

FRANK, Otto:

Prolapse of the rectum in children. Cesk.pediat.16 no.3:238-241
Mr '61.

1. Klinika pediatricke chirurgie pediatricke fakulty KU v Praze,
prednosta doc. MUDr. V. Kafka.
(RECTUM dis)

FRANK, O.

Aganglionic dysfunction of the intestines in newborns and infants. Rozhl. chir. 43 no.11.731-735 N '62.

1. Klinika pro detskou chirurgii fakulty detkeho lekarstvi Karlovy University v Prase, (prednosta prof. dr. V. Kafka, DrSc.).

-FRANK, Otto, dr.

Disability evaluation in paralysis of the extremities. Liječn.
vjesn. 86 no.2:187-199 F'64

1. Iz Drugostepene invalidske komisije Republickog zavoda za
socijalno osiguranje u Zagrebu.

S

FRANK, Otto, dr.

Role of the general practitioner in disability insurance. Lijecn.
vjesn. 86 no.5:571-580 My '64

1. Iz Drugostepene invalidske komisije Republickog zavoda za
socijalno osiguranje u Zagrebu.

Frank, S.

The common bullhead (*Ameiurus nebulosus* les. 1819) in waters of our country. P. 35
Prague. Narodni Museum. CASOPIS; ODDIL PRIRODOVEDNY. Praha.
Vol. 125, no. 1, 1956

Source: EEAL - LC Vol. 5. No. 10 Oct. 1956

FRANK, St.

Nannobrycon equea (Steindachner). Wszechswiat no.5:123-124
My'61.

FRANK, S.

Trichogaster trichopterus var. sumatranus Ladiges 1933. Wszechwiat
no.9:239 S '62.

FRANK, S.

Jordaniella floridae (Goode and Bean 1879). *Wszechswiat* no.7/8:
204 J1-Ag '62.

FRANK, S.

Pterophyllum eimekei Ahl 1928. Wszechswiat no.7/8:204 J1-Ag
'62.

FRANK, S.

~~_____~~ Gymnoscorymbus ternetzi (Boulenger 1895). Wszechswiat no.6:
163 Ja '62.

FRANK, S.

Roeboides microlepis (Reinhardt 1849). Wzschwiat no.6:163-
164 Je '62.

YARUSTOVSKIY, A.A.; SVETLOV, M.F.; LIKIN, V.V., redaktor; BALAKIREV, V.F.,
redaktor; FRANK, S.I., vedushchiy redaktor; BEGICHEVA, M.H.,
tekhnicheskii redaktor.

[Operation of mechanical and electrical sluice gate equipment]
Eksploatatsiia mekhanicheskogo i elektricheskogo oborudovaniia
shliuzov. Moskva, Izd-vo Ministerstva rechnogo flota SSSR, 1952.
210 p. [Microfilm] (MLRA 7:11)
(Sluice gates)

FRANK, T.

FRANK, T. 1st National Economic Conference of the Textile Industry. p. 28.

Vol. 11, No. 12, June 1956.

MUSZAKI ELET

TECHNOLOGY

Budapest, Hungary

So: East European Accession, Vol. 6, No. 2, Feb. 1957

FRANK, Tibor

Mechanization of the cleaning of textile factories as a
means of industrial organization. Magy textil 15 no.8:
388 Ag '63.

FRANK, Tibor

Relationship of industrial management with work psychology
and work physiology in the field of textile industry. Magy
textil 15 no.12:568-571 D '63.

FRANK, T

Frank T.

Frank T. Eng. "Pumps and Injectors Used in Steam Power Stations."
(Pompy i strumienice stosowane w elektrowniach cieplnych). Energetyka.
No. 1-2, 1950, pp. 13-21, 9 figs. 1 tab.

The influence of temperature on the operation of the pumps, cavitation and the origin of that phenomenon in hot water pumps. Descriptions of the arrangement of pumps in steam-power plants, drive and design of circulating water pumps, characteristics of the work and design of condensate-removal pumps. Reciprocating air pumps and their design, steam and water injectors. Arrangement of pumps, boiler feed water tanks and deaerators in general use. Selecting the size of feed water pumps on the basis of characteristics of their curves. Indications for designing feed water pump installations in boiler houses.

SO: Polish Technical Abstracts No. 2, 1951

Frank, T.

621.511.22

4870. Layout of the main building of a power station with 50 MW turbogenerators. Z. MAOZ-KOWSKI; Alicja T. FRANK. *Pracjal elektrotech.*, 30, 176-82 (May 21, 1954) in Polish.

Relatively small floor area and size of the main building of steam power station are required by units comprising two 60 MVA 10 kV turbogenerators and 110 atm. 510°C 230 tons/hour boilers. Details of steam system, coal pulverizing plant, main electrical circuit and two alternative layouts of equipment and of the reinforced concrete buildings are given.

J. LUKASZEWICZ

FRANK, T.

Completion of the largest thermoelectric power plant in Denmark, p. 49. (ENERGETYKA, Stalinograd, Vol. 9, no. 1, Jan./Feb. 1955.)

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4, No. 1, Jan. 1955, Uncl.

FRANK, T.

The technical book as an aid to worker and engineer.

p. 161
Vol. 9, no, 3, May/June 1955
ENERGENTYKA
Stalinograd

SO: Monthly List of East European Accessions (EEAL) LC, VOL. 5, no. 2
Feb. 1956

FRANK, T.

A discussion of Soviet electric power engineers on electric systems of hydroelectric power plants. p. 229.

ENERGETYKA, Vol. 9, No. 5 Sept./Oct. 1955

(Ministerstwo Energetyki) Stalinograd.

SOURCE: EAST EUROPEAN ACCESSIONS LIST Vol. 5, No. 1

Jan. 1956

FRANK, T.

Increasing the coefficient of power of equipment used in electric-power plants.
p.39.

ENERGETIKA (Ministerstwo Energetyki) Stalinograd
Vol. 10, no. 1, Jan./Feb. 1956

So. East European Accessions List

Vol. 5, No. 9

September 1956

FRANK, T.

FRANK, T. Selection of equipment for direct current installations in electric-power plants. p.292 Vol. 32 no. 7 July 1956
Warszawa Poland:

SOURCE: East European Accessions List (EEAL) Vol. 6 No. 4 April 1957

FRANK, T.

FRANK, T. Organizational problems in light industry. p. 35.

Vol. 10, no. 6, June 1956

TOHBTERMELES

Budapest, Hungary

So: East European Accession, Vol. 6, No. 5, May 1957

FRANK, Tibor; SZASZ, Marton; MARK, Ferenc; BOSNYAK, Tamas; LUGOSI, Karoly;
~~FEKETE~~, Istvan; TOMPOS, Karoly; KABDEBO, Kornel; JAVOR, Bela; SCHEFTSIK,
Jeno; VOGL, Ferenc; REITER, Gyorgy

Conference on the current tasks of the light industry workers. Munka
szemle 5 no.3:5-7 Mr '61.

