITTED: January 23, 1960

Card 3/3

DENISOV, G.G.

Using sand jet perforator for excluding reservoir waters. Neftepром. delo no.7:22-23 '63. (MIRA 17:2)

1. Volgogradskiy nauchno-issledovatel'skiy institut neftyanoy i gazovoy promyshlennosti.

BULATKIN, I.K.; DENISOV, G.G.

Engineering of interval oriented hydrochloric acidization with the use of hydraulic perforator. Neftepromm. delo no.8:12-17 '63. (MIRA 17:4)

1. Volgogradskiy nauchno-issledovatel'skiy institut neftyanoy i gazovoy promyshlennosti.

DENISOV, G.G.; YERMILOV, V.I.; PEYSAKHOV, R.M.

Directional interval hydrochloric well acidization using a hydraulic perforator. Neftepprom. delo no.1:20-24 '64. (MIRA 17:4)

1. Volgogradskiy nauchno-issledovatel'skiy institut neftyanoy i gazovoy promyshlennosti.

DENISOV, G.G.; TRZHENSIMEKH, V.I.

Features of the exploitation of wells in fractured reservoir rocks. Nefeprom.delo no.5:15-17 '64. (MIRA 17:9)

1. Volgogradskiy nauchno-issledovatel'skiy institut neftyanoy i gazovoy promyshlennosti.

DENISOV, G.G.; TRZHENSIMEKH, V.I.

Improving exclusion-repair work in the fields of Volgograd Province. Nauch.-tekh. sbor. po dob. nefti no.22:79-81 '64. (MIRA 17:9)

1. Volgogradskiy nauchno-issledovatel'skiy institut neftyanoy i gazovoy promyshlennosti.

DENISOV, G.G.; YERMILOV, V.I.

Evaluating the methods used in hydrochloric-acid treatments. Neft. khoz. 43 no.1:56-58 Ja '65. (MIRA 18:3)

DENISOV, G.G.

Unutilized possibilities for sand-jet perforation. Neftepром. delo no.3:27-29 '65. (MIRA 18:10)

1. Volgogradskiy nauchno-issledovatel'skiy institut neftyanoy i gazovoy promyshlennosti.

DENISOV, G.G.; KOTEL'NIKOV, V.M.; MATROKHIN, N.S.

Effect of volley perforation on the intactness of casing strings. Neftepromm. delo no.3:22-24 '65. (MIRA 18:10)

1. Volgogradskiy nauchno-issledovatel'skiy institut neftyanoy i gazovoy promyshlennosti.

MONFRED, Yu.B., kand. tekhn. nauk, red.; DENISOV, G.I., inzh., nauchnyy red.; ABRAMOVA, V.M., tekhn.red.

[Large-panel construction; manufacture in forms] Krupnopanel'noe stroitel'stvo; proizvodstvo v kassetnykh formakh. Sbornik statei. Moskva, Gos. izd-vo lit-ry po stroit., arkhit. i stroit. materialam, 1961. 149 p. (MIRA 14:9)
(Concrete slabs)

DENISOV, G.M.; OKHRIMENKO, V.D.

Instruction should be revised. Transp. stroi. 9 no.11:61-62 N '59
(MIRA 13:3)
1. Nachal'nik upravleniya Stalinskstroyput' (for Denisov). 2. Nachal'nik proizvodstvenno-tekhnicheskogo otdela Gorem No.33 tresta Gortransstroy (for Okhrimenko).
(Railroads—Track)

DENISOV, G.M.

Earthwork machinery and transportation facilities should work in three shifts. Transp. stroi. 11 no.10:14-16 O '61. (MIRA 14:10)

1. Nachal'nik upravleniya Stalinskstroyput'.
(Transportation, Automotive) (Earthmoving machinery)

DENISOV, G.M.

At construction sites in the Kuznetsk Basin. Mekh. stroi. 21 no.3:1-3 Mr '64. (MIRA 17:3)

1. Zaveduyushchiy otdelom stroitel'stva Kemerovskogo (promyshlennogo) oblastnogo komiteta Kommunisticheskoy partii Sovetskogo Soyuza.

