CHALIKOV, Anatoliy Viktorovich; VARSHAVSKIY, V.I., nauchn. red.;
GINTSBURG, V.I., ved. red.

[Programming of design calculations] Programmirovanie proektnykh raschetov. Leningrad, Izd-vo "Nedra," 1964. 113 p. (MIRA 17:7)

L 04906-67 EWT(d)/EWP(1) IJP(c)

ACC NR: AT6022684 SOURCE CODE: UR/0000/66/000/000/0158/0164

48

1/2

B+1

AUTHOR: Varshavskiy, V. I.; Vorontsova, I. P.

ORG: none

16

TITLE: The use of stochastic automatons of variable structure to solve certain behavior problems

SOURCE: Moscow. Institut avtomatiki i telemekhaniki. Samoobuchayushchiyesya avtomaticheskiye sistemy (Self-instructing automatic systems). Moscow, Izd-vo Nauka, 1966, 158-164

16

TOPIC TAGS: game theory, stochastic process, finite automaton

ABSTRACT: The authors analyze some behavior problems for variable-structure stochastic automatons in game situations. The definitions and notation adopted in the paper are those of M. L. Tsetlin (e.g., Konechnyye avtomaty i modelirovaniye prosteyshikh form povedeniya. --UMN, 1963, vol. XVIII, vyp. 4 (112)). The zero-sum game of a variable-structure automaton with a single opponent using one pure strategy is considered in an effort to demonstrate the conditions for asymptotic behavior optimality of such an automatic device in a stationary random environment. The simplest stochastic automaton version is considered, i.e., the line-

Card 1/2

L 04906-67

ACC NR: AT6022684

automaton without input. Expressions are derived for the mathematical win expectancy of such an automaton (Ck). Games by two such Ck automatons are considered for pure strategies, state diagrams are analyzed, and experimental data on Ck automaton assignment game behavior are presented. In the case of the nonstationary (random) environments (to which the problem of inter-automaton gaming can ultimately be resolved) it is not yet possible to formulate requirements as the method of changing the state transition probabilities. It is also shown that a Ck automaton which has functioned for any extended period of time in one stationary medium is very slow to retrain itself for operation in another environment. The elimination of this defect is seen as the key to the design of an automaton capable of optimal behavior in nonstationary environments. The authors wish, in conclusion, to express their sincere gratitude to M. L. Tsetlin, I. I. Pyatetskiy-Shapiro, V. Yu. Krylov, S. L. Ginzburg, and V. A. Volkonskiy for their willingness to take part in a discussion of the problems considered in this paper and for their many helpful suggestions. Orig. art. has: 2 figures, 3 tables, and 9 formulas.

SUB CODE: 09,12/ SUBM DATE: 02Mar66/ ORIG REF: 008

Card 2/2

SOV/153-2-3-20/29

5(2)

AUTHORS: Pozin, M. Ye., Kopylev, B. A., Varshavskiy, V. L.

TITLE: The Flotability of Gypsum and of a Precipitate With Different Reagents

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1959, Vol 2, Nr 3, pp 412-419 (USSR)

ABSTRACT: The authors investigated various enrichment reagents and regulators for the flotation of gypsum ($CaSO_4 \cdot 2H_2O$) and the precipitate ($CaHPO_4 \cdot 2H_2O$) to achieve a separation of the two substances by flotation. The investigations carried out showed the following results: in the presence of oleic acid (consumption: 750-1000 g/ton) and of IM-11 (consumption: 500-750 g/ton) the precipitate and gypsum were practically completely floated at pH 6.5-7. The flotability of the precipitate and gypsum by oleic acid decreases rapidly with the decrease of the pH value of the pulp. In the flotation with IM-11 a decrease of the pH value leads to a certain activation of the gypsum flotation and to a considerable reduction of the flotation of the precipitate. These effects of the pH value are shown by figure 2.

Card 1/4

SOV/153-2-3-20/29

The Flotability of Gypsum and of a Precipitate With Different Reagents

The anion reagent aeroflot-25 proved to be the most efficient among the flotation reagents investigated. In the presence of aeroflot-25 the precipitate is strongly floated whereas gypsum is hardly floated at all. The flotation of a precipitate-gypsum mixture differs from the flotation of the individual components since in the common presence of gypsum and precipitate in the liquid phase of the pulp a mutual inhibition of the flotability occurs. It was found that a reduction of the content of precipitate in the mixture leads to a considerable reduction of the flotation which is due to the inhibiting effect of gypsum on the flotation of the precipitate. The use of aeroflot-25 in the mixture with kerosene as collector for the basic flotation in the presence of copper salts and the processing of the residues with reagent IM-11 in the presence of trikresyl phosphate makes it possible to obtain a concentrate containing 29-30% P_2O_5 from the original mixture with a content of approximately 17% P_2O_5. In this case 79-80% of P_2O_5 are again obtained. Furthermore it was found that the use of trikresyl phosphate as peptizer in the processing of the residues

Card 2/4

SOV/153-2-3-20/29

The Flotability of Gypsum and of a Precipitate With Different Reagents

of basic flotation makes it possible to obtain a concentrate strongly enriched with P_2O_5. 2 tables show the results of flotation of precipitate gypsum mixtures with contents of 21.5% P_2O_5 (Table 1), and 17.2% P_2O_5 (Table 2), respectively, by Aeroflot-25 in the presence of copper sulphate. Table 3 shows the results of flotation of a precipitate gypsum mixture with 17.2% P_2O_5 by the addition of aeroflot-25 in 4 portions in the presence of kerosene and copper sulphate. Table 4 gives a survey on the processing of the residues obtained in basic flotation with the reagent IM-11 in the presence of trikresyl phosphate. Figure 8 shows a principal scheme of the separation of a precipitate-gypsum mixture by flotation with aeroflot-25 in the presence of kerosene and by the reagent IM-11 in the presence of trikresyl phosphate. There are 8 figures, 4 tables, and 4 Soviet references.

ASSOCIATION: Leningradskiy tekhnologicheskiy institut imeni Lensoveta Kafedra tekhnologii neorganicheskikh veshchestv (Leningrad Technological Institute imeni Lensovet, Chair of Inorganic

Card 3/4

The Flotability of Gypsum and of a Precipitate With Different Reagents

Substances)

SUBMITTED: March 12, 1958

VARSHAVSKIY, V.L.

Scientific conference on mineral fertilizers. Khim.prom. no.7: 544 Jl '62. (MIRA 15:9)
(Fertilizers and manures--Congresses)

POZIN, M.Ye.; KOPYLEV, B.A.; VARSHAVSKIY, V.L.

Various reagents for the floatability of gypsum and dicalcium phosphate. Izv.vys.ucheb.zav.; khim.i khim.tekh. 2 no.3: 412-419 '59. (MIRA 13:3)

1. Leningradskiy tekhnologicheskiy institut imeni Lensoveta, kafedra tekhnologii neorganicheskikh veshchestv.
(Gypsum) (Calcium phosphate) (Flotation)

POZIN, M.Ye.; KOPYLEV, B.A.; VARSHAVSKIY, V.L.; PINTER, I.

Crystallization of calcium sulfate in the reaction of monocalcium phosphate with sulfuric acid in a phosphoric acid medium. Zhur. prikl.khim. 34 no.11:2384-2390 N '61. (MIRA 15:1)

1. Leningradskiy tekhnologicheskiy institut imeni Lensoveta.
(Calcium sulfate)

VARSHAVSKIY, V.L.

Interuniversity Scientific Conference devoted to the development of the new methods of manufacturing mineral fertilizers. Znur.-prikl.khim. 35 no.12:2805-2806 D '62. (MIRA 16:5)

(Fertilizers and manures--Congresses)

VARSHAVSKIY, V. L.

Interuniversity Scientific Conference of Departments of the
Technology of Inorganic Substances devoted to the development
of new methods of the production of mineral fertilizers.
Zhur. VKHO 8 no.2:221-222 '63. (MIRA 16:4)

(Fertilizers and manures--Congresses)

ARNAUTOV, V.T.; BARANOV, V.M.; DONSKOY, S.A.; PASTUKHOV, A.I.; SMIRNOV, L.A.; TORSHILOV, Yu.V.; TRET'YAKOV, M.A.; UDOVENKO, V.G.; FREYDENZON, Ye.Z.; SHCHEKALEV, Yu.S.; Prinimali uchastiye: MAKAYEV, S.V.; KOMPANIYETS, G.M.; NAGOVITSYN, D.F.; NOVOLODSKIY, P.I.; VARSHAVSKIY, V.L.; KOROGCDSKIY, V.G.; KLIBANOV, Ye.L.: MEDVEDEVSKIKH, Yu.; TALANTSEVA, T.I.; DUBROV, N.F.; DZEMYAN, S.K.; TOPYCHKANOV, B.I.; CHARUSHNIKOV, O.A.; KHARITONOV, Yu.A.

