AL'TSHULER, S.A., prof., red.; KUSURGASHEV, I.M., red.

[Paramagnetic resonance] Paramagnitnyi rezonans; sbornik statei. Kazan', Izd-vo Kazanskogo univ., 1964. 161 p.
(MIRA 18:12)

ACCESSION NR: AP4042412 S/0056/64/047/001/0382/0383

AUTHOR: Al'tshuler, S. A.; Yastrebov, V. N.

TITLE: Electron-nuclear paramagnetic resonance on V^3 ions in corundum

SOURCE: Zh. eksper. i teor. fiz., v. 47, no. 1, 1964, 382-383

TOPIC TAGS: electron nuclear paramagnetic resonance, electron nuclear resonance, corundum, vanadium impurity

ABSTRACT: Electron-nuclear paramagnetic resonance has been experimentally displayed in corundum doped with V^{3+}. The measurements were performed by means of a nuclear resonance spectrometer with elevated sensitivity, which made it possible to obtain on the aluminum nuclei a signal-to-noise ratio of the order of several thousands at helium temperatures. Measurements involved the use of an improved Pound's diagram in the spectrometer and the method of synchronous detection. The corundum specimen investigated had a volume of 0.1 cm^3 and a concentration of V^{3+} ions of approximately 0.5% in relation to the number of Al^{3+} ions. When the crystal was

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ACCESSION NR: AP4042412

oriented so that the angle θ between its trigonal axis and external magnetic field H lay within a range from 20° to 45°, a clear resonance line, corresponding to transition ±1/2, is observed at a temperature of 1.5K. The width of the line is 0.2—0.3 Mc. By increasing the temperature to 4.2K the line broadens and the effect disappears. At angles less than 20° or greater than 45° the effect cannot be observed because the line is too broad. In the first case (<20°), the cause of broadening is a strong decrease of the gyromagnetic ratio γ at small θ (the measurements were performed at a constant generator frequency of approx 6 Mc by changing the field H); in the second case (>45°) the cause was the merging of the principal absorption line with the side lines. Because of the great width, the positions of only four side lines, corresponding to transitions ±1/2 → ±3/2 and ±3/2 → ±5/2, were established.

ASSOCIATION: Kazanskiy gosudarstvenny*y universitet (Kazan State University)

SUBMITTED: 22Apr64 ATD PRESS: 3083 ENCL: 00

SUB CODE: NP NO REF SOV: 003 OTHER: 000

Card 2/2

L 24761-65 EWT(l)/EPF(c)/EPF(n)-2/EIR/T/EPA(bb)-2/EWA(l) Pr-4/Ps-4/Pu-4 WW

ACCESSION NR: AP5003464 S/0181/65/007/001/0310/0312

AUTHORS: Al'tshuler, S. A.; Mineyeva, R. M.

TITLE: Concerning nuclear magnetic resonance in nuclei belonging to paramagnetic atoms

SOURCE: Fizika tverdogo tela, v. 7, no. 1, 1965, 310-312

TOPIC TAGS: paramagnetic atom, nuclear magnetic resonance, line broadening, hyperfine structure

ABSTRACT: In view of the difficulties in observing nuclear magnetic resonance (NMR) in paramagnetic atoms, owing to the large linewidth, the author indicates another possibility of observing NMR in paramagnetic atoms under experimental conditions that are easily realized. The method is based on the fact that the crystalline field very frequently gives rise to doublets in ions of rare-earth metals, and the lower level of the doublet usually corresponds to

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L 24761-65

ACCESSION NR: AP5003464

a large g factor. At a temperature 1--2K and a magnetic field close to 1000 Oe the splitting of such a doublet is so large that the population of the lower sublevel is larger than the population of the upper one by approximately 10^5. This eliminates the broadening due to the dipole-dipole interaction of the electron magnetic moments. This also makes possible the use of crystals with large paramagnetic-ion concentration, so that the intensity of the NMR effect can be increased and the number of defects causing line broadening is decreased. Since the local field is [illegible] kOe for Tb^{3+} in ethyl sulfate), the effect can be observed in relatively weak external fields. Orig. art. has: 1 formula.

ASSOCIATION: Kazanskiy gosudarstvennyy universitet im. V. I. Ul'yanova-Lenina (Kazan' State University)

SUBMITTED: 14Aug64 ENCL: SUB CODE: GP NR

NR REF SOV: 004 OTHER: 003

Card 2/2

L 40773-65 EWT(m)/T/EWA(m)-2

ACCESSION NR: AP5006493 S/0056/65/048/002/0464/0466

AUTHORS: Al'tshuler, S. A.; Valishev, R. M.

TITLE: Study of weak exchange interactions by the paramagnetic resonance method

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 2, 1965, 464-466

TOPIC TAGS: electron paramagnetic resonance, resonance spectrum, zinc compound, exchange pair, exchange integral

ABSTRACT: The authors studied the electron paramagnetic resonance spectrum of Ni^{2+} exchange pairs found in single-crystal $ZnSiF_6 \cdot 6H_2O$ [illegible] of the nickel ions were isomorphically replaced by nickel. The measurements were made with a superheterodyne radiospectroscope at [illegible] cps and 1.5°K. The results show that near the two funda-

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ACCESSION NR: AP5006493

[illegible] explain the experimentally [illegible]

ASSOCIATION: [illegible] State

SUBMITTED: 31Aug64 ENCL: 00 SUB CODE: NP, SS

NR REF SOV: 00 OTHER: 004

Card 2/2

L 2451-66 EWT(1) LJP(c)

ACCESSION NR: AP5024708 UR/0056/65/049/003/0862/0866

44,55

AUTHOR: Al'tshuler, S. A.; Kochelayev, B. I. 44,55

61
58
B

TITLE: Shift of the fine structure components of the Rayleigh scattering line in paramagnetics

21,44,55

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 3, 1965, 862-866

TOPIC TAGS: fine structure, Rayleigh scattering, paramagnetic material, spin phonon interaction, laser, paramagnetic ion

ABSTRACT: The Rayleigh scattering effect was used to study the spin-phonon interaction in paramagnetics, making it possible to avoid the usual experimental difficulties associated with generation of sound at phonon frequencies (10^{10}—10^{11} cps), when observation of the acoustic paramagnetic resonance is impossible due to line broadening. A shift in the fine structure components of a Rayleigh line was postulated as a result of frequency coincidence of a scattering phonon and one of the divisions of spin levels of a paramagnetic ion. As an example of the postulated effect, an MgO crystal, doped with Ni^{2+} and Fe^{2+} (whose spin-

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L 2451-66

ACCESSION NR: AP5024708 3

spin-phonon interactions are well known) was considered. Other crystals containing V^{3+}, Cr^{4+}, and Ti^{3+} are also suitable. The effect can be observed particularly well in crystals containing ions of rare earths with an even number of electrons, and also in liquids. Since the shift in the velocity of sound is proportional to the difference of spin level populations, the greatest shift can be expected at low temperatures, when the intensity of Rayleigh scattering is greatly reduced. For this reason, the use of a laser as a light source is warranted. Possible experiments for observing the scattering of light with simultaneous saturation of the paramagnetic resonance lines are discussed. Orig. art. has: 10 formulas. [YK]

ASSOCIATION: Kazanskiy gosudarstvennyy universitet (Kazan' State University)

SUBMITTED: 18Mar65 ENCL: 00 SUB CODE: NP, EM

NO REF SOV: 002 OTHER: 002 ATD PRESS: 4109

GVK

Card 2/2

L 22922-66 JD/JG
ACC NR: AP6009717 SOURCE CODE: UR/0386/66/003/004/0177/0180

AUTHOR: Al'tshuler, S. A.

ORG: Kazan' State University im. V. I. Ul'yanov-Lenin (Kazanskiy gosudarstvennyy universitet)

TITLE: Use of substances containing rare earth ions with even number of electrons to obtain infralow temperatures

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 3, no. 4, 1966, 177-180

TOPIC TAGS: rare earth element, magnetic moment, paramagnetic cooling, paramagnetic ion, paramagnetic relaxation

ABSTRACT: Since only rare earth ions with an odd number of electrons have been used so far to obtain low temperatures by magnetic cooling, it being assumed that ions with an even number of electrons are unsuitable, the author calls attentions to a possibility of advantageously using rare-earth ions with an even number of electrons. The following arguments are presented: 1. Practically all isotopes of

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L 22922-66

ACC NR: AP6009717

rare-earth triply charged ions with an even number of electrons (Pr^{3+}, Tb^{3+}, Ho^{3+}, and Tm^{3+}) have a nuclear spin $I \neq 0$, and a relatively large hyperfine magnetic interaction, so that the magnetic moment of the ion in the ground state is increased 10 -- 100 times. 2. The substances considered, in which the paramagnetism carriers have a magnetic moment of magnitude intermediate between the electronic and nuclear moments, can be used to obtain lower temperatures than reached with the aid of ordinary paramagnetic salts. It is estimated that the sample temperature can be readily reduced to 10^{-4} -- 10^{-5}°K. If elements with $I \gg 1/2$ are used (Pr or Ho), then the total splitting of the magnetic field will be large enough that initial cooling with He^3 will be sufficient. 3. In rare-earth ions the gyromagnetic factors and the spin-level splitting exhibit an appreciable dependence on the crystal orientation relative to the magnetic field, making it possible to effect magnetic cooling by rotating the magnetic field and varying the angle with the crystal axes. 4. Substances with 'intermediate electron-nuclear paramagnetism' can be conveniently used

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ACC NR: AP6009717

to measure very low temperatures. 5. Rapid establishment of thermal equilibrium between the spin system and the lattice vibrations can be readily effected. It is noted in conclusion that introduction of a trace of ions with an even number of electrons to reduce the relaxation time can be used in this case as well as in the salts customarily used for magnetic cooling. The author thanks V. P. Peshkov for useful discussions.

SUB CODE: 20/ SUBM DATE: 05 Jan66/ ORIG REF: 002/ OTH REF: 001

Card 3/3 GW

ALTSHULER, S. B.

"On Activating Effect of Certain Metal Oxides on Fe-Cu-contact, Used in the Synthesis of Gasoline from Water Gas.". Iz. Ak. Nauk SSSR Otdel. Tekh. Nauk, No. 2, 1943.

Inst. Orgainic Chemistry, Dept. of Chem. Sci., Acad.

AL'TSHULER, S.V.

"Determination of the Perturbation Orbits for Deutrons,"
Zhur., Eksper. i Teoret. Fiz., 8, 1938

MEZENTSEV, V.A.; AL'TSHULER, S.V., redaktor; PERGAMENSHCHIK, Ye.N. tekhnicheskiy redaktor.

[Wind] Veter. Moskva, Gos. izd-vo kul'turno-prosvetitel'noi lit-ry 1947. 62 p. (MLRA 8:8)
(WINDS)

AL'TSHULER, S.

Artshuler, S V

Меченые атомы. Москва, Гос. изд-во технико-теорет. лит-ры, 1947.