1. Textilipari Muszaki Tudomanyos Egyesulet Ipargazdasagi Szakosztalya
titkara (for Frank).
2. Kispesti Textilgyar munkaügyi osztaly vezetője
(for Mark).
3. Konnyuipari Miniszterium Munkaügyi es Oktatasi Osztalya vezetője
(for Szasz).
4. Ujpesti Gyapjuszovogyar munkaügyi osztalya vezetője
(for Bosnyak).
5. Kender Juta es Textil Ipar munkaügyi osztaly vezetője
(for Lugosi).
6. Kobanyai Textilgyar munkaügyi osztalya vezetője
(for Fekete).
7. Konnyuipari Miniszterium Pamutipari Igazgatosaga munka-
ügyi osztaly vezetője (for Tompos).
8. Magyar Pamutipar munkaügyi osztaly vezetője
(for Kabdebo).
9. Majus 1 Ruhagyar munkaügyi osztalya vezetője
(for Javor).
10. Konnyuipari Miniszterium Len-Kenderipari Igaz-
gatosaga munkaügyi osztalya vezetője (for Scheftsik).
11. Ruhaipari Tervezo Vallalat (for Vogl).
12. Goldberger Textilmuvek munkaügyi foosztaly vezetője
(for Reiter).

FRANK, Tibor

Is plant management an organic part of the activity of
Hungary's textile industry enterprises? A polemic article.
Magy textil 14 no.2:84-85 F '62.

FRANK, Tibor; KOTWICKI, T. [translator]

Present state and tasks for the future in the field of
organization of enterprises in the Hungarian textile
industry. Przegl włokien 16 no.7/8:431-433 J1-Ag '62.

FRANK, Tibor

Organization and procedure of the technical divisions of the technical industry enterprises. Magy textil 14 no.11:515-517 N '62.

1. Hazai Pamutzovogyar.

FRANK, Tibor

Improvement of the transportation work at the Hungarian Cotton Weaving Factory. Kozleked kozl 18 no.48:865-867 2 D '62.

FRANK, Tibor

Report on the Moscow conference on the textile industry economics.
Magy textil 15 no.4:188-189 Ap '63.

FRANK, Tibor

Training of textile industry engineers-economists in the
Soviet Union. Magy textil 15 no.5/6:264 My-Je '63.

FRANK, Tibor

Aptitude tests carried out in the Hungarian Cotton Mill. Magy
textil 15 no.7:317-318 JI '63.

FRANK, Tibor

Organizational experience with the manager of the textile industry enterprises. Musz elet 18 no.9:6 25 Ap '63.

FRANK, Tibor

Possibilities for the development of industrial management
within the framework of the Federation of Technical and Scientific
Associations. *Műsz. Elet.* 18 no.21:2 10 0 '63.

FRANK, Tibor

Problems relating to the selection and employment of textile industry workers. Munka szemle 8 no.4:7-9 Ap '64.

FRANK, Tibor

Formation of an up-to-date organization at industrial enterprises.
Munka szemle 8 no.11:20-23 N '64.

FRANK, Tibor

Conditions for the formation of an adequate "operational
atmosphere." Magy textil 16 no. 6:280-283 Je '64.

FRANK, Tibor

Is there any manpower shortage in the light industry? Husz
elet 19 no.19:4 10 S '64

FRANK, Tibor

Is there any shortage of manpower in the light industry?
Musz elet 19 no.21:2 8 G '64.

FRANK, Tibor

Organizational tasks of management. Elem ipar 18 no.10:
321-328 0 '64.

FRANK, Tibor

New features of the work of the Federation of Technical
and Scientific Associations. Musz elet 20 no.1&2 14 Ja '65.

CISAR, Ludvik, inz.; FRANK, Vaclav, inz.

Causes and analysis of the collapse of some constructions.
Poz stavby 11 no.11: 603-606 '63.

1. Technicky a zkusebni ustav stavebni, Praha.

FRANK, W.

Structural balances in power economy. p. 570

ENERGIA ES ATOMTECHNIKA. (Energiagazdalkodasi Tudomanyos Egyesulet)
Budapest Hungary

Vol. 11, no. 9/10, Sept./Oct. 1958

Monthly list of East European Accessions (EEAI) LC., VOL. 8, no. 7, July 1959

Uncl.

YANOVSKIY, M.I.; GAZIYEV, G.A.; NIKIFOROV, V.P.; MAKARENKO, V.G.; ZIMIN,
R.A.; MARININ, P.I.; FRANK, Yu.A.

Gas chromatograph with automatic pickup of samples from a flow.
Zav. lab. 31 no. 12:1526-1528 '65 (MIRA 19:1)

1. Institut khimicheskoy fiziki AN SSSR.

The Construction of Electromagnetic Barriers of Rod-Shaped Materials. *Z. Frank*. (*Sbornik Delekskopie*, 1964, 200-204). [In Czech]. The construction of barriers is discussed with special reference to a equipment of recent (1964).

DCMAC--IESAR, B.; FRANK, Z.

Malformations formed by local application of hypothermia
in the second half of pregnancy in the white rats. Bul sc
Youg 7 no.1/2:5-6 F-Ap '62.

1. Zavod za histologiju i embriologiju Medicinskog fakulteta,
Zagreb.

*

Internal Medicine

CZECHOSLOVAKIA

FRANK, Zdenek; STVERAL, Jiri; DVORAK, Josef; Institute of Aeronautical Medicine (Ustav Leteckeho Zdravotnictvi), Prague.

"Radio Waves Another Scourge of Civilization."

Prague, Radar, Vol 1, No 3, Nov 66, pp 56 - 58

Abstract: Factors influencing the medium in which people are living are discussed. Radio waves are defined as waves with frequencies between 100 kilocycles and 3,000,000 kilocycles, that is waves 1 cm to 3,000 meters long. Although these waves do not affect the senses of the body, they do have an influence on it. Thermal and non-thermal effects of the radio waves on the human organism are described. Clinical aspects of these effects are evaluated. Some of these effects are described in detail. Protection against the influence of electromagnetic fields is discussed; some peculiar effects of these fields on human beings are described. Biological effects of radio waves are discussed. 1 Table, no references.

1/1

Problem of the development of automation technology in the chemical industry. Automatizace 7 no.12:318-319 D '64.

1. Institute of Chemical Industry, Automation, Satelice.

FRANK-KAMENETSKI, A. D.

Origin of chemical elements. Biol i khim 5 no. 2:1-12 '63.

L 17129-63 EWT(d)/EPF(n)-2/FCC(w)/BDS AFFTC/ASD/ESD-3/APGC/IJP(C)/SSD
ACCESSION NR: AP3004963 S/0208/63/003/004/0766/0769

AUTHOR: Frank-Kamenetskiy, A. D. (Moscow) ⁶⁵₆₄

TITLE: Solution of a kinetic equation by the Monte Carlo method ¹⁶

SOURCE: Zhurnal vyshisl. matematiki i matematich. fiziki, v. 3, no. 4, 1963, 766-769

TOPIC TAGS: Monte Carlo, kinetic equation, approximate solution

ABSTRACT: Use of the Monte Carlo method allows the acceleration of computation on standard high-speed machines, obtaining the solution of a kinetic equation with essentially greater accuracy than by the use of other known methods. The author considers such a solution of a kinetic equation in an example of the problem of finding the distribution of the flow of mono-energetic neutrons in a multi-zone heterogeneous cylindrical nucleus with arbitrary distribution of isotropic sources. For finding the mean flows in the zones $\bar{\Phi}_k$, the random motions N of the neutrons are tracked from the moment of "birth" to capture. For each neutron, its mileage in the given zone λ_{kv} is registered. Obviously, for large values of N

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L 17129-63

ACCESSION NR: AP3004963

$$\bar{\Phi}_k = \frac{c}{V_k N} \sum_{v=1}^N \lambda_{kv} \quad (1)$$

where c is an arbitrary constant. The initial coordinates of the neutrons are chosen in a random fashion with respect to the given distribution of the sources. "I express my deep gratitude to I. M. Sobol' for his valuable comments." Orig. art. has: 6 formulas, 1 graph, and 1 table.

