manganese and molybdenum. I.N. Chernikova (Moscow Institute of Steel), B.G. Livshits and N.G. Makhukov (Moscow Institute of Steel and Groznyy Petroleum Institute) told of processes of annealing in different alloys. Reports on the internal friction of "metastable" solid solutions were delivered by B.G. Livshits, Yu.S. Avraamov, S.O. Mezhennaya, V.B. Osvenskiy, and L.N. Belyakov (Moscow Institute of Steel). G.M. Ashmarin (Moscow Institute of Steel) reported on the temperature dependence of internal friction of iron alloys with vanadium. The reports of K. Mishek and K. Toman (Institute of Technical Physics of the Czechoslovakian Academy of Sciences, Prague), G.K. Mal'tseva and V.S. Postnikov (Kemerovo Pedagogical Institute) were devoted to the decomposition of supersaturated solid solutions. L.F. Usova (Moscow Institute of Steel), A.V. Grin', V.A. Pavlov (Institute of Physics of Metals USSR AS in Sverdlovsk), R.S. Lebedev and V.S. Postnikov (Kemerovo Pedagogical Institute), O.I. Datsko, R.I. Garber, T.T. Mogil'nikova (the latter two of the Physico-Technical Institute, UkrSSR AS in Khar'kov) and N.S. Borisov and V.M. Rozenberg (Institute for the Science of Metals and Physics of Metal TsNIIChM) delivered reports on a number of related subjects. S.O. Tsobkallo (Leningrad Polytechnical

Institute) covered the resilient reaction of spring alloys, various physical and technological effects on it and the methods of its measurement. Ya.P. Selisskiy (Institute of Precision Alloys TsNIIChM) told of subsiding oscillations of ultrasonic frequency in some ferromagnetic solid solutions. R.I. Garber and A.I. Kovalev (Physico-Technical Institute UkrSSR AS in Khar'kov) spoke of the temperature dependency of moduli of elasticity of iron.

ACCESSION NR: AP4028445 S/0181/64/006/004/1152/1157

AUTHORS: Shtrakhman, K. M.; Piguzov, Yu. V.

TITLE: Temperature and concentration dependence of the relaxation effect in homogeneous solid replacement solutions of silver and cadmium

SOURCE: Fizika tverdogo tela, v. 6, no. 4, 1964, 1152-1157

TOPIC TAGS: temperature dependence, concentration dependence, relaxation effect, silver, cadmium, solid solution, relaxation oscillator RKF MIS

ABSTRACT: Measurements of internal friction were made in an RKF MIS relaxation oscillator, on samples containing 21.4, 26.6, 31.0, and 35.3% Cd. The samples were very carefully prepared and treated, and (after measurements) they were chemically analyzed and the lattice constants and structures were determined. By means of the internal-friction measurements and determination of elastic aftereffects, the authors observed the relaxation effect in homogeneous solid replacement solutions of Ag and Cd for different temperatures and the indicated values of Cd concentration. The relaxation time and activation energy of the relaxation process were found to differ but insignificantly from the corresponding values obtained during investigation of Cd diffusion by the ordinary method (in solid solutions at constant concentration). It is thus possible to study diffusion processes in Ag-Cd alloys by measuring the relaxation effect. On this basis, the authors computed the diffusion coefficient and plotted its temperature dependence. The activation energy is found to depend directly on the energy of elastic distortion, for one atom of Cd, of the lattice in the solid solution. By examining this energy, the difference may be explained between activation energies of Cd and Ag diffusion and between the diffusion rates of the two under identical conditions of temperature and concentration. "The authors consider it their duty to point out that this topic was suggested by Professor B. N. Finkel'shteyn, Doctor of the physical and mathematical sciences, now deceased. They also thank Yu. Kh. Vekilov for discussions on the results of the work." Orig. art. has: 6 figures and 1 table.

Card 1/2

ACCESSION NR: AP4028445

ASSOCIATION: Moskovskiy institut stali i splavov (Moscow Institute of Steel and Alloys)

SUBMITTED: 05Nov63 DATE ACQ: 27Apr64

SUB CODE: MM, SS NO REF SOV: 001 ENCL: 00

OTHER: 007

Card 2/2

ACCESSION NR: AP4043340 S/0181/64/006/008/2274/2280

AUTHORS: Shtrakhman, K. M.; Piguzov, Yu. V.

TITLE: On the mechanism of the relaxation effect in homogeneous substitutional solid solutions based on silver

SOURCE: Fizika tverdogo tela, v. 6, no. 8, 1964, 2274-2280

TOPIC TAGS: solid solution, relaxation effect, silver alloy, lattice deformation, temperature dependence

ABSTRACT: In view of the incompleteness of the existing theories of the relaxation process, the authors attempted to obtain a more satisfactory quantitative agreement with the experimental results of the relaxation effect in solid solutions of the systems Ag-In, Ag-Cd, and Ag-Mg. A new formula is derived for the degree of relaxation, including relaxation both due to the change in the energy of the atomic interaction and due to the change in the energy of

Card 1/3

ACCESSION NR: AP4043340

the solid-solution lattice deformation. This theorem is based on the theory of LeClaire and Lommer concerning the Zener relaxation effect as a result of the change in the degree of the short-range order. The results are compared with the experimental values and temperature and concentration dependences of the degree of relaxation in these systems are plotted. It is concluded that a theory of LeClaire and Lommer is more consistent in all respects than the Zener concept of reorientation of pairs of dissolved atoms. The relaxation effect proposed by LeClaire and Lommer is refined by introducing not only the change in the energy of interaction of the atoms during the relaxation but also the energy of the elastic deformation of the lattice. The formula derived for the degree of relaxation takes into account the changes in the energy of interaction of the atoms and the energy of the elastic deformation. The contributions from both types of energy are evaluated separately. The temperature dependence and the concentration dependence of the degree of relaxation were investigated by measuring the internal

Card 2/3

Card 3/3

LIVSHITS, Boris Grigor'yevich, prof., doktor tekhn.nauk. Prinimali uchastiye: PIGUZOV, Yu.V., kand.tekhn.nauk; SOLOV'YEVA, E.A., kand.tekhn.nauk. KONDORSKIY, Ye.I., prof., doktor fiz.-matem. nauk, retsenzent; RAKHSHTAYT, A.G., dotsent, kand.tekhn.nauk, red.; EL'KIND, V.D., tekhn.red.

[Physical properties of metals and alloys] Fizicheskie svoistva metallov i splavov. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1959. 366 p. (MIRA 13:5)
(Metals)

PHASE I BOOK EXPLOITATION SOV/5305

Moscow. Institut stali

Relaksatsionnyye yavleniya v metallakh i splavakh; trudy Mezhvuzovskogo soveshchaniya (Relaxation Phenomena in Metals and Alloys; Transactions of the Inter-Institute Conference) Moscow, Metallurgizdat, 1960. 326 p.

Sponsoring Agency: Ministerstvo vysshego i srednego spetsial'nogo obrazovaniya RSFSR and Moskovskiy institut stali imeni I.V. Stalina.

Ed. (Title page): B.N. Finkel'shteyn; Ed. of Publishing House: Ye.I. Levit; Tech. Ed.: A.I. Karasev.

PURPOSE: This collection of articles is intended for personnel in scientific institutions and schools of higher education and for physical metallurgists and physicists specializing in metals. It may also be useful to students of these fields.

COVERAGE: The collection contains results of experimental and theoretical investigations carried out by schools of higher education and scientific research institutions in the field of the relaxation phenomena in metals and alloys. Several articles are devoted to the investigation—by the internal-friction method—of the decomposition of supersaturated solid solutions. Also analyzed are the defects of the crystalline lattice, plastic deformations, high-temperature behavior of alloys, and creep. Problems of the relation between internal friction and temper brittleness, the use of the method of internal friction in the investigation of powder-metallurgy products, and the mechanism of impact fatigue are discussed. The collection also contains articles on the damping characteristics of materials, elastic after-effect, and the new slow-detection method. No personalities are mentioned. References follow most articles. There are 366 references: 192 Soviet and 174 non-Soviet.

Card 2/

PIGUZOV, Yu.V.; BAYAZITOV, M.I.

Investigating the temper brittleness of high chromium steel by the internal friction method. Izv.vys.ucheb.zav.; chern. met. no.3:147-152 '60. (MIRA 13:4)

1. Moskovskiy institut stali.
(Chromium steel--Brittleness) (Internal friction)

Piguzov, Yu V

S/126/60/010/02/015/020
E021/E335

AUTHORS: Piguzov, Yu.V., Krishtal, M.A. and Golovin, S.A.

TITLE: The Nature of the Maximum of Internal Friction in Steel After Thermal Treatment

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol. 10, No. 2, pp 285 - 290

TEXT: Experiments were carried out on three steels - U7A, U9A and U12A - the compositions of which are given in Table 1. Measurements of internal friction were taken on a relaxator at a frequency of 1 cps. Results for two steels are given in Fig. 1, where the internal friction is plotted against temperature. The curves contain the usual maxima at 200 °C. The curves with the higher peaks are for the steel with the greater amount of carbon. The absolute values of the peaks are given in Table 2. Working in the cold leads to a decrease in the value of the peak corresponding to the decrease in the retained quantity of austenite. Fig. 2 shows the internal friction - temperature curves for U9A steel after quenching from sub-critical temperatures (720 °C and 670 °C). A low maximum is obtained at 200 °C, much less than that after quenching from the austenitic condition. Thus, the 200 °C peak can be explained by two phenomena taking

Card 1/3

S/126/60/010/02/015/020
E021/E335

The Nature of the Maximum of Internal Friction in Steel After Thermal Treatment

place simultaneously: diffusion of carbon atoms in the retained austenite and migration of carbon atoms to the dislocation regions forming on account of the martensitic transformation and thermal stresses. Further experiments were carried out on armco iron containing 0.019% carbon after 25% and 75% deformation. Fig. 3 shows the curves obtained. Deformation of 25% leads to two peaks at 40 and 200 °C. 75% deformation gives one peak at 200 °C. The disappearance of the first peak can be explained by migration of carbon atoms in the alpha-iron to more energetic positions - in dislocations. The peak at 200 °C is much lower than for quenched steels because of the smaller amount of austenite.
There are 2 tables, 3 figures and 10 references: 2 German 2 English and 6 Soviet.