Developing and mastering the technology of converting vanadium cast iron in oxygen-blown converters with a 100 ton (Mg) capacity. Stal' 25 no.6:504-508 Je '65. (MIRA 18:6)

1. Nizhne-Tagil'skiy metallurgicheskiy kombinat (for Makayev, Kompaniyets, Nagovitsyn, Novolodskiy, Varshavskiy, Korogodskiy, Klibanov, Medvedevskikh, Talantseva). 2. Ural'skiy nauchno-issledovatel'skiy institut chenykh metallov (for Dubrov, Dzemyan, Topychkanov, Charushnikov, Kharitonov).

ACCESSION NR: AP5020231 [illegible]

UR/0069/65/027/004/0593/0597
541.18.046.8

AUTHORS: Pozin, M. Ye.; Kopylev, B. A.; Yefremov, I. F.; Varshavskiy, V. L.; Markovich, A. S.

TITLE: Coagulation processes in the manufacture of superphosphates

SOURCE: Kolloidnyy zhurnal, v. 27, no. 4, 1965, 593-597

TOPIC TAGS: superphosphate, phosphorus compound, fertilizer, potassium compound, calcium sulfate

ABSTRACT: The mechanism of potassium sulfate deposition on apatite granules in the manufacture of superphosphates was investigated to determine the effect of the particle size on this process. The electrokinetic [illegible] other minerals in the superphosphate [illegible]

[illegible]

10-15 μ show a [illegible]

Card 1/2

L 63833-65

ACCESSION NR: AP5020231

and form no slime coatings which retard [illegible] tion is a result of the [illegible] forces at [illegible] value; in sulfuric acid its [illegible]

ASSOCIATION: Dnepropetrovskiy [illegible] Engineering Institute [illegible]

SUBMITTED: 09Mar64 ENCL: 00 SUB CODE: GC, IC

NO REF SOV: 009 OTHER: 003

Card 2/2 Jlk

NIKITENKO, M.D., inzh.; SURIN, P.P., inzh.; VARSHAVSKIY, V.L., inzh.

Manganese content of E11, E12 and E13 electrical steel. Stal' 21 no. 1:30-31 Ja '61.
(MIRA 14:1)

1. Alpayevskiy metallurgicheskiy kombinat.
(Manganese steel---Electric properties)

VARSHAVSKIY, V.L.; BEDRIK, I.A.

Rapid ramming of new hearths. Metallurg 8 no.5:13 My '63.
(MIRA 16:7)

1. Starshiy inzh. tekhnicheskogo otdela Alapayevskogo metallurgicheskogo kombinata (for Varshavskiy). 2. Starshiy master martenovskogo tsekha Alapayevskogo metallurgicheskogo kombinata (for Bedrik).

(Open-hearth furnaces—Maintenance and repair)

S/183/62/000/004/001/001
B117/B144

AUTHORS: Sigal, M. B., Varshavskiy, V. Ya., Koziorova, T. N.

TITLE: Determination of fiber-forming properties of new polymers

PERIODICAL: Khimicheskiye volokna, no. 4, 1962, 21 - 24

TEXT: The author's method and apparatus described earlier (Khim. volokna, no. 5, 29 (1959)) are superior to those more recently reported (Man-Made Text., 38, no. 439, 71 (1961)) in that they need a minimum of only 1 g polymer as against 25 g. The improved device allowed considerable variations in the conditions for fiber formation from the melt and stretching, these processes being conducted either continuously or individually. The reliability and reproduceability of the method was checked with a standard polycaprolactam fiber. The fiber-forming properties of some new polymers produced in the VNIIV, Institut elementoorganicheskikh soyedineniy AN SSSR (Institute of Elemental Organic Compounds AS USSR) and other institutions were determined. The best of these, yielding strong, elastic, and stretchable fibers, were: polyamide on the basis of n-amino-ethyl-phenyl acetic acid, copolymer of octamethylene diamine salt and hexahydro terephthalic acid (72 %) containing 28 % caprolactam, a polyamide on the basis of non-

Card 1/2

Determination of fiber-forming ...

S/183/62/000/004/001/001
B117/B144

amethylene diamine salt and hexahydro terephthalic acid, which is plasticized with o-oxydiphenyl (10 % of the polymer weight). There are 1 figure and 1 table.

ASSOCIATION: VNIIV

SUBMITTED: December 12, 1961

Card 2/2

VARSHAVSKIY, V.Ya.; SIGAL, M.B.

Polyformaldehyde, a new raw material for synthetic fibers. Khim.volok. no.1:5-9 '63. (MIRA 16:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna.
(Formaldehyde) (Textile fibers, Synthetic)

SIGAL, M.B.; SHABLYGIN, M.V.; VARSHAVSKIY, V.Ya.

Use of the infrared spectroscopy method for studying "polifen" fibers. Khim. volok. no.2:25-27 '65. (MIRA 18:6)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna.

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3

Absorption spectra of solutions of nitrophenols and polynitrophenols in water-free hydrazine. Ya. M. Varshavskii and A. I. Shatenshtein. *J. Phys. Chem.* (U.S.S.R.) 22, 475-82(1948)(in Russian). cf. preceding abstr.—The spectra are similar to those in 0.005 *N* NaOH, but the maxima are shifted toward the red for *m*-nitrophenol (120 mμ) > 3.5- > 2.5- > 2.4- > *o*- > 2.6- > *p* (43 mμ). As these shifts are greater than those in NH_3, they probably are due to formation of mol. compds. between phenolate ions and the basic solvent. If they were due to ionic assocn., they would have been smaller in N_2H_4, which has a greater dielec. const. than NH_3. An *app.* for prepg. solns. without contact with air is described.

J. J. Bikerman

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3

Absorption spectra of solutions of aromatic nitro compounds in solvents having labile hydrogen atoms. A.
Shatenshtein and Ya. M. Varshavskii (Karpov Inst.
Phys.-Chem., Moscow). *J. Phys. Chem.* (U.S.S.R.)
22, 529-39(1948); cf. preceding abstr. The hypothesis
attributing the coloration of nitro-compd. solns. in NH_3,
etc., to complex formation between acidic solutes and basic
solvents is confirmed by detg. the spectra in other solvents
having labile H atoms. This hypothesis accounts for the
color reaction of Janovsky (*Ber.* 24, 971(1891)). The
spectra of nitrated phenols in alk. acetone are very similar
to those in 0.005 *N* NaOH, but the max. are shifted to-
ward the red for 2,5-dinitrophenol (65 and 17 mμ for the
two bands) > *m*-nitrophenol > 3,5- > 2,6- > *p*- > 2,4- >
picric acid > *o*-nitrophenol (16 mμ). The spectra be-
tween 450 and 680 mμ of a dinitroxylene (m p. 90°), *m*-
dinitrobenzene, 2,4-dinitrotoluene, and 2,4-dinitroanisole
in liquid NH_3 and in 0.0005 *N* NaOH in acetone are simi-
lar. The absorption max. of the fresh solns. are at 635 (in
NH_3) and 652 (in acetone), 555 and 568, 558 and 578,
and 530 and 555 mμ; the position of the max. varies little
but the intensity of coloration decreases strongly with
time (hrs.).

J. J. Bikerman

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

22

Determination of aromatic hydrocarbons C_6-C_8 in cracked gasoline by absorption spectra. Ya. M. Varshavskii (Moscow State Univ.). *Zavodskaya Lab.* 15, 1170-6 (1949). By using 2011 and 2517 A. bands for C_6H_6 and 2690 A. for MePh good analyses of cracked gasoline were performed; accuracy for C_6H_6 is within 0-20%; if MePh is present the error is somewhat higher. For EtPh the error is 12-22%, while for xylenes it is 11-30%. The results are of sufficient accuracy for most practical purposes. G. M. Kosolapoff

SHATENSHTEYN, A. I., <u>VARSHAVSKIY, YA. M.</u>

Chlorofluoroethane

Physicochemical constants of 1,2-chlorofluoroethane. Zhur. ob. khim. 22 no. 7, 1952.

Monthly List of Russian Accessions, Library of Congress, November 1952. Unclassified.

VARSHAVSKIY, YA. M.