ASSOCIATION: none

SUBMITTED: 27Aug62

DATE ACQ: 30Aug63

ENCL: 00

SUB CODE: MM

NO REF SOV: 003

OTHER: 001

Card 2/2

VALENTA, Oldrich, inz. dr. CSc.; WEINER, Evzen, inz. dr. CSc. [deceased]

Effect of long-lasting vibration on the strength and bond of concrete.
Stav cas 12 no.2:85-101 '64.

ACCESSION NR: AP4015558

S/0089/64/016/002/0119/0122

AUTHOR: Frank-Kamenetskiy, A. D.

TITLE: Application of the Monte-Carlo method to the multigroup reactor computation

SOURCE: Atomnaya energiya, v. 16, no. 2, 1964, 119-122

TOPIC TAGS: Monte-Carlo method, multi group reactor computation, fission cross-section neutron capture, neutron scattering

ABSTRACT: The author discusses the application of the Monte-Carlo method for determination of the multiplication coefficient and the energy and space distribution of neutron fluxes in the multi-group transport approximation. The neutron scattering is assumed to be isotropic in the laboratory system. The probabilities of transitions between groups depend on both the elastic and inelastic neutron scattering. The computation of trajectories and fluxes in the group is similar to that given in the author's previous work (Zh. vy*chisl. matem. i matem. fiziki v. 3, 766 (1963)), as applied to two-

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ACCESSION NR: AP4015558

dimensional cylindrical geometry. Several generations of neutrons (original, secondary, etc.) are considered in succession. The method is justified when the ratio of the size of the active zone and the average migration path is close to unity. Thus, the Monte-Carlo method supplements the other computational method; its error is minimal when that of the diffusion approximation is maximal. Orig. art. has: 2 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 17Jul63

DATE ACQ: 12Mar64

ENCL: 00

SUB CODE: NS

NO REF SOV: 006

OTHER: 005

Card 2/2

SOV/124-58 1-1263

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 1, p 156 (USSR)

AUTHOR: Frank-Kamenetskiy, G. Kh.

TITLE: Strain Calculation for Ring-shaped Parts (Raschet deformatsiy kol'tsevykh detaley)

PERIODICAL: V sb.: Gidroturbostroyeniye. Nr 4. Moscow-Leningrad, Mashgiz, 1957, pp 195-210

ABSTRACT: Bibliographic entry

Card 1/1

FRANK-KAMENETSKIY, L. Z.

"Partial Denervation of the Stomach in Ulcerous Diseases," Khirurgiya, No.5,
1948.

Surgical Clinic, 2nd Moscow Med. Inst. im. Stalin

USSR/Medicine/Neurology

FD-2939

Card 1/1 Pub. 17-3/23

Author : Frank- Kamenetskiy L. Z. (deceased) and Khodzhayev, Z. P.

Title : ~~Frank- Kamenetskiy L. Z. (deceased) and Khodzhayev, Z. P.~~
The vagus nerves as conductors of motor impulses to stomach and duodenum

Periodical : Byul. eksp. biol. i med., 7, 10-12, July 1955

Abstract : Following earlier experiments with resection of both vagus nerves below the diaphragm, author undertook chronic experiments on dogs cutting either the left (anterior) or the right (posterior) trunk. Both nerves were cut on the controls. The left resection produced changes typical of bilateral subdiaphragmatic vagotomy, the right resection affected only the stomach fundus. There was a comparatively quick restoration of motor functions of the stomach and duodenum after resection of either nerve trunk. 1 reference, 1 USSR, 1 since 1940, photographs.

Institution : Stalinabad Medical Institute

Submitted : 20 August 1954

BRINDLEY, G.W.; ZVIAGIN, B.B. [translator]; ~~FRANK-KAMENETSKAYA, T.A.~~,
[translator] redaktor; TSUKERMAN, A.M., redaktor; GRIBOVA, M.P.
tehnicheskiiy redaktor.

[X-ray identification and crystal structures of clay minerals;
collection of articles. Translated from the English] Rentgenovskie
metody opredelenia i kristallicheskoie stroenie mineratov glin;
sbornik statei. Perevod s angliiskogo B.B.Zviagina i T.A.Frank-
Kamenetskoi. Pod red. i s predisl. V.A.Frank-Kamenetskogo. Moskva,
izd-vo inostranoi lit-ry, 1955. 402 p. (MLRA 8:11)
(Clay) (X-rays)

~~FRANK-KAMENETSKAYA, I. A.~~

GRIM, Ralph E.; ZVIAGIN, B.B. [translator]; MIKHAYEVA, I.V. [translator];
MIKHAYEV, V.I. [translator]; RAZBEGAYEVA, G.I. [translator];
~~FRANK-KAMENETSKAYA~~, T.A. [translator]; FRANK-KAMENETSKIY, V.A.,
redaktor; YAKOVENKO, M.Ye., redaktor; DUMBRE, I.Ya., tekhnicheskiy
redaktor

[Clay mineralogy. Translated from the English] Mineralogiia glin.
Perevod angliiskogo B.B.Zviagina i dr. Pod red. i s predisl. V.A.
Frank-Kamenetskogo. Moskva, Izd-vo inostrannoi lit-ry, 1956.
454 p. (MLRA 9:10)