Card 2/3

S/126/60/010/02/015/020
E021/E335

The Nature of the Maximum of Internal Friction in Steel After Thermal Treatment

ASSOCIATIONS: Tul'skiy mekhanicheskiy institut
(Tulsk Mechanical Institute
Moskovskiy institut stali im. I.V. Stalina
Moscow Institute of Steel im. I.V. Stalin

SUBMITTED: Fenruary 18, 1960

Card 3/3

188200

24210
S/148/61/000/001/009/015
A161/A133

AUTHORS: Vishnyakov, D. Ya.; Piguzov, Yu. V., and Lei T'ing-ch'uan

TITLE: Temper brittleness of structural manganese steel and the effect of molybdenum on it investigated by the internal-friction method

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, no. 1, 143 - 150 761

TEXT: Experimental data are presented proving that the temper brittleness in manganese steel is caused by the separation of carbon and nitrogen from alpha solution on dislocations, and that molybdenum inhibits this process. Two steel compositions were studied:

(%)	C	Mn	Mo	Si	S	P	N	O
no. 1	0.42	1.80	-	0.21	0.020	0.013	0.016	0.00020
no. 2	0.40	1.89	0.54	0.14	0.032	0.015	0.019	0.00019

The steel was melted in a high-frequency induction furnace, cast into 37-kg ingots, forged at 1,250°C and annealed at 850°. Impact test specimens were

Card 1 5

24210

S/148/61/000/001/009/015

Temper brittleness of structural manganese steel...A161/A133

cut from square billets and hardened in oil-heat no. 1 at 830°C, heat no. 2 at 890° (which corresponds to the $Ac_3+50°$ point). Part of the quenched specimens were tempered at 350 - 650° (with 50° intervals) with 2 hours soaking. Half of these specimens were rapid-cooled (in water), half of them slowly (in the furnace). Other specimens were tempered at 650°, cooled rapidly (producing a tough state), then part of them was embrittled by holding at 500° for 12 hours. Rods of annealed steel 6 mm in diameter were drawn with intermittent annealings (650°, 1 hr) in a vacuum furnace to 0.8 mm diameter, and this wire annealed in a vacuum at 850°C for 2 hrs. The 0.8 mm diameter and 115 mm long specimens were heated at $Ac_3+50°$ (5 min) inside austenite steel pipes, and cooled in oil. This quenching method protected the specimens from decarbonizing. The internal friction and the shear modulus were measured simultaneously in a РКФ-МИС (RKF-MIS) vacuum relaxator at a frequency of 1 c that had been described previously (Ref. 9: Yu. V. Piguzov, V. S. Postnikov. ПС-55-448 (PS-55-448) instruments and stands. ITEI, 1955) using a method that made the experiment data comparable. This method had been described in two publications: Ref. 10: Yu. V. Piguzov, L. S. Fedotova, M. F. Alekseyenko. Trudy konferentsii po relaksatsionnym

Card 2/5

24210
S/148/61/000/001/009/015
Temper brittleness of structural manganese steel...A161/A133

yavleniyam v chistykh metallakh i splavakh (Proceedings of the conference on relaxation phenomena in pure metals and alloys), Metallurgizdat, 1960; Ref. 11: Yu. V. Piguzov, M. I. Bayazitov. Izv. vyssh. uch. zavedeniy. Chernaya metallurgiya, 1960, no. 3. A drop of impact resistance was found in no. 1 steel in the 450 - 550°C range (Fig. 1, a) The addition of 0.54% Mo raised the impact resistance after tempering at 350 - 550°C and reduced it after tempering at 650°C (this phenomenon was noticed in a previous investigation, too). The presence of Mo in steel (as in no. 2) completely eliminated the difference in impact resistance after different coolings from the tempering temperature (Fig. 1, b), but a general decrease of impact resistance at 500 - 600° tempering was noticeable. Conclusions: 1) Structural manganese steel (0.4% C, 1.8% Mn) tends to temper brittleness both at slow cooling after high-temperature tempering and after embrittlement (500°C, 12 hrs). The addition of 0.54% Mo had a high reducing effect on this tendency. 2) The internal-friction method is well suited for studying the temper brittleness phenomenon and its nature. The physical mechanism of temper brittleness in manganese steel revealed by the method consists in the liberation of carbon (and nitrogen) from the solid α-solution (due to different solubility at different temperatures) on dislocations

Card 3/5

S/148/61/000/001/009/015

Temper brittleness of structural manganese steel...A161/A133

(mainly on the boundaries of grains and blocks), which prevents plastic deformation preceding rupture, i.e. makes rupture brittle. Molybdenum inhibits the liberation of interstitial atoms from the solid solutions and thus effectively reduces the tendency to temper brittleness in manganese steel. There are 7 figures and 11 references: 9 Soviet-bloc and 2 non-Soviet-bloc. The two references to English-language publications read as follows: E. Klier. Tr. A.S.M., 43, 1951, 935; Lo-ching Chang J. Mech. Phys.cs of solids, 3, 1955, 212.

ASSOCIATION: Moskovskiy institut stali (Moscow Steel Institute)

SUBMITTED: March 14, 1960

S/126/61/011/002/012/025
E193/E483

1/3 1500

AUTHORS: Estrin E.I., Zuyeva G.M., Maksimova O.P., and Piguzov Yu.V.

TITLE: On the Problem of Internal Friction Effects Associated With the Direct and Reverse Martensitic Transformation

PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol.11, No.2, pp.252-260

TEXT: The object of the present investigation was to study the phenomena of "phase work hardening" i.e. the structural changes brought about in the γ-phase of the 73.5 Fe 23.7 Ni-2.8 Mn alloy during the martensitic transformation. To this end, the variation of the kinetics of the martensitic transformation during cooling was studied as well as the character of the temperature dependence of internal friction of specimens subjected to one of the following heat treatments: (1) γ→α transformation, carried out to various degrees of completion; (2) γ→α→γ transformation carried out to attain various degrees of stability of austenite; (3) γ→α→γ transformation followed by annealing under conditions

Card 1/4

On the Problem of Internal

S/126/61/011/002/012/025
E193/E483

ensuring the maximum supplementary stabilization of the γ-phase (1 h at 525°C). The kinetics of the martensitic transformation were studied by the magnetostriction measurements the torsional vibration method having been used to determine the temperature dependence of internal friction. In both cases wire specimens (0.7 mm in diameter) preliminarily vacuum annealed at 1100°C were used, extra precautions having been taken to avoid any plastic deformation of the specimens during handling. Specimens, containing various proportions (11, 24, 28 and 48%) of martensite were prepared by rapid quenching in liquid nitrogen, followed by heating to room temperature at various heating rates. The α→γ transformation was carried out by immersing the specimens for 10 sec in a salt bath at 540°C and water quenching. The results of the study of the kinetics of the γ→α transformation in wire specimens confirmed the results obtained earlier on standard specimens (Ref. 2 and 4). With increasing degree of "phase work-hardening" the stability of austenite increased after both γ→α and γ→α→γ transformation. The stability of martensite was further increased by annealing at 525°C. The

Card 2/4

On the Problem of Internal

S/126/61/011/002/012/025
E193/E483

results of the study of the temperature dependence of internal friction can be summarized as follows (i) no anomalies were observed on the internal friction curves for the fully annealed specimens; (ii) curves for specimens that had undergone partial $\gamma \rightarrow \alpha$ transformation had the following specific features a peak (A) at 170°C, the magnitude of which increased with increasing proportion of martensite in the specimens a peak (B) at 290°C, a ledge (C) at 580°C a ledge (D) at 730°C, a sharp peak (E) at 810°C, (iii) after the $\alpha \rightarrow \gamma \rightarrow \alpha$ transformation, the specific features (A) and (C) disappeared completely and the ledge (D) almost completely peak (B) becoming more pronounced and shifted to a lower temperature (approx 250°C) (iv) after a supplementary annealing the height of peak (B) decreased.
Since the specific features (A) (D) and (E) have no direct bearing on the problem under investigation, peaks (B) and (C) are discussed in detail. It is shown that the internal friction peak at 250°C is associated with the re-orientation of pairs of carbon atoms which takes place as a result of stresses set up in the alloy, it being postulated that the relaxation processes leading to the appearance of peak (B) cannot take place in the absence of

Card 3/4

On the Problem of Internal

S/126/61/011/002/012/025
E193/E483

lattice distortions. Regarding the peak (C) the fact that it was observed only in specimens containing martensite and that it occurred in the temperature range of the reverse martensitic transformation indicated that this peak is due to the increase in the internal friction caused by the $\alpha \rightarrow \gamma$ transformation. K.M.Rozin, B.N Finkel'shteyn, T.Ke and Ch Tszen are mentioned for their contributions in this field. There are 4 figures, 1 table and 20 references: 13 Soviet and 7 non-Soviet.

ASSOCIATION Institut metallovedeniya i fiziki metallov
IsNIIChM (Institute of Science of Metals and Physics of Metals TsNIIChM)

SUBMITTED March 12, 1960

Card 4/4

L 12171-66 EWT(m)/EWA(d)/T/EWP(t)/EWP(z)/EWP(b)/EWA(c) JD

ACC NR: AP6000176 UR/0148/65/000/009/0155/0157

AUTHOR: Bayasitov, M. I.; Kidin, I. N.; Piguzov, Yu. V.

ORG: Moscow Institute of Steel and Alloys (Moskovskiy institut stali i splavov)

TITLE: Effect of lattice defects on the solubility of carbon in Alpha-iron

SOURCE: IVUZ. Chernaya metallurgiya, no. 9, 1965, 155-157

TOPIC TAGS: lattice defect, alpha iron, carbon, solubility, internal friction, electric resistance, solid solution

ABSTRACT: To fill the gap in knowledge of the effect of dislocation density on the solubility of C at high temperatures, which is one of the factors determining proneness to aging in low-carbon steels when rapidly cooled from these temperatures, the authors investigated the effect of various dislocation densities on the solubility of C in the lattice of α-iron at elevated temperatures. Specimens of steel containing 0.01, 0.04 and 0.15% C were subjected to dilatational strain (1 to 10% elongation) in order to produce various dislocation densities. After quenching from 600°C, the solubility of C in the lattice of α-iron was determined by investigating: internal friction, electric resistance (at liquid-nitrogen temperature) and coercive force. Findings: At 300°C the background of internal friction increases, which indicates that the high-temperature curve of internal friction is displaced in the direction of low temperatures for specimens deformed more than 5%, which may be attributed to the con-

Card 1/3

UDC: 669.111.4:620.18:539.67

L 12171-66

ACC NR: AP6000176

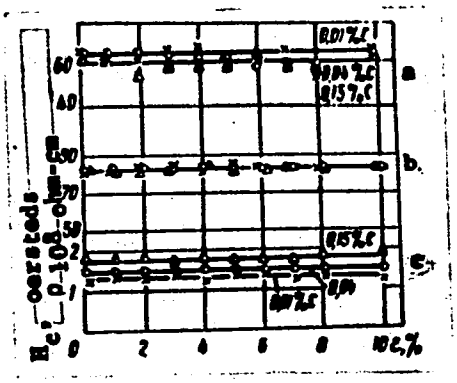


Fig. 1. Height of the 40-degree maximum of internal friction, electric resistance and coercive forces as a function of degree of prior deformation.

Card 2/3

L 12171-66

ACC NR: AP6000176

comitant charge in the kinetics of segregation of C from the solid solution. The height of the 40-degree maximum of internal friction, electric resistance, and coercive force measured after quenching of pre-deformed specimens from 600°C (Fig. 1) remain unaffected. Apparently the cyclic stresses applied to the specimen during the measurement of internal friction are too small to upset the equilibrium of the C atoms present in the dislocation zones near the grain boundaries. Part of the dissolved atoms will be arrayed in a more ordered manner in the neighborhood of lattice defects and thus reduce the height of the 40-degree maximum of internal friction. On the other hand, the temperature of treatment (quenching from 600°C) is sufficiently high to cause part of the C atoms bound in both the old defects (grain boundaries) and the new defects caused during deformation, passes into the solid solution. Thus it seems that these conditions of experiment result in a new equilibrium state of the solid solution, at which the C concentration and hence also all the physical characteristics investigated in this study differ little from the initial state. Orig. art. has: 3 figures.