47 p. illus. 20 cm. (Научно-популярная библиотека)

Tagged Atoms. Moscow, State Publishers of Technical-Theoretical Literature, 1947
(Popular Science Library)

1. Atoms. I. Title. *Title transliterated:* Mechenye atomy.

QC778.A5 54-17550

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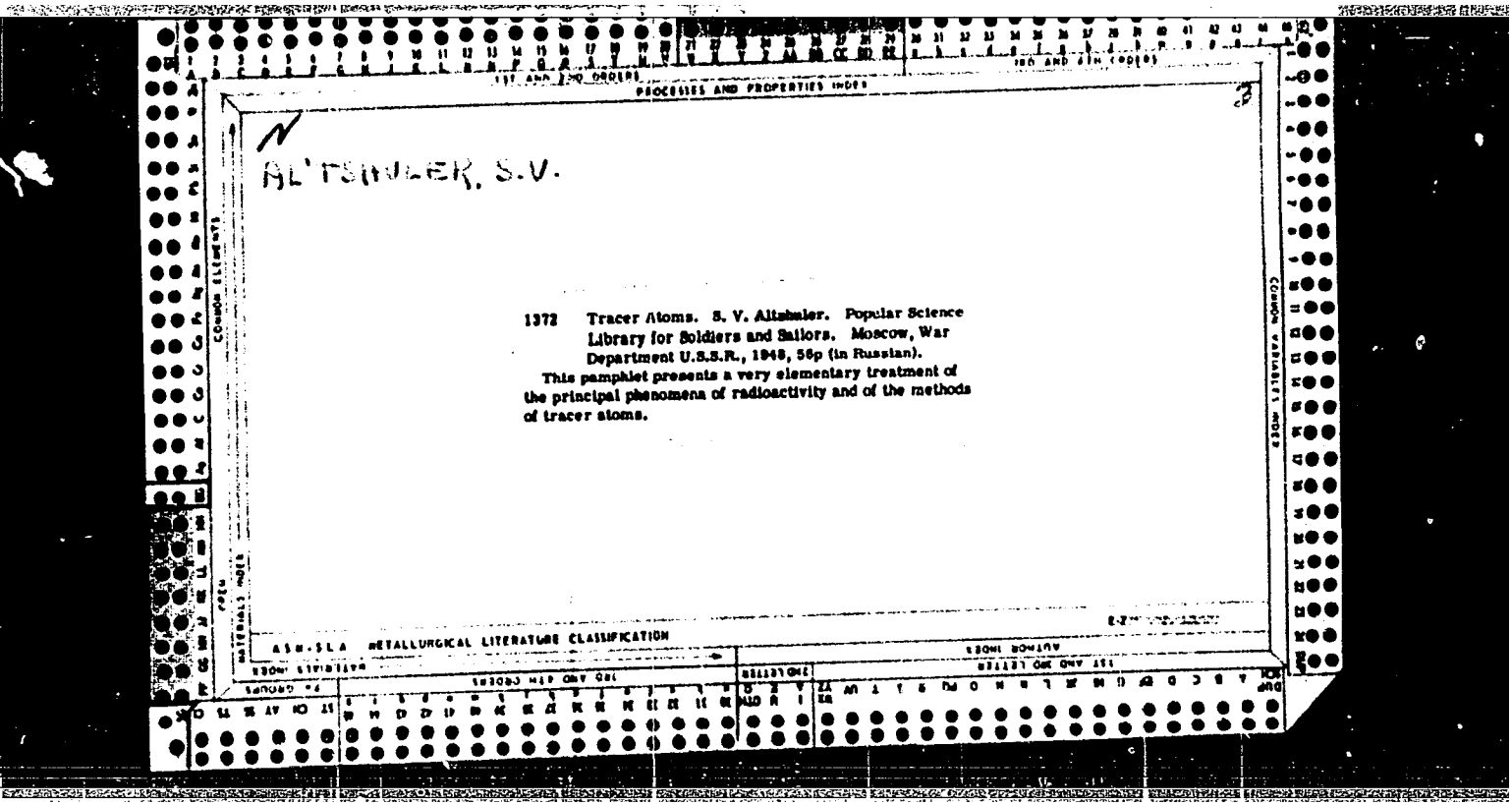

AL'TSHULER, S.V.

1372 Tracer Atoms. S. V. Altshuler. Popular Science Library for Soldiers and Sailors. Moscow, War Department U.S.S.R., 1948, 56p (in Russian).

This pamphlet presents a very elementary treatment of the principal phenomena of radioactivity and of the methods of tracer atoms.

AL'TSHULER, S.V.

"Effect of the Nuclear Spin on the Resonance Paramagnetic Absorption in Solutions of Manganese and Copper Salts," Nuclear Sci. Abstracts, 4, No. 16, 1950

23491
S/165/60/000/002/007/008
A104/A129

158102

AUTHORS: Panchenkov, G.M., Karryyev, Ch.S., and Al'tshuler, S.V.

TITLE: Polymerization of propylene by aluminosilicate catalyst of 50% Al_2O_3 and 50% SiO_2

PERIODICAL: Akademiya nauk Turkmenskoy SSR. Izvestiya. Seriya fiziko-tekhnicheskikh, khimicheskikh i geologicheskikh nauk, no. 2, 1960, 109-112

TEXT: The authors describe results obtained at polymerization of propylene by an aluminosilicate ball catalyst of 50% Al_2O_3 + 50% SiO_2. Laboratory equipment and test methods were described in Refs. 14 and 15, Panchenkov, G.M., Vestnik MGU, 1946, no.2, and Izvestiya AN TSSR, 1960,no.2. The polymerization was investigated at 180, 200 and 220°C, atmospheric pressure and a volumetric gas supply rate of 20-80 hours^{-1}. The amount of catalyst was 50 m^3 for all tests. All tests were accompanied by increased temperatures due to the exothermic nature of the polymerization reaction. After tests the polymer was distilled into dimeric, trimeric and tetrameric fractions. Residues evaporating at temperatures above 220°C, higher poly-

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Polymerization of propylene ...

mers and condensation products comprised the high polymer fraction. The temperature of 200°C and the volumetric gas supply rate during 40 hours^{-1} provide optimum conditions of polymerization of propylene into dimeric, trimeric and tetrameric fractions. The dimeric fraction was subjected to spectral analysis revealing the presence of cis- and trans-compounds of olefinic hydrocarbons C_6H_{12}. The following hydrocarbons were determined: cis-2-hexene, cis-4-methyl 2-pentene and trans-4-methyl 1-pentene. The presence of trans-2-hexene and other hydrocarbons is assumed. Physical and chemical properties of products derived from polymerization of propylene by aluminosilicate catalyst of 50% Al_2O_3 + 50% SiO_2 are shown in Table 1. The reaction of polymerization of propylene on aluminosilicate cracking catalyst is accompanied by the reaction of hydrogen redistribution. There are 4 figures, 1 table and 15 references: 9 Soviet-bloc and 6 non-Soviet-bloc.

ASSOCIATION: Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti im. I.M.Gubkina (Moscow Institute of Petrochemical and Gas Industry im. I.M.Gubkin)

SUBMITTED: December 24, 1959

S/165/60/000/003/001/009
A104/A129

AUTHORS: Panchenkov, G. M.; Karryyev, Ch. S., Al'tshuler, S. V.

TITLE: Thermodynamic conditions of the polymerization of propylene into low-molecular compounds

PERIODICAL: Akademiya nauk Turkmenskoy SSR. Izvestiya. Seriya fiziko-tekhnicheskikh, khimicheskikh i geologicheskikh nauk, no. 3, 1960, 26 - 32

TEXT: The article describes the methods and gives the results of calculations in respect of equilibrium constants and equilibrium yields of the polymerization reaction of propylene into low-molecular compounds at various temperatures and pressures. Being a successive reaction the polymerization can be expressed as $2A_1 \rightleftarrows A_2 + A_1 \rightleftarrows A_3 + A_1 \rightleftarrows A_4$ etc., where A_1, A_2, A_3, A_4 represent the respective quantities of monomer, dimer, trimer and tetramer moles. The approximate value of the isobaric potential ΔZ_T is determined by

$$\Delta Z_T = \Delta H_{298} - T \cdot \Delta S_{298} \qquad (1)$$

In standard state, i.e. ΔZ^o, the isobaric potential is linked with the equilibrium constant K_{eq} by

Thermodynamic conditions of the polymerization of...

$$\ln K_{eq} = -\frac{\Delta Z^o}{RT} \qquad (2)$$

Substitution of Equation (1) in Equation (2) produces

$$\lg K_{eq} = -\frac{\Delta H_{298}}{2.3 \cdot R \cdot T} + \frac{\Delta S_{298}}{2.3 \cdot R} \qquad (3)$$

The dimer equilibrium yield or the degree of conversion of the initial propylene can be determined with the help of given T - P. At the equilibrium moment of the dimerization reaction $2A_1 \rightleftarrows A_2$, the quantity of A_1 and A_2 moles is proportional to $2 \cdot (1-x)$ and x, i.e.

$$K_{eq} = \frac{x(2-x)}{4 \cdot P \cdot (1-x)^2} \qquad (4)$$

which shows, that conversion depth x is linked to its specific pressure equilibrium constant product

$$A = K_{eq} \cdot P \qquad (5)$$

and can easily be determined based on dependency x on value $A = K_{eq} \cdot P$ of reaction $2\,B \rightarrow A$. Knowledge of the isobaric potential and equilibrium constant reveals merely

Thermodynamic conditions of the polymerization of...

the principal possibilities of the process which might, under adverse circumstances, progress at extremely low speed. Higher temperatures and the use of catalysts are inevitable for the acceleration of the process. Approximate estimation of the trimer andtetramer reaction can be obtained by the monotype reaction method described by A. V. Kireyev, [Ref. 2: Kurs fizicheskoy khimii (Course of Physical Chemistry), Goskhimizdat 1955] according to

$$\lg K_{eq,2} = \lg K_{eq,1} + \frac{\Delta H_1^\circ - H_2^\circ}{2.3 \cdot R \cdot T} \qquad (6)$$

which enables the determination of the equilibrium constant of reaction 2 to be made if the equilibrium constant of reaction 1 and heat content variations of both reactions are known. There are two monotype reactions:

$A_1 + A_1 \rightleftarrows A_2$ reaction 1

$A_2 + A_1 \rightleftarrows A_3$ reaction 2

Reaction 1 shows the dimerization reaction. Determination of the thermal effect is based on the temperature necessary for the formation of the final product. The formation temperature of organic compounds in an ideal gaseous state can be estab-

lished on the basis of typical numbers and the addition of corrections in respect of various groups as per molecule of the compound. Equilibrium yield values of trimer (or tetramer) reaction $A + B \rightleftarrows C$ is determined as

$$K_{eq} = \frac{x(2-x)}{P\cdot(1-x)^2}; \quad A = K_{eq} \cdot P \qquad (7)$$

i.e., the equilibrium moment of the quantity of moles in the derived substance C is proportional to x and that of A and B to 1 - x; total quantity is 2 - x. The theoretical yield of trimers and tetramers is determined according to auxiliary quantity values. Resulting values of equivalent constants and equivalent yields of trimer and tetramer reactions reveal that the polymerization of propylene produces satisfactory yields of: dimers at 250 - 300°C; trimers at 200 - 220°C; tetramers at 150 - 180°C. There are 6 tables, 1 figure and 4 references: 3 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATION: Moskovskiy institut neftekhimicheskoy i gazovoy promyshlenosti im. Gubkina (Moscow Institute of Petrochemical and Gas Industry im.Gubkin)

SUBMITTED: December 24, 1960

S/165/60/000/003/002/009
A104/A129

AUTHORS: Karryyev, Ch. S.; Panchenkov, G. M., Al'tshuler, S. V.