DENISOV, G.N.

Prevention of cracks on veneered surfaces. Der.prom. 8 no.4:21 Ap '59. (MIRA 12:6)

1. Fabrika klavishnykh instrumentov "Kuban'."
(Veneers and veneering)

1. DENISOV, G. P.

2. USSR (600)

4. Incubators

7. Protecting "Rekord-39" and VIR-9 incubators against two-phase operation at 380/220 voltage. Ptitsevodstvo no. 6, 1952.

9. Monthly List of Russian Accessions, Library of Congress, February 1953. Unclassified.

DENISOV, G. S.

TRIKHOT KO, A.P.

24(7) p 3 PHASE I BOOK EXPLOITATION SOV/1365

L'vov. Universytet

Materialy X Vsesoyuznogo soveshchaniya po spektroskopii. t. 1: Molekulyarnaya spektroskopiya (Papers of the 10th All-Union Conference on Spectroscopy. Vol. 1: Molecular Spectroscopy) [L'vov] Izd-vo L'vovskogo univ-ta, 1957. 499 p. 4,000 copies printed. (Series: Its: Pizychnyy zbirnyk, vyp. 3/8/)

Additional Sponsoring Agency: Akademiya nauk SSSR. Komissiya po spektroskopii. Ed.: Gazer, S.L.; Tech. Ed.: Saranyuk, T.V.; Editorial Board: Landsberg, G.S., Academician (Resp. Ed., Deceased), Neporent, B.S., Doctor of Physical and Mathematical Sciences, Fabelinskiy, I.L., Doctor of Physical and Mathematical Sciences, Fabrikant, V.A., Doctor of Physical and Mathematical Sciences, Kornitskiy, V.G., Candidate of Technical Sciences, Rayskiy, S.M., Candidate of Physical and Mathematical Sciences, Klimovskiy, L.K., Candidate of Physical and Mathematical Sciences, Miliyanchuk, V.S., Candidate of Physical and Mathematical Sciences, and Glauberman, A. Ye., Candidate of Physical and Mathematical Sciences.

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Card 5/30

CHULANOVSKIY, V.M.; BURGOVA, M.P.; DENISOV, G.S.; ZHUKOVA, Ye.L.

Infrared absorption study of molecular bonding characteristics in nonelectrolytic solutions. Fiz. sbor. no.3:42-51 '57. (MIRA 11:8)

1. Leningradskiy ordena Lenina gosudarstvennyy universitet im. A.A. Zhdanova.
(Solution (Chemistry)) (Chemical bonds) (Dielectrics--Spectra)

DENISOV, G. S.

CHULANOVSKIY, V. M.; BULANIN, M. O.; DENISOV, G. S.; and SHUVALOVA, E.

"Infrared Absorption Spectra of Some Two- and Three Component Solutions with Hydrogen Bonding."

report submitted at the 4th International Meeting of Molecular Spectroscopy, Bologna, Italy, 7-12 Sept 1959.

Physical Institute of the University, Leningrad.

24(4), 24(7)

AUTHOR: Denisov, G.S.

SOV/51-6-4-10/29

TITLE: On Measurement of the Intensity of Strong Absorption Bands in the Infrared Spectra of Liquids (Ob izmerenii intensivnosti sil'nykh polos pogloshcheniya v infrakrasnykh spektrakh zhidkostey)

PERIODICAL: Optika i Spektroskopiya, 1959, Vol 6, Nr 4, pp 475-477 (USSR)

ABSTRACT: Investigations of the intensity of the infrared absorption spectra of some liquids are difficult or impossible because of their very high coefficients of absorption. To study bands with very high absorption it is necessary to use layers 1-5 μ thick. Keussler (Ref 2) constructed a cell by means of which liquid layers of 0.3-4.0 μ could be obtained and their ultraviolet absorption spectra measured. To construct his cell Keussler used two quartz plates, polished to the same degree as Fabry-Perot etalons. The present author used a similar technique to construct a cell of two highly-polished rock-salt plates. The spacer was in the form of a ring of aluminium deposited by vacuum evaporation. The cell was adjusted until the two plates were parallel to one another to within 2%; to carry out this adjustment interference bands from a mercury lamp were used. The separation between plates was measured interferometrically on an empty cell using a recording spectrometer