SUB CODE: 11, 20/ SUBM DATE: 14May65/ ORIG REF: 006/ OTH REF: 003

Card 3/3 HW

L 12999-66 EWT(m)/EWP(w)/T/EWP(t)/EWP(b)/EWA(c) JD/JW
ACC NR: AP6001684 SOURCE CODE: UR/0148/65/000/012/0101/0107

AUTHOR: Grdina, Yu. V.; Glikman, Ye. E.; Piguzov, Yu. V. 52

ORG: Siberian Metallurgical Institute (Sibirskiy metallurgicheskiy institut); Moscow Institute of Steel and Alloys (Moskovskiy institut stali i splavov) 48 B

TITLE: Study of reversible temper brittleness of steel 16,55

SOURCE: IVUZ. Chernaya metallurgiya, no. 12, 1965, 101-107

TOPIC TAGS: ~~reversible temper brittleness~~, brittleness, steel, internal friction, phosphorus, metal grain structure

ABSTRACT: The discovery (M. G. Lozinskiy, A. Ye. Fedorovskiy, Izvestiya AN SSSR, OTN, 6, 1958, and others) of the relationship between internal friction and the processes of the embrittlement of technically pure steels during tempering (450-550°C) still leaves unclarified the mechanism of the phenomenon of reversible temper brittleness (TB). In this connection, the authors investigated internal friction in five steels with distinct proneness to temper brittleness, by mounting wire specimens (diameter 0.8 mm, length 100 mm) in a relaxation oscillator. Internal friction was measured over a temperature range from room temperature to 600°C at a frequency of 1.1 cps, whereupon isothermal embrittlement was carried out in the oscillator's furnace for 8-12 hr; after cooling to room temperature the internal friction of the embrittled specimens

Card 1/3 UDC: 669.011.7

4

was determined over the 20-600°C range. A definite correlation was established between proneness to TB and the variation in internal friction. In the phosphorus-free steel for which tempering at 530°C leads to a rise in the threshold of cold brittleness and intensification of the etchability of boundaries in picric acid, the internal friction background increases, whereas in the phosphorus-containing steels (0.032-0.05% P) the internal friction background decreases: this change may be attributed to the enrichment of grain boundaries with P, an enrichment that is of adsorptional nature. The other alloy elements in the steels (Mn, Ni, Si) do not affect TB: brittleness develops even in pure carbon steel if it contains a sufficient amount of P. On high-temperature tempering (650°C), the grain boundaries are mainly enriched with C, while P then gets distributed uniformly throughout the grain volume. Low-temperature tempering, on the other hand, causes the grain boundaries to be enriched with P, which leads to some decrease in the internal friction background level: this may be associated with the displacement of part of C atoms from the boundary zones into the grain interior owing to the intensified adsorption of P. The attendant increase in the number of dislocation points leads to a decrease in the internal friction background level. After such tempering the steel assumes a brittle state with enhanced proneness to intergranular fracture, which is associated with the decrease in the surface energy of grain boundaries owing to the adsorption of P and the concomitant facilitation of the formation and development of intercrystalline cracks. Reheating to 650°C again restricts the intercrystalline adsorption of P and increases the concentration of C in

L 12999-66
ACC NR: AP6001684

the solid solution at the grain boundaries. As a result, following rapid cooling, brittleness is eliminated: this, in the authors' opinion, accounts for the well-known fact of the reversibility of TB. Orig. art. has: 1 table and 4 figures.

SUB CODE: 11, 20/ SUBM DATE: 07Jul65/ ORIG REF: 012/ OTH REF: 005

jrn

Card 3/3

BAYAZITOV, M.I.; PIGUZOV, Yu.V.

Effect of the grain size on the height of the [illegible] of internal friction. Fiz. met. i metalloved. 20 no.4 [illegible] 634 O '65. (MIRA 18:11)

1. Moskovskiy institut stali i splavov.

L 04186-67 EWT(m)/T/EWP(t)/ETI IJP( ) JD/JG/GD

ACC NR: AT6026903 SOURCE CODE: UR/0000/66/000/000/0018/0021

AUTHOR: Piguzov, Yu. V.; Verner, V. D.; Shulepov, V. I.; Rzhevskaya, I. Ya.

ORG: none

TITLE: A study of the behavior of interstitial atoms in molybdenum by means of internal friction

SOURCE: AN SSSR. Institut metallurgii. Vnutrenneye treniye v metallakh i splavakh (Internal friction in metals and alloys). Moscow, Izd-vo Nauka, 1966, 18-21

TOPIC TAGS: internal friction, molybdenum, carbon, nitrogen, oxygen, activation energy, temperature dependence, solid solution, quenching, tempering, plastic deformation

ABSTRACT: An internal friction study was made of the effects of C, O_2 and N_2 additions in molybdenum. The temperature dependence of internal friction was measured in a vacuum on samples of 1 mm width and 0.35 mm thickness. Oscillation frequencies ranged from 0.5 to 2.1 cps. Quenched samples exhibited a wide internal friction peak, spread over the range 60-400°C, the height of which increased linearly as a function of quenching temperature due to the higher solubilities of the interstitial atoms. The concentration ratio C/C_{max} for C, N_2 and O_2 corresponded with the internal friction ratio Q^{-1}/Q^{-1}_{max}. The peak itself consisted of three components--I, II, III--a high central por-

Card 1/2

L 04186-67
ACC NR: AT6026903

tion (II) and two neighboring plateaus (I, III). The related activation energies as determined by the Wert-Marx method were 26, 32, and 39 Kcal/mol for I, II and III respectively. Component III was associated with carbon since it vanished after quenching from 1000°C, and the concentration of carbon in solid solution is negligible below 1200°C. The central component II may have been caused by oxygen since oxygen is the most soluble interstitial in molybdenum; also Q^{-1}/Q^{-1}_{max} correlated best with O_2/O_2 max.

Component I was probably caused by nitrogen. The activation energy for nitrogen diffusion in molybdenum was previously determined by Hartley and Wilson to be 25.1 ± 2.7 Kcal/mol. The peaks and the low temperature background decreased in magnitude after tempering at 600°C for 30 min, or in quenched samples after annealing in hydrogen at 1600°C. Deformation of vacuum annealed samples pushed the high temperature side toward the left, either as a result of the breakaway of dislocations from Cottrell atmospheres or because of localized differences in deformation conditions. Orig. art. has: 6 figures.

SUB CODE: 11,20/ SUBM DATE: 02Apr66/ ORIG REF: 001/ OTH REF: 004

Card 2/2 LC

S/181/62/004/005/004/055
B102/B104

AUTHORS: Vekilov, Yu. Kh. and Piguzov, Yu. V.

TITLE: Internal friction in silver chloride at low temperatures

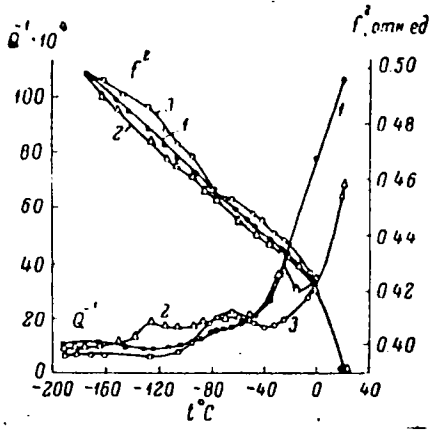
PERIODICAL: Fizika tverdogo tela, v. 4, no. 5, 1962, 1099 - 1102

TEXT: The internal friction and the shear modulus of deformed AgCl samples with and without irradiation were measured in a relaxator with inversion pendulum for the region -190 - +20°C. The logarithmic decrement of low-amplitude free flexural vibrations was taken to be a measure of internal friction. The degree of predeformation amounted to ~99%, and the frequency of vibrations was 1 cps. All measurements were made on heated samples, the rate of heating being 30°C/hr. The non-irradiated samples were studied first. These were then irradiated with ultra-violet rays for 10 to 50 min at the temperature of liquid nitrogen. The temperature dependences of internal friction (Q^{-1}) and shear modulus ($G \sim f^2$, f = frequency) were measured; the results are shown in the figure. The results can be explained by assuming that the ultra-violet radiation

Card 1/3

Internal friction in silver ...

Fig. Temperature dependence of internal friction and shear modulus in silver chloride.
Legend: (1) before irradiation; (2) irradiated at -190°C; (3) after a second cooling of the sample irradiated at -190°C.



Card 3/3

BAYAZITOV, M.I.; KIDIN, I.N.; PIGUZOV, Yu.V.

Effect of lattice defects on the solubility of carbon in alpha iron. Izv. vys. ucheb. zav.; chern. met. 8 no.9:155-157 '65. (MIRA 18:9)

1. Moskovskiy institut stali i splavov.

KILIN, I.N.; LAYEVSKIY, F.K.; [illegible], Yu.V.; FARINA, I.V.

Investigating the isothermal decomposition of austenite by the internal friction method. Fiz. met. i metalloved. 18 no.3:[illegible] 317 Ag '64. (MIRA 17:8)

1. Moskovskiy institut [illegible].

BAYAZITOV, M.I.; KIDIN, I.N.; PIGUZOV, Yu.V.

Diffusibility of carbon in alpha-iron. Izv. vys. ucheb. zav.; chern. met. 8 no.7:137-140 '65. (MIRA 18:7)

1. Moskovskiy institut stali i splavov.

KRECHMER, V.G.; PAISOV, I.V.; PIGUSOV, Yu.V.

Certain characteristics of internal friction in complex-alloy high-resistance steel. Izv. vys. u-neb. zaved. chern. met. 8 no.1:91-94 '65 (MIRA 18:1)

1. Moskovskiy institut stali i splavov.

L 20811-65 EWT(m)/T/EWP(t)/EWP(b) IJP(c)/AFWL/SSD/ASD(m)-3/ESD(gs) JD

ACCESSION NR: AR4048238 S/0137/64/000/009/I027/I028

SOURCE: Ref. zh. Metallurgiya, Abs. 9I176

AUTHOR: Vekilov, Yu. Kh.; Pigusov, Ya. V.

TITLE: The effect of lattice defects on the internal friction of silver chloride

CITED SOURCE: Relaksats. yavleniya v met. i splavakh. M., Metallurgizdat, 1963, 92-96

TOPIC TAGS: lattice defect, internal friction, silver chloride, irradiation effect, shear modulus

TRANSLATION: The effect of irradiation on the internal friction of samples of silver chloride was investigated. Internal friction and shear modulus G of deformed samples was measured in the irradiated and nonirradiated state in a temperature interval from -190 to +20°. The irradiation was performed with an ultraviolet radiation source at -190°; the irradiation period varied from 10 to 50 min. Internal friction was measured on a relaxation oscillator with a reverse

Card 1/2

pendulum. The degree of preliminary deformation of the samples, performed by extrusion of the monocrystalline substance and subsequent drawing, was approximately 90%. Irradiation does not change the magnitude of internal friction at -190° and brings about the emergence of peaks on the curve for the temperature dependence of internal friction associated with relaxation of G. The peaks in internal friction at -125, -65, and -25° are extremely unstable and disappear immediately on heating to room temperature, with the exception of the internal friction peak at -65° which disappears after a second heating to room temperature. Contrary to the case of irradiation at room temperature, irradiation at -190° does not lead immediately to a decrease in internal friction; heating to room temperature is necessary for this effect. The change observed in the temperature dependence of internal friction is connected with the emergence of local defects and their interaction with dislocations at high temperature.

SHTLAKBE', K.N.; [illegible], V.V.

Mechanism of the [illegible] effect [illegible] substitutional [illegible] Fiz. tver. t[illegible]: 2274-2280 Ap '64.

1. Moskovskiy [illegible] pedagogicheskiy institut.

L 8559-65 EWT(a)/EPR/EWP(q)/EWP(b) Pg-4 SSD/AGWL/ASD(m)-3 MJW/JD
ACCESSION NR: AR4044211 S/0137/64/000/006/I038/I038

SOURCE: Ref. zh. Metallurgiya, Abs. 6I226

AUTHOR: Piguzov, Yu. V.; Bernshteyn, M. L.