TITLE: Kinetics of the polymerization of propylene by aluminum silicate and oxide catalysts

PERIODICAL: Akademiya nauk Turkmenskoy SSR. Izvestiya. Seriya fiziko-tekhnicheskikh, khimicheskikh i geologicheskikh nauk, no. 3, 1960, 33 - 37

TEXT: This paper was read at the All-Union Conference on Organic Catalysis convened on November 16 - 20, 1959, in Moscow, and deals with results of investigations of the polymerization of propylene by aluminum silicate and oxide catalysts, carried out in view of its importance in petroleum processing and in petrochemical industry. Tests were performed at atmospheric pressure, temperature ranges from 100 - 300°C and a volumetric velocity of gas supply of 20 - 400 per hour^{-1}. The following catalysts were subjected to investigation: aluminum silicate with varying content of oxidizing components; aluminum silicate with nickelous and chromic oxides; molybdenum oxide and nickel-molybdenum oxide based on alumina. Tests were carried out in an installation consisting of a furnace for obtaining propylene by dehydration of pure isopropyl alcohol over active alumina at 350°C, and a special

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Kinetics of the polymerization of...

polymerization device. The gas supply was measured by a rheometer and the consumption by a RG-400 (GSB-400) gas meter. Before entering the reactor the gas was dried by calcium chloride. All tests were accompanied by an increase in temperature caused by the exothermic nature of the process. Before and after each test the installation was blown through with nitrogen and the original activity of the catalyst was restored by air scavenging at 500°C. After stabilization the polymeride was distilled into dimeric (125°C), trimeric (125 - 170°C) and tetrameric (170 - 220°C) fractions whereas the residue obtained over 220°C and the condensation products comprised the fraction of "higher polymers". Then the following features were determined: density, content of hydrogen, and the content of saturated and unsaturated hydrocarbons for the initial gas, and the density, refraction coefficient, molecular weight and bromide content for the polymeride fractions. The most advantageous temperature for aluminum silicate catalysts is 200°C. At this temperature and a gas supply rate of 20 - 50 per hour^{-1} a maximum depth of propylene conversion was reached (45 - 55%). The respective yields of polymeride fractions were as follows: dimer 23 - 24%; trimer 9 - 11%; tetramer 9 - 12%. Temperatures over 220°C and a gas supply rate exceeding 60 per hour^{-1} decrease the conversion depth and the polymeride shows a higher content of dimer fractions and a lower content of trimer

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Kinetics of the polymerization of...

and tetramer fractions. Investigation into the polymerization capacity of aluminum silicates with varying content of oxidizing components carried out at 200°C and at a gas supply rate of 20 - 50 per hour^{-1} revealed the superiority of catalysts containing 10 - 15% alumina. They showed a maximum conversion depth (55%) and highest yields of dimeric, trimeric and tetrameric fractions, i.e., 24, 10 and 12%, respectively. Increase in the alumina content over 20% leads to a decrease of conversion depth, reducing the yield of dimeric, and increasing the yield of trimeric and tetrameric fractions. Tested separately, neither pure alumina nor silica revealed any catalyzing ability under described conditions. Results of tests on the polymerization of propylene by aluminum silicate catalyst consisting of 50% Al_2O_3 + 50% SiO_2 at 180, 200 and 220°C, atmospheric pressure and at a gas supply rate of 20 - 60 per hour^{-1} published by G. M. Panchenkov (Ref. 13: Izvestiya AN TSSR, no. 2, 1960) showed that a maximum conversion depth (35 - 37%) and highest yields of dimeric (10 - 11%), trimeric (8 - 9%) and tetrameric (9 - 10%) fractions were observed at 200°C and at a gas supply of 20 - 30 per hour^{-1}. The dimeric fraction was subjected to a spectral analysis and showed a content of cis-hexene-2, trans-4 methyl pentene-2 and cis-4 methyl pentene-2. The presence of trans-hexene-2 and other hydrocarbons was presumed but could not be conclusively established. In accordance with thermodynamic calculations and obtained results, the polymerization

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of propylene can be expressed by

$$2\,A_1 \xrightarrow{K_1} A_2 + A_1 \xrightarrow{K_2} A_3 + A_1 \underset{K_4}{\overset{K_3}{\rightleftarrows}} A_4 + A_1 \underset{K_6}{\overset{K_5}{\rightleftarrows}} A_5 \text{ etc.} \qquad (1)$$

where A_1, A_2, A_3, A_4, A_5 - is the respective quantity of monomer, dimer, trimer, tetramer and higher polymer moles. According to the method developed by G. M. Panchenkov [Ref. 15:)(ФХ (ZhFKh), no. 2 and 3, 1952] all investigated reactions can be expressed in a system of differential equations of the kinetic process. The dimerization rate constant is determined by a differential equation. The estimated values of the respective apparent rate constants in respect of the dimerization reaction of propylene $\frac{K^*}{C}$ at 180, 200 and 220°C on aluminum silicate catalyst of 50% Al_2O_3 + 50% SiO_2 are as follows:

$$180^\circ C\ \frac{K^*}{C} = 2.2 \cdot 10^{-6} \text{ mole/sec}$$

$$200^\circ C\ \frac{K^*}{C} = 111 \cdot 10^{-6} \text{ mole/sec}$$

$$220^\circ C\ \frac{K^*}{C} = 255 \cdot 10^{-6} \text{ mole/sec}$$

Card 4/5

Kinetics of the polymerization of...

There are 16 references: 11 Soviet-bloc and 5 non-Soviet-bloc. The references to the English-language publications read as follows: H. Gayer, Ind. Eng. Chem., v. 25, 1933; A. Clark, Ind. Eng. Chem., v. 47, no. 7, 1953; E. W. Tamele, Discuss. Faraday Soc., no. 8, 1955; C. L. Thomas, Ind. Eng. Chem., v. 37, no. 6, 1945 and v. 41, 1949.

ASSOCIATION: Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti im. I. M. Gubkina (Moscow Institute of Petrochemical and Gas Industry im. I. M. Gubkin)

SUBMITTED: December 24, 1959

Card 5/5

AL'TSHULER, Vitaliy Solomonovich; SECHENOV, Gennadiy Petrovich; BANKVITSER, A.L., red.; RYLINA, Yu.V., tekhn. red.

[Fluidized bed processes under pressure] Protsessy v kipiashchem sloe pod davleniem. Moskva, Izd-vo AN SSSR, 1963. 213 p. (MIRA 16:12)
(Fluidization) (Gas manufacture)

BANNIKOV, A.G., prof. (Moskva); IVANOV, B.N., kand.geograf.nauk (Simferopol');
AL'TSHULER, S.V. (Moskva).

New books. Priroda 53 no.1:19,28,56,84,90,94 '64. (MIRA 17:2)

AL'TSHULER, S.V. (Moskva)

Nature of "inert" genes. Priroda 54 no.2:102-103 F '65.
(MIRA 18:10)

AL'TSHULER, S.Z., Eng.

Fast repair of a 25,000 kilowatt turbogenerator. Nab. energ., 1, No. 1, 1951.

SO: MLRA. October 1952

AL'TSHULER, S.Z., inzhener; LOMONOSOV, M.A., inzhener; ROZENTAL', A.Ya., inzhener; RYABKO, N.M., inzhener.

Damage to turbogenerator rotors produced by the British firm "BTH." Elek.sta. 28 no.9:86-87 S '57. (MIRA 10:11)
(Turbogenerators)

ACC NR: AR7000847 SOURCE CODE: UR/0058/66/000/009/D063/D063

AUTHOR: Al'tshuler, T. S.

TITLE: Investigation of low temperature glasses containing neodymium 3 and cerium 3 positive ions

SOURCE: Ref. zh. Fizika, Abs. 9D492

REF SOURCE: Sb. Tezisy dokl. Yubileyn. nauchn. konferentsii, posvyashch. XX-letiyu in-ta. Kazansk. fiz.-tekhn. in-t, 1966, Sekts. fiz. n. Kazan', 1966, 20-21

TOPIC TAGS: electron paramagnetic resonance, neodymium chloride, neodymium nitrate, neodymium containing glass, cerium containing glass

ABSTRACT: An investigation was made of chlorides, nitrates, rhodamides, and acetates of Nd^{3+} AND Ce^{3+} ions using electron paramagnetic resonance. Absolute ethanol, inorganic acids, triethylphosphate, pyridine, and glycerin were used as solvents. Measurements were carried out at 4.2K in the frequency range of 230—420 Mc, and at a frequency of 9320 Mc. The nature of the solvent affects the line

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ACC NR: AR7000847

shape and the concentration variation relationship with the g-factor. In concentrated solutions (0.5 m) of chlorides, acetates, and neodymium throcyanates, as well as in alcoholic solutions of cerium chloride, g = 2.3, while in nitrate and neodymium-thiocyanate solutions, g = 2. At a frequency of 9320 Mc in an alcohol solution of hydrated neodymium chloride, two lines were observed: $g_{\parallel}$ = 2.36 and $g_{\perp}$ = 3.08. N. Kask. [Translation of abstract] [NT]

SUB CODE: 20/

Card 2/2

ACC NR: AR7001777 (N) SOURCE CODE: UR/0196/66/000/010/L028/L028

AUTHOR: Al'tshuller, T. S.

TITLE: Methods of controlling the reliability of ship cable junctions during cable joining

SOURCE: Ref. zh. Elektrotekhnika i energetika, Abs. 10L139

REF SOURCE: Tr. Leningr. korablestroit. in-ta, vyp. 47, 1965, 3-4

TOPIC TAGS: naval equipment, reliability engineering, ~~ship cable junction~~, ~~cable junction reliability~~ electric cable, ship component

ABSTRACT: The junction of internal ship cables is achieved by cold sheathing of the cable wires placed in a copper housing and restoring of the insulating rubber layer with hot vulcanization. Internal defects of the insulation, while not lowering the electric strength reduce the life and reliability of the insulation. Control of the insulating quality of the cable at the point of junction is accomplished using γ-radiation to detect defects. The iridium isotope IR^{192} with an energy of 0.7 Mev was selected as the source of γ-radiation. γ-radiation was recorded

Card 1/2 UDC: 629.12.066

ACC NR: AR7001777

photographically on RT2 film with a 25-sec exposure. The film was placed at a distance of 350 mm from the test object. In the insulating layer, the sectors containing flaws are more transparant in the γ -picture. The reliability of the contact of the cable wires is estimated using inductively coupled circuits to match the value of resistance ΔR_c, introduced by the cable in the coil of an air-coil transformer located in the vicinity of the junction point. The value of introduced resistance is

$$\Delta R_1 = \left(\frac{\omega M}{R_{11}}\right)^2,$$

where ω is the angular frequency, M, the mutual inductance of the transformer and the cable, R_{11}, the resistance of the cable, which is compared to ΔR_1 of a standard cable, providing the quantitative evaluation of the cable wire contact junction. Both methods of cable joint-quality control permit the production of miniature portable control devices. Three illustrations. I. Besedin. [Translation of abstract] [DW]

SUB CODE: 09/13

Card 2/2

ACCESSION NR: AP4034942 S/0181/64/006/005/1542/1544

AUTHORS: Benderskiy, V. A.; Blyumenfel'd, L. A.; Shevchenko, I. B.; Al'tshuler, T. S.

TITLE: Electrical and magnetic properties of donor acceptor crystals

SOURCE: Fizika tverdogo tela, v. 6, no. 5, 1964, 1542-1544

TOPIC TAGS: electric property, magnetic property, donor acceptor crystal, organic semiconductor, aromatic amine, aromatic hydrocarbon, chloranil, bromanil

ABSTRACT: So many theories have been proposed for the generation of carriers in organic semiconductors that the authors sought to weigh the evidence and uncover the proper theory. They compared the activation energies of conduction with the position of the band of carrier displacement in weak donor-acceptor systems in both solid and liquid phases. They examined complexes of chloranil and bromanil with aromatic amines (o-aminophenol, n-bromanalid, and diphenylamine) and aromatic hydrocarbons (pyrene and stilbene). In all these complexes the absorption bands of the films proved to be identical to the spectra of the solutions. Change in the aggregate state did not lead to expansion of the band, and the shift in the band did not exceed 0.07 ev. For the hydrocarbons the band

Card 1/2

ALITSHULLER, V.A., inzh.; KARTSEV, V.L., inzh.; MURASHKO, N.I., inzh.; PETROV, S.Ya., inzh.

Three-stage distance-type protection system using transistor devices. Elek. sta. 35 no.8:63-68 Ag '64. (MIRA 17:12)

AL'TSHULER, V.B.

Study of the interaction of vocal and motor reactions in epileptics.
Trudy Inst. vys. nerv. deiat. Ser. patofiziol. 7:50-67 '60.
(MIRA 14:4)

(EPILEPTICS) (REFLEXES)

AL'TSHULER, V.B.

Interrelation of vocal and motor conditioned reactions to stimuli of varying strength in epileptics and in healthy subjects. Trudy Inst. vys. nerv. deiat. Ser. patofiziol. 7:274-277 '60. (MIRA 14:4)
(EPILEPTICS) (CONDITIONED RESPONSE)

S/169/62/000/001/066/083
D228/D302

AUTHOR: Al'tshuler, V. M.