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On Measurement of the Intensity of Strong Absorption Bands in the Infrared Spectra of Liquids

SF-2M in the region 4000-7500 Å (the author thanks A.N. Mironova and Prof. A.N. Zaydel' for making a spectrometer SF-2M available to him). By this method the separation between plates could be measured between 1 and 7 μ. The precision of these measurements was one order higher than the precision with which optical density was measured in recording infrared absorption spectra. It was found that the error due to change of inner dimensions of the cell in filling it with liquid could be safely neglected. The author paid special attention to the possible effect of selective reflection in the region of an absorption band, where the refractive index of the liquid studied changes very rapidly. The intensity of a beam which passed normally through a plane-parallel layer of thickness h of a substance whose complex refractive index is $n - i\chi$, is given by Eq (1) taken from Vlasov's work (Ref 4). In Eq (1)

$$\rho = \frac{(n - n_1)^2 + \chi^2}{(n + n_1)^2 + \chi^2}, \qquad \tan\frac{\varphi}{2} = -\frac{2\chi n_1}{n^2 - n_1^2 + \chi}$$

and n_1 is the refractive index of the cell walls (rock-salt).

On Measurement of the Intensity of Strong Absorption Bands in the Infrared Spectra of Liquids

Dependence of the optical density D on thickness h, deduced from Eq (1) is shown in Fig 2. It is seen that the optical density is strictly proportional to thickness only when $\rho = 0$, i.e. when $n = n_1$ and $\chi = 0$. If, within the limits of the band which is investigated, the value of ρ does not change very much, then (at not too small values of h) the additional optical density D_o due to reflection may be allowed for by measuring the optical density outside the absorption band and calculations using formulae given by McMahon (Ref 5). If the value of ρ itself is small, then D_o is practically independent of wavelength and the absorption coefficient may be written in the form

$$\chi = \frac{\lambda}{2\pi} \cdot \frac{D - D_o}{h} .$$

If the value of ρ changes considerably within the limits of the absorption band which is investigated, then the form and intensity of this band may be strongly distorted by selective reflection. In the latter case the values of n and χ can be calculated from Eq (1), or one has to measure the reflection spectrum as well. It is difficult to

On Measurement of the Intensity of Strong Absorption Bands in the Infrared Spectra of Liquids

estimate the value of χ at which the proportionality between D and h (Lambert's law) no longer holds. Experimentally one can use the form of the band $\chi(\lambda)$ as the criterion of whether selective reflection needs to be allowed for. If this form is the same for different thicknesses of the liquid layers studied, then Lambert's law is obeyed and selective reflection can be safely neglected. This can be seen in Fig 3 for a $C{=}O(H{\cdot}C_3H_7)CO$ absorption band, whose form is independent of the layer thickness between 1.2 and 4.0 μ. Acknowledgment is made to Prof. V.M. Chulanovskiy who directed this work. There are 3 figures and 6 references, 3 of which are Soviet, 2 English and 1 international.

SUBMITTED: May 7, 1958

24(7), 5(3) SOV/51-6-6-5/34

AUTHORS: Bulanin, M.O., Denisov, G.S. and Pushkina, R.A.

TITLE: Spectroscopic Investigation of the Hydrogen Bond in Mercaptans (Spektroskopicheskoye issledovaniye vodorodnoy svyazi v merkaptanakh)

PERIODICAL: Optika i spektroskopiya, 1959, Vol 6, Nr 6, pp 754-759 (USSR)