TITLE: Investigation of internal friction of iron subjected to thermomechanical and thermomechanical-magnetic treatment

CITED SOURCE: Sb. Relaksats. yavleniya v met. i splavakh. M., Metallurgizdat, 1963, 85-91

TOPIC TAGS: internal friction, iron, thermomechanical treatment, thermomechanical magnetic treatment

TRANSLATION: Investigation was conducted on samples of technically pure Fe (0.046% C). Internal friction was measured with help of a reciprocal low-frequency torsional pendulum in the interval of temperatures from -196° to +500° on wire (diam. 0.5-0.8 mm) and square rectangular samples (1.2-1.5 mm). For thermomechanical

Card 1/3

L 8559-65

ACCESSION NR: AR4044211

treatment and thermomechanical-magnetic treatment of wire samples there was set up an installation for hot drawing, consisting of a tubular electric furnace, a solenoid, and a traction device. Along with internal-friction peaks at 40 and 200° known for Fe, there is revealed a relaxation peak at -50°; this internal-friction peak is absent in an annealed sample and appears during cold deformation; the height of the maximum internal-friction increases with an increase in the degree of rolling. Thermomechanical and thermomechanical-magnetic treatment thus lead to the appearance of an internal-friction peak at -50°; the absolute magnitude of maximum internal friction after these treatments is greater than after cold deformation with the same degrees of rolling. The application of a magnetic field increases the internal-friction peak at -50°. The probable mechanism of the action of the magnetic field on technically pure Fe is magnetostriction or a change of domain structure. The height of the internal-friction peak at 40° in a hardened sample is higher than in an annealed one. In the presence of a magnetic field the magnitude of this internal-friction peak increases in proportion to the field strength. After thermomechanical-magnetic treatment there occurs the most intense separation of C from the lattice and the peak at 40° drops intensely.

Card 2/2 3

L 8559-65
ACCESSION NR: AR4044211

The internal-friction peak at 200° appears for all samples except annealed ones; the height of this peak increases with an increase in the degree of rolling - the largest value of this maximum is observed for samples undergoing thermo-mechanical-magnetic treatment. Thus, shear-wise deformation and phase transitions have an identical influence on internal-friction peaks at 40° (carbonic) and at 200° (deformation). This shows that relaxation effects at these temperatures are associated chiefly with dislocations, the density of which may be increased not only by means of cold deformation, but also as a result of shear-type phase transition. The revealed internal-friction peak at -50° is assumed to be connected with shear-type collective shift which is carried out during migration of mobile dislocations.

SUB CODE: MM, AS ENCL: 00

Card 3/3

KRISHTAL, Mikhail Aronovich; FIGUZOV, Yuriy Vasil'yevich; GOLOVIN Stanislav Alekseyevich; GARBER, M.I., prof., retsenzent

[Internal friction in metals and alloys] Vnutrennee trenie v metallakh i splavakh. Moskva, Izd-vo Metallurgiia, 1964. 245 p. (MIRA 17:6)

BEYLIN, V.M.; VEKILOV, Yu.Kh.; KADYSHEVICH, A.Ye.; PIGUZOV, Yu.V.; RATTKE, R.

Influence of the intrinsic photoeffect on the damping of elastic waves in Ge. Fiz. tver. tela 5 no.8:2371 Ag '63. (MIRA 16:9)

1. Moskovskiy institut stali i splavov.
(Elastic waves) (Photoelectricity)

L 33555-65 EWP(k)/EWA(c)/EWT(m)/EWP(b)/T/EWA(d)/EWP(w)/EWP(t) Pf-4 JW/JD/EW

ACCESSION NR AM4043700 BOOK EXPLOITATION S/ S/

Krishtal, Mikhail Aronovich; Piguzov, YUriy Vasil'yevich; Golovin, Stanislav Alekseyevich

Internal friction in metals and alloys (Vnutrennoye treniye v metallakh i splavakh), Moscow, Izd-vo "Metallurgiya", 1964, 245 p. illus., biblio. Errata slip inserted. 3,350 copies printed.

TOPIC TAGS: internal friction, diffusion, plastic deformation, carbon steel, alloyed steel, super saturated solid solution, dispersion hardening, metal aging, cold shortness, fatigue strength, metal physics, crystal lattice defect

PURPOSE AND COVERAGE: This book examines the basic experimental and theoretical research on internal friction in metals and alloys. There is a detailed treatment of the experimental methods and the design of equipment for the study of energy dissipation in a material when there are vibrations of low and high amplitude. Special attention is given to the amplitude dependence of internal friction and its practical and theoretical importance. A review of data from literature and the research of the authors on diffusion, thermodynamic activity, crystal lattice defects, plastic deformation, fast particle irradiation, and the high temperature behavior of alloys using the methods of internal friction

Card 1/3

L 33555-65
ACCESSION NR AM5043700

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is included. The phase transformations in carbon and alloyed steels upon quenching and annealing, the precipitation of supersaturated solid solutions, the interaction of dissolved atoms, dispersion hardening, and deformation aging are considered. There is an analysis of the relationship of processes causing temper brittleness, cold shortness, and fatigue strength with the characteristics of internal friction at low and high vibration amplitudes. Data are reported on the damping of solid and porous materials. The methods of complex study of the physical and mechanical properties of alloys using measurements of internal friction and other research methods are described. The book is intended for engineers, technicians, and researchers at research institutes and central plant laboratories and can also be used by students of higher technical education institutes.

TABLE OF CONTENTS [abridged]:

Card 2/3

L 33555-65
ACCESSION NR AM4043700

Ch. IIII. Internal friction in alloys subjected to plastic deformation -- 151
Ch. V. Internal friction in phase and concentration transformations in metals and alloys -- 187

SUBMITTED: 30Oct63 SUB CODE: MM

NO REF SOV: 217 OTHER: 166

Card 3/3

L 31101-65 EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EWP(b) LJP(c) MJW/JD

ACCESSION NR: AP5003499 S/0148/65/000/001/0091/0094

AUTHOR: Krechmer, V.G.; Paisov, I.V.; Piguzov, Yu. V.

TITLE: Some peculiarities of internal friction in complexly alloyed high strength steels

SOURCE: IVUZ. Chernaya metallurgiya, no. 1, 1965, 91-94

TOPIC TAGS: internal friction, steel internal friction, alloy steel, steel heat treatment, steel mechanical property/ 45KhGSNT steel, 45KhSNT steel

ABSTRACT: This paper is a study of internal friction in highly alloyed 45KhGSNT and 45KhSNT steels in relation to their mechanical properties after heat treatment. Ingots were melted in an induction furnace, and forged into 20 mm diameter rods at temperatures [illegible] rods were slowly cooled, tempered at 900C, and annealed at 680C.

at a frequency of 0.75-0.85 cps. The curves of

Card 1/2

L 31101-65

ACCESSION NR: AP5003499

5

first plotted up to 150C, then the sample was cooled at a rate of 3C/sec, and the internal friction was measured again. Then the operation was repeated, heating to 200C and so forth at 50C intervals up to 600C. Various friction peaks at temperatures from 200 to 500C were observed and plotted depending on the temperature peaks. These peaks are explained by structural changes in the steel. The two steel types are compared as to their relaxation, rigidity modulus and impact toughness. Steel 45KhSNT shows a more rapid weakening than steel 45KhGSNT with rising temperature — due to its lower carbon

and manganese content. The composition of these two alloys is:

	C	Si	Mn	Cr	Ni	Ti	P	S
45KhGSNT	0.47	1.30	1.38	1.38	1.18	0.22	0.022	0.025
45KhSNT	0.44	1.70	0.75	1.26	1.54	0.024	0.023	0.032

Orig. art. has: 2 figures and 1 table.

ASSOCIATION: Moskovskiy institut stali i splavov (Moscow steel and alloys institute)

SUBMITTED: 05Jun64 ENCL: 00 SUB CODE: MM

NO REF SOV: 004 OTHER: 000

Card 2/2

PIGUZOVA, L.I.; NIKOLINA, V.Ya.; DUBININ, M.M.; SHISHAKOVA, T.N.

Resistance to acids of synthetic erionite zeolites. Khim. i topl. i masel 10 no.10:32-34 O '65. (MIRA 18:

1. Vsesoyuznyy nauchno-issledovatel'skiy institut po pererabotke nefti i gazov i polucheniyu iskusstvennogo zhidkogo topliva.

BORESKOVA, Ye.G.; TOPCHIYEVA, K.V.; PIGUZOVA, L.I.

Catalytic activity of synthetic zeolites in the cracking of cumene. Kin. i kat. 5 no.5:903-909 S-O '64. (MIRA 17:12)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova, khimicheskiy fakul'tet.

L 5303-66 EWT(m)/T

ACC NR: AP5024964 SOURCE CODE: UR/0286/65/000/016/0024/0024

AUTHORS: Piguzova, L. I.; Dimov, N. P.

19
B

ORG: none

TITLE: A method for obtaining n-zeolite. / Class 12, No. 173721

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 16, 1965, 24

TOPIC TAGS: zeolite, hydrochloric acid

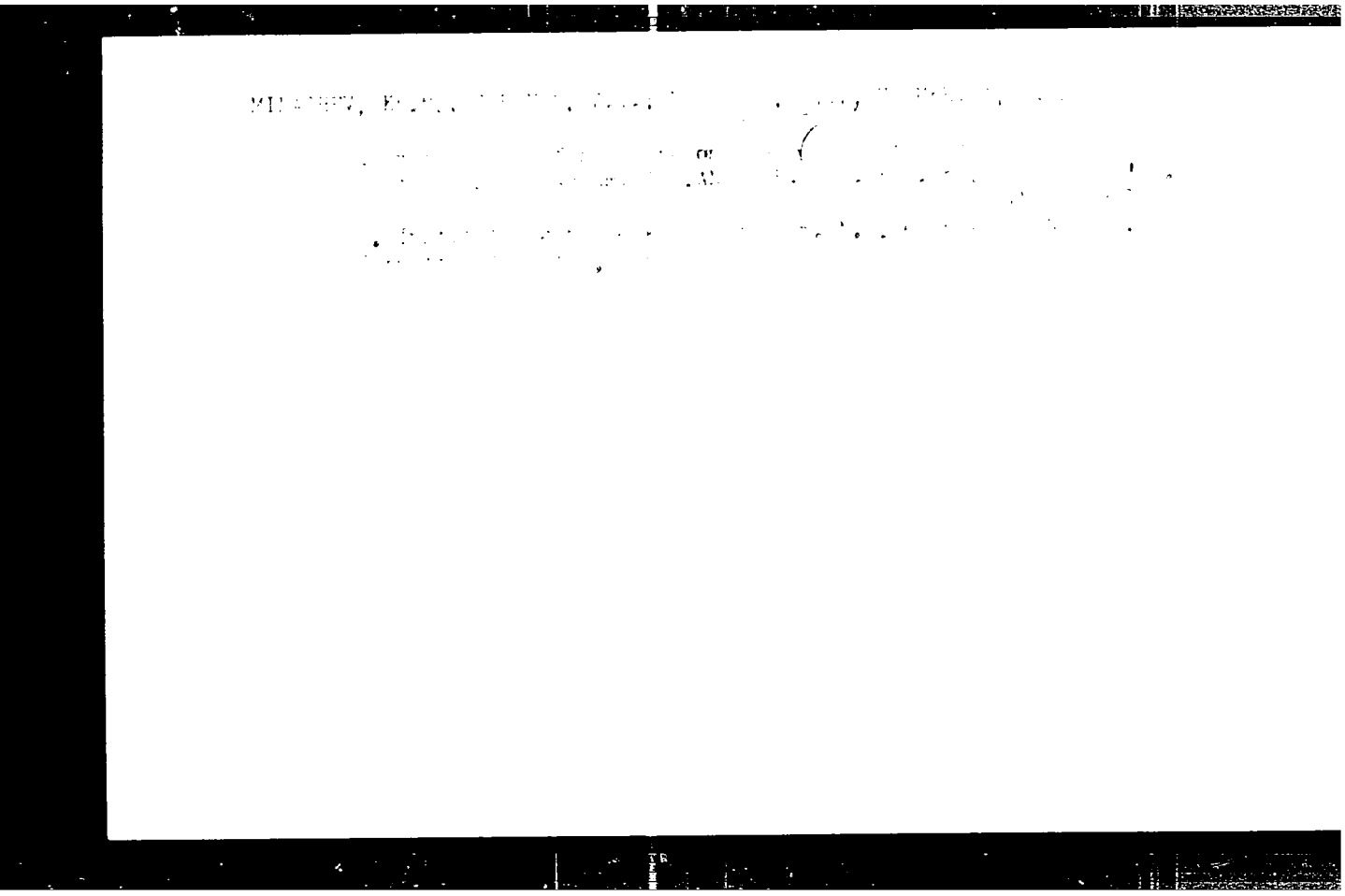
ABSTRACT: This Author Certificate presents a method for obtaining n-zeolite based on the natural mineral. To obtain an acid-resistant zeolite, chabazite treated with hydrochloric acid of 0.01N concentration at the temperature of 96-98C is used as the raw material.