USSR/Chemistry - Reaction, Kinetics 1 Jul 52
Denterium

"The Reaction Capacity of Some Aromatic Compounds,"
A. I. Shatenshtein, Ya. M. Varshavskiy

"Dok Ak Nauk SSSR" Vol LXXXV, No 1, pp 157-160

A study of the reaction capacity of org substances as related to their constitution and the nature of the reaction medium is conducted by measuring the rate of isotopic exchange of hydrogen. In this work a systematic investigation of exchange reactions of aromatic org.substances in acid medium is begun. The solvent used is deuterium bromide. For the study in alk medium, deuteroammonia is used. Presented by Acad A. N. Frumkin 7 May 52. 224T23

SIMONS, Joseph, 1897- [redaktor]; KNUNYANTS, I.L., chlen-korrespondent [redaktor]; VARSHAVSKIY, Ya.M., kandidat khimicheskikh nauk [redaktor].

[Fluorine and its compounds] Ftor i ego soedineniia. Volume 1. Perevod s angliiskogo, pod red. I.L.Knuniantsa i IA.M.Varshavskogo. Moskva, Izd-vo inostrannoi lit-ry, 1953- . (MLRA 6:8)

1. Akademiya nauk SSSR (for Knunyants). (Fluorine)

MELLON, Melvin Guy, 1893- [author]; IL'INAYA, A.A.; VARSHAVSKIY, Ya.M. [translators]; SHPOL'SKIY, E.V. [redaktor].

[Absorbtion spectroscopy; collection of articles] Absorbtsionnaia spektroskopiia; sbornik statei. Perevod s angliiskogo A.A.Il'inoi i IA.M.Varshavskogo, pod red. E.B.Shpol'skogo. Moskva, Izd-vo inostrannoi lit-ry, 1953. 375 p.
(MLRA 6:8)
(Spectrum analysis)

VARSHAVSKIY, Ya. M.

Investigation of the reactivity of aromatic compounds by the method of isotopic exchange with deuterium bromide. V. R. Kalinachenko, Ya. M. Varshavskiy, and A. I. Shatenshteyn. Doklady Akad. Nauk S.S.S.R. 91, 577-80, (1953); cf. C. A. 46, 9395.

VARSHAVSKIY, Ya. M.

Nuclear Science Abstracts
July 15, 1954
Chemistry

ISOTOPIC EXCHANGE OF HYDROGEN IN HYDROCARBONS IN A LIQUID MEDIUM OF DEUTERIUM FLUORIDE. Ya. M. Varshavskii and A. I. Shatenshtein. Doklady Akad. Nauk S.S.S.R. 91, 297(1953) Mar. 11. (In Russian)

The mechanism of the rate of D exchange between D-enriched HF and hydrocarbons was investigated. D-enriched HF was produced by the isotopic exchange reaction of HF and heavy water. Isotopic exchange was measured between DF and the hydrocarbons benzene, toluene, anthracene, phenyl methyl ester, dimethylaniline, naphthaline, phenanthrene, diphenyl methane, triphenyl methane, chlorobenzene, tetraline, decalin, cyclohexane, methylcyclohexane, hexane, and heptane. The rate of exchange is explained by the probable generation of fluorine oxide during the preparation of D-enriched HF. (J.S.R.)

9-17-54

VARSHAVSKIY, Ia. M.

AUDRIETH, Ludwig Frederick; OGG, Betty Ackerson; YAKOVLEVA, Ye.A.[translator];
VARSHAVSKIY, Ya.M., redaktor; SARATOVA, , M.V., redaktor; POPOV, V.I.,
redaktor GERASIMOVA, Ye.S., tekhnicheskiy redaktor

[The chemistry of hydrazine. Translation from the English] Khimiia gidrazina. Perevod s angliiskogo E.A.IAkovlevoi. Pod red. IA.M. Varshavskogo. Moskva, Izd-vo inostrannoi lit-ry, 1954. 237 p.
(Hydrazine) (MIRA 8:4)

VARSHAVSKIY, Ya.M.

TERENT'YEVA, Yev.A.

"Quantitative ultramicroanalysis." P.Kirk. Translated by IA.M.Varshavskii; I.P.Alimarin ed. Reviewed by E.A.Terent'eva. Usp.khim. 23 no.4:524-526 '54. (MLRA 7:7)
(Chemistry, Analytical--Quantitative) (Kirk, Paul)
(Microchemistry)

VARSHAVSKIY, Ya. M.

62

Hydrogen isotope interchange in hydrocarbons in a liquid deuterium fluoride medium. Ya. M. Varshavskii and A. I. Shatenshtein. *Doklady Akad. Nauk S.S.S.R.* 95, 297-9 (1954).—The effect was studied of the dielec. const. of the medium on the mechanism of double exchange reactions. Because of the high dielec. const. of HF (175 at −78°, 84 at 0°), DF was selected as the solvent (dielec. const. of HBr 6 at −80°), and was expected to favor the ionization of hydrocarbons, which was confirmed by Kilpatrick and Luborsky (*C.A.* 47, 7867*e*). The soly. of the samples of hydrocarbons (0.2 g. in 20 g. HF) was tested, and benzene, toluene, anthracene, anisole, and dimethylaniline were sol. at 25 and 50°, whereas naphthalene, phenanthrene, Ph_2CH_2, Ph_3CH, PhCl, Tetralin, Decalin, cyclohexane, hexane, and heptane were either only partially sol. or insol. The D-exchange rate const. in benzene in a DF soln. is on the order of 10^4 greater than in HBr. The H atoms in the toluene side-chain were not exchanged for D in 1000 hrs., whereas all the ring atoms were exchanged in 15 min. at 25°. BF_3 addn. to DF accelerates the exchange, as found with cyclohexane, which exchanged its H atoms only slowly in the absence of BF_3. The H atoms connected to tertiary C atoms are readily exchanged for D. The method of prepn. of DF may not have excluded the possibility of formation of F_2O, which, being an oxidizing agent, could have accelerated the exchange. W. M. Sternberg ①

VARSHAVSKIY, Ya. M.

USSR.

5281

ON THE DISTRIBUTION OF DEUTERIUM DURING ISOTOPIC EXCHANGE WITH HYDROGEN. Ya. M. Varshavskii and S. E. Vaisbery (Karpov Physico-Chemical Inst., Moscow). Zhur. Fiz. Khim. 29, 523-32(1955) Mar. (In Russian)

Factors of the distribution-coefficient functions for D between two-component systems of all combinations of H_2, CH_4, C_2H_6, C_2H_2, C_6H_6, NH_3, H_2O, HF, PH_3, H_2S, HCl, AsH_3, H_2Se, HBr, and HI are evaluated in relation to the spectra of the compounds and the position in the periodic table of the component elements. (G.Y.)

liquid deuterium fluoride. It is suggested that the isotopic exchange of hydrogen in liquid [illegible]
[illegible]

VARSHAVSKIY, YA.M.

USSR/ Chemistry - Physical chemistry

Card 1/2 Pub. 22 - 25/50

Authors : Varshavskiy, Ya. M., and Vaysberg, S. E.

Title : About rules governing the equilibrium distribution of deuterium during isotopic hydrogen interchange reactions

Periodical : Dok. AN SSSR 100/1, 97-100, Jan 1, 1955

Abstract : Experiments show that the maximum possible deuterium distribution coefficient should occur during isotopic hydrogen exchange between the hydride of the most heavy alkali metal and one of the non-metal compounds of the first period. The equilibrium constant of the interchange reaction depends upon the nature of the statistical deuterium distribution between the reacting molecules and upon the various degree of hetero-dynamism of the

Institution : The L. Ya. Karpov Scientific Research Phys-Chemical Institute

Presented by: Academician V. A. Kargin, July 27, 1954

Periodical : Dok. AN SSSR 100/1, 97-100, Jan 1, 1955

Card 2/2 : Pub. 22 - 25/50

Abstract : hydrogen isotopes in the molecules of both substances. It was established that the very same deuterium distribution rules pertain also to tritium as well as isotopes of other monovalent elements except that the distribution effects will be different. Five references: 4 USSR and 1 USA (1947-1954). Tables; diagram.

SIMONS, J.H., editor; KNUNYANTS, I.L., akademik, redaktor; VARSHAVSKIY, Ya.M., kandidat khimicheskikh nauk, redaktor; ZAKHAR'YEVSKIY, V.A., redaktor; GRIBOVA, M.P., tekhnicheskiy redaktor

[Fluorine chemistry. Translated from the English] Ftor i ego soedineniia. Perevod s angliiskogo. Pod red. I.L.Knuniantsa i IA.M.Varshavskogo. Moskva, Izd-vo inostrannoi lit-ry, Vol.2. 1956. 495 p. (MIRA 9:11)
(Fluorine)

VARSHAVSKIY, YA. M.