ABSTRACT: The authors used infrared absorption spectra to study hydrogen bonds in aliphatic mercaptans (thio-alcohols) and hydrogen bonds formed between thio-hydrile groups of mercaptans with molecules of solvents. The infrared spectra of mercaptansand their solutions were recorded by means of a Perkin-Elmer spectrometer 12B with an LiF prism, an FEOU-18 amplifier and an EPP-09 potentiometer used as a recorder. The integral absorption coefficient K was deduced from the area of the band due to valence vibrations of the SH group. The infrared absorption spectra were recorded in the region 2400-2700 cm^{-1} for liquid ethyl mercaptan (C_2H_5SH) and normal propyl mercaptan ($n\text{-}C_3H_7SH$) and their solutions in CCl_4. Table 1 shows the frequencies of the SH vibrations and the corresponding integral absorption coefficients K at various concentrations of CCl_4 solutions of both mercaptans. Fig 1 gives the absorption curves obtained for solutions of propyl mercaptan in CCl_4. The band due to valence vibrations of the SH group has a half-width of about 58 cm^{-1} in

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Spectroscopic Investigation of the Hydrogen Bond in Mercaptans

the spectra of pure mercaptans. In dilute CCl_4 solutions this band is displaced towards higher frequencies by about 20 cm^{-1} and its half-width decreases to 25 cm^{-1} while its integral intensity falls by a factor of 7-8. In solutions with medium concentration splitting of this band is observed (Fig 1). All these facts indicate that a hydrogen bond of the S--H...S type exists in liquid mercaptan and this bond leads to association of molecules. Association between mercaptan molecules should be accompanied by appearance of SH groups with the following bonds

$$\text{--S--H...S and H...S--H}$$
$$\qquad\qquad\qquad\qquad\qquad\quad |$$

Existence of such bonds was confirmed by spectral studies of C_3H_7SH dissolved in $CHCl_3$ and $(C_3H_7)_2S$ (Table 2, Fig 2). Studies of the infrared spectra of C_3H_7SH dissolved in acetone (Fig 3, curve 1), dioxane (curve 2) and triethylamine (curve 3) showed that in acid solutions only a small decrease of the SH-band frequency occurs and the intensity of this band rises strongly. On the other hand dissolution of C_3H_7SH in triethylamine produces a considerable displacement, decrease of intensity and flattening of the SH-band. In a note added at proof-reading

Spectroscopic Investigation of the Hydrogen Bond in Mercaptans

stage the authors mention R.A. Spurr and H.F. Byers's work (J. Phys. Chem., Vol 62, 425, 1958) who confirmed the existence of the S--H...S bond in aliphatic mercaptans. Acknowledgment is made to V.M. Chulanovskiy for his advice. There are 3 figures, 2 tables and 23 references, 14 of which are English, 4 Soviet, 3 French and 2 German.

SUBMITTED: July 15, 1958

SOV/51-7-2-7/34

AUTHORS: Bulanin, M.O., Denisov, G.S. and Shchepkin, D.N.

TITLE: On the Study of Equilibria During Formation of the Hydrogen Bond in Solutions, Using Infrared Absorption Spectra. The Case of Inseparable Bands. (Ob izuchenii ravnovesiy, obuslovlennykh obrazovaniyem vodorodnoy svyazi v rastvorakh, po infrakrasnym spektram pogloshcheniya. Sluchay nerazdelyayushchikhsya polos)

PERIODICAL: Optika i spektroskopiya, 1959, Vol 7, Nr 2, pp 187-192 (USSR)

ABSTRACT: An infrared absorption spectroscope can be used to determine accurately the concentrations of free and associated molecules in solutions and to find the equilibrium constant K for the reaction of formation of hydrogen bonds. The temperature dependence of the equilibrium constant can be used to determine the energy of the reaction and hence the energy of the hydrogen bond. The present authors discuss theoretical determination of the equilibrium constant K and the integral absorption coefficients c_k of the molecules which make up the associated complex (formed by means of a hydrogen bond between a molecule of the solvent and a molecule of the solute). The discussion deals with the case when the absorption bands of the monomer and the complex are overlapping. Equilibrium of the type A + B $\rightleftarrows$ AB (where A is the solute and B is the

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On the Study of Equilibria During Formation of the Hydrogen Bond in Solutions. Using Infrared Absorption Spectra. The Case of Inseparable Bands.

solvent) is considered. It is shown that the treatment of the experimental results described by Lord and his co-workers (Ref 6) leads to considerable errors. A better method of determination of K and ε_k is described; this method uses the least-squares technique. The paper is entirely theoretical. Acknowledgment is made to Prof. V.M. Chulanovskiy for his advice. There are 4 figures, 1 mathematical appendix and 9 references, 2 of which are Soviet, 4 English, 1 French, 1 German and 1 from an international journal.