SUB CODE: MT, GC/ SUBM DATE: 09May64/ ORIG REF: 000/ OTH REF: 000

8C

Card 1/1 UDC: 661.183.6

0901 0540



L 4108-66 EWT(m)/T

ACC NR: AP5024950

UR/0065/000/010/0032/0034
543.544

38
B

AUTHOR: Piguzova, L. I.; Nikolina, V. Ya.; Dubinin, M. M.; Shishakova, T. N.

TITLE: Acid resistance of the synthetic zeolite erionite

SOURCE: Khimiya i tekhnologiya topliv i masel, no. 10, 1965, 32-34

TOPIC TAGS: zeolite, hydrochloric acid, gas adsorption, adsorption, desorption

ABSTRACT: Synthetic erionite, having the formula $0.5K_2O \cdot 0.4Na_2O \cdot Al_2O_3 \cdot 6.6SiO_2 \cdot 5.5H_2O$, was treated with solutions of hydrochloric acid of various concentrations for 1 hr at 96 — 98C. It was found that under drastic conditions (acid of pH 2.1 — 2.4), the structure of the zeolite remains preserved. No changes in the crystal lattice of the zeolite, even when treated with 0.1 N HCl, could be detected by x-ray structural analysis. The water adsorption capacity also changed very little. The synthetic zeolite in the H-form was studied under stationary conditions in the adsorption-desorption of an NO_2-N_2O_4 gas mixture: after 8 adsorption cycles, no appreciable change in adsorption properties was observed. Very slight amounts of benzene adsorbed on synthetic erionite showed that its effective por radius is about 5A. "The NO_2 — N_2O_4 adsorption-desorption experiments were carried out at the Kazan khimiko-tekhnologicheskiy institut im. S. M. Kirova (Kazan Chemical Engineering Institute) by E. B. Krasnyy and T. G. Musin, who used a technique which they developed." Orig. art. has: 5 figures and 1 table.

ASSOCIATION: VNII NP

Card 1/2

L 4108-66

ACC NR: AP5024950

SUBMITTED: 00 ENCL: 00 SUB CODE: MT, GC

NO REF SOV: 004 OTHER: 005

BVK

Card 2/2

L 59599-65
ACCESSION NR: AP5017967 UR/0062/65/000/006/1116/1118 10 B
541.183+539.26

AUTHOR: Dubinin, M. M.; Nikolina, V. Ya.; Piguzova, L. I.; Shishakova, T. N.

TITLE: Structure of synthetic erionite (zeolite T)

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 6, 1965, 1116-1118

TOPIC TAGS: zeolite, erionite, zeolite structure

ABSTRACT: Crystalline zeolites T were synthesized in which the maximum content of adsorbed water at 20C was about 16%. X-ray diffraction studies of the zeolites were carried out with filtered radiation from chromium, iron, and copper anticathodes. The data show that the crystals belong to a hexagonal system with lattice constants a = 13.25 A and c = 15.12 A, which are the same as the lattice constants of the natural zeolite erionite. The structure of erionite is also discussed in terms of data reported in the literature. The most important property of erionite is its stability to acids. It is also stable to acidic gases, and this is an advantage over synthetic zeolites of types A and X. Orig. art. has: 1 table.

Card 1/2

L 59599-65
ACCESSION NR: AP5017967

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry, Academy of Sciences, SSSR)

SUBMITTED: 120ct64 ENCL: 00 SUB CODE: IC, SS

NO REF SOV: 000 OTHER: 007

Card 2/2

L 43930-65 EWT(m)/EPF(c)/EWP(j)/T Pc-4/Pr-4 RM

ACCESSION NR: AT5008629 S/2933/64/007/000/0173/0179

AUTHORS: El'tekov, Yu. A.; Pigusova, L. I.; Novikova, V. N.

TITLE: Absorption of thiophene from liquid solutions by type X molecular sieves

SOURCE: AN SSSR. Bashkirskiy filial. Khimiya serasorganicheskikh soyedineniy, soderzhashchikhsya v neftyakh i nefteproduktakh, v. 7, 1964, 173-179

TOPIC TAGS: molecular sieve, adsorption, thiophene, benzene

ABSTRACT: The adsorption of thiophene from solutions of low equilibrium concentration in n-heptane and benzene was investigated. Nine samples of type X zeolites were examined to shed light on the effect of structural peculiarities and of type of bonding on the absorbing properties of the zeolites. Concentrations ranged up to 0.1. Results show that the introduction of binding clays in the zeolites lowers the maximum adsorption of thiophene in proportion to the content of binder. Differences in the nature of binding clays have practically no effect on the adsorption of thiophene. When the zeolite cavities are far from being filled with thiophene molecules but when binding clay is present, adsorption is diminished 40-50%. Thiophene from n-heptane is positively adsorbed at all concentrations, and even at concentrations of 0.1 it almost completely

Card 1/2

ACCESSION NR: AT5008629

displaces molecules of n-heptane. Thiophene is positively adsorbed from benzene solutions at equilibrium concentrations up to 0.05-0.1, and molecules of benzene are found in the zeolite cavities along with thiophene molecules. NaX and CaX zeolites are not effective in separating thiophene from benzene, but they may be used, even in static conditions, to concentrate thiophene from dilute benzene solutions. Orig. art. has: 6 figures, 2 tables, and 2 formulas.

ASSOCIATION: Institut fizicheskoy khimii AN SSSR (Institute of Physical Chemistry, AN SSSR); VNII NP

SUBMITTED: 00 ENCL: 00 SUB CODE: OC , GC

NO REF SOV: 006 OTHER: 006

LL

Card 2/2

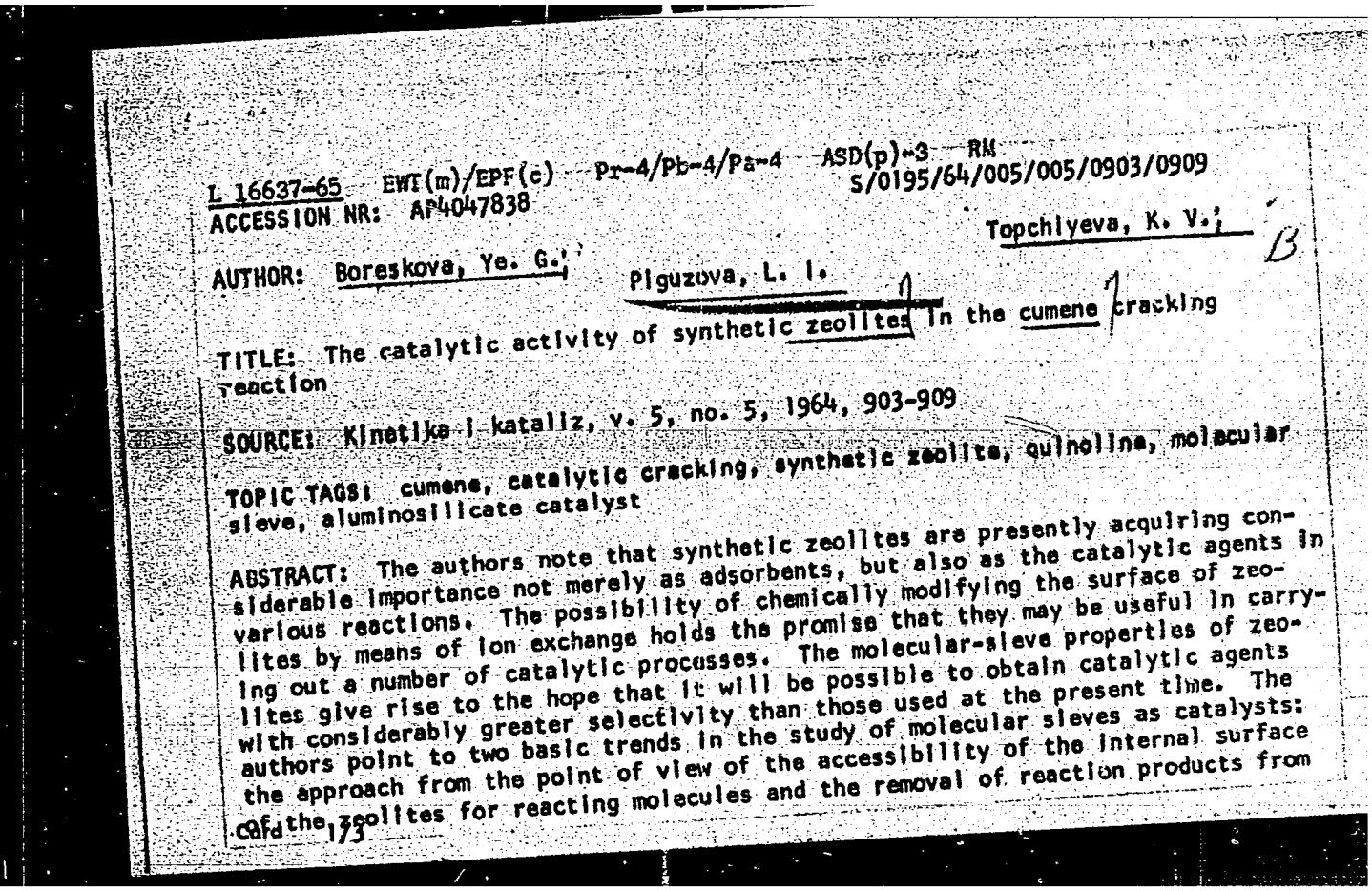
PIGUZOVA, L.I.; VITUKHINA, A.S.

Production of the sorbent CaX (10%) and some of its catalytic properties. Khim. i tekh. topl. i masel 8 no.6:17-21 Je '63. (MIRA 16:6)

(Sorbents) (Catalysis)

SALTANOVA, V...; [illegible], I.[illegible]; [illegible], I.V.