TITLE: A graphical and cartographical method of reckoning and precalculating tides

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 1, 1962, 17, abstract 1V102 (Tr. Gos. okeanogr. in-ta, no. 63, 1961, 8-24)

TEXT: Three methods are usually used to precalculate the sea-level heights: 1) From harmonic constants, 2) by means of special tide tables published every year, and 3) by means of special atlases. The suggested method is based on the separate cartographic representation of the hourly wave coordinates S_2 and K_1 in relation to mean sea-level and on the graphical depiction of corrections which take into account the change of the astronomic part of these tidal components, for each solar day and also for the distorting influence of other waves. The use of nomographic charts to obtain a particular correction ensues from the ratio of the

Card 1/3

A graphical and ...

wave components $\frac{H_{O_1}}{H_{K_1}}$ for a complex diurnal wave and $\frac{H_{M_2}}{H_{S_2}}$ for a complex semidiurnal wave. The hourly ordinates of waves S_2 and K_1 in respect of mean sea-level are graphically depicted by means of sinusoidal curves separately for each point of observation. The hours of the day from 0 to 24 are plotted along the y-axis, the amplitudes of H being plotted on the x-axis. The moment of high water is determined in relation to the point of origin by means of a special positional angle for the given wave, expressed in hours, and is plotted according to the y-axis scale. Such graphs are constructed for each point having harmonic constants. The values of the wave ordinates (taken from the graphs), to which number corresponding to the ordinal numbers of the hours of the day are allotted, are plotted on the maps, then the lines of these quantities are drawn. The true level ordinates are obtained by introducing the hourly (numeral) amendments of the maps of waves S_2 and K_1,

Card 2/3

S/169/62/000/001/067/083
D228/D302

AUTHORS: Al'tshüler, V. M. and Vladimirov, O. A.

TITLE: Calculating the semidiurnal tide (M_2) in the Baffin Sea and the Davies Strait by G. V. Polukarov's method

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 1, 1962, 17-18, abstract 1V106 (Tr. Gos. okeanogr. in-ta, no. 64, 1961, 112-117)

TEXT: The calculation was made for 39 points on a square grid with a side length of 60 miles. The map of the cotidal hours agrees well with similar, previously constructed maps. This area's semidiurnal waves are formed not only by the Atlantic tidal wave but are even induced, too, by the wave from the Arctic Ocean. Shore reflection has a great influence on the propagation of the M_2 wave. In the narrow part of the Davies Strait the wave's velocity diminishes markedly, but its amplitude grows considerably. In the north of the Baffin Sea the wave's amplitude also increases in

Card 1/2

S/169/62/000/003/082/098
D228/D301

AUTHOR: Al'tshuler, V. M.

TITLE: Deflecting force of the earth's rotation and allowing for it in tidal calculations

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 3, 1962, 10, abstract 3V65 (Tr. Gos. okeanogr. in-ta, no. 63, 1961, 3 - 7)

TEXT: Methods of numerically predicting the determination of the tide level and the velocity of tidal currents are considered. G. V. Polukarov takes for the deep sea ($h > 100$ m) the equations of tidal wave movement in the following form:

$$\frac{\partial u}{\partial t} - 2\omega v \sin\varphi = g\frac{\partial \zeta}{\partial x}$$

Card 1/ 5

Deflecting force of ...

$$\frac{\partial v}{\partial t} + 2\omega u \sin\varphi = - g \frac{\partial \xi}{\partial y}$$

and the equation of continuity as:

$$\frac{\partial \xi}{\partial t} = - \frac{\partial (uh)}{\partial x} - \frac{\partial (vh)}{\partial y}$$

where u and v are the velocity components of the tidal current in the direction of the x- and the y-axis respectively, ξ is the sea's level, h is the sea's depth, ω is the angular rate of the earth's rotation, φ is the latitude, and g is the acceleration of gravity. Additional terms which take friction into account, are introduced into the equation in the case of the shallow sea ($h < 100$ m). Polukarov calculates the components of the tidal current velocity from the level's known values by the formulas:

Card 2/5

Deflecting force of ...

$$u' = \frac{g\left[-2\omega \sin\varphi\left(\xi_1' - \xi_0\right) - \sigma\left(\xi_1'' - \xi_0''\right)\right]}{2l\left(4\omega^2 \sin^2\varphi - \sigma^2\right)};$$

$$u'' = \frac{g\left[-\sigma\left(\xi_1' - \xi_0'\right) - \sigma\left(\xi_2'' - \xi_0'\right)\right]}{2l\left(4\omega^2 \sin^2\varphi - \sigma^2\right)};$$

$$v' = \frac{g\left[2\omega \sin\varphi\left(\xi_2' - \xi_0'\right) - \sigma\left(\xi_2'' - \xi_0''\right)\right]}{2l\left(4\omega^2 \sin^2\varphi - \sigma^2\right)};$$

$$v'' = \frac{g\left[\sigma\left(\xi_2' - \xi_0'\right) + 2\omega \sin\varphi\left(\xi_2'' - \xi_0''\right)\right]}{2l\left(4\omega^2 \sin^2\varphi - \sigma^2\right)};$$

where u', u", v', and v" are functions of x and y. For each tidal wave ξ', u', and v' determine the level and the velocity components of tidal currents at the moment when the moon passes across the mid-meridional belt. ξ'', u", and v" define the level and the component velocities in a quarter of the period; σ is the angular velocity of the period's wave components. These equations are satisfactory only for areas of low and moderate latitudes. In polar latitudes these equations give values for the current components which do not

Deflecting force of ...

correspond to the observed currents. This is because the denominators of the right parts of the equations converge on zero with increasing latitude. A deficiency of this method is the fact that the original equations are taken for the case of an ideal liquid. They do not allow for the forces of internal friction and the vertical velocity components; the density of water is taken as equalling unity, while the pressure is assumed to be purely hydrostatic. No allowance is also made for all the components of the deflecting force of the earth's rotation. When taking into account the deflecting force of the earth's rotation it is possible to obtain satisfactory results for large polar-latitudinal areas with the equations:

$$\frac{\partial u}{\partial t} - (2\omega \sin\varphi + \frac{v}{R} \operatorname{tg}\varphi)v = - g \frac{\partial}{\partial x} (\zeta - \bar{\zeta})$$

$$\frac{\partial v}{\partial t} + 2\omega u \sin\varphi = - g \frac{\partial}{\partial y} (\zeta - \bar{\zeta})$$

Card 4/5

S/169/62/000/003/082/098
D228/D301

Deflecting force of ...

When calculating currents in polar regions from other schemes the additional term of the deflecting force of the earth's rotation should also be taken into account. 4 references. [Abstracter's note: Complete translation.]

Card 5/5

AL'TSHULER, V.M.; DMITRIYEVA, A.A.

Some oceanographic calculations in the design of tidal electric power stations. Uch.zap.LGU no.309:3-54 '61. (MIRA 15:3)
(Tidal power)

AL'TSHULER, V.M.

Determining the distances between level indicators in a tidal sea in research for the planning of hydraulic structures. Trudy GOIN no.70:39-46 '62. (MIRA 15:6)
(Hydraulic engineering—Research) (Tides)

AL'TSHULER, V.M.

Energy of a tidal wave and its transportation. Trudy GOIN no.74:67-74 '63. (MIRA 16:7)

(Tidal waves)

AL'TSHULER, V.M.

Deficiencies in the dual method of harmonic analysis of tides and some recommendations for eliminating them. Trudy GOIN no.81:106-129 '64. (MIRA 17:11)

AL'TSHULER, V.M.

Evaluation of the accuracy of measurements of tides with a sounding lead. Trudy GOIN no.82:19-24 '64 (MIRA 18:2)

Harmonic analysis of short-term series of shallow-water tides. Ibid.:74-86

AL'TSHULER, V.M.

Harmonic analysis of diurnal series of tidal currents. Okeanologiia 4 no.5:918 '64 (MIRA 18:1)

AL'TSHULER, V.M., kand. geogr. nauk; ANTROPOVA, L.V., st. inzh.; BUKHTEYEV, V.G., st. inzh.; VOLODINA, Z.G., ml. nauchn. sotr.; RZHONSNITSKIY, V.B., kand. geogr. nauk; SELITSKAYA, Ye.S., kand. geogr. nauk; FUKS, V.R., kand. geogr. nauk; BREKHOVSKIKH, Yu.P., red.; TIMONOV, V.V., red.

[Study of tidal phenomena in a heterogeneous sea] Issledovanie prilivnykh iavlenii v neodnorodnom more. Leningrad, Gidrometeoizdat, 1965. 183 p. (MIRA 18:8)

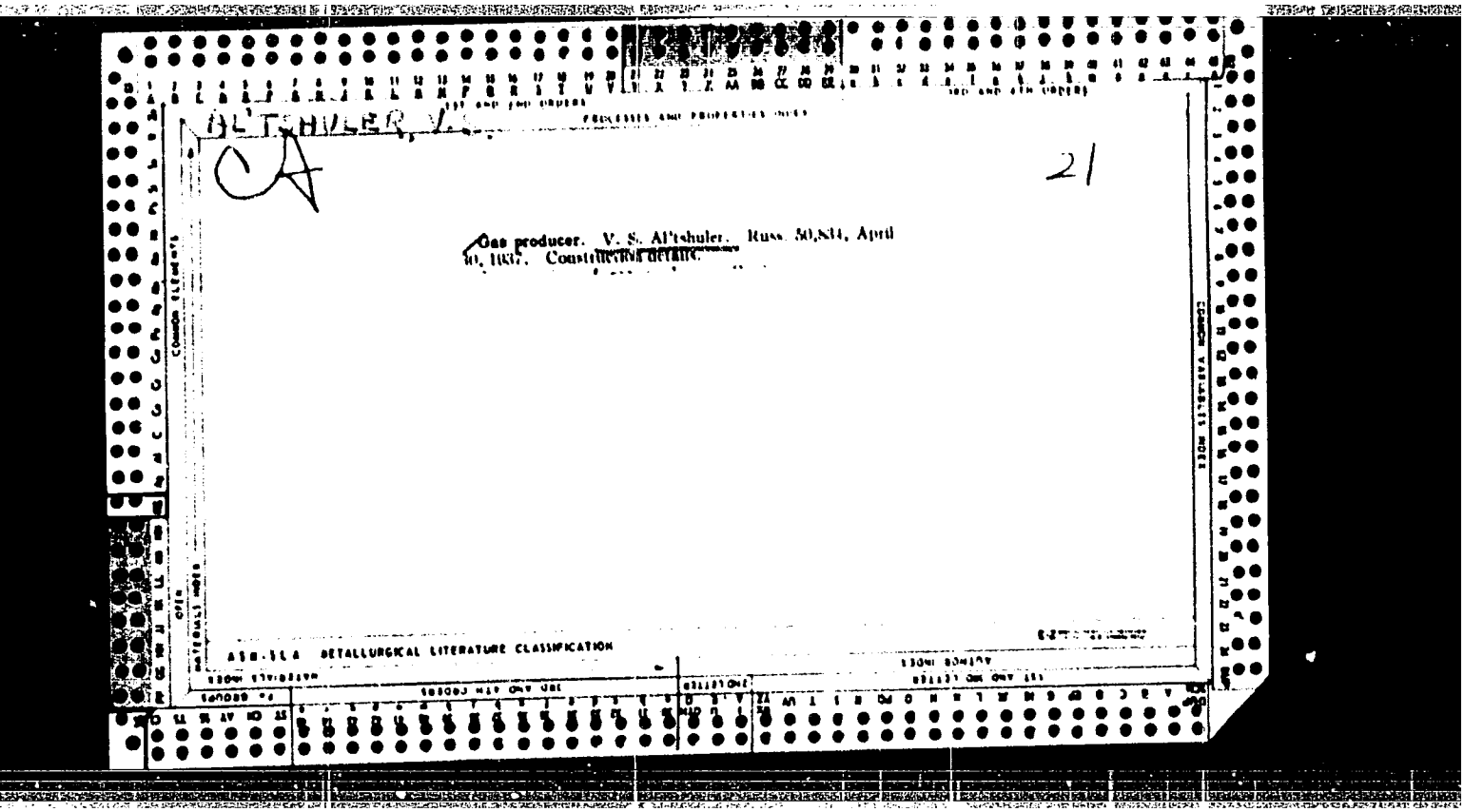
1. Leningradskoye otdeleniye Gosudarstvennogo okeanograficheskogo instituta (for Al'tshuler). 2. Murmanskoye upravleniye gidrometeorologicheskoy sluzhby (for Antropova). 3. Leningradskiy gidrometeorologicheskiy institut (for Bukhteyev). 4. Gosudarstvennyy okeanograficheskiy institut (for Volodina, Selitskaya). 5. Leningradskiy gosudarstvennyy universitet imeni A.A.Zhdanova (for Rzhonsnitskiy, Fuks).