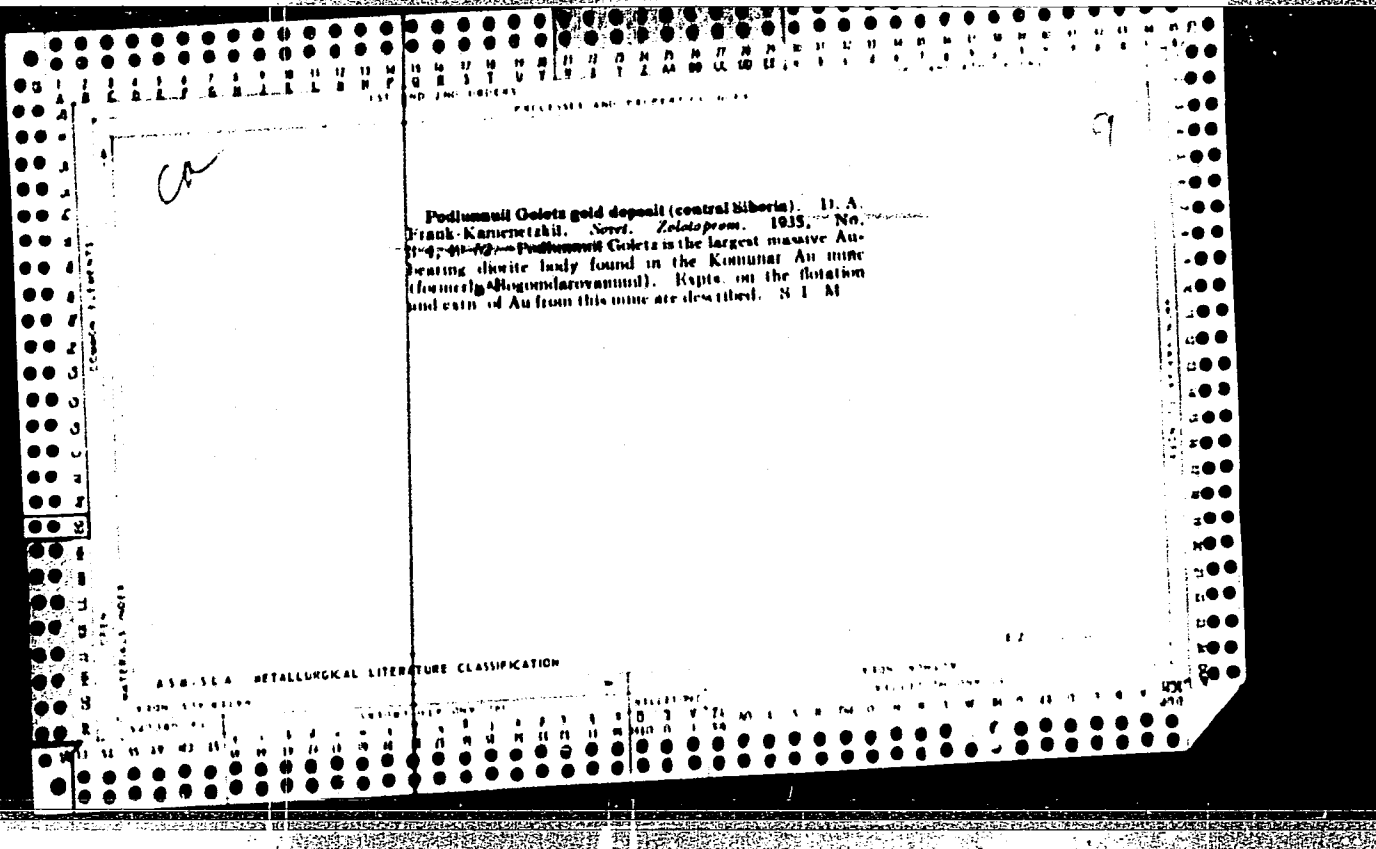
(Clay)

1933-1957

FRANK-KAMENETSKIY, D. A.

"Recovering Sulfite Concentrates," USSR Patent 31, 132, Spetember 30, 1933

Concentrating zinc vapors. D. A. Frank-Kamenetski.
Russ. 19,750, Feb. 28, 1934. Zn vapors are toned by
passing through a tower filled with coke.



1ST AND 2ND ORDERS PROCESSES AND PROPERTIES INDEX

A 53
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761. Limiting Form of Free Convection for Large Grashof Numbers. D. A. Frank-Kamenetskiĭ. *Comptes Rendus (Doklady) de l'Acad. des Sciences, U.S.S.R.* 17, 1-2, pp. 9-12, 1937. In English.—For free convection the theory of similitude indicates that $Nu = \phi (Gr, Pr)$, where Nu , Gr and Pr are the Nusselt, Grashof and Prandtl numbers respectively. Experiments have shown that $Nu = K Gr^{1/2}$ for large values of Gr . According to the present author this is not a limiting law, and it is shown that at sufficiently high values of Gr a limiting law of the form $Nu = K Gr^{1/2} Pr$ is to be expected. For such a case it follows that the coefficient of heat transfer must increase proportionally to the square root of the determining dimension, to the $3/2$ power of the excess temperature and directly as the pressure. This result is considered to be of importance in the theory of post-explosion heat transfer, and the heat transfer in internal combustion engines, but experimental verification of this is difficult on account of the disturbing effects of radiation and forced convection.

R. W. P.

METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

117 AND 119 ODDS

118 AND 120 EVENS

BC

A-1

Theory of thermal propagation of flame.
J. B. ZELDOVITSON and D. A. FRANK-KAMENETSKI
 (J. Phys. Chem. Russ., 1938, 12, 100-105).--
 Consideration of diffusion and heat conduction in a
 flame lead to the expression $(T - T_0)/(T_1 - T_0) =$
 $(a - a_0)/(a_1 - a_0) = (b - b_0)/(b_1 - b_0) \dots$, where $T,$
 $a, b \dots$ are the temp. and concn. in a point of the
 flame, T_1 is theoretical temp. of combustion, $a_0, b_0 \dots$
 $a_1, b_1 \dots$ concns. before and after the reaction,
 respectively, and T_0 the temp. before the reaction.
 J. J. B.

A 58-51A METALLURGICAL LITERATURE CLASSIFICATION

118 AND 119 ODDS

120 AND 121 EVENS

117 AND 119 ODDS

118 AND 120 EVENS

1ST AND 2ND ORDERS PROCESSES AND PROPERTIES INDEX 100 AND 4TH ORDERS

SA

A 5?

3765. Temperature Distribution in Reaction Vessel and Stationary Theory of Thermal Explosions. D. A. Frank-Kamenetskii. *Comptes Rendus (Doklady) de l'Acad. des Sciences, U.S.S.R.* 18. 7. pp. 413-414, 1958. In English.—By a further application of dimensional analysis to similar equations (see preceding Abstract) relations among non-dimensional parameters are established which enable the critical condition for inflammation to be determined in terms of one parameter δ . This parameter assumes a critical value for each vessel. For low gas pressures and small vessels $Gr \rightarrow 0$, and convection becomes negligible. Critical values of δ are calculated for this case for spherical, cylindrical and plane parallel vessels, and these are found to be in satisfactory agreement with experimental determinations. R. W. P.