Development of a vanadium catalyst for the oxidation of sulfur dioxide in accordance with the conditions of a fluidized bed. Trudy [illegible] no.3:130-133 '61. (MIRA 14:[illegible])
(Vanadium)
(Sulfur dioxide)
(Oxidation)



L 16637-65 EWT(m)/EPF(c) Pr-4/Pb-4/Pa-4 ASD(p)-3 RM
ACCESSION NR: AP4047838 S/0195/64/005/005/0903/0909

AUTHOR: Boreskova, Ye. G.; Topchiyeva, K. V.; Piguzova, L. I. B

TITLE: The catalytic activity of synthetic zeolites in the cumene cracking reaction

SOURCE: Kinetika i kataliz, v. 5, no. 5, 1964, 903-909

TOPIC TAGS: cumene, catalytic cracking, synthetic zeolite, quinoline, molecular sieve, aluminosilicate catalyst

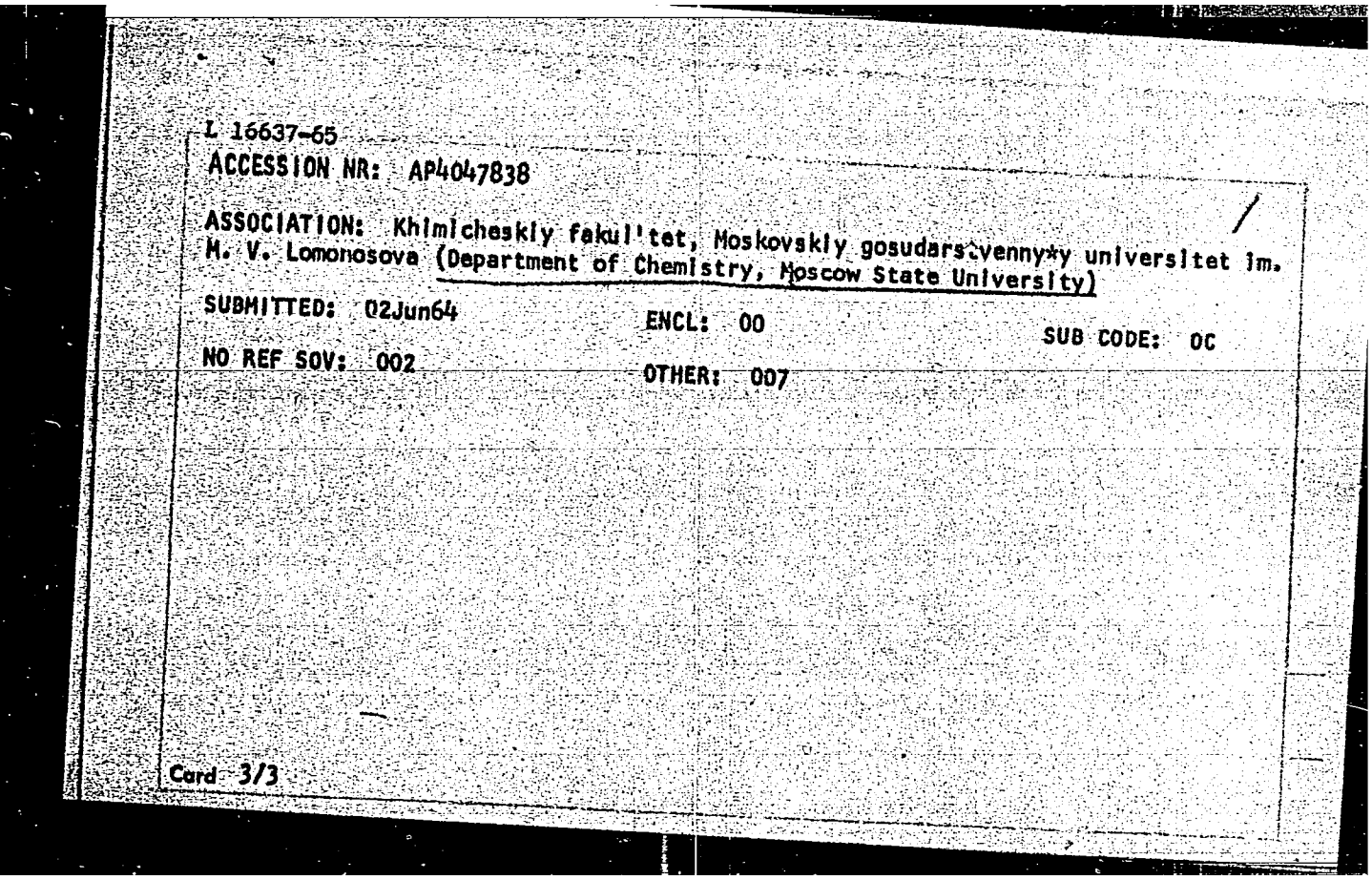
ABSTRACT: The authors note that synthetic zeolites are presently acquiring considerable importance not merely as adsorbents, but also as the catalytic agents in various reactions. The possibility of chemically modifying the surface of zeolites by means of ion exchange holds the promise that they may be useful in carrying out a number of catalytic processes. The molecular-sieve properties of zeolites give rise to the hope that it will be possible to obtain catalytic agents with considerably greater selectivity than those used at the present time. The authors point to two basic trends in the study of molecular sieves as catalysts: the approach from the point of view of the accessibility of the internal surface of the zeolites for reacting molecules and the removal of reaction products from

Card 1/3

L 16637-65
ACCESSION NR: AP4047838

the pores; and the study of the character of the intermediate interaction, depending on the chemical properties and the electron structure of the catalytic agent. The present article deals with the second of these approaches and is devoted to a study of the catalytic activity of synthetic zeolites of type X and Y, the structure of which precludes any effect of pore size on reaction selectivity. The chemical composition of the samples varied widely both with respect to the nature and degree of the exchange of the replacing cation, and also with respect to the ratio of SiO_2/Al_2O_3 in the structure. The catalytic activity of the zeolites was determined according to the model reaction of cumene cracking, the kinetic mechanism of this reaction previously being studied on amorphous aluminosilicate catalysts. The adsorption heat values of all components of the reaction were determined, and it is shown that decationized zeolites possess maximum activity. The authors found a sharp increase in the activity of the type-X zeolite as its calcium ion content increased. A determination was made of the speed and activation energy constants of the reaction for all the samples studied. The contaminating effect of quinoline adsorption at high temperatures on the cumene cracking reaction in the case of decationized samples was established. The authors also discuss the problem of the nature of the active centers of various zeolite forms. Orig. art. has: 2 tables and 5 figures.

Card 2/3



L 16637-65
ACCESSION NR: AP4047838

ASSOCIATION: Khimicheskiy fakul'tet, Moskovskiy gosudarstvenny*y universitet im. M. V. Lomonosova (Department of Chemistry, Moscow State University)

SUBMITTED: 02Jun64 ENCL: 00 SUB CODE: OC

NO REF SOV: 002 OTHER: 007

Card 3/3

Z/011/62/019/008/001/003
E073/E435

AUTHORS: Lulova, N.I., Piguzova, L.I. et al

TITLE: Investigation of adsorbents of the molecular sieves type by means of gas chromatography

PERIODICAL: Chemie a chemická technologie. Přehled technické a hospodářské literatury, v.19, no.8, 1962, 366, abstract Ch 62-4958. (Khimiya i tekhnologiya topliv i masel, v.7, no.5, 1962, 70-73)

TEXT: Gas chromatography was used for examining the efficiency of molecular sieves NaX, CaX of the sodium type, calcium type and the sieves partly converted from the sodium to the calcium type and for studying the effect of synthesis conditions on their physical and chemical properties. Another possible application is for monitoring the quality of molecular sieve samples. Examples of chromatographic tests are given. 6 figures, 5 references.

[Abstracter's note: Complete translation.]

Card 1/1

LULOVA, N.I.; PIGUZOVA, L.I.; TARASOV, A.I.; FEDOSOVA, A.K.

Gas chromatography method used in the quality control of synthesized adsorbent specimens of the molecular sieve type. Khim.i tekh.topl.i masel 6 no.8:59-63 Ag '61. (MIRA 14:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut po pererabotke nefti i gaza i polucheniyu iskusstvennogo zhidkogo topliva.

(Adsorbents) (Gas chromatography)

PIGUZOVA, L.I.

Stability of the activity of a vitreous spheroid aluminosilicate catalyst. Khim. i tekh. topl. i masel 3 no.1:47-52 Ja '58.
(MIRA 11:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut po pererabotke nefti i gaza i polucheniyu iskusstvennogo zhidkogo topliva.
(Catalysts)

SULIMOV, A.D.; LOBEYEV, M.V.; KOZHINA, I.N.; PIGUZOVA, L.I.; PAPKO, T.S.

Effect of the chemical composition of an aluminum-cobalt-molybdenum catalyst on its activity during hydrefining and autofining. Khim. i tekh. top. i masel 3 no.12:32-36 D '58. (MIRA 11:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut neftyanoy promyshlennosti.
(Catalysts--Analysis) (Petroleum--Refining)

PIGUZOVA, L. I., TOPCHIEVA, K. V., KALIKO, I. A., AGAFONOV, A. V., PANCHENKOV, G. M., KARAKIN, N. P., PIRSKIY, Y. S.

"Studying the Nature of Activity of Aluminosilicate Catalysts."

Report submitted at the Fifth World Petroleum Congress, 30 May - 5 June 1959. New York.

S/065/60/000/008/009/010/XX
E030/E112

AUTHORS: Piguzova, L.I., Nikitin, Yu.S., and Shvartsman, I.P

TITLE: Dependence of Pore Structure and Activity of an Alumina/Silica Catalyst on Change in Chemical Composition

PERIODICAL: Khimiya i tekhnologiya topliv i masel, 1960, No. 8, pp. 15-21

TEXT: Adsorption isotherms of a series of alumina/silica catalysts have been obtained using methanol. The effect of the chemical composition on the pore size, catalytic activity, and chemical stability, was determined by studying catalysts with alumina contents from 0.5 up to 80%, and it appears to dominate most other effects, including the pore size distribution of the fresh catalyst. The differential pore size distribution of fresh catalyst has three types of behaviour, depending on the chemical composition: for alumina contents greater than 40% it is very uniform, but for smaller contents it has strong peaks, around 40 Å for 15-40% alumina content and around 120 Å for alumina contents between 15 and 1.5%. The effect of subjecting the

Card 1/3

S/065/60/000/008/009/010/XX
E030/E112

Dependence of Pore Structure and Activity of an Alumina/Silica Catalyst on Change in Chemical Composition

catalyst to water vapour at 750 °C is always to decrease the pore volume and specific surface area, and shift the differential pore size distribution peaks towards the larger dimensions; the decrease in volume is greatest (55 to 60%) for alumina contents of 30 to 40%. The effect on catalytic activity was judged by the cracking of a straight run benzine and a kerosine/gas oil fraction. No definite correlation was obtained between catalytic activity and specific surface area. The peak in surface area at 15.0% alumina content did not have a correspondingly marked peak in activity, and the minimum in area at 30 40% alumina content had no corresponding minimum in activity so that, apart from other conditions known to affect the catalytic activity, the main correlation of activity is with chemical composition. Stability of the catalyst towards 0.1N HCl and alkali at 20 °C was greatest for 40% alumina (where Al-O-Si groups would be dominant) and least at very small or high alumina concentrations

Card 2/3

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E030/E112

Dependence of Pore Structure and Activity of an Alumina Silica Catalyst on Change in Chemical Composition

(where Al-O-Al or Si-O-Si groups would be dominant) as is confirmed by stability of the catalyst in practical use. These effects are attributable to the differing ionic radii of silica and alumina, the nature of the bond between them, and the degree of coordination of the aluminium.