SUBMITTED: November 28, 1958

5(4) SOV/32-25-3-16/62

AUTHORS: Tsekhovol'skaya, D. I., Zavaritskaya, T. A., Denisov, G. S., Chulanovskiy, V. M.

TITLE: The Use of Infra-red Spectroscopy for Analysing Titanium Tetrachloride (Primeneniye infrakrasnoy spektroskopii k analizu chetyrekhkhloristogo titana)

PERIODICAL: Zavodskaya Laboratoriya, 1959, Vol 25, Nr 3, pp 300-302 (USSR)

ABSTRACT: A lecture on this investigation was given at the XII Vsesoyuznoye soveshchaniye po spektroskopii (Twelfth All Union Conference of Spectroscopy) in Moscow in November 1958. The properties of titanium depend considerably on the minimum amount of impurities. It is not possible to determine all admixtures of $TiCl_4$ by the chemical and physico-chemical analyses being used at present. In the present investigation the composition of various admixtures of $TiCl_4$ was investigated and methods of their quantitative determination by means of infra-red absorption spectra have been worked out. The spectrometers IKS-6, IKS-12, and Perkin Elmer 12-V were used in the investigations. Various technical samples of $TiCl_4$ showed a considerable amount of spectral bands which

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The Use of Infra-red Spectroscopy for Analysing Titanium Tetrachloride

came from various admixtures, as e.g., $VOCl_3$, $SiCl_4$, $TiOCl_2$, C_6Cl_6, $CH_2ClCOCl$, $CHCl_2$, $COCl$, CCl_3COCl, HCl, $COCl_2$, CO_2. It was found that the hydrolysis of $TiCl_4$ proceeds with formation of oxychlorides of the type Ti-O-Ti and Ti=O and not of hydroxychlorides. The determinations of $VOCl_3$ and $COCl_2$ are given. CO_2 was determined from the maximum at $\nu = 2338cm^{-1}$, whereas chlorine-substituted acetylchlorides were determined from the oscillations of the C=O group. The solubility of CO_2, HCl, $COCl_2$, and C_6Cl_6 in $TiCl_4$ could be determined by means of the investigation results which also showed that, with a $TiCl_4$ excess, the hydrolysis proceeds according to the scheme $TiCl_4 + H_2O \longrightarrow TiOCl_2 + 2\ HCl$. There are 1 table and 5 references, 1 of which is Soviet.

ASSOCIATION: Vsesoyuznyy alyuminiyevo-magniyevyy institut (All-Union Aluminum-Magnesium Institute)

DENISOV, G.S.

PHASE I BOOK EXPLOITATION SOV/5151

Leningrad. Universitet

Molekulyarnaya spektroskopiya (Molecular Spectroscopy) [Leningrad] Izd-vo Leningr. univ., 1960. 198 p. 4,700 copies printed.

Resp. Ed.: F. L. Skripov; Eds.: Ye. V. Shchemeleva and V. D. Piastro; Tech. Ed.: S. D. Vodolagina.

PURPOSE: This collection of articles is intended for scientific workers, instructors and students of physics and chemistry. It may also be used by engineers and technicians employing molecular spectroscopy.

COVERAGE: The collection of articles describes spectroscopic studies of liquids and solutions, and includes data on applied molecular spectroscopy. Individual articles deal with the molecular interaction in solutions, and specifically with the hydrogen bond problem. Works on the optimum utilization of spectral apparatus and on the analytical application of molecular spectroscopy are also included.

Aspects of the structure of high and low molecular compounds and of molecular complexes are also covered. The collection was published in honor of the 70th birthday of Professor Vladimir Mikhaylovich Chulanovskiy, Soviet specialist in molecular spectroscopy and spectral analysis. There are no references.

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DENISOV, G.S.