SHATENSHTEYN, A.I.; VARSHAVSKIY, Ya.M. [redacted]

Methods of isotopic analysis of water. Part 1: New apparatus for density measurement by the dropping method. Zhur. anal. khim. 11 no.6:746-748 N-D '56. (MLRA 10:6)

1. Fiziko-khimicheskiy institut im. L.Ya. Karpova, Moskva.
(Water) (Specific gravity)

HYDRO

VARSHAVSKIY, Ya.M.

980

4/

140

[illegible] OF THE DISTRIBUTION COEFFICIENT [illegible]

[illegible] try). Zhur. Fiz. Khim. 30, 1647-51(1956) July. (In Russian)

[illegible]

[illegible]

:FH

VARSHAVSKIY, Ya M.

SHATENSHTEYN, A.I.; KALINACHENKO, V.R.: VARSHAVSKIY, Ya.M.

Hydrogen exchange between benzene and naphthalene derivatives and liquid deuterium bromide [with English summary in insert]. Zhur. fiz.khim. 30 no.9:2098-2105 S '56. (MIRA 9:12)

1. Fiziko-khimicheskiy institut imeni L.Ya. Karpova, Moskva. (Hydrocarbons) (Hydrobromic acid-d)

Name: VARSHAVSKIY, Yakov Mikhaylovich

Dissertation: Investigation of reactions of isotope exchange of hydrogen

Degree: Doc Chem Sci

Affiliation: /Not indicated/

Defense Date, Place: 30 Dec 56, Council of Order of Labor Red Banner Sci Res Phys-Chem Inst imeni Karpov

Certification Date: 20 Apr 57

Source: BMVO 14/57

VARSHAVSKIY, YA.M.

SHATENSHTEYN, A.I.; ZVYAGINTSEVA, Ye.N.; YAKOVLEVA, Ye.A.; IZRAILEVICH, Ye.A.;
VARSHAVSKIY, Ya.M.; LOZHKINA, M.G.; VEDENEYEV, A.V.

Acid-base catalysis of the hydrogen isotope exchange reaction. Probl. kin. i kat. 9:218-233 '57. (MIRA 11:3)
(Catalysis) (Hydrogen--Isotopes)

~~VARSHAV~~ VARSHAVSKII, YA. M.

ROGINSKIY, S.Z.; BRODSKIY, A.I.; VARSHAVSKIY, Ya.M.

Discussion. Probl. kin. i kat. 9:369-370 '57. (MIRA 11:3)
(Chemical reaction, Rate of) (Isotopes)

VARSHAVSKIY, Ya.M.

The influence of thermodynamic isotope effect on the kinetics of the substitution reaction. Probl. kin. i kat. 9:363-368 '57. (MIRA 11:3)
(Chemical reaction, Rate of) (Isotopes)

[illegible]

SHATENSHTEYN, A.I.; VARSHAVSKIY, Ya.M.

Methods for isotopic analysis of water. Report No.3. The complete isotopic analysis of water by decomposition with iron [with summary in English]. Zhur.anal.khim. 12 no.2:236-239 Mr-Ap '57. (MLRA 10:7)

1. Fiziko-khimicheskiy institut im. L.Ya. Karpova, Moskva.
(Water--Analysis) (Oxygen--Isotopes) (Hydrogen--Isotopes)

A rapid semi-micro method for complete isotopic analysis of water is described. In combination with the drop determination of density the method permits separate determination of heavy isotopes of O^{17} and H (deuterium)^{17} in samples with any content of deuterium.

VARSHAVSKIY, Ya. M.

AUTHORS: **Varshavskiy**, Ya. M., and Vaysberg, S. E., (Moscow). 74-12-4/4

TITLE: Thermodynamic and Kinetic Peculiarities of the Isotope-Exchange-Reaction of Hydrogen (Termodinamicheskiye i kineticheskiye osobennosti reaktsii izotopnogo obmena vodoroda).

PERIODICAL: Uspekhi Khimii, 1957, Vol. 26, Nr 12, pp. 1434-1468 (USSR).

ABSTRACT: Deuterium is of particularly great importance especially in organic chemistry, because it makes it possible to determine the way taken by hydrogen in chemical reactions by means of marked atoms. The exchange velocity can serve as a criterion for the structure and the preparedness of reaction of various substances. The article comprises the most important research results in the field of the thermodynamics and kinetics of the isotope exchange reaction of hydrogen; in this connection also general rules governing isotope exchange reaction are derived. The following chapters are dealt with:

I) The thermodynamics of isotope exchange.

a) The connection between the distribution coefficient of isotopes and the equilibrium constant of the isotope exchange reaction.

b) Methods for the statistical computation of equilibrium in isotope exchange.

c) Rules governing the deuterium distribution in the isotope ex-

Card 1/2

Thermodynamic and Kinetic Peculiarities of the Isotope-Exchange- 74-12-4/4
Reaction of Hydrogen.

change of hydrogen.

d) Experimental data concerning the distribution of the equilibrium of deuterium in isotope exchange reactions of hydrogen.

II) Some details concerning the reaction kinetics of isotope exchange:

a) General problems,

b) On the kinetic equation of the isotope reaction.

c) Limits of the applicability of the kinetic equation of first order.

There are 2 figures, 5 tables, and 76 references, 36 of which are Slavic.

AVAILABLE: Library of Congress.

1. Hydrogen-Reaction 2. Isotope exchange-Thermodynamics

Card 2/2

USCOMM-DC-54784

VARSHAVSKIY, Ya. M.

"A Method For Investigating the Reactions of Hydrogen Isotope Exchange in a Liquid Deuterium Fluoride Medium," by Ya. M. Varshavskiy and M. G. Lozhkina, Physico-Chemical Institute imeni L. Ya. Karpov, Zhurnal Fizicheskoy Khimii, Vol 31, No 4, Apr 57, pp 911-914

A description is given of a method for obtaining pure liquid hydrogen fluoride enriched with deuterium and of a procedure for hydrogen isotope exchange studies in this solvent. The deuterium fluoride was prepared by the thermal decomposition of KF.DF. The equipment used and methods for preventing corrosion by hydrogen fluoride and escape of hydrogen fluoride and boron trifluoride are described in detail. The equipment was constructed of monel and fluorine plastics. (U)

Sum. IN 1451

AUTHORS: Varshavskiy, Ya. M., Shatenshteyn, A. I. 75-13-3-6/27

TITLE: A Photographic Method for Measuring the Color Intensity of a Solution in Small Volumes (Fotograficheskiy metod izmereniya intensivnosti okraski rastvora pri malykh ob"yemakh)

PERIODICAL: Zhurnal analiticheskoy khimii, 1958, Vol 13, Nr 3, pp. 294 - 298 (USSR)

ABSTRACT: For determining very small amounts of a compound by means of ultramicrochemical methods (References 1,2) microspectrophotometry can also be successfully employed, as due to its high sensitivity it is possible to work with very diluted solutions. In publications some types of microcuvettes were described which can in connection with a photometer (mainly with the electrical spectrophotometer СФ -4) be used for measuring the color intensity of very small amounts in a solution (References 3,4). In the present paper a simple device for a photographic method of measuring the color intensity of a solution is described. Capillary cuvettes with a volume of 0,05-0,1 ml were used. 2 cuvettes, one of them containing the solution to be investigated, and the other a comparison solution with lower color

Card 1/3

A Photographic Method for Measuring the Color Intensity 75-13-3-6/27
of a Solution in Small Volumes

intensity are directly beside each other fastened in front of a photographic plate (the axis of the capillary cuvettes lie at a right angle to the plate). A beam of parallel light rays first goes through the cuvettes and then blackens the plate. The intensity of blackening depends on the light used and on the concentration of the solution. In front of the comparison cuvette a controllable light-absorption device is fastened by which an equal blackening of the plate for both cuvettes can be obtained. The absorption of the solution to be investigated is then equal to the absorption of the light-absorption device. When the corresponding absorption is determined for every position of the light-absorption device the concentration of the solution to be investigated can be immediately determined from Beer's law without using a calibration curve. The construction of the device used, which is drawn in the paper, is described in detail. The cuvettes, the light-absorption device and the measuring method are also described in detail. There are 4 figures and 5 references, 3 of which are Soviet.