COMMON ELEMENTS

OPEN

MATERIALS INDEX

ASB-11A METALLURGICAL LITERATURE CLASSIFICATION

FROM SOURCE

100 AND 4TH ORDERS

LIST AND INDEX COPIERS PROCESSES AND PROPERTIES INDEX

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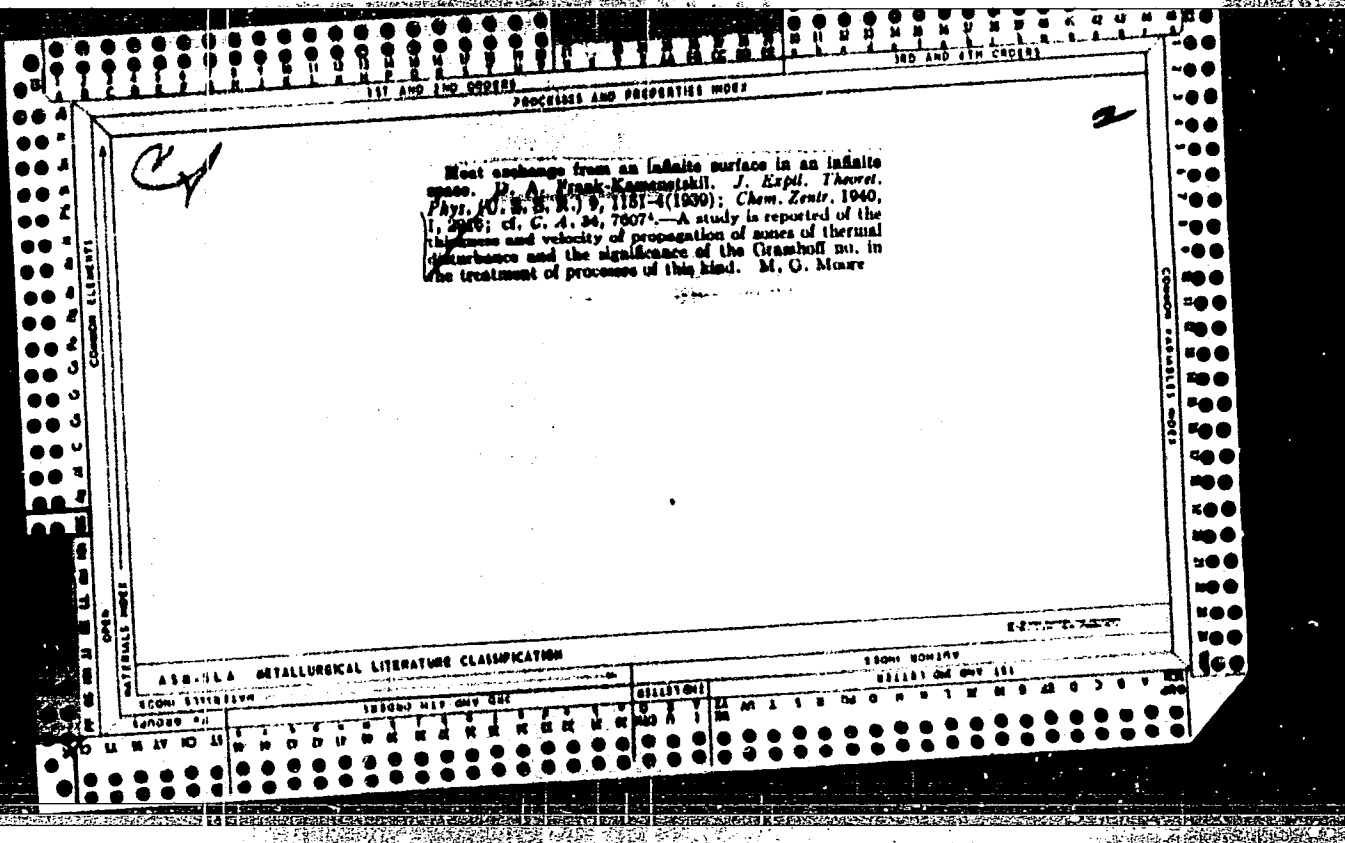
3-A

4898. Theory of Uniform Flame Propagation. J. B. Zeldovich and D. A. Frank-Kamenetski. *Comptes Rendus (Doklady) de l'Acad. des Sciences, U.S.S.R.* 18, 9, pp. 683-687, 1938. In English.—Of the existing theories of flame propagation, only that of Lewis and v. Elbe [see Abstract 4247 (1934)] takes into account the kinetics of the chemical process, and they assume that up to a given temperature of ignition no reaction occurs. Actually the reaction velocity is not an explicit function of time, but of the temperature and concentration of the reactants. The manner in which it depends on the time and on the distance from the flame front cannot be obtained before integrating the equation for propagation, and the resulting expression must, in particular, contain the required velocity of propagation. A general method of solving the complex differential equations involved is now suggested. H. H. Ho.

METALLURGICAL LITERATURE CLASSIFICATION

SIGNATURE

CALL NO. QM 451



PROCESSING AND PROPERTIES INDEX

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CA

Calculation of thermal explosion limits. D. A. Frank-Kamenetskii. *Acta Physicochim. U. R. S. S.* 10, 305-70 (1939) (in English).—A thermal explosion theory leading to the equation $\Delta T = -(Q/\lambda)_{\infty} - K/RT_0 (U/RT_0)(T - T_0)$ is developed. The ignition temp. explosion limits so calcd. agree with those experimentally found for acetone by Rice (cf. *C. A.* 22, 1909); MeNO, by Appin; N₂O, by ...

...ovich and Yakovlev (cf. *C. A.* 33, 0002); and for H₂ by Y. and Shantarovich (cf. *C. A.* 31, 4101). The explosion limit calcd. for N₂O was subsequently found experimentally. With Et azide, the calcd. values disagree with the exptl. values of Rice and Campbell (*C. A.* 29, 5273).

P. H. Rathmann

METALLURGICAL LITERATURE CLASSIFICATION

1950-1959

1960-1969

1970-1979

1980-1989

1990-1999

2000-2009

2010-2019

2020-2029

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1ST AND 2ND DEPT'S PROCESSES AND PROPERTIES INDEX 100 AND 6TH DEPT'S

CA 24

Temperature distribution in reaction vessel, and stationary theory of thermal explosion. D. A. Frank-Kamenetskii. *J. Phys. Chem.* (U. S. S. R.) 13, 734-55 (1939); *cf. C. A.* 33, 6049^g.—By math. analysis of the mechanism of heat loss in a gas mixt. it has been possible to devise a method of calcg. the inflammation limit from the kinetics and heat effect of the reaction, the thermal cond. of the gas mixt., and the dimensions of the vessel. The results agree generally with existing exper. data. B. C. P. A.

U.S.S.R. METALLURGICAL LITERATURE CLASSIFICATION

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

LIST AND PROPERTIES INDEX

PROCESSES AND PROPERTIES INDEX

THESE AND OTHER INDEXES

A-1

Diffusion theory of heterogeneous reactions.
 D. A. FRANK-KAMENETSKI (J. Phys. Chem. Russ.,
 1939, 13, 756-758).—The kinetics of heterogeneous
 reactions are worked out for the case where the rate
 of reaction at the interface and the rate of diffusion
 of reactants to the interface are comparable in
 magnitude. R. C.