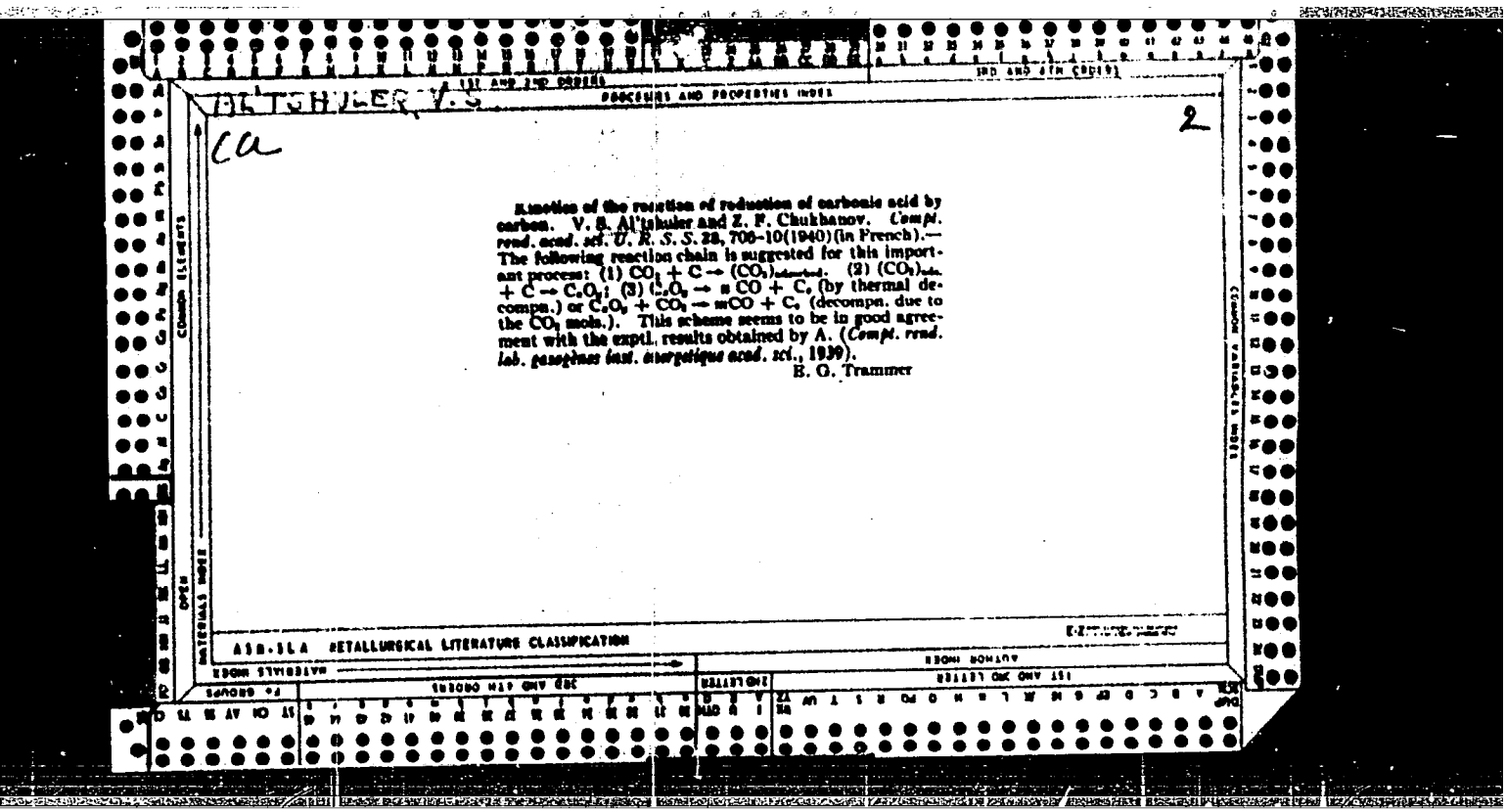
AL'TSHULER, V.M.

Calculation of true tidal fluctuations in harmonic analysis.
Trudy GOIN no.87:96-104 '65. (MIRA 19:1)

AL'TSHULER, V.M.; TRAPEZNIKOV, Yu.A.

Tables for calculating the elements of maximum tidal current.
Trudy GOIN no.87:115-165 '65. (MIRA 19:1)





ALTSHULER, V.S

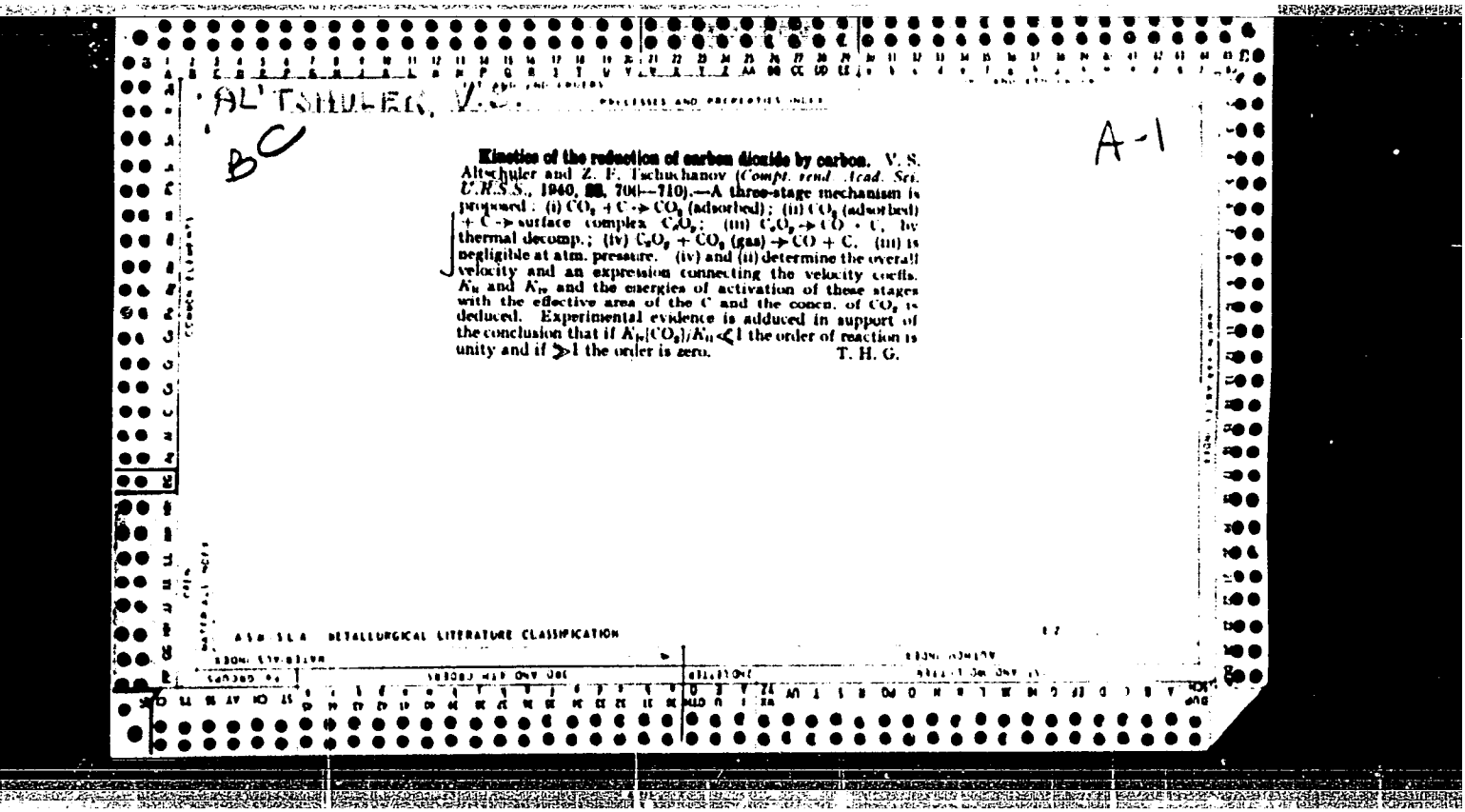
Ca

2

Kinetics of the reaction of reduction of carbonic acid by carbon. V. S. Al'tshuler and Z. F. Chukhanov. *Compt. rend. acad. sci. U. R. S. S.* 28, 708–10(1940)(in French).—The following reaction chain is suggested for this important process: (1) $CO_2 + C \rightarrow (CO_2)_{adsorbed}$. (2) $(CO_2)_{ads.} + C \rightarrow C_2O_2$; (3) $C_2O_2 \rightarrow n\,CO + C_n$ (by thermal decompn.) or $C_2O_2 + CO_2 \rightarrow nCO + C_n$ (decompn. due to the CO_2 mols.). This scheme seems to be in good agreement with the expti. results obtained by A. (*Compt. rend. lab. gazogènes inst. énergétique acad. sci.*, 1939).

B. G. Trammer

A18-51A METALLURGICAL LITERATURE CLASSIFICATION



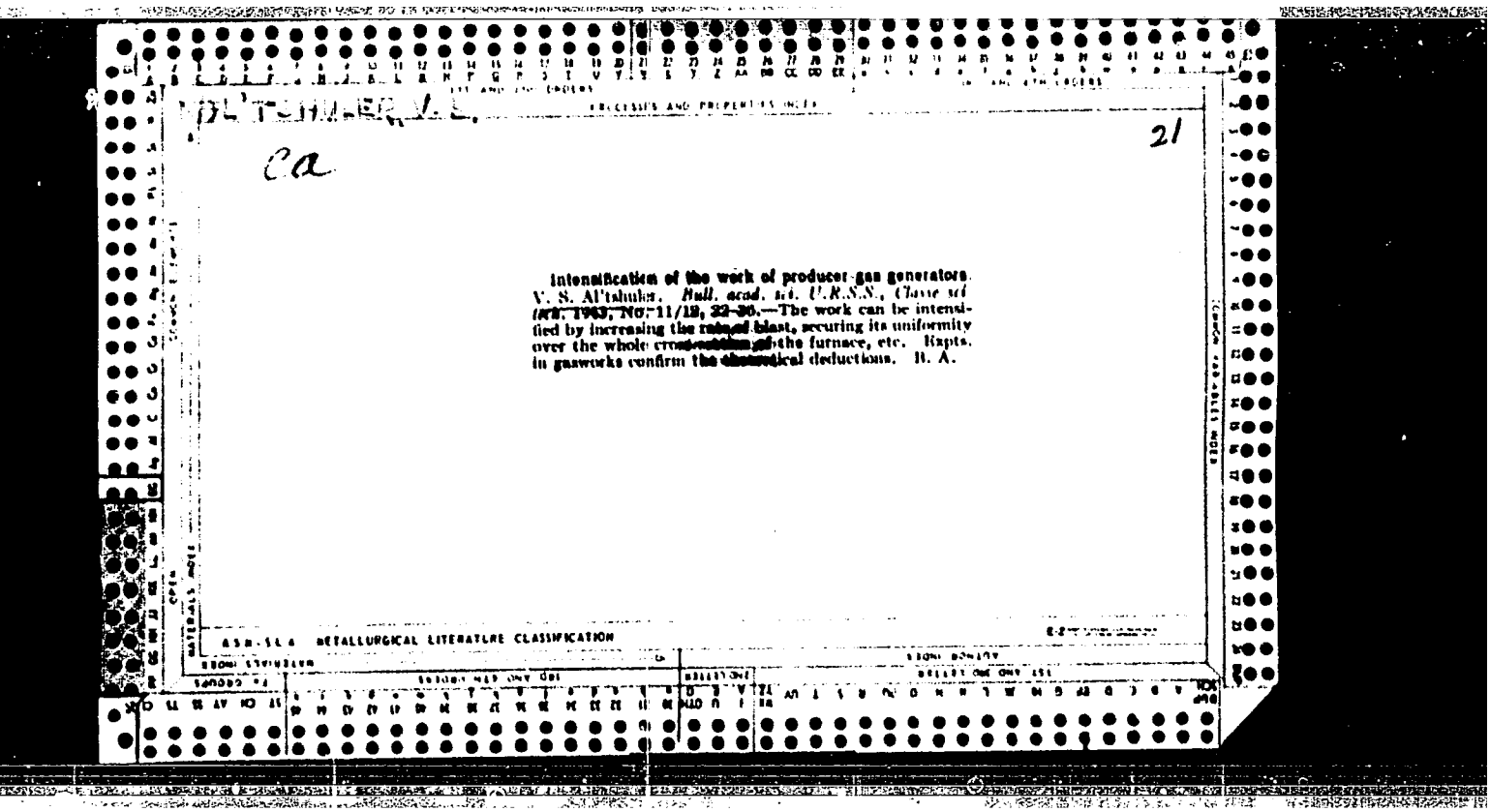
AL'TSHULER, V.S.