There are 5 figures, 1 table and 8 references: 7 Soviet (two of which are translations) and 1 English.

ASSOCIATION: VNII NP

Card 3/3

PIGUZOVA, L.I.

Thermal stability of the structure of molecular sieve-type sorbents. Khim.i tekh.topl.i masel 6 no.4:9-14 Ap '61. (MIRA 14:3)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut po pererabotke nefti i gazov i polucheniyu iskusstvennogo zhidkogo topliva. (Sorbents)

AUTHORS: Sulimov, A. D; Lobeyev, M. V; Kozhina, I. N; SOV/65-58-12-7/16
Piguzova, L. I, and Papko, T. S.

TITLE: The Effect of the Chemical Composition of an Aluminium-Cobalt-Molybdenum Catalyst on its Activity During Hydro-purification and Auto-Hydropurification Processes (Vliyaniye khimicheskogo sostava alyumokobal'tmolib-denovogo katalizatora na yego aktivnost' v protsessakh gidroochistki i avtogidroochistki)

PERIODICAL: Khimiya i Tekhnologiya Topliv i Masel, 1958, Nr 12, pp 32 - 36 (USSR)

ABSTRACT: Hydrogenation-desulphurisation over oxide catalysts at 10 - 70 atms pressure of hydrogen, and temperatures of 360 - 420°C is the most effective method for purifying petroleum products. The authors investigated the de-sulphurisation and dehydrogenation activity of aluminium-cobalt-molybdenum catalyst and defined its optimum chemical composition. Diesel fuel from Romashkinsk petroleum was used in these tests. The composition of the diesel fuel is tabulated. Samples of the catalysts were prepared according to a process similar to that used in industry. Wet aluminium oxide was suspended in aqueous solutions of ammonium molybdate and cobalt

Card 1/4

nitrate. The suspension was filtered on a vacuum filter until the moisture content equalled 70% and then pressed. The 4 x 4 mm tablets were dried first on air, then at 120 - 150°C, and finally at 650°C for 8 hours. A series of catalyst samples containing 20% of CoO and MoO_3, but with a different ratio of CoO:MoO_3 were prepared. Characteristics of these samples are given in Table 1. Most satisfactory results were obtained when the catalyst contained 1.9% CoO and 18.1% MoO_3 which corresponds to a molar ratio CoO:MoO_3 equal to 1:5. Other samples had the same molar ratio, but the total content of CoO and MoO_3 varied between 5 and 30%. After thermal treatment the catalyst was sulphonated during the hydropurification of the kerosine fraction between 120 and 240°C containing 0.6% sulphur; this process was carried out at 380°C, a pressure of 20 atms and a volume rate of the raw material supplied of 0.5 hour^{-1}. The catalyst was sulphonated for 24 hours. The same catalyst was tested for its dehydrogenation acti-

The Effect of the Chemical Composition of an Aluminium-Cobalt-Molybdenum Catalyst on its Activity During Hydropurification and Auto-Hydropurification Processes

SOV/65-58-12-7/16

vity during auto-hydropurification. The initial concentration of hydrogen in the circulating gas equalled 60%. Details on the concentration of hydrogen, temperature, initial pressure etc. are given. The constant pressure and concentration of hydrogen in the circulating gas were determined after 40 - 50 hours. Tables 2 and 3 give data on the desulphurisation and dehydrogenation activity of the catalyst. At constant partial pressure of hydrogen, catalysts containing 1.9 - 8.9% CoO and 18.1 - 10.7% MoO_3 have similar activity after desulphurisation. Catalysts containing more than 10% cobalt oxide and less than 10% of molybdenum trioxide were much less effective during desulphurisation. The dehydrogenation activity of the catalyst increases on increasing its molybdenum-trioxide content. Aluminium-molybdenum catalysts were most satisfactory, and aluminium-cobalt catalysts showed less activity. The authors recommend

Card 3/4

The Effect of the Chemical Composition of an Aluminium-Cobalt-Molybdenum Catalyst on its Activity During Hydropurification and Autohydropurification Processes SOV/65-58-12-7/16

as most suitable catalysts those containing 1.4 - 3% CoO and 13 - 17% MoO_3. There are 3 Tables and 7 References: 4 English, 1 German and 2 Soviet.

ASSOCIATION: VNII NP

Card 4/4

LULOVA, N.I.; PIGUZOVA, L.I.; TARASOV, A.I.; FEDOSOVA, A.K.

Gas chromatography used for investigating adsorbents of molecular sieve type. Khim.i tekh.topl.i masel 7 no.5:70-73 My '62. (MIRA 15:11)

(Adsorbents) (Gas chromatography)

Pigurova, K. I.

128

PHASE I BOOK EXPLOITATION SOV/6246

Soveshchaniye po tseolitam. 1st, Leningrad, 1961.

Sinteticheskiye tseolity; polucheniye, issledovaniye i primeneniye (Synthetic Zeolites: Production, Investigation, and Use). Moscow, Izd-vo AN SSSR, 1962. 286 p. (Series: Its: Doklady) Errata slip inserted. 2500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Otdeleniye khimicheskikh nauk. Komisiya po tseolitam.

Resp. Eds.: M. M. Dubinin, Academician and V. V. Serpinskiy, Doctor of Chemical Sciences; Ed.: Ye. G. Zhukovskaya; Tech. Ed.: S. P. Golub'.

PURPOSE: This book is intended for scientists and engineers engaged in the production of synthetic zeolites (molecular sieves), and for chemists in general.

Card 1/[illegible]

Synthetic Zeolites: (Cont.) SOV/6246

COVERAGE: The book is a collection of reports presented at the First Conference on Zeolites, held in Leningrad 16 through 19 March 1961 at the Leningrad Technological Institute imeni Lensovet, and is purportedly the first monograph on this subject. The reports are grouped into 3 subject areas: 1) theoretical problems of adsorption on various types of zeolites and methods for their investigation, 2) the production of zeolites, and 3) application of zeolites. No personalities are mentioned. References follow individual articles.

TABLE OF CONTENTS:

Card 2/[illegible] 5

Synthetic Zeolites: (Cont.)

Card 3/3

Synthetic Zeolites: (Cont.) SOV/6246

Card 7/13

SOV/6246

Synthetic Zeolites: (Cont.)

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5.1190

66865

SOV/76-33-11-23/47

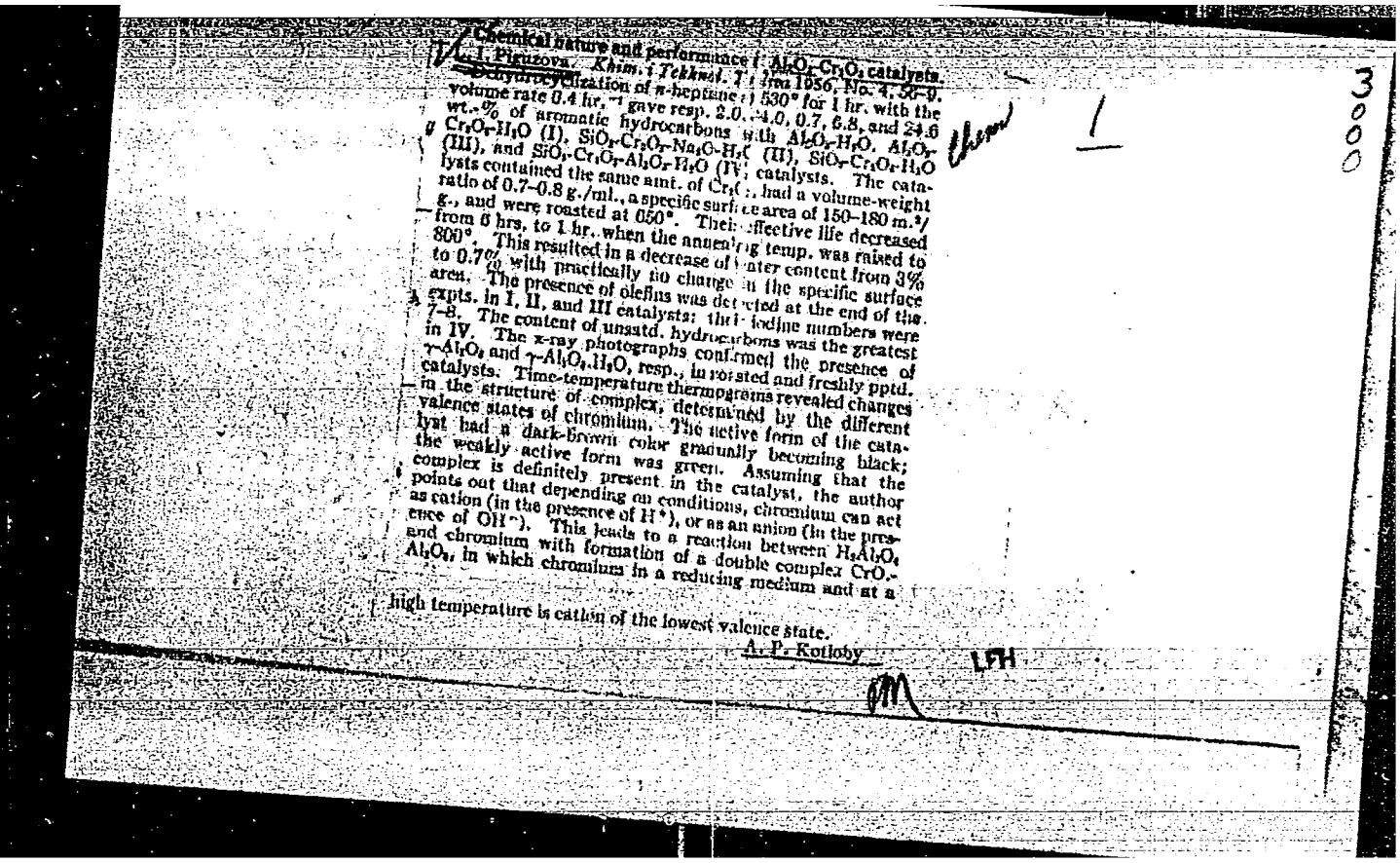
AUTHORS: Semenova, Ye.S., Piguzova, L.I.