ASD-51A METALLURGICAL LITERATURE CLASSIFICATION

GROUP	CLASS	INDEX	CLASS	GROUP
1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30
31	32	33	34	35
36	37	38	39	40
41	42	43	44	45
46	47	48	49	50
51	52	53	54	55
56	57	58	59	60
61	62	63	64	65
66	67	68	69	70
71	72	73	74	75
76	77	78	79	80
81	82	83	84	85
86	87	88	89	90
91	92	93	94	95
96	97	98	99	100

Carbon dioxide reduction. D. A. Frank-Kamenetskii. *Compt. rend. acad. sci. U. R. S. S.* 23, 1663-5 (1959). The kinetics of the reduction of CO₂ by activated ash-free sugar C were measured under static conditions by a method similar to that of Brown and Travers (*C. A.* 26, 3427) at 600, 800° and at pressures of 50-200 mm. Hg. The course of the reaction was followed by measuring the thermal cond. of the gas mist. With a surface-cleaned C a measurable reaction takes place at not less than 800°, and between 600° and 750° the reaction is CO₂ + C = CO + (CO) (I),

where (CO) denotes a surface oxide of C which can be regarded as chemisorbed CO. In this temp. range the total pressure, after an initial drop, remains approx. const. From 750° to 900° a steady increase in pressure is found which in the initial stages is not equiv. to the CO formed. No CO is formed between 600° and 800°, and the only sign of action is an initial fall in pressure owing to activated adsorption of CO₂. The formation of an activated complex (CO₂) is probably responsible also for the initial fall in pressure between 800° and 750°. The phenomena between 750° and 900° are considered as a superposition of I and of (CO) desorption, (CO) → CO. At room temp. only the process of a phys. CO₂ adsorption has been observed, and its velocity is immeasurably high. Two schemes of the reaction mechanism satisfactorily explain the observed phenomena: (1) the direct impact of activated CO₂ mole. on a C surface free from (CO₂) and (CO), and (2) the theory that the first step of the reaction is the activated CO₂ adsorption followed by the reaction of chemisorbed (CO₂) with a surface free from (CO).

Physico-Chem. Lab.
Mor., AS

B. C. P. A.

ASH-11A METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PHENOMENA INDEX

BC

Resonance theory of auto-catalysis. D. A. FRANK-KAMENETSKI (Compt. rend. Acad. Sci. U.R.S.S., 1936, 25, 669-670).—A lowering of activation energy through resonance between two canonical structures of the transition state, arising when reaction takes place in a collision of a molecule of product with a mol. in the initial state, is suggested in the case of reactions of the form $A \rightarrow B_1 \rightarrow B$ where A and B are initial and final states, and B_1 is the transition state. I. J. J.

Inst. of Chem. Physics, Leningrad

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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2

cc

Periodic processes in the kinetics of oxidation reactions.
 D. A. Pecher-Komarovskii... *Compt. rend. acad. sci. U. R. S. S. 29, 671-2(1958)* (in English). — For the autocatalytic reaction proceeding with the participation of two active intermediates products X and Y given by the scheme:
 $A + X \rightarrow B + 2X, X + Y \rightarrow B + 2Y, A + Y \rightarrow B$ it is shown that the process proceeds in a periodic fashion, representing a kind of nonlinear vibration. The mechanism may play an important role in the oxidation of higher hydrocarbons and may explain the phenomena of two-stage ignition.
 H. C. Thomas

Inst. Of Chem. Physics, Leningrad

ASB-3LA METALLURGICAL LITERATURE CLASSIFICATION

FROM CIV 82124

FROM CIV 82124

COLLECTION

FROM CIV 82124

FRANK-KAMENEESKIY, D. A.

"A Thermodynamic Analogy of the Uncertainty Principle," Zhur. Eksper. i Teoret.
10, No. 6, 1940. pp. 700-702

Inst. Chemical Physics, Leningrad.

PROCESS AND PROPERTIES INDEX

21

Laminar combustion in carbon pores. D. A. Frank-Kamenetskii. *J. Tech. Phys.* (U. S. S. R.) 10, 1207-9 (1940); *cf. C. A.* 33, 4705⁹.—Theoretical computation of kinetic and diffusion phenomena are based on the experimental results of Predvoditelev and Tsukhanova (preceding paper). The coeff. of O diffusion at 1000-1100°, is estimated to be 3.5 cm.²/sec. Roksalana Gamow

METALLURGICAL LITERATURE CLASSIFICATION

1950-1959

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FRANK-KAMENETSKIY, D. A.

"Diffusion Theory of Photographic Development," Acta Physicochemica URSS,
Vol. 12, pp 13-24, 1940

2

Carbon dioxide reduction. A. D. Somovskaya and D. A. Frank-Kamenetskii. *Acta Physicochim. U.S.S.R.*, 12, 879-88(1940) (in English).—The kinetics of the reaction $CO_2 + C = 2CO$ were investigated by a static method over a temp. range of 800-900° at pressures of 30-200 mm. Hg. According to the reaction scheme adopted, the primary step is $CO_2 + C = CO + [CO]$ (where $[CO]$ denotes chemisorbed CO) occurring on the free C surface and re-activating activation in the gas phase. The energy of activation is about 27 kg. cal., independent of surface conditions. The reaction is inhibited by the $[CO]$ accumulated on the surface. The crit. increment of the reaction $[CO] = CO$ depends on the surface conditions and on the presence of mineral admixts.; it decreases upon the addn. of Fe. At low temps. activated CO_2 adsorption inhibits the reduction of CO_2 . The stationary reaction rate of the CO_2 reduction is given by the formula:

$$W = \frac{0.6 \times 10^{-4} C \exp \left[\frac{E_1}{2430} - \frac{(26800 + E_2)}{RT} \right]}{0.8 (C/\gamma) \exp \left(\frac{26800}{RT} \right) + 2.0 \times 10^{-4} \exp \left[\frac{E_1}{2430} - \frac{E_2}{RT} \right]}$$

In this equation W is the reaction rate in moles per cm.² per sec., C is the concn. of CO_2 in the gas phase in moles per cc., γ is the adsorption capacity of C in moles of $[CO]$ per sq. cm., and E_2 is the desorption energy of $[CO]$ in cal. per mole.

H. C. Thomas

ASM-A1A METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND GROUPS 3RD AND 4TH GROUPS

PROCESSES AND PROPERTIES INDEX

A-1

BC

Thermal explosion of the $H_2 + O_2$ mixture. D. Frank-Kamenetskii (*Acta Physicochim. U.R.S.S.*, 1940, 18, 730-731).—The location of the third explosion limit of the $H_2 + O_2$ mixture, reported by Oksenberg and Sommers (A. 1939, 1, 286), was predicted by the author on theoretical grounds (cf. A., 1940, 1, 286). The approx. agreement between theory and experiment indicates the thermal nature of this third limit. P. L. U.