BC

A-1

Kinetics of the reduction of carbon dioxide by carbon. V. S. Altschuler and Z. F. Tschuchanov (*Compt. rend. Acad. Sci. U.R.S.S.*, 1940, **28**, 706—710).—A three-stage mechanism is proposed: (i) $CO_2 + C \rightarrow CO_2$ (adsorbed); (ii) CO_2 (adsorbed) + C → surface complex C_xO_y; (iii) $C_xO_y \rightarrow CO + C$, by thermal decomp.; (iv) $C_xO_y + CO_2$ (gas) → CO + C. (iii) is negligible at atm. pressure. (iv) and (ii) determine the overall velocity and an expression connecting the velocity coeffs. K_{II} and K_{IV} and the energies of activation of these stages with the effective area of the C and the concn. of CO_2 is deduced. Experimental evidence is adduced in support of the conclusion that if $K_{IV}[CO_2]/K_{II} \ll 1$ the order of reaction is unity and if $\gg 1$ the order is zero. T. H. G.

A S M S L A METALLURGICAL LITERATURE CLASSIFICATION

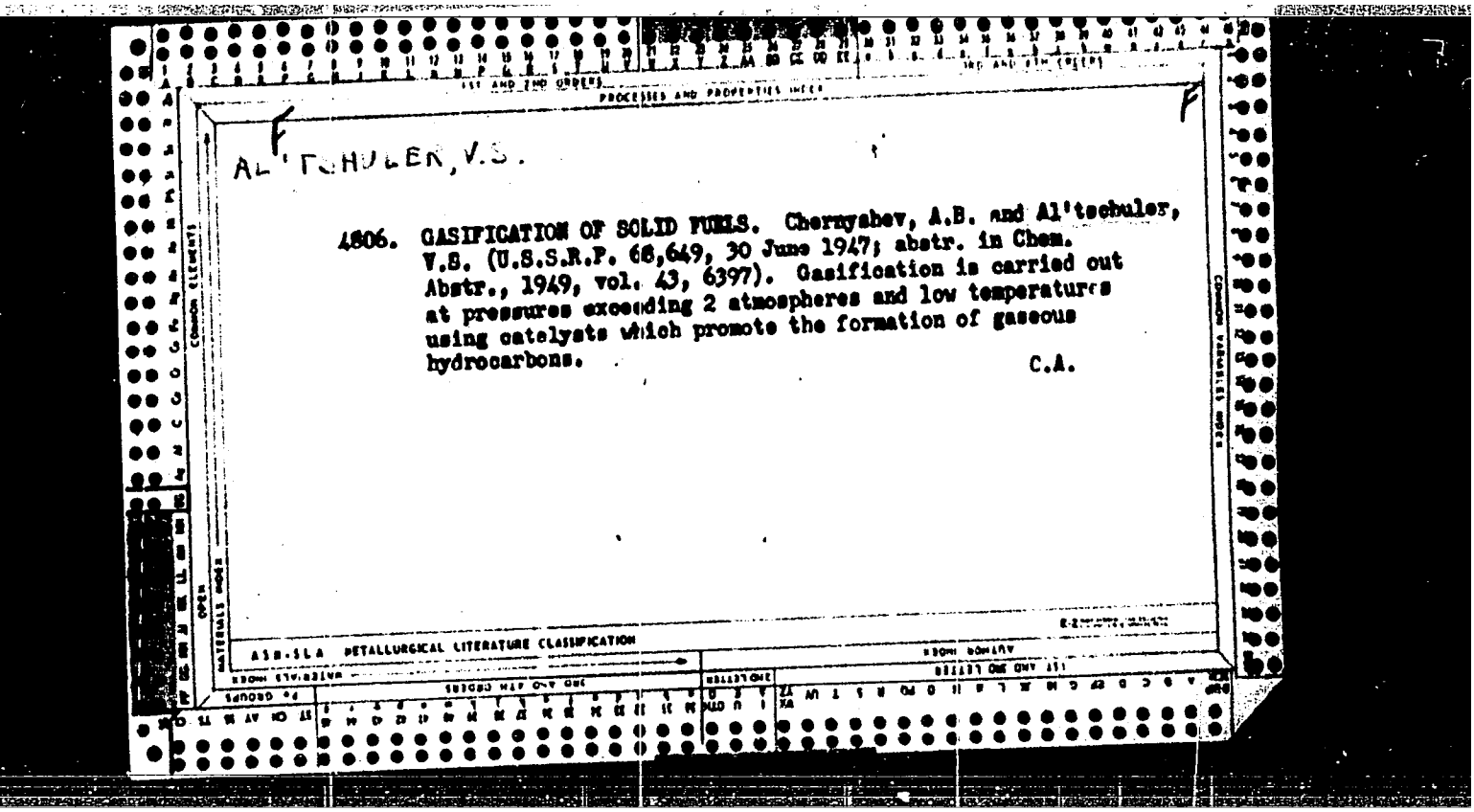


21

Ca

Intensification of the work of producer-gas generators. V. S. Al'tshuler. *Bull. acad. sci. U.R.S.S., Classe sci. tech.* 1943, No. 11/12, 22–36.—The work can be intensified by increasing the rate of blast, securing its uniformity over the whole cross-section of the furnace, etc. Expts. in gasworks confirm the theoretical deductions. B. A.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

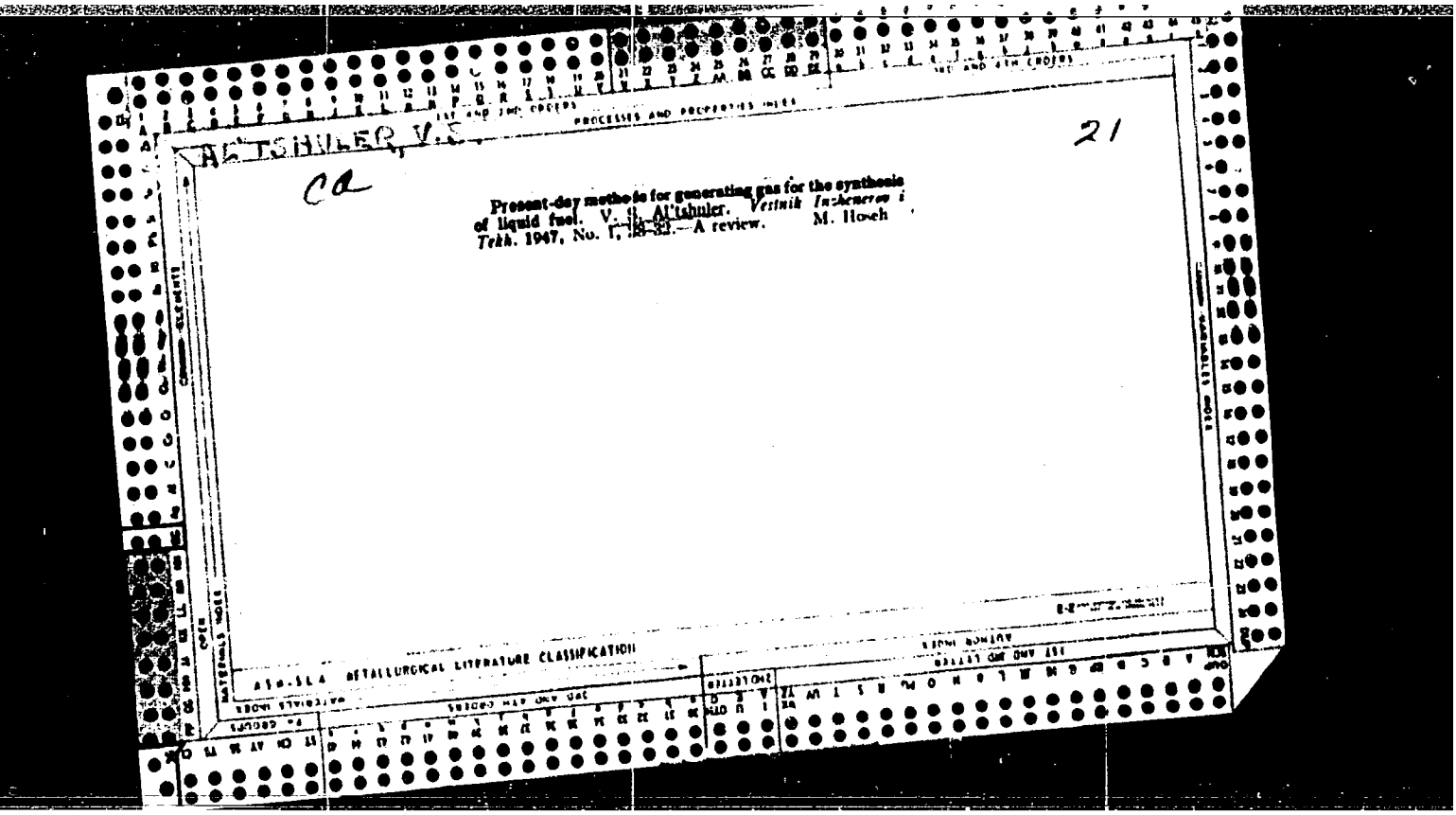


F

AL'TSHULER, V.S.

4806. GASIFICATION OF SOLID FUELS. Chernyshev, A.B. and Al'tshuler, V.S. (U.S.S.R.P. 68,649, 30 June 1947; abstr. in Chem. Abstr., 1949, vol. 43, 6397). Gasification is carried out at pressures exceeding 2 atmospheres and low temperatures using catalysts which promote the formation of gaseous hydrocarbons. C.A.

F



AL'T'SHULER, V. S.

May 1947

USSR/Carbon
Gas producers

"The Gasification of Carbon Under High Pressure," A . B. Chernyshev, V. S. Al't'shuler, Member Correspondents of the Academy of Sciences, 3 pp

"Doklady Akademii Nauk SSSR" Vol LVI, No 5

Graphs showing 1) relationship between temperature equilibrium and proportion of methane, 2) the relationships between pressure and caloric value of the synthetic fuel, and 3) the relationship between the $O2/H_2O$ ratio in the blast and the caloric value.

PA 9T51

AL'TSHULER, Vitaliy Solomonovich.

Academic degree of Doctor of Technical Sciences, based on his defense, 22 December 1953, in the Council of the Inst of Combustible Minerals, Acad Sci USSR, of his dissertation entitled: "Problems of high productivity gasification in solid fuels."

Academic degree and/or title: Doctor of Sciences

SO: Decisions of VAK, List no. 4, 25 February 1956, Byulleten' MVO SSSR, No. 1, January 1957, Moscow, pp. 14-24, Uncl. JPRS/NY-440

AL'TSHULER, V. S.

1319. EFFECT OF PRESSURE ON LOW TEMPERATURE CARBONIZATION OF SOLID FUELS. I. Chernyshev, A.B., Al'tshuler, V.S. and [illegible] (Izv. Akad. Nauk SSSR Otdel. Tekh. Nauk (Bull. Acad. Sci. U.S.S.R. Sect. Tech. Sci.), Oct. 1953, 1393-1400; Dokl. Akad. Nauk SSSR (Rep. Acad. Sci. U.S.S.R.), 1 Jan. 1954, vol. 94, (1), 117-120). Laboratory experiments are recorded in which Baltic shale, Moscow Region and Donets coals, and Ukrainian brown coal, were heated in a retort at 550-630°C and 20-100 atm. while products were removed in a stream of nitrogen. Decomposition of the fuel was shown to depend on temperature, not pressure. Pressure affected secondary reactions in the vapour/gas phase, directly by assisting polymerization and condensation, and indirectly by increasing the time the products remained in the apparatus. With time in apparatus constant, increased pressure decreased the yield of unsaturated compounds and light tar fractions, and increased that of asphaltenes and carboids. Increase of time led to increase in yield of semicoke and gas, decrease in tar, increase of light fractions and neutral compounds and decrease of phenols in the tar, and decrease of unsaturated compounds, and increase of methane and its homologues, in the gas. (L.).