Card 2/3

A Photographic Method for Measuring the Color Intensity 75-13-3-6/27
of a Solution in Small Volumes

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova, Moskva (Moscow, Physical-Chemical Institute imeni L. Ya. Karpov)

SUBMITTED: June 21, 1956

1. Solutions--Spectrographic analysis

Card 3/3

AUTHORS: Varshavskiy, Ya. M., Vaysberg, S. E. 76-32-2-32/38

TITLE: On the Limits of Applicability of the First Order Kinetic Equation for Isotopic Exchange Reactions (O granitsakh primenimosti kineticheskogo uravneniya pervogo poryadka dlya reaktsiy izotopnogo obmena)

PERIODICAL: Zhurnal Fizicheskoy Khimii, 1958, Vol. 32, Nr 2, pp. 454-459 (USSR).

[illegible]

ABSTRACT: The authors investigate the problem concerning the limits of applicability of first order equations for reactions of isotopic exchange in dependence upon the degree of deviation of the quantity α (distribution coefficient of isotopes) from unity. The investigation is carried out with the example of a bimolecular reaction where any dissociation reaction intendedly is expressed by a first order equation (as its velocity is limited by the dissocoiation of a component), the greatest part of the association reaction, however, apparently still is bimolecular. The kinetic equation for the reaction of isotopic exchange (taking place according to bimolecular mechanism) is deduced. It is shown that this equation is one of second order and practically becomes

Card 1/3

On the Limits of Applicability of the First Order Kinetic Equation for Isotopic Exchange Reactions

76-32-2-32/38

a first order equation only on certain conditions. For this, one of the following three conditions is sufficient: 1. - When the coefficient of equilibrium distribu tion of the isotopes is close to unity. 2. - A small concentration of that component in which the accumulation of the respective isotope is measured. 3. - Small concentration of that isotope in the system the accumulation of which is measured in the respective component. It is shown that the deviation of the velocity constant of the bimolecular reaction in the isotopic exchange continuously increases from the velocity constant calculated according to the first order equation with the increase of the exchange proportion, and that it tends towards a certain maximum. This maximum is not greater than twice the minimum value corresponding to the beginning of the exchange. For a number of values of the isotopic distribution coefficient the corresponding maximum deviations are calculated which practically can occur within the range of the concentration changes of the component and of the isotopes. The extent of this deviation makes it possible to estimate the degree of non-conformity between the velocity constant and the kinetic equation of first order and to determine the limits of applicability of this equation.

Card 2/3

On the Limits of Applicability of the First Order Kinetic Equation for Isotopic Exchange Reactions

76-32-2-32/38

There are 2 figures, and 12 references, 5 of which are Soviet.

ASSOCIATION: Physico-chemical Institute imeni L. Ya. Karpov, Moscow
(Fiziko-khimicheskiy institut im. L. Ya. Karpova, Moskva)

SUBMITTED: April 15, 1957.

1. Exchange reactions--Mathematical analysis

Card 3/3

Varshavskiy, Ya. M.

20-2-31/60

AUTHORS: Varshavskiy, Ya. M., Vasil'yev, G. Ya., Karpov, V. L., Lazurkin, Yu. S., Petrov, I. Ya.,

TITLE: On Isotopic Exchange Between Gaseous Hydrogen and Solid Polymers Under the Action of Nuclear Radiation (Ob izotopnom obmene mezhdu gazoobraznym vodorodom i tverdymi polimerami pri deystvii yadernykh izlucheniy)

PERIODICAL: Doklady AN SSSR, 1958, Vol. 118, Nr 2, pp. 315-316 (USSR)

ABSTRACT: In the case of irradiation of polymeric hydrocarbons gaseous products, which mainly conatain hydrogen, are separated out. The explanation of the problem of the reversibility of the corresponding process, i.e. of the possibility of the penetration of hydrogen from the gaseous phase into the molecules of the polymer during the irradiation would be desirable. The authors tried to explain this problem by the method of the marked atoms, using deuterium; they studied the exchange of isotopes between the gaseous deuterium and various solid polymers in the radiation field of a nuclear rector. The following polymers of the vinyl-series were examined: Polyethylene, polypropylene, polystyrol, divinyl-caoutchouc, polymethyl-metacrylate. The performance of

Card 1/3

On Isotopic Exchange Between Gaseous Hydrogen and Solid Polymers Under the Action of Nuclear Radiation

2o-2-31/6o

the measurements is described shortly. A table illustrates the effectively found percentage of deuterium in the above given polymerics after the irradiation. The results of various parallel measurements differ at the most for o,o2 per cent. On occasion of all these polymers it was shown in particular that the penetration of deuterium is not connected with the adsorption of gaseous deuterium. The control tests, which were made for this purpose, showed that, if there is no radiation, no dueterium was found in the polymer. The effects, observed here, obviously are cuased by a chemical interaction between the molecules of the polymer and the molecules of the deuterium on occasion of the action of deuterium. The highest quantity of deuterium penetrated into polyethylene and into polypropylene. In polybutadiene and polystyrol the exchange is some what slower, whereas in the case of polymethyl-metacrylate no signs were noticed of an exchange. At present a mechanism with the formation of free radicals, is assumed for polyethylene: $R\text{-}CH_2\text{-}R_1\text{-}\sim \rightarrow R\text{-}\dot{C}H\text{-}R_1 + H$.Probably the deuterium penetrates in the case examined here because of a reaction between a polymeric radical and a deuterium molecule into the polymer: $\dot{R} + D_2 \longrightarrow RD + D$, $RH + D \longrightarrow \dot{R} + HD$. The equili-

Card 2/3

On Isotopic Exchange Between Gaseous Hydrogen and Solid Polymers Under the Action of Nuclear Radiation 20-2-31/60

brium concentration of the solved deutrium in the polymer has the order of 10^{-6} mol/g.The penetration of deuterium into the molecules of the polymers may, to some degree, also be caused by exchange of isotopes between the gaseous dueterium and the free radicals. There are 1 table, and 5 references, 4 of which are Slavic.

PRESENTED: June 24, 1957, by V.A. Kargin, **Academician**

SUBMITTED: June 24, 1957

AVAILABLE: Library of Congress

Card 3/3

5(4)

AUTHORS: ~~Varshavskiy, Ya. M.,~~ Vaysberg, S. E., Trubitsyn, B. A. SOV/20-122-5-23/56

TITLE: The Equilibrium Distribution of Deuterium in Hydrogen Exchange With Liquid Hydrogen Chloride (Ravnovesnoye raspredeleniye deyteriya pri vodorodnom obmene s zhidkim khloristym vodorodom)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 5, pp 831 - 833 (USSR)

ABSTRACT: The present paper deals with the first investigation of the deuterium exchange in liquid hydrogen chloride; the isotope-equilibria in several systems which contain hydrogen chloride are investigated. Some earlier papers are first discussed. It was of importance, above all, to obtain a reliable value of the distribution coefficient α of the deuterium for the isotopic equilibrium between hydrogen chloride and the aromatic C-H-bond and to compare its value with that of α for the case of an O-H bond and an aliphatic C-H bond. Knowledge of these quantities

Card 1/3

is of importance also for the investigation of deuteron exchange with liquid hydrogen chloride at present being carried out by the authors. The authors investigated the equilibrium distribution between hydrogen chloride and benzene, cyclopentane, and also water. These investigations were carried out on liquid-phase systems under pressure. After the establishment of equilibrium, the liquid hydrogen was vaporized and the water obtained by neutralization was then investigated with respect to its deuterium content. The carrying out of measurements is discussed in short. In isotope-exchange, equilibrium was attained from both sides by carrying out experiments with direct and inverse exchange. The tests concerning isotope exchange in hydrocarbons were carried out with an aluminum-chloride catalysis. The data thus obtained are compiled in a table. They permit the following conclusion to be drawn: At one and the same temperature the values obtained for the isotope

The Equilibrium Distribution of Deuterium in Hydrogen Exchange With Liquid Hydrogen Chloride SOV/20-122-5-23/56

exchange of hydrogen chloride with compounds containing an O-H bond and also an aromatic or aliphatic O-H bond are found to agree in practice. The hydrogen exchange (in the presence of $AlCl_3$) between liquid hydrogen chloride and a saturated hydrocarbon that contains no third carbon atom is of special interest. Liquid hydrogen chloride is suited for the investigation of the suitability of organic compounds for the reactions of electrophile substitution by the method of deuteron exchange. There are 1 figure and 12 references, 9 of which are Soviet.