ASIA-ILA METALLURGICAL LITERATURE CLASSIFICATION

GROUPS: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

LETTERS: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

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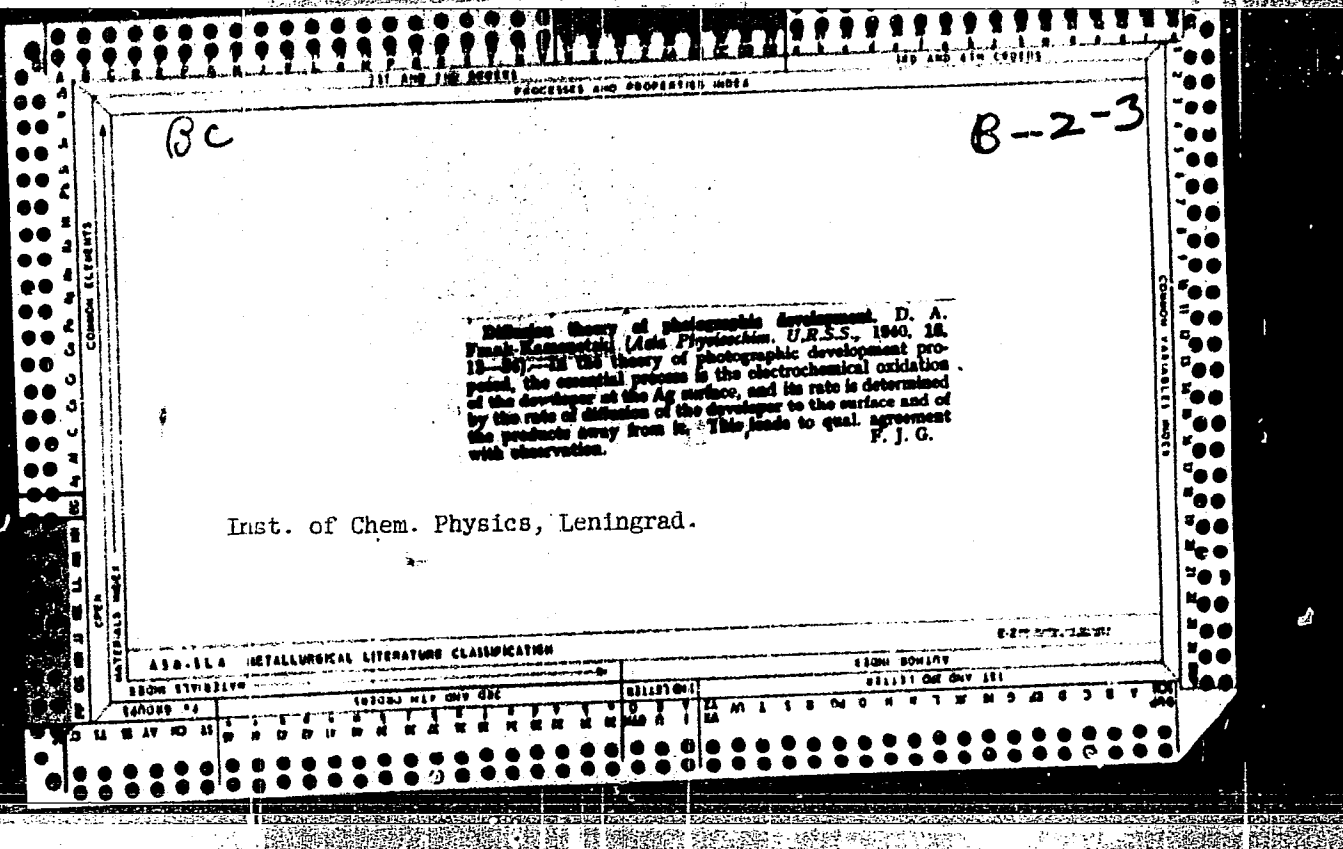
BC

Mechanism of two-stage ignition. D. A. Frank-Kamenetski
(*J. Phys. Chem. Russ.*, 1930, 14, 20-25).—Reaction rate of which increases to ignition, decreases, and then rises to a second ignition (cf. Belov and Neumann, *A.*, 1938, 1, 236) can take place if $dx/dt = k_1x^2 - k_2xy$ and $dy/dt = k_3xy - k_4y^2$, x and y being the concns. respectively of the combustible substance A , of an intermediate product X formed from A , and of another intermediate product Y originating from X . In combustion of hydrocarbons the product X is probably a per-acid, and Y an aldehyde. J. J. B.

BC

A-1

Reduction of carbon dioxide by carbon. A. F. Semetshkova and D. A. Frank-Kamenetzi (*J. Phys. Chem. Russ.*, 1940, 14, 281-284).—When CO_2 or sugar C is heated with CO_2 at 30–200 mm. Hg the gas pressure, after a small fall due to an adsorption of CO_2 , remains const. at 600° since half of the CO formed is adsorbed by C; at 770° the pressure increases slowly, and at 800° rapidly since 2 CO are liberated for 1 CO_2 consumed. The reaction $\text{CO}_2 + \text{C} = \text{CO} + \text{adsorbed CO}$ has an activation energy of 27 kg.-cal. for Fe_2O_3 , C, or $\text{C} + \text{Al}_2\text{O}_3$ or $+ \text{Fe}_2\text{O}_3$. For the activation energy of the desorption of CO vale. of 23–63 kg.-cal. are obtained. J. J. B.



Ca

Kinetics of complex reactions I. Homogeneous reactions. D. A. Frank-Kamenetskii. *Uspekhi Khim.* 10, 423-415 (1941). Review. Formation of intermediate products, stationary and nonstationary course of reactions, autocatalysis and its mechanism, periodic reactions and the principle of detailed equilibrium are discussed and illustrated by various examples (combustion of CO, H₂, F halogen reactions, thermal decomposition of hydrocarbons, polymerization of α,α -disubstituted ethylenes). F. H. Rathmann

Kinetics of complex reactions II. Heterogeneous reactions. D. A. Frank-Kamenetskii. *Uspekhi Khim.* 10, 600-59 (1941). Review. Theoretical and review. The kinetics of adsorption on nonhomogeneous surfaces and the rate of various stages of adsorption in heterogeneous catalysis are discussed. Ethylene hydrogenation and the CO₂ + C = 2 CO reaction are considered as examples of heterogeneous complex reactions. 34 refs. F. H. Rathmann

ASAC 35A METALLURGICAL LITERATURE CLASSIFICATION

2

2

Ignition and extinction of solid surfaces. D. A. Frank-Kamenetski
(*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **80**, 734-737).—An
equation for the steady surface temp. during surface reaction is
derived, and the conditions of the surroundings for this temp. to be
unique are determined. The implications of this with respect to
the transition of a reaction from small to large temp. intervals above
the surroundings are considered. H. V. S.-R.

PROCESSING AND PROPERTIES INDEX

2

Activation in heterogeneous reactions. D. A. Frank-Kamenetskii. *Doklady Akad. Nauk U. R. S. R., Physico-Chem. and Math. Sci. Sect.* 1942, No. 1-2, 55-9 (in Russian, 59, in English, 60).—The questions of the participation of the surface energy of a solid in the process of activation and the current theories on the subject are considered. If the reaction starts at the moment when the gas molecules hit the solid surface the activation takes place in the gas phase. The energy of activation does not depend in this case on the specific properties of the surface, or on its energy and kinetic characteristics. On the other hand, if adsorbed molecules participate in the reaction the activation takes place on the surface. In this case the surface energy may participate in the activation even though the mechanism is not clear, and the kinetics of the reaction depend on the nonuniformity of the surface. Investigations of the relation between the energy of activation and the preexponential multiple involved in the alteration of surface properties, particularly with the introduction of different admixtures, offer the possibility of detg. the fundamental kinetic characteristics of a heterogeneous surface—the function of the distribution of the activation energies. The theories and discussion presented are illustrated with a concrete example of the reaction of CO₂ with C.