4

USSR.

Thermodynamics of gasification of solid fuels under high pressure. A. B. Chitruyshev, V. S. Al'tshuler, and G. S. Shafir. *Trudy Inst. Goryuch. Iskopaemykh, Akad. Nauk S.S.S.R.* 3, 86–94(1954).—C gasification was studied at 1–300 atm. pressure and 300–1100° temp., with various gasification media (steam, steam with O_2, air, and H_2). CH_4 is the only detectable hydrocarbon formed when C is gasified at 300 atm. and 1100° under gas-synthesis conditions. High pressure during the gasification of solid fuels increases the proportion of H_2O, CO_2, and CH_4, and H_2O and CO_2 must be eliminated to raise the B.t.u. of the gas. The effect of high pressure upon C gasification differs with the temp., and good results are obtained at around 700° and 20–30 atm. pressure. The gasification-medium compn. greatly affects the B.t.u. of the gas produced. Higher H- and O-contg. components and reduction in the N_2 concn. in the gasification medium raise the B.t.u. considerably. The optimum O_2 concn. in the gas depends on the thermal gasification conditions. The O_2 consumption is lower and steam consumption is higher at higher pressures. Other gaseous hydrocarbons (e.g. C_2H_6) may also form in the actual gasification of solid fuels through cracking and hydrogenation of the high-mol. components of the coal.

W. M. Sternberg

B I

Al'tshuler, V. S.

II.C.U.R.A. (R.H.C.).

62

Effect of pressure on low-temperature carbonisation of solid fuels. A. B. Chernyshev, V. S. Al'tshuler, and G. A. Shafir (*Dokl. Akad. Nauk. SSSR*, 1951, 94, 117—121).—Measurements of yields of coke, tar, and the products of primary and secondary decomposition at 550° and various pressures, under a stream of N_2, show that the primary decomposition of the fuel into coke and volatiles is not affected by pressure, while increase of pressure affects secondary gas-phase reactions directly by promoting polymerisations and condensations, and indirectly by increasing the time of residence.

R. C. MURRAY.

(2)

Al'tshuler, V. S.

Laboratory investigation of semicoking of nonagglomerated Ukrain. S.S.R. brown coal under pressure. A. B. Chernyshev, V. I. Tolubinskii, V. S. Al'tshuler, M. I. Rabinovich, G. A. Shiffr, and G. N. Khopta. *Akad. Nauk Ukr. S.S.R., Inst. Teploenerget., Sbornik Trudov* 1935, No. 11, 37–50.—A comparison of results obtained in low-temp. carbonization of brown coal under pressure and in a stream of N, with the results obtained in a steam + N stream, shows that steam lowers the char yield but increases the yield of the primary tar. The proportion of heat entering the gas is increased in the presence of steam. An appreciable proportion of the steam introduced is decompd., and the decompn. is increased at higher steam residence time. The abs. amt. of steam decompd. increases with increased steam feed. The tar-quality changes caused by steam were found to involve the production of a higher paraffin content of carboxylic acids, phenols, and neutral oil.

W. M. Sternberg

Chem

6

V.S. Al'tshuler

Nonagglomerated brown-coal gasification of the Ukrain. S.S.S.R. with a steam-oxygen blast under pressure and under laboratory conditions. A. B. Chernyshev, V. I. Tolubinskii, V. S. Al'tshuler, M. I. Rabinovich, G. A. Shafir, and G. N. Khopta. *Akad. Nauk Ukr. S.S.R., Inst. Teploenerget., Sbornik Trudov* 1955, No. 11, 81-93.—Expts. on the gasification of nonagglomerated brown coal at pressures up to 50 atm., with a blast of varying compn., shows that gasification is complete in a short distance of about 400 mm. or 10-12 times the particle size. The proportion of CH_4 and CO_2 in the gas is higher at higher pressures, and, for a given blast compn., the CO content is lower. Raising the H_2O:O proportion at a given gas pressure raises the CO_2 and H proportion in the gas and lowers the CH_4 and CO proportion. The B.t.u. of the gas produced at higher pressure is higher. Increased pressures raise the carbonization share in the gas production. A larger part of the potential heat capacity in the fuel enters the gas in the charring zone, resulting in a lower O and steam consumption in the total process. When considering the differences in the size of the industrial installations and the higher temp. used, industrial gasification will prove more profitable than can be obtained on a bench scale. W. M. S.

ALTSHULER, V.S.

CHERNYSHEV, Andrey Borisovich; LAVROV, N.V., doktor tekhnicheskikh nauk, otvetstvennyy redaktor; FAERBEROV, I.L., doktor tekhnicheskikh nauk, redaktor; SHISHAKOV, N.V., doktor tekhnicheskikh nauk, redaktor; AL'TSHULER, V.S., doktor tekhnicheskikh nauk, redaktor; IVANOV, V.M., kandidat tekhnicheskikh nauk, redaktor; PITIN, R.N., kandidat tekhnicheskikh nauk, redaktor; KLIMOV, V.A., redaktor izdatel'stva; SOMOROV, B.A., tekhnicheskiy redaktor

[Selected works] Izbrannye trudy. Moskva, Izd-vo Akademii nauk SSSR, 1956. 368 p. (MLRA 9:8)

1. Chlen-korrespondent AN SSSR (for Chernyshev)
(Coal gasification)

AL'TSHULER, V. S.

2

A method for the production of city gas by the methanation of water gas. V. S. Al'tshuler and V. V. [illegible] ... Prom. 1956, No. ... illustrate the lab. app. for methanating water gas ... [illegible]

... gas ... temp. ... [illegible] ... methanated at 28[illegible] at a velocity ... [illegible] ... catalyst was composed of ... [illegible]

ALTSHULER, V.S.

Low-temperature carbonization of solid fuels in a reactive gas atmosphere under high pressure

AL'TSHULER, V.S.; LEBEDEV, V.V.

Manufacture of utility gas. Mul. tekh.-ekon. inform. no.1:10-11 '57. (MIRA 11:4)

(Gas manufacture and works)

Al'tshuler, V.S.

AUTHORS: Al'tshuler, V.S. and Shishakov, N. V. 65-7-1/14

TITLE: A Complex Gas-chemical Utilisation of Coals as a Basis of a Centralised Supply of Gas for the Eastern Regions of the USSR (Kompleksnoye gazokhimicheskoye ispol'zovaniye ugley kak osnova tsentralizovannogo gazosnabzheniya vostochnykh rayonov SSSR)

PERIODICAL: Khimiya i Tekhnologiya Topliva i Masel, 1957, No.7, pp. 1 - 15 (USSR)

ABSTRACT: Various schemes for the gasification of Siberian brown coals mined by open-cast methods (high pressure, fluidised bed and blast furnace process) with simultaneous utilisation of some of the gas components for synthesis, for the purpose of a centralised supply of gas for the Eastern regions of the USSR, are discussed and an experimental investigation of semi-coking of ITATSK coals and gasification of semi-coke under pressure up to 30 atm. is described. Data on the ITATSK brown coals are given in Table 1, mean data on the yield and quality of semi-coke and the composition of gas in Tables 2 and 3, respectively. Semi-coking was carried out using a stream of nitrogen-steam mixture (50% N_2, 50% H_2O). The method and apparatus used were described in Ref.2. Gasification of semi-

Card1/2

V. S. ALTSHULER

11(0) PHASE I BOOK EXPLOITATION SOV/1868

[illegible] nauchno-tekhnicheskoye obshchestvo neftyanoy promyshlennosti

Puti razvitiya gazovoy promyshlennosti SSSR; materialy Vsesoyuznogo soveshchaniya (Trends in the Development of the Gas Industry in the USSR; Materials Presented at the All-Union Conference) Moscow, Gostoptekhizdat, 1958. 438 p. 3,000 copies printed.

Eds.: A.D. [illegible], [illegible], P.S. [illegible], Yu.A. [illegible], V.I. [illegible], V.S. [illegible], [illegible], F.A. [illegible], A.S. [illegible]; Exec. Eds.: [illegible] and [illegible]; Tech. Ed.: [illegible]; Editorial Board: [illegible] (Chief Ed.), [illegible], Yu.A. [illegible], V.S. [illegible], and [illegible].

PURPOSE: The book is intended for specialists engaged in the production and gathering of natural gas, the extraction of gas from coal and shale, the construction and operation of trunk gas pipelines, gas supply to cities, and the processing of gas.

COVERAGE: The authors review the basic trends in the development of the USSR gas industry, the prospecting and exploration of new gas deposits, the gasification of solid fuels, the gathering and utilization of natural gas, the automation of gas field operations, the exploitation of gas wells, and ways to increase output. They further discuss the processing of natural gas with application of refrigeration, the experience gained in the laying and operating of trunk gas pipelines, the automation of gas pipeline operation, and underground gas storage facilities. There are no references.

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Trends in the Development of the Gas (Cont.) SOV/1868

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SOV/65-58-7-1/12

AUTHORS: Al'tshuler, V. S. and Shafir, G. S.

TITLE: Obtaining Gases of Given Composition During the Gasification of Solid Fuels Under High Pressure (Polucheniye gazov zadannogo sostava pri gazifikatsii tverdykh topliv pod vysokim davleniyem).

PERIODICAL: Khimiya i Tekhnologiya Topliv i Masel, 1958. Nr. 7. pp. 1-8. (USSR).

ABSTRACT: Gasification under pressure makes it possible to obtain cheap, fine-grained, low-quality fuels. The authors investigated a gas generating process under high pressure to obtain a gas with required proportion of active components and the minimum content of methane. The plant used for these experiments is described (Fig. 1). The basic apparatus comprises a cylinder made of stainless steel (height = 800 mm, internal diameter = 150 mm). Inside the cylinder is a stainless steel reactor (length = 500 mm and internal diameter = 50 mm) on which a 1.1 kw heater is fixed. To achieve better mixing of the reaction gases (O_2, CH_4, CO_2), with the water vapour at the inlet of the reactor tube, a perforated 100 mm high cylinder is used which is filled with 8 - 10 mm pieces of fireclay. During the experiment the temperature of the reaction

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layer is regulated by platinum-platinum-rhodium thermocouples which are placed in the centre of the layer at 15 and 350 mm from the base of the reactor. Two series of experiments were carried out to determine the conditions under which the formation of methane during the gasification of fuels is inhibited: (1) experiments on the gasification of peat semi-coke by using a mixture of $H_2O:O_2$ = 1; 5 and 10 at pressures of 1, 20 and 50 atms; (2) experiments on the processes of interaction of various mixtures of CO_2 + H_2O ($CO_2:H_2O$ = 0.2; 1.0 and 2.0) with peat semi-coke at temperatures of 750° to 950°C and pressures of 1 and 20 atms. Fig.2: variations in the ratio of $H_2O:CO$ according to the height of the layer during the gasification of peat semi-coke under pressure. Experimental data on the rate of formation of methane - Fig.3 - shows that the rate of formation increases with increasing temperature of the layer and increasing pressure in the apparatus; above 1300° - 1350°C it decreases. The methane content in the gas is considerably lower when the height of the layer decreases. A second series of experiments concern the formation of methane in the zone of reduction

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reactions. Fig.4: the dependence of the methane content in dry gas on the temperature at varying ratios of CO_2:H_2O and pressures of 1 and 20 atms. An increase in the CO_2:H_2O ratio leads to a decreased content of methane in the gas and increases in the pressure to an increased methane content. The same applies to increases in temperature; in this case the increase is greater the higher the pressure and the lower the CO_2:H_2O ratio. These experiments show that the most effective method of inhibiting the formation of methane during the gasification of fuels under pressure lies in changing the composition of the gas mixture entering the zone of reduction reactions. Further investigations concern the thermodynamic and experimental work of the interaction of methane with water vapour under high and under normal pressure in the presence of coal or of a neutral capping. Thermodynamic calculations of the reaction equilibrium of $CO_2 + H_2O$ were made at pressures of 1, 20 and 40 atms, temperatures of 700 - 1100°C and the ratios of H_2O:CH_4 = 1, 5 and 10 in the presence of carbon or a neutral capping. These tests were for regulating the methane content in the gas produced during the