ASSOCIATION: Fiziko-khimicheskiy institut im.L.Ya.Karpova (Physico-Chemical Institute imeni L.Ya.Karpov)
PRESENTED: June 9, 1958, by V.A.Kargin, Academician
SUBMITTED: June 9, 1958

Card 3/3

VARSHAVSKIY, Ya.M.

Nature and mechanism of electrophilic hydrogen exchange. Probl.fiz.khim. no.2:61-96 '59. (MIRA 13:7)

1. Laboratoriya khimicheskoy reaktsionnosti i polimorizatsii Nauchno-issledovatel'skogo fiziko-khimicheskogo instituta imeni L.Ya. Karpova. (Deuterium) (Hydrogen)

VARSHAVSKIY, Ya.M., doktor khimicheskikh nauk; VAYSBERG, S.E., kand. khimicheskikh nauk

Present-day methods for producing heavy water. Khim.nauka i prom. 4 no.4:498-509 '59. (MIRA 13:8)
(Deuterium oxide)

66428

~~5(4)~~ 5.2400(H), 5.3200

SOV/20-128-6-33/63

AUTHORS: Alikhanov, P. P., Varshavskiy, Ya. M.

TITLE: Equilibrium Distribution of Deuterium on Hydrogen Exchange With Liquid Deuterium Iodide

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 6, pp 1214-1216 (USSR)

ABSTRACT: This paper belongs to a series of investigations of the isotope equilibria in various systems of hydrogenous compounds (Refs 1-4). An investigation is made of the exchange reaction between the aromatic C-H bond and the deuterium-containing HJ. Benzene, which would be well suited for this investigation because of the equivalence of all H atoms, reacts too slowly so that diphenyl had to be used. In the dissolution of diphenyl in liquid hydrogen iodide the 6 H-atoms in ortho- and para-position are easily exchanged while the 4 H-atoms in meta-position virtually did not react. The deuterium concentration in HJ was determined by analysis of the water obtained by decomposition of HJ in the nitrogen current over CuO at 350 - 400°. The reaction with diphenyl took place in sealed glass tubes at a pressure of 4 - 15 atm. After equilibration had been reached, the HJ was evaporated, the diphenyl in the oxygen current was burnt, and

66428

SOV/20-128-6-33/63

Equilibrium Distribution of Deuterium on Hydrogen Exchange With Liquid Deuterium Iodide

the deuterium content of the water obtained was determined. The resulting distribution coefficient α was checked by the counter-reaction of D-substituted diphenyl in ortho- and para-position with HJ. The experimental data on α are compared in the table with the values calculated by means of the formulas contained in reference 8. The values coincide well. As is shown in figure 1, good agreement was also obtained for the other hydrogen halides (Refs 2-4). In the present paper the following values are given for the equilibrium coefficient α: $\alpha_{0^0} = 4.07$, $\alpha_{25^0} = 3.47$ and $\alpha_{50^0} = 3.13$. There are 1 figure, 1 table, and 9 Soviet references.

ASSOCIATION: Nauchno-issledovatel'skiy fiziko-khimicheskiy institut im. L. Ya. Karpova (Scientific Research Institute of Physical Chemistry imeni L. Ya. Karpov)

PRESENTED: June 19, 1959, by S. S. Medvedev, Academician

SUBMITTED: April 13, 1959

Card 2/2

GRECHKO, V.V.; SHKARENKOVA, L.S.; VARSHAVSKIY, Ya.M.

Heat denaturation of DNA in heavy water. Biokhimiia 28 no.6:1059-1064 N-D'63 (MIRA 17:1)

1. Institute of Radiation and Physical-Chemical Biology, Academy of Sciences of the U.S.S.R., Moscow.

VARSHAVSKIY, Ya.M., doktor khim.nauk, red.; **GEL'BSHTEYN, A.I.**, kand. khim.nauk [translator]; **SHUB, D.M.**, kand.khim.nauk [translator]; **SHEGLOV, O.F.**, kand.khim.nauk [translator]; **ARNOL'DOV, V.V.**, red.; **IOVLEVA, N.A.**, tekhn.red.

[Catalytic, photochemical, and electrolytic reactions] Kataliticheskie, fotokhimicheskie i elektroliticheskie reaktsii. Moskva, Izd-vo inostr.lit-ry, 1960. 436 p. Translated from the English. (MIRA 13:11)

(Chemical reactions)

KITOVA, A.I.; VARSHAVSKIY, Ya.M.

Electron absorption spectra of solutions of aromatic hydrocarbons in liquid HCl in the presence of $AlCl_3$. Dokl. AN SSSR 135 no.6:1395-1398 D '60. (MIRA 13:12)

1. Fiziko-khimicheskiy institut im. L.Ya. Karpova. Predstavleno akademikom V.A. Karginym.

(Hydrocarbons--Spectra)

KNUNYANTS, I.L., glav. red.; BAKHAROVSKIY, G.Ya., zam. glav. red.; BUSEV, A.I., red.; VARSHAVSKIY, Ya.M., red.; GEL'PERIN, N.I., red.; DOLIN, P.I., red.; KIREYEV, V.A., red.; MEYERSON, G.A., red.; MURIN, A.N., red; POGODIN, S.A., red.; REBINDER, P.A., red.; SLONIMSKIY, G.S., red.; STEPANENKO, B.N., red.; EPSHTEYN, D.A., red.; VASKEVICH, D.N., nauchnyy red.; GALLE, R.R., nauchnyy red.; GARKOVENKO, R.V., nauchnyy red.; GODIN, Z.I., nauchnyy red.; MOSTOVENKO, N.P., nauchnyy red.; LEBEDEVA, V.A., mladshiy red.; TRUKHANOVA, M.Ye., mladshiy red.; FILIPPOVA, K.V., mladshiy red.; ZHAROVA, Ye.I., red.; KULIDZHANOVA, I.D., tekhn. red.

[Concise chemical encyclopedia] Kratkaia khimicheskaia entsiklopediia. Red. koll.: I.L.Knuniants i dr. Moskva, Gos. nauchn. izd-vo "Sovetskaia entsiklopediia." Vol.1. A -- E. 1961. 1262 columns. (MIRA 15:2)

(Chemistry--Dictionaries)

VARSHAVSKIY, Ya.M., doktor khimicheskikh nauk; ROGINSKIY, S.Z.; SHNOL', S.E., kand.biologicheskikh nauk

Isotopes in biochemistry. Zhur.VKHO 6 no.3:275-284 '61.
(MIRA 14:6)

(Radioisotopes) (Biochemistry)

VARSHAVSKIY, Ya.M.; OGLOBLIN, A.A.

Use of tritium in physical and biological research. Atom. energ. 11 no.3:264-267 S '61. (MIRA 14:9)

(Tritium)

S/020/61/136/001/031/037
B004/B056

AUTHORS: Kartasheva, L. I., Bulanovskaya, Z. S., Barelko, Ye. V., Varshavskiy, Ya. M., and Proskurnin, M. A.

TITLE: Investigation of Radioactive Benzene Oxidation in Aqueous Solution by Means of Tagged Atoms

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No. 1, pp. 143-146

TEXT: The authors discuss the process of interaction between benzene and the products of water radiolysis with reference to the results obtained in Refs. 1 - 9. In discrepancy to the scheme of I. Stein and J. Weiss (Ref. 3) assuming $C_6H_6 + OH^\bullet \longrightarrow C_6H_5^\bullet + H_2O$; $C_6H_6 + H^\bullet \longrightarrow C_6H_5 + H_2$ they regard direct $OH^\bullet$ and $H^\bullet$ addition with $C_6H_7^\bullet$ and $C_6H_6OH^\bullet$ formation as being more probable. The authors attempt to explain this problem by examining benzene radiolysis in the presence of heavy water. If addition of $H^\bullet$ and $OH^\bullet$ to C_6H_6 occurs, the forming insoluble substance is found to contain deuterium not only in the OH groups but also in the C=H bonds in which no isotope exchange takes

Card 1/3
2

place unless under irradiation (Ref. 10). The residual content of C-bound D in the substance was determined by "washing out" deuterium from the OH groups by means of a solvent of ordinary hydrogen composition (exchange $OD \rightleftarrows OH$). The ratio OD : CD expresses the probability of $OH^\cdot$ and $H^\cdot$ addition. Benzene and water containing 26.7 atom per cent were irradiated from Co^{60}; γ-dose was 170 r/sec, time of irradiation 250 hours. The mixture which previously was degassed by repeated freezing was irradiated in glass ampoules. The white substance that had formed was centrifuged off and divided into three portions after drying. In the first portion deuterium was directly determined. The second portion was dissolved in alcohol and evaporated for 14 times in order to remove the deuterium of the hydroxyl groups by isotopic exchange. Subsequently, the deuterium content was determined. The third portion was repeatedly treated with soda solution in order to remove phenol traces and to attain isotopic exchange in the hydroxyl groups. Furthermore, deuterium was also determined in the benzene which had not undergone reaction. ~~The following results were obtained: Table 1~~

Card 2/~~3~~ 2 Physico-Chem. Inst. im. L. Ya. Karpov

S/020/61/138/001/019/023
B101/B231

21-6100 also 2209

AUTHORS: Bulanovskaya, Z. S., Varshavskiy, Ya. M., Karpov, V. L., and Petrov, I. Ya.