I. S. Ioffe

METALLURGICAL LITERATURE CLASSIFICATION

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No. 4

Periodic reactions and the mechanism of hydrocarbon oxidation.
J. G. Gervart and D. A. Frank (Kamenyich) (*Bull. Acad. Sci. U.R.S.S., Cl. Sci. Chem.*, 1943, 210-230).—The passage of a mixture of higher hydrocarbons and air (or O_2) through a turbulent reaction chamber causes, within a suitable temp. range, regular pulsations of cold flame. The frequency of these is almost independent of the type of fuel or of its concn. but increases sharply with a rise in temp. or of $[O_2]$. Experiments were carried out with straight-run, polymer, and by-product (from synthetic rubber manufacture) gasolines. The optimum temp. for the occurrence of pulsations was 390° , with a range of $301-443^\circ$, this being widest for fuels of high olefine content. The duration of the pulsations is 2-6-20 sec., being the greater in the larger of the two reaction vessels used. The excess air concn. was 0.04-0.23. The data presented, particularly the independence of the pulsation frequency of the rate of fuel feed, confirm the kinetic nature of the phenomenon.
V. B.

Institute of Chemical Physics

FRANK-KAMENETSKIY, D. A.

"Theory of Vapor Condensation in the Presence of Noncondensing Gases,"
Zhur. Tekh. Fiz., 12, No.7, 1942, pp. 327-366.

Inst. Chem. Phys., AS USSR

PROCESSING AND PROPERTIES INDEX

(10-11-72)

BC

Calculation of isomerization equilibrium of ethane and methylcyclohexane. D. A. Frank-Kamenetski and V. G. Markovitch (*J. Gen. Chem. Russ.*, 1942, 12, 816-820). Quant. calculation of isomerization equilibrium with hydrocarbons, normally very difficult on account of large probable errors in the initial data, is rendered possible for C_7H_{16} (I) and C_7H_{16} (II) by the very accurate experimental data of Kishinovsky (A., 1934, 291; 1939, 1, 473) on the heats of hydrogenation of the isomers, by the known Hamao and infra-red spectra which give vibration frequencies of the mol. (Linnét and Avery, A., 1960, 1, 4; Crawford, *ibid.*, 1960, by data of mol. structure and internat. distances (e.g., Pauling, A., 1937, 1, 448), giving mol. moments of inertia, and by the fact that the absence of internal rotation simplifies calculations. It is shown that the state sum method and the standard entropy method yield the same results for equilibrium constants and concns. at corresponding temp. The const. (state sum method) is 15.71 (354° K.), 9.06 (473° K.), 5.52 (673° K.), 4.74 (773° K.), or 4.31 (873° K.) and the % of (I) in the equilibrium mixture is 9.99, 9.04, 15.34, 17.42, or 19.90 respectively. The heat effect of isomerization has a min. at ~473° K. The calc. concns. of (II) are > the only analytical val. recorded (Slobodin, A., 1937, 11, 174) but in that case equilibrium was either not attained or it was complicated by the presence of extraneous gases produced possibly by polymerisation and decomp. of the polymers. In the standard entropy method the total S ($S_{trans} + S_{cis} + S_{gem}$) is consistently ~2.10 g.-cal. per degree per mol. > Linnét and Avery's results (*ibid.*); as the results for S_{gem} agree exactly it is supposed that the earlier workers took 12 and not 4 as the symmetry no. for (I), which would make their results low by $R \log 3$ (or 2.19). G. S. S.

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ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

FRANK-KAMENETSKIY, D. K.

"Mathematical Theory of Thermal Explosions," Acta Physicochemica URSS, Vol. 16,
pp 357-361, 1942

in 60.

... to ...
... ..

Isomerization equilibrium states of methylacetylene. D. A. Frank-Kamenetski and V. G. Markovitch (*Ann. Physicochim. U.S.S.R.*, 1948, 19, 808-813).—The value of the equilibrium constant, calc. from spectroscopic and heat of hydrogenation data, are 18.6,

9.9, 6.5, 4.7, and 4.2 at 25°, 300°, 400°, 500°, and 600° respectively. With rise of temp. the proportion of $C(CH_3)_2$ in the equilibrium mixture rises from 6.6% to 19.2%. Revised value for the entropy of $C(CH_3)_2$ at these temp. are 60-62, 65-67, 73-64, 76-78, and 79-81 g.-cal. per degree per mol. respectively. C. R. H.

B-1-3

DC

PROCESSES AND PROPERTIES INDEX

... of ... D. A. Frank-Kamada (Compt. ...
 ... U.S.S.R., 1944, 107, 183-184). Thermal poly-
 ... gives primarily the cyclic dimeride (I), probably
 ... which is relatively stable at high temp.;
 ... polymerization with
 ... derivative of (I) was identified. When the
 ... are passed through HNO₃ (d 1.4), a red product
 ... containing 6.5% of acid N, is obtained;
 ... this can be converted by ... into a solid mass,
 ... which on combustion with ... has a definite mol. wt.
 ... and derived tars are
 ... Such tars cannot be obtained by
 ... but a (II) compound could be
 ... A. T. P.

Inst. Chem. Physics; AS

METALLURGICAL LITERATURE CLASSIFICATION

SOCIETY

23-200

41-6. ...
... ..

Kinetics and mechanism of photographic development. D. A. Frank-Kamenetskii (*Acta Physicochim. U.R.S.S.*, 1943, 18, 91-92).— The exponential increase of velocity of linear growth of an individual Ag nucleus with time (Rabinovitch, A., 1943, 1, 93) can be explained on the assumption that rate of development is determined by the electrochemical oxidation of the developer proceeding on the whole surface of the Ag nucleus, the deposition of Ag taking place, however, only on its perimeter. The theory of Anastasevitch (*ibid.*, 95) is discussed.

AS USSR, Inst. of Chem-Phy.

A.I. - Reaction

3v abs

Thermal reactions of acetylene. I. Kinetics and mechanism of thermal polymerization of acetylene and its reaction with nitric oxide. D. A. Frank-Kamenetski (*Acta Physicochim. U.R.S.S.*, 1943, 18, 148-156).—The thermal polymerization of C_2H_2 at 400–700° and 50–760 mm. occurs in three stages: (i) an induction period without change of pressure, (ii) a homogeneous bimol. dimerization, (iii) a heterogeneous reaction with formation of high polymers, H_2 and C. NO prolongs (i), and polymerization is delayed until the NO is consumed. The temp.-dependence of (i) and (ii) corresponds with the same activation energy. The kinetics agree with a scheme involving primary combination of $2C_2H_2$ to give an unstable C_4H_4 , which can decompose into $2C_2H_2$ or two radicals, the latter at a slow rate. L. J. J.

Inst. of Chem-Phy.

II-8, Reaction

Ab. Abs.

Ignition of carbon and kinetics of its reaction with oxygen.
A. Klivanova and D. Frank-Kamenetzi (Acta Physicochim. U.R.S.S., 1943, 18, 387-405). - The kinetics of the reaction between C and O₂ at ordinary pressure and at high temp. have been measured by a method based on the determination of the temp. which a C filament must attain before it ignites in a stream of air or other O₂-containing gas. The abs. reaction velocity at ~ 1200°K. is ~ 10⁻⁴ mol. per c.c. per sec., a val. of the same order as is obtained by other methods. The present data show a temp.-dependence which suggests an activation energy > energies previously reported. The present val. is 75-135 kg.-cal. per mol., corresponding with a reaction order 0.4-0.8, and definitely < 1.
C.R.H.

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