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gasification of fuels, and aimed at increasing the effectiveness of manufacturing the gas. Data on the degree of conversion of methane with water vapour is given in a table on page 5. The process was carried out at large excess of water vapour. Further experiments were carried out in the presence of capping made from 3 - 5 mm grains of fireclay at 500°- 1100°C, pressures of 1, 10, 20 and 40 atms and ratios of $H_2O:CH_4$ of 1, 5 and 10; the rate of movement of the air draught = 0.425; 1.06; 3.45 and 6 m/second. During other experiments the content of nitrogen in the air draught mixture was varied. The height of the layer in all experiments was 500 mm. The degree of conversion of methane at various temperatures and pressures is practically independent of the $H_2O:CH_4$ ratio i.e. from the concentration of CH_4 in the air draught (Fig.5), which implies that the reaction $CH_4 + H_2O$ is a first order reaction. Fig.6: the effect of pressure on the degree of conversion of methane at various temperatures. Data on the rate of reaction of $CH_4 + H_2O$ in the presence of a neutral capping shows that practically total conversion of methane can be achieved e.g. at pressures up to 20 atms and at a tempera-

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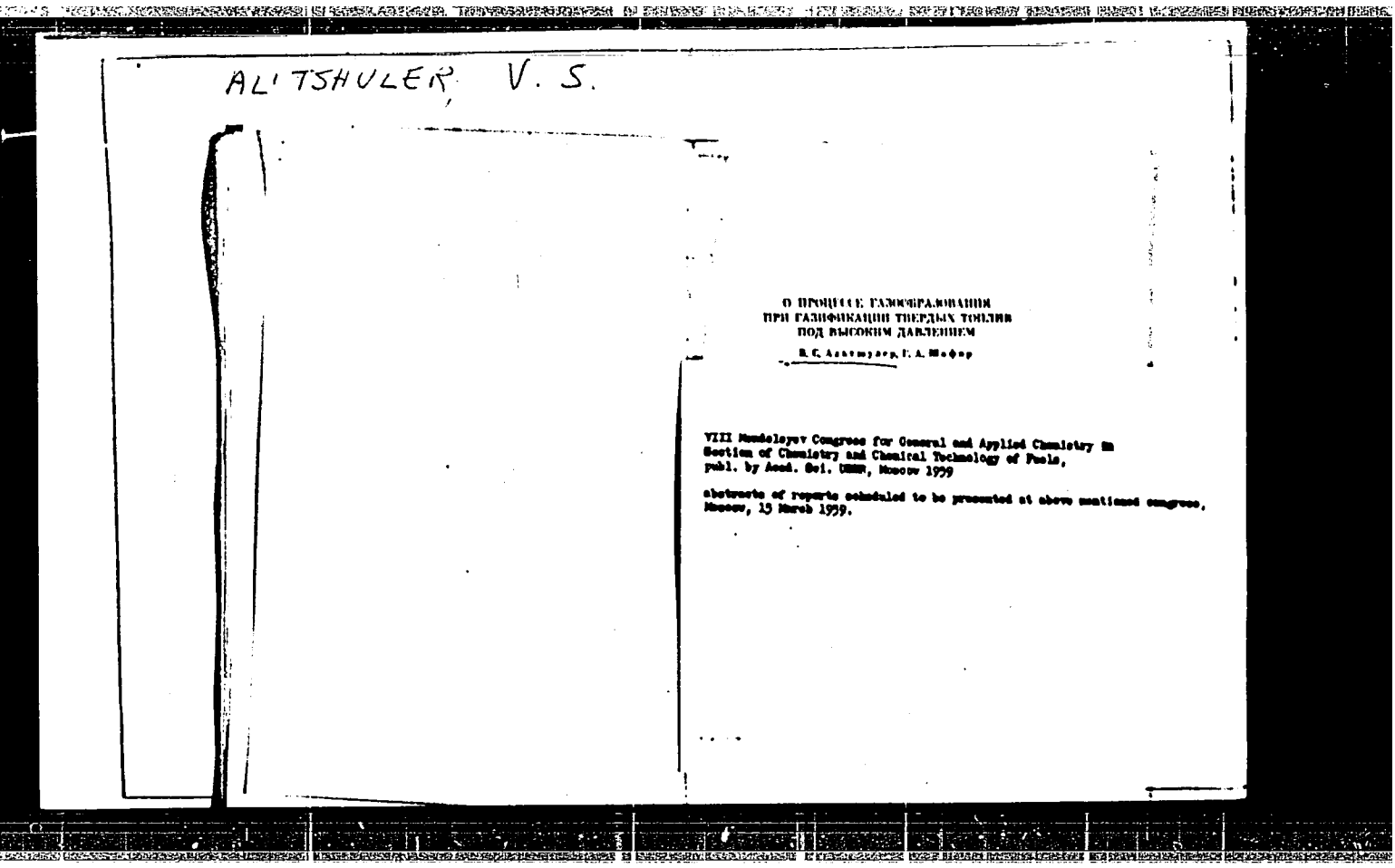
ture of the order of 1100°C, the concentration of methane in the initial gas does not affect the rate of conversion. There are 6 Figures, 1 Table, 5 Soviet References.

ASSOCIATION: IGI AN SSSR.

1. Gas generating systems--Operation 2. Solid fuels--Applications
3. Pressure--Applications 4. Gases--Properties

SECHENOV, G.P.; AL'TSHULER, V.S.

Using high pressures in fluidized bed gas producers.
Gaz.prom. no.11:12-18 N '58. (MIRA 11:11)
(Gas producers) (Fluidization)



ALI'TSHULER, V. S.

О ПРОЦЕССЕ ГАЗООБРАЗОВАНИЯ
ПРИ ГАЗИФИКАЦИИ ТВЕРДЫХ ТОПЛИВ
ПОД ВЫСОКИМ ДАВЛЕНИЕМ

В. С. Альтшулер, Г. А. Мюфер

VIII Mendeleyev Congress for General and Applied Chemistry
Section of Chemistry and Chemical Technology of Fuels,
publ. by Acad. Sci. USSR, Moscow 1959

abstracts of reports scheduled to be presented at above mentioned congress,
Moscow, 15 March 1959.

Al'tshuler, V.S.

11(2,7) PHASE I BOOK EXPLOITATION SOV/2416

Gazosnabzheniye vostochnykh rayonov SSSR na osnove gazifikatsii tverdykh topliv (Supplying the Eastern Regions of the USSR With Gas Produced by Solid Fuel Gasification) Moscow, Gostoptekhizdat, 1959. 214 p. 2,000 copies printed.

Ed.: N.V. Shishakov, Doctor of Technical Sciences; Executive Ed.: T. D. Yefremova; Tech. Ed.: A.V. Trofimov.

PURPOSE: This collection of articles is intended for designing, planning, and scientific research personnel, as well as for engineers, technicians, and students specializing in solid fuel gasification.

COVERAGE: This collection of articles describes the problem of supplying the eastern regions of the USSR with synthetic gas derived from the gasification of solid fuels to overcome that area's lack of natural gas. Individual articles discuss the distribution of the region's coal deposits, the quality and types of coal encountered, gasification process, and the economics involved in the production and supply of the synthetic gas product. The author thanks V.S. Al'tshuler, Doctor of Technical Sciences. References accompany each article.

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AVAILABLE: Library of Congress (TF735.R92537)

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10-20-59

Al'tshuler, V.S.

PHASE I BOOK EXPLOITATION SOV/3731

Akademiya nauk SSSR. Institut goryuchikh iskopayemykh

Gazifikatsiya i goreniye topliva (Fuel Gasification and Combustion) Moscow, Izd-vo AN SSSR, 1959. 227 p. (Series: Its: Trudy, Vol 11) Errata slip inserted. 1,800 copies printed.

Ed.: N. V. Lavrov; Ed. of Publishing House: V. N. Pokrovskiy; Tech. Ed.: L. N. Dorokhina.

PURPOSE: This collection of articles is intended for scientific research workers and engineers studying combustion processes and solid fuel gasification.

COVERAGE: This collection concerns the theoretical and experimental study of the mechanism of chemical reactions occurring in combustion and gasification. Results of the isotopic method of studying the gas generating process and its reactions, and the reaction of carbon monoxide and heated coal are analyzed and the pilot plants used in this study are described. Reactions of coal combustion, coal oxidation, methane dissociation and conversion are discussed and their equilibrium constants given in tables. The processes of methane oxidation by oxygen and synthesis-gas production by oxidizing natural gas with the subsequent reduction of oxidation products by carbon are analyzed as is the effect of an excessive amount of air on the burning process of powdered solid fuel. The utilization of heavy petroleum residue and tar for combustion and gasification purposes is also discussed along with the principles of fluidization. Analysis, routine control and intensification of physical and chemical processes by means of ultrasonic vibrations are also covered. No personalities are mentioned. References accompany all but the first article.

TABLE OF CONTENTS:

ALTshuler, V.S.

PHASE I BOOK EXPLOITATION SOV/3731

Akademiya nauk SSSR. Institut goryuchikh iskopayemykh

Gazifikatsiya i goreniye topliva (Fuel Gasification and Combustion) Moscow, Izd-vo AN SSSR, 1959. 227 p. (Series: Its: Trudy, Vol 11) Errata slip inserted. 1,800 copies printed.

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AVAILABLE: Library of Congress

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JA/eds/fal
7-18-60

SECHENOV, G.P.; AL'TSHULER, V.S.

Gasification of fine-grained fuel in a fluidized bed under a pressure of up to 15 atm. Gaz. prom. 4 no.11:14-18 '59. (MIRA 13:2)
(Gas manufacture and works)

AL'TSHULER, V.S.; SHAFIR, G.A.

Thermodynamic investigation of the conversion of methane by water vapor and carbon dioxide under high pressure. Trudy IGI 11:66-74 '59. (MIRA 13:6)

(Methane) (Water vapor) (Carbon dioxide)

AL'TSHULER, V.S.; SECHENOV, G.P.

Certain conditions required for the normal operation of gas generators with a fluidized bed. Trudy IGI 11:139-147 '59.
(MIRA 13:6)

(Gas producers) (Fluidization)

SECHENOV, G.P.; AL'TSHULER, V.S.

Effect of pressure on the behavior of a fluidized bed. Trudy IGI 11:188-197 '59. (MIRA 13:6)
(Fluidization)

FEDOSEYEV, Sergey Dmitriyevich; CHERNYSHEV, Andrey Borisovich [deceased]; AL'TSHULER, V.S., doktor tekhn.nauk, retsenzent; PITIN, R.N., kand.tekhn.nauk, red.; YEFREMOVA, T.D., vedushchiy red.; FEDOTOVA, I.G., tekhn.red.

[Semicoking and gasification of solid fuel] Polukoksovanie i gazifikatsiia tverdogo topliva. Moskva, Gos.nauchno-tekhn.izd-vo neft. i gorno-toplivnoi lit-ry, 1960. 325 p. (MIRA 13:7)
(Fuel) (Carbonization)

AL'TSHULER, V.S.; LAVROV, N.V.; PITIN, R.N.; FARBEROV, I.L.; SHAFIR, G.S.

Underground gasification of coals under high pressure. Trudy IGI 13:75-82 '60. (MIRA 14:5)
(Coal gasification, Underground)

AL'TSHULER, V.S.; SHAFIR, G.S.

Kinetics of the process of natural gas conversion by carbon dioxide under high pressure. Trudy IGI 16:24-35 '61. (MIRA 16:7)
(Carbon dioxide) (Methane)

LI TSZYA-TSZUN [Li Chia-tsung]; AL'TSHULER, V.S.

Conditions of mixing solid materials suitable for the thermal processing of fuels with a solid heat carrier. Trudy IGI 16: 195-203 '61. (MIRA 16:7)

(Coal gasification)

FRIDLAND, M.I.; SECHENOV, G.P.; AL'TSHULER, V.S.

Effect of pressure on the entrainment of fines from fluid-bed gasifiers. Trudy VNII 16:204-210 '61. (MIRA 16:7)
(Coal gasification) (Fluidization)

SECHENOV, G.P.; AL'TSHULER, V.S.

Gasification of fine-grain fuels in a fluidized bed under pressure. Trudy IGI 16:211-226 '61. (MIRA 16:7)
(Coal gasification) (Fluidization)