TITLE: Influence of gamma radiation of Co^{60} on isotopic exchange between hydrocarbon polymers and gaseous deuterium

PERIODICAL: Doklady Akademii nauk SSSR, v. 138, no. 1, 1961, 146-148

TEXT: In a previously issued work (DAN, 118, 315 (1958)) it has been demonstrated that ionizing radiation leads to isotopic exchange between the hydrogen of some polymers and deuterium. Experiments made at that time were based on the radiation of a water-moderated water-cooled reactor. It was the aim of the present work to give this effect a more detailed examination by applying pure gamma rays of Co^{60} and to find out whether such exchange also occurs in low-molecular hydrocarbons. Experiments were made in metal ampoules (20 ml) at a deuterium pressure of up to 150 atmospheres. The stuffing box of the ampoule valve was made of polyethylene. Its cover was provided with an end cap. After irradiation the deuterium pressure was measured, the sample was burnt in O_2 at a temperature of

Card 1/5

S/020/61/138/001/019/023
B101/B231

Influence of gamma radiation of...

900°C, and the deuterium concentration in the water of the combustion product was determined. As has been shown by control tests, long-lasting contact between polymer and deuterium fails to form heavy water in the combustion product. The polymers used in the process were polyethylene and polymethylmethacrylate. Fig. 1 shows the deuterium concentration in polyethylene as a function of the radiation dose, Fig. 2 as a function of pressure (dose, $200 \cdot 10^6$ r). Applying low pressure (up to 2 atmospheres) resulted in a rapid increase of the deuterium concentration which slowed down, however, when pressure was raised (up to 150 atmospheres). Experiments made at temperatures of 100°C and -196°C, at a dose of $80 \cdot 10^6$ r, and at a deuterium pressure of ~100 atmospheres showed that the deuterium content of polyethylene amounts to 0.25 atom%, whereas at the temperature of -196°C 0.08 atom% was obtained. The results stated hereinafter have been obtained with liquid low-molecular hydrocarbons:

Card 2/5

23814
S/020/61/138/001/019/023
B101/B231

Influence of gamma radiation of...

Table 1

substance	originally weight-in quantity, g	pressure of D, atm, before irradiation	pressure of D, atm, after irradiation	concentration of D, atom%	yield, molecules per 100 ev
n-pentane	0.80	10	10	0.09	0.8
n-pentane	0.70	147	141	0.46	3.9
cyclopentane	0.50	10	10	0.18	1.3
cyclopentane	0.70	147	125	0.55	4.0
n-hexane	0.46	10	10	0.10	0.8
n-hexane	0.55	142	135	0.26	2.2
cyclohexane	0.43	10	10	0.02	0.1
cyclohexane	0.50	142	142	0.21	1.6
benzene	0.80	10	10	0.05	0.2
benzene	0.55	147	141	1.32	5.2

It has thus been confirmed that ionizing radiation initiates isotopic exchange of hydrogen between the C—H bonds The type of radiation has no

Card 3/5

23814

S/020/61/138/001/019/023
B101/B231

Influence of gamma radiation of...

sensible influence on this effect which must be taken into consideration when using radioactive indicators in the fields of chemistry and biology. There are 2 figures, 1 table, and 2 Soviet-bloc references.

X

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physico-chemical Institute im. L. Ya. Karpov)

PRESENTED: December 12, 1960, by V. A. Kargin, Academician

SUBMITTED: December 8, 1960

Card 4/5

29825
S/020/61/140/006/024/030
B107/B101

5.2430

AUTHORS: Varshavskiy, Ya. M., and Vaysberg, S. E.

TITLE: Equilibrium distribution of tritium in isotopic exchange of hydrogen

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 6, 1961, 1361-1363

TEXT: Data for calculating the equilibrium constants and the distribution ratio protium - tritium by the method by Urey (Ref. 1, see below), Bigeleisen - Mayer (Ref. 2, see below) and V. M. Tatevskiy (ZhFKh, 25, 261 (1951)) are not available up to date. The present work gives a method for calculating roughly the distribution ratio protium - tritium by means of the so-called β factors. These β factors (Ya. M. Varshavskiy, S. E. Vaysberg, Usp. khim., 29, 1434 (1957)) are a quantitative measure for the thermodynamic inequality of two isotopes of an element in a certain substance. In first approximation, they depend only on the number of outside electrons and occupied electron shells. Thus the β factors of CH_4, NH_3, and H_2O are all about equal to the β-factor of HF. The β factors for the tritium - protium exchange in diatomic hydrides (including free radicals) may be calculated

Card 1/2

29825

Equilibrium distribution of... S/020/61/140/006/024/030
B107/B101

from the vibration frequencies of the hydride (ν_H) and the tritide (ν_T):
$$\beta = (\nu_T/\nu_H)\left\{\left[1-\exp(hc\nu_H/kT)\right]/\left[1-\exp(-hc\nu_T/kT)\right]\right\}\exp\left[(-hc/2kT)(\nu_H-\nu_T)\right].$$
The β factors for the tritium - protium exchange at 20°C are listed in Table 1 and represented as function of the atomic number in Fig. 1. Table 2 gives the calculated distribution ratios at 20°C. ($\alpha = \beta_1/\beta_2$). There are 1 figure, 2 tables, and 9 references: 6 Soviet and 3 non-Soviet. The three references to English-language publications read as follows: Ref.1: H. C. Urey, J. Chem. Soc., <u>1947</u>, 562; Ref.2: J. Bigeleisen, M. Mayer, J. Chem. Phys., <u>15</u>, 261 (1947); Ref. 8: P. Stats, H. Morgan, J. Goldstein, J. Chem. Phys., <u>24</u>, 916 (1956). X

ASSOCIATION: Institut radiatsionnoy i fiziko-khimicheskoy biologii Akademii nauk SSSR (Institute of Radiation- and Physicochemical Biology of the Academy of Sciences USSR)

PRESENTED: May 23, 1961, by A. N. Frumkin, Academician

SUBMITTED: May 23, 1961

Card 2/~~3~~2

VARSHAVSKIY, Ya.M.; KITOVA, A.I.

Optical cell for measuring absorption spectra of chemically active solutions under pressure. Opt. i spektr. 13 no.4:569-571 O '62.
(MIRA 16:3)
(Absorption spectra) (Solution (Chemistry))
(Optical instruments)

VARSHAVSKIY, Ya. M.

"Some particulars of the bithermic separation method of hydrogen isotopes."

CHEMISTRY (PHYSICAL), SOCIETY OF (French) - 12th Annual Meeting-
Paris, France, 4-8 Jun 62

Institute of Radiation and Phsico-chemical Biology, Academy of Sciences USSR

34827
S/020/62/142/005/019/022
B110/B101

5.2430

AUTHORS: Kitova, A. I., and Varshavskiy, Ya. M.

TITLE: Exchange of deuterium between aromatics and liquid deuterium chloride

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 142, no. 5, 1962, 1112-1115

TEXT: The principal investigation results of the isotopic exchange of hydrogen with liquid deuterium chloride are given. HCl enriched with 1.5-2% deuterium was obtained from a mixture of concentrated H_2SO_4 and HCl with the calculated amount of D_2O. The high vapor pressure (~40 atm) of DCl at room temperature required Teflon-lined Monel metal containers. The required DCl amount was siphoned to the hydrocarbon in the Monel test tube, and heated in the thermostat for a certain time. DCl was evaporated, the hydrocarbon purified, burned in the O_2 flow, and the deuterium concentration was determined by the dropping method in the resulting water. n

Card 1/4

S/020/62/142/005/019/022
B110/B101

Exchange of deuterium between...