Hydrogen bonding of ketones with chloroform appearing in the valence absorption band of the carbonyl group. Opt. i spektr. 11 no.3:428-431 S '61. (MIRA 14:9)
(Carbonyl group--Spectra) (Ketones--Spectra)

DENISOV G.S.

STRUCTURE AND PHYSICAL PROPERTIES OF MATTER IN A LIQUID STATE reports read at the 4th Conference convened in KIYEV from 1 to 5 June 1959, published by the publishein House of KIYEV University, KIYEV, USSR, 1962

Articles of special interest are those beginning on pp 57, 65, 115 and 144 (2) respectively.

S/048/62/026/010/002/013
B101/B186

AUTHORS: Chulanovskiy, V. M., Bulanin, M. O., Denisov, G. S., Shuvalova, Ye. V., and Shchepkin, D. N.

TITLE: Effect of the solvent on the infrared spectrum of the substance, and its consideration in analytical work

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 10, 1962, 1230 - 1236

TEXT: The variation in the spectrum of a solvent in the presence of a dissolved substance, and thus also of its absorption coefficient, is discussed on the basis primarily of Western publications. Reference is made to a paper by M.-L. Josien et al. (Compt. rend. Acad. sci., 249, 256 (1959)) concerning the dependence of symmetrical and asymmetrical vibrations of the CH_2 group in CH_2Cl_2 on the concentration, confirmed experimentally by the present authors. The 3630 cm^{-1} which characterizes the formation of H bonds was found for methyl alcohol, just as it had been found for benzyl alcohol by J.J. Fox, A. E. Martin (Trans. Farad. Soc., 36, 897 (1940)). In contrast to M. Van Thill, E. D. Becker, J. C. Pimentel (J. Chem. Phys., 27,

Effect of the solvent on the infrared ...

95 (1957)), the splitting of the 3340 and 3520 cm^{-1} bands of methanol dissolved in N_2 at 20°K is not attributed to different types of molecular associations but to different types of H bonds. On the other hand, it was found in the author's laboratory that the stretching vibration band of the NH group in diethyl or dimethyl amine was a singlet, which is explained by different distributions of electrons in the alcohol and the amine. The formation of different types of associations of the oxygen atom was observed for the C=O band of ketones dissolved in hexane after addition of chloroform. With camphor, all three bands of the carbonyl group successively appear with increasing concentration of chloroform: one band for the monomer group and two for the associated group. Such types of intermolecular bonds are compared with coordination bonds, and are explained by incomplete saturation of atoms in the molecule. There are 5 figures.

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000310120011-2"

CHULANOVKSIY, V.M.; BULANIN, M.O.; DENISOV, G.S.; SHUVALOVA, Ye.V.; SHCHEPKINA, D.N.

Allowance for the effect of a solvent on the infared specturm of a substance in analytical work. Izv. AN SSSR.Ser.fiz. 26 no.10:1230-1236 O '62. (MIRA 15:10)

(Spectrum, Infared) (Solvents)

DENISOV, S.S.; RYL'TSEV, Ye.V.; [illegible]

Appearance of dipole-dipole interaction in the infrared spectrum of solutions of tetraalkyl ammonium salts. Dokl. AN SSSR 161 no.5:1093-1096 8 '65. (MIRA 18:10)

1. Nauchno-issledovatel'skiy fizicheskiy institut Leningradskogo gosudarstvennogo universiteta im. A.A.Zhdanova. Submitted March 29, 1965.

DENISOV, G.V.; POTAPYUK, N.N.

Structural features and testing of the hydraulic suspension system of S-80 and S-100 tractors. Trakt.i sel'khozmash. 30 no.2:2-4 F '60. (MIRA 13:5)
(Crawler tractors--Hydraulic equipment)

DENISOV, G. Ye., inzh.; GNOYEVETS, I. F.

Experience in the consolidation of main and approach lines. Put' i put. khoz. 6 no.10:8-13 '62. (MIRA 15:10)

1. Nachal'nik Chistyakovskoy distantsii Donetskoy dorogi (for Denisov). 2. Nachal'nik Shterovskoy distantsii Donetskoy dorogi (for Gnoyevets).