(rate of isotopic exchange) and k (velocity constant) were calculated according to the second author (ZhFKh, 30, 1376 (1956)), the coefficient α for the deuterium distribution between hydrocarbon and HCl was assumed to be 2.2. In benzene, about 2 H atoms are exchanged at ~20°C within one year ($K^{\sim 20}_{C_6H_6} = 4 \cdot 10^{-8}\,sec^{-1}$). The isotopic equilibrium is established faster with increasing number of aromatic rings: at 25°C, in naphthalene, <71 hrs (n = 7.6); phenanthrene, <23 hrs (n = 10); pyrene, <6 hrs (n = 9.6). The decrease of k with increasing test duration proves the non-equivalence of the individual H atoms in the molecule as to electrophilic substitution. k(naphthalene): $1 \cdot 10^{-4} - 1 \cdot 10^{-5}\,sec^{-1}$; k(phenanthrene): $0.9 \cdot 10^{-4} - 0.6 \cdot 10^{-4}\,sec^{-1}$; k(pyrene): $6 \cdot 10^{-4} - 1 \cdot 10^{-4}\,sec^{-1}$. Results obtained for diphenyl: at 25°C: 2 hrs, n = 0.5; 10 hrs, n = 0.7; 21 hrs, n = 1.7; 49 hrs, n = 2.9; at 20°C: 79 hrs, n = 3.0; 279 hrs, n = 5.2; 1200 hrs, n = 6.0; 4800 hrs, n = 6.0. Owing to the chemical

Card 2/4

S/020/62/142/005/019/022
B110/B101

Exchange of deuterium between...

properties of diphenyl, the four H atoms in m-position are not inclined to electrophilic substitution. Results obtained for toluene, ethyl benzene, and isopropyl benzene: at 25°C: 6 hrs, n = 0.4, 0.4, 0.5; 10 hrs, n = 0.7, 0.7, 0.7; 24 hrs, n = 1.7, 1.5, 1.4; at 20°C: 1200 hrs, n = 4.4, 4.0, 4.1. The similarity of values proves the low effect of the alkyl group substituents on the substitutionability of H atoms in the benzene ring. In monoalkyl benzenes, the metahydrogen atoms are well suited for electrophilic substitution since the inductive effect and the effect σ of the π-conjugation of the alkyl group have the same sign. In mesitylene, durene, pentamethyl benzene, the isotopic equilibrium is established at 25°C within 1 hr. Since the H atoms of CH_3 groups do not react with DCl, no isotopic exchange took place in hexamethyl benzene. In di- and triphenyl methane, only the o- and p-hydrogen atoms were exchanged. The ability for electrophilic substitution decreases with increasing number of phenyl groups per aliphatic C-H bond. In naphthalene, the hydrogenation of one ring increases the substitutionability of H atoms

Card 3/4

Exchange of deuterium between... S/020/62/142/005/019/022
B110/B101

of the other ring. Addition of $AlCl_3$ accelerates the isotopic exchange C_6H_6 - DCL, cyclopentane - DCl, and cyclohexane - DCl, but not that of $CH_3C_6H_5$ - DCl. The electrophilic reactivity increases as follows: $HI < HCl < HBr \ll HF$, which does not agree with the increase in acidity $HF \ll HCl < HBr < HI$. There are 1 table and 17 references: 15 Soviet and 2 non-Soviet. The two references to English-language publications read as follows: H. C. Brown et al., J. Am. Chem. Soc., 75, 6292 (1953). R. P. Bell, Acids and Bases, London, 1952, p. 57. X

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physico-chemical Institute imeni L. Ya. Karpov)

PRESENTED: September 30, 1961, by A. N. Frumkin, Academician

SUBMITTED: September 22, 1961

Card 4/4

VAYSBERG, S.E.; VARSHAVSKIY, Ya.M.

Dual-temperature hydrogen isotope exchange between a gas-vapor mixture and a solution of the gas. Zhur.fiz.khim. 37 no.1:87-93 Ja '63. (MIRA 17:3)

1. Fiziko-khimicheskiy institut imeni L.Ya.Karpova.

S/076/63/037/002/006/018
B101/B186

AUTHORS: Vaysberg, S. E., Varshavskiy, Ya. M. (Moscow)

TITLE: Investigation of the two-temperature exchange of deuterium in the system water - hydrogen chloride

PERIODICAL: Zhurnal fizicheskoy khimii, v. 37, no. 2, 1963, 307-309

TEXT: It was sought to determine efficiency of two-temperature columns, which is important for the concentration of deuterium, and to compare it with that of rectification. For this purpose, di-temperature isotopic separation of hydrogen was effected in counter-current columns in the system hydrochloric acid - gas-vapor mixture of hydrogen chloride and water. The deuterium content of the water was 0.65 at%, that of the hydrochloric acid 0.61 at%. Results: The two-component state of the phases may lead to a shift in the enrichment peak to beyond the current ratio λ, equal to the partition factor α of deuterium. Maximum enrichment in the given system at column temperatures of $t = 17^{\circ}C$ and $t' = 90^{\circ}C$ corresponded to $\lambda = 2.7-2.9$, whereas $\alpha_{17^{\circ}C} = 2.53$. The ratio φ between the HET on rectification of water and the HET on di-temperature isotopic exchange has

Card 1/2

Investigation of the two-temperature ... S/076/63/037/002/006/018
B101/B186

been found equal to 0.4. There are 1 figure and 1 table.

ASSOCIATION:	Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physicochemical Institute imeni L. Ya. Karpov)
SUBMITTED:	August 17, 1961

Card 2/2

GRECHKO, V.V.; MASLOVA, R.N.; SHKARENKOVA, L.S.; SILINA, Ye.I. [deceased]; VARSHAVSKIY, Ya.M.

Effect of heavy water on the properties of DNA and proteins. Dokl. AN SSSR 152 no.3:740-743 S '63. (MIRA 16:12)

1. Institut radiatsionnoy i fiziko-khimicheskoy biologii AN SSSR. Predstavleno akademikom V.A.Engel'gardtom.

MANUSADZHYAN, V.G.; ZYAKUN, A.M.; CHUVILIN, A.V.; VARSHAVSKIY, Ya.M.

Use of the mass spectrometric method for studying the derivatives of amino acids and smaller peptides. Part 2: Mass spectrometric analysis of ethyl esters of N-acylpeptides. Izv. AN Arm.SSR.Khim.nauki 17 no. 2:143-155 '64. (MIRA 17:6)

1. Institut radiatsionnoy i fiziko-khimicheskoy biologii AN SSSR.

VARSHAVSKIY, Ya.M., prof.

Symposium on the Physics and Chemistry of Biopolymers, held in the German Democratic Republic. Vest. AN SSSR 34 no. 1:66-69 Ja '64. (MIRA 17:5)

MANUSADZHYAN, V.G.; SARKISYAN, G.S.; BAZHULINA, N.P.; VARSHAVSKIY, Ya.M.

Use of the infrared spectroscopy method in studying short peptides and their derivatives. Dokl. AN Arm. SSR 38 no.5:277-283 '64. (MIRA 17:6)

1. TSentral'naya nauchno-issledovatel'skaya laboratoriya AN Armyanskoy SSR. Predstavleno chlenom-korrespondentom AN Armyanskoy SSR N.M.Kocharyanom.

MANUSADZHYAN, V.G.; BAZHULINA, N.P.; SARKISYAN, G.S.; VARSHAVSKIY, Ya.M.

Infrared spectra of the hydrochloric salts of ethyl esters o di- and tripeptides and ethyl esters of N-acetyl of di- and tripeptides. Dokl. AN Arm. SSR 39 no.1:21-28 '64. (MIRA 17:8)

1. Predstavleno chlenom-korrespondentom AN ArmSSR N.M.Kocharyanom.

MANUSADZHYAN, V.G.; YAKUSHINA, L.M.; VARSHAVSKIY, Ya.M.

Infrared spectra of di- and triamino alcohols. Dokl. AN Arm. SSR 39 no. 2:69-72 '64. (MIRA 17:9)

1. Predstavleno chlenom-korrespondentom AN Armyanskoy SSR N.M.Kocharyanom.

MANUSADZHYAN, V.G.; VARSHAVSKIY, Ya.M.

Use of the mass spectrometric method for studying the derivatives of amino acids and smaller peptides. Part 1: On the possibility of identification of amino acids by characteristic peaks in esters of their acyl derivatives. Izv.AN Arm.SSR.Khim.nauki 17 no. 2:137-142 '64. (MIRA 17:6)

1. Institut radiatsionnoy i fiziko-khimicheskoy biologii AN SSSR.