(Railroads--Consolidation)

1. DENISOV, I.

2. USSR (600)

4. Paper Box industry

7. Semi-automatic paper-cup machine. Khol. tekh. 29 no. 3, 1952

9. Monthly List of Russian Accessions, Library of Congress, January 1953. Unclassified.

DENISOV, I.; MIROSHNICHENKO, Ya.

Centralize the use of machines. Den. i kred. 16 no. 7:67-70 Jl '58. (MIRA 11:7)

(Ukraine--Banks and banking--Accounting)
(Machine accounting)

DENISOV, I.

84-58-1-18/32

AUTHOR: Denisov, I.

TITLE: Conference on Flight Training Methodology (Letno-metodicheskaya konferentsiya)

PERIODICAL: Grazhdanskaya aviatsiya, 1958, Nr 1, p 29 (USSR)

ABSTRACT: A conference of representatives of Territorial Administrations, aviation groups and educational and training establishments of the Aeroflot took place in Ul'yanovsk, in the School of Advanced Pilotage, sometime before January, 1958. The need for an exchange of information and experience which had been accumulated by different agencies over a period of years was felt for a long time. The purpose of the conference was to work out a standard methodology of training of the flight personnel of the Aeroflot. A number of reports were made and discussed, in particular those by Chief of the ShVLP, Shubin, about the operation of the school, his deputy for flight service, Pilipenko, about the training methodology for flight personnel, and reports by the plane commander-instructors Trenin and Klimas, about flying the Il-14 on a rectangular route during daytime and at night, with utilization of instruments and radio facilities. The discussions are said to have disclosed unsatisfactory functioning of Directorates of Transport Aviation, of training establishments, of the State Scientific Research Institute (GosNII) of the GVF, and the Publishing Department of the Main Administration of the GVF,

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Conference on Flight Training Methodology

the latter having failed to issue on time the methodological aids for flight training on the IL-14, although the aircraft has been in operation for several years. The situation is growing worse with the introduction of the newest jet and turbojet equipment. Methodological manuals were requested to be prepared together with the flight testing of the new aircraft. The Technical Directorate of the Main Administration was asked to furnish trainers to the schools and training outfits. It was also suggested that a methodological council be established at the Main Administration for preliminary review of training schedules, textbooks, instructions and forthcoming trainers. The bulk of second pilots were found to have been reduced to mere flight mechanics, after the flight mechanics began to be eliminated from the plane crews. Technical maintenance was recommended to be charged to the aviation engineering service of airports and units. Regulations concerning training outfits were found to be obsolete and in need of a revision, the main task of such outfits in the future being the coordination of methodological practices in the operational units. It was recommended that a conference be called once every year. The text is accompanied by a photograph showing a group of conferees inspecting the semiautomatic windshield blinds developed in the ShVLP.

AVAILABLE: Library of Congress
1. Pilots - Training 2. Aeronautics - Study and Teaching

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DENISOV, I.

On the sixth continent. Sov.foto 17 no.6:28-32 Je '57. (MLRA 10:8)
(Antarctic regions--Photography)

RAGUZOV, V.; DENISOV, I.

Wages of apprentices and instuctors in on the job training. Sots. trud 5 no.2:137-139 F '60. (MIRA 13:6)
(Vocational education) (Wages)

DENISOV, I.

Full utilization of hidden potentialities. Rech.transp. 20 no.6: 10-11 Je '61. (MIRA 14:6)

1. Nachal'nik Irtyshskogo parokhodstva.
(Inland water transportation—Employees)

DENISOV, I.

Put the decisions of the 22d Congress of the CPSU into operation.
Rech. transp. 21 no.5:5-8 My '62. (MIRA 15:5)

1. Nachal'nik Irtyshskogo parokhodstva.
(Inland water transportation)

DENISOV, I.

Dissemination of technological information in the Irtysh Basin. Rech. transp. 19 no.12:45-46 D '60. (MIRA 13:12)

1. Predsedatel' Irtyshskogo basseynovogo pravleniya Nauchno-tekhnicheskogo obshchestva vodnogo transporta.
(Irtysh Valley--Merchant seamen)
(Professional education)