TITLE: Aluminum Silicate Molybdenum Oxide Catalyst for the Process of Destructive Hydrogenation of Heavy Raw Petroleum

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 11, pp 2509-2512 (USSR)

ABSTRACT: The multifunctional catalysts have become of special importance in the complicated process of destructive hydrogenation. Several of them, as for example WS_2, have a small isomerization capacity, which leads to a gasoline fraction with a low octane number. At atmospheric pressure and at 400°C, WS_2 mainly acts as dehydrogenation catalyst, which may be due to its weakly acid properties (in contrast to the aluminum silicate catalysts (Refs 2-5)). Therefore by introduction of ammonium molybdate into the wet Al-Si mass, aluminum silicate-molybdenum catalysts, which have acid properties (Refs 8-12) were prepared. It has not yet been determined, whether these catalysts represent a compound (with new properties), or mechanical mixtures. In the laboratory of M.V.Rysakov experiments were made to compare the activity of aluminum

Card 1/2



Chemical nature and performance of Al_2O_3–Cr_2O_3 catalysts.
G. I. Pigurova. *Khim. i Tekhnol. Topliva* 1956, No. 4, 56–9.
Dehydrocyclization of *n*-heptane at 530° for 1 hr. with the volume rate 0.4 hr.$^{-1}$ gave resp. 2.0, 4.0, 0.7, 6.8, and 24.6 wt.-% of aromatic hydrocarbons with Al_2O_3–H_2O, Al_2O_3–Cr_2O_3–H_2O (I), SiO_2–Cr_2O_3–Na_2O–H_2O (II), SiO_2–Cr_2O_3–H_2O (III), and SiO_2–Cr_2O_3–Al_2O_3–H_2O (IV) catalysts. The catalysts contained the same amt. of Cr_2O_3, had a volume-weight ratio of 0.7–0.8 g./ml., a specific surface area of 150–180 m.^{2}/g., and were roasted at 650°. Their effective life decreased from 6 hrs. to 1 hr. when the annealing temp. was raised to 800°. This resulted in a decrease of water content from 3% to 0.7% with practically no change in the specific surface area. The presence of olefins was detected at the end of the expts. in I, II, and III catalysts; their iodine numbers were 7–8. The content of unsatd. hydrocarbons was the greatest in IV. The x-ray photographs confirmed the presence of γ-Al_2O_3 and γ-$Al_2O_3.H_2O$, resp., in roasted and freshly pptd. catalysts. Time-temperature thermograms revealed changes in the structure of complex, determined by the different valence states of chromium. The active form of the catalyst had a dark-brown color gradually becoming black; the weakly active form was green. Assuming that the complex is definitely present in the catalyst, the author points out that depending on conditions, chromium can act as cation (in the presence of H^+), or as an anion (in the presence of OH^-). This leads to a reaction between $H_2Al_2O_4$ and chromium with formation of a double complex $CrO.Al_2O_3$, in which chromium in a reducing medium and at a high temperature is cation of the lowest valence state.

A. P. Kotloby

Effect of the chemical nature and composition of cracking catalysts on the duration and extent of their activity. [illegible] *Khim. i Tekhnol. Topliva* 1956, No. 8, 43-[illegible] The specific activity of Al silicate contg. 0.1%-30% by wt. of Al_2O_3 was detd., and was related to the spec. surface area and pore vol. and radius before and after regeneration. [illegible] increasing the concn. of Al_2O_3 up to 40% the specific surface area decreased to a min.; higher concns. gave slight increases. The effect was accompanied by a decrease in the pore vol. and radius. This behavior was even more pronounced when the catalyst was treated 6 hrs. at 750° with steam (100 vol./vol. of catalyst/hr.). This treatment lowered the spec. area from 350 to 165, from 205 to 82, and from 246 to 186 sq. m./g. for catalysts contg. resp. 0.5, 4.0, and 6.0% Al_2O_3. The specific activity of the treated catalyst, was 1.5 times higher than that of the fresh catalyst. The effect of annealing on the structure of the catalyst and on coke and gas formation was measured at 450-850°. Annealing of a catalyst contg. 18% Al_2O_3 decreased the sp. surface from 325 cu. m./g. to 210 cu. m./g. and raised the index of specific activity from 18 to 28 without any changes in the conversion. At >850° the catalyst sintered and became deactivated. Addn. of 4.5% [illegible] the catalyst had practically no effect on its structure, though the activity index fell by 3-4 points. However, when the same catalyst was regenerated at higher temp. the index fell by 16 points. A similar though less pronounced effect was observed [illegible] catalyst contg. [illegible]

PIGUZOVA, L.I.

Chemical nature and action of aluminum and chromium salt catalysts.
Khim. i tekh.topl.no.4:56-59 Ap '56. (MLRA 9:9)
(Catalysts)

PIGUZOVA, L.I.

Effect of the chemical characteristics and composition of cracking catalysts on their action stability. Khim.i tekh.topl. no.6:43-54 Je '56. (MLRA 9:9)

1.Vsesoyuznyy nauchno-issledovatel'skiy instrumental'nyy institut.
(Catalysts) (Cracking process)

65-1-9/14

AUTHOR: Piguzova, L. I.

TITLE: On the Stability of the Activity of a Glass Aluminosilicate Bead Catalyst. (Ob ustoychivosti aktivnosti steklovidnogo alyumosilikatnogo sharikovogo katalizatora).

PERIODICAL: Khimiya i Tekhnologiya Topliv i Masel,1958,Nr.1.pp.47-52. (USSR).

ABSTRACT: The relation between the structure and the stability of bead catalysts of identical chemical composition, but prepared by different methods, was investigated. The aluminosilicate bead catalyst was prepared either by mixing a solution of sodium silicate with a solution of aluminium sulphate, acidified with sulphuric acid (method 1), or from sodium aluminate (method 2). In the latter case a gel was formed by adding to the alkaline sol an acid solution of ammonium sulphate. The prepared acid or alkaline Al-Si sol was converted into a gel in oil, forming transparent beads, which underwent syneresis. The catalysts had similar chemical composition and a porous structure. The stability of the catalytic activity, with respect to temperature and to water vapour, was 3 - 4 points higher when prepared by method 2. Table 1 gives data on the activity and

Card 1/3

On the Stability of the Activity of a Glass aluminosilicate Bead Catalyst.

stability of catalysts prepared by different methods, and show that they are superior in quality. Experimental results showed that the effective surface of the catalyst decreases rapidly at 900°C. The chemical stability of catalysts with similar composition and structure was tested. Table 1 shows the influence of the glassy structure and spheroid forms on the stability of Al-Si catalysts. For tabloid catalysts the index of stability was decreased by 3 - 5 points. The chemical stability of Al-Si catalysts is characterised by their solubility when treating them for 2 hours with acid or alkali. Results are tabulated (Table 2). Glass bead catalysts were found to be much more stable than china catalysts. The various phenomena are explained by the Academician N. V. Belov, et al. who investigated the properties of silicates and aluminosilicates (Ref.12 and 13) and by D. I. Mendeleyev (Ref.14). The lowering of the index of activity and of the index of stability in the case

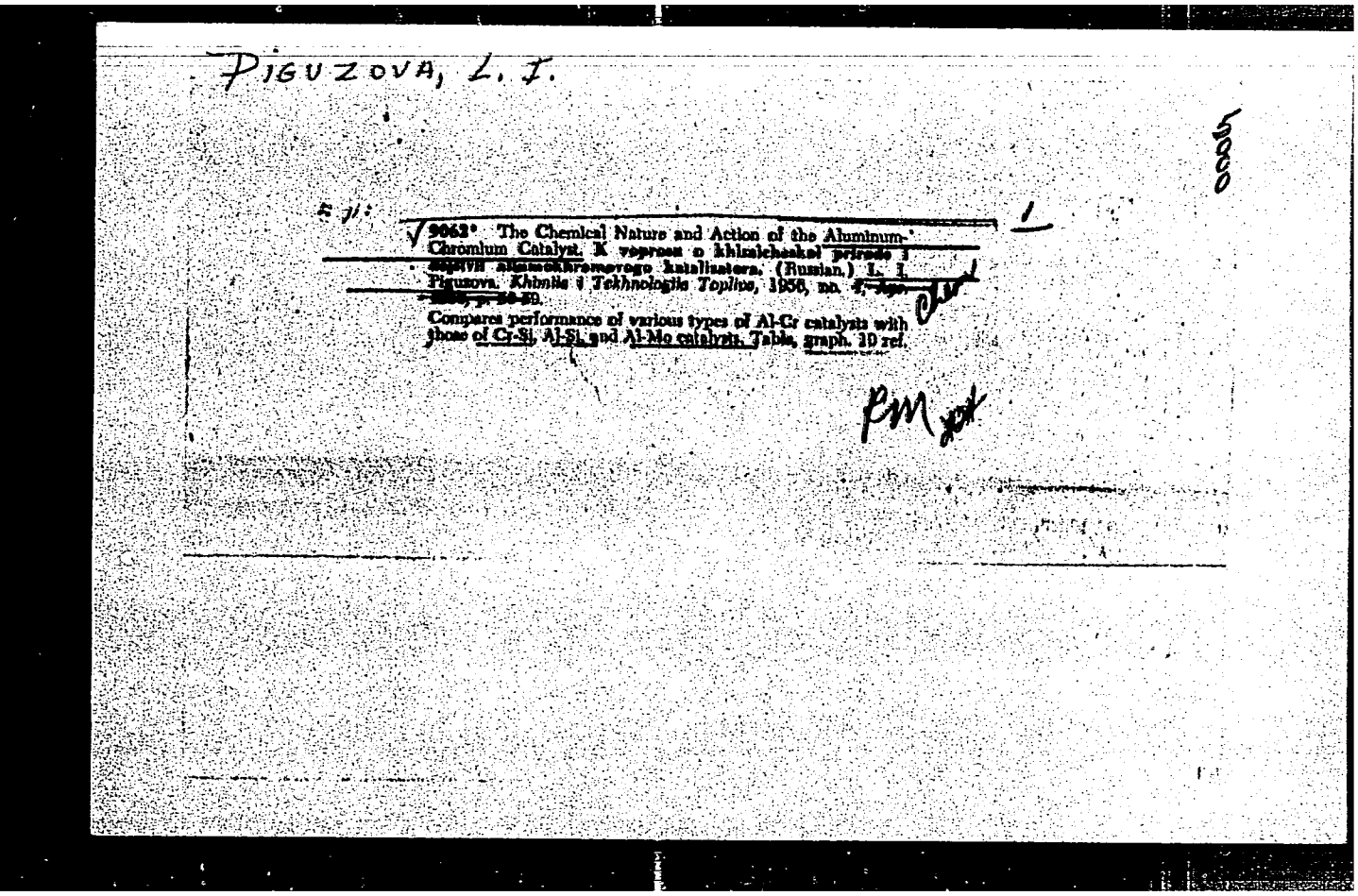
On the Stability of the Activity of a Glass Aluminosilicate Bead Catalyst. 65-1-9/14

of tabloid catalysts, containing 17% Al_2O_3 (prepared by mixing aluminium and silicon hydroxide) can be explained by the marked disorder and by the discontinuity of the bonds in the complex. There are 2 Tables and 17 Reference: 4 English and 13 Russian.

ASSOCIATION: VNII NP

AVAILABLE: Library of Congress.

Card 3/3



PIGUZOVA, L. I.

5000

Ref: 9062* The Chemical Nature and Action of the Aluminum-Chromium Catalyst. K voprosu o khimicheskoi prirode i deistvii aliumokhromovogo katalizatora. (Russian.) L. I. Piguzova. *Khimiia i Tekhnologiia Topliva*, 1956, no. [illegible], [illegible], p. 80-89.

Compares performance of various types of Al-Cr catalysts with those of Cr-Si, Al-Si, and Al-Mo catalysts. Table, graph. 10 ref.

PIGUZOVA, L.I.

Selection of synthetic, stable oxide catalysts for cracking. Probl. kin. i kat. 10:303-309 '60. (MIRA 14:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut po pererabotke nefti i gaza i polucheniyu iskusstvennogo zhidkogo topliva.
(Oxides) (Catalysts)

26524
S/065/61/000/008/009/009
E194/E135

5.5600

AUTHORS: Lulova, N.I., Piguzova, L.I., Tarasov, A.I., and Fedosova, A.K.

TITLE: Checking the quality of synthetic samples of molecular sieve type adsorbents by gas chromatography

PERIODICAL: Khimiya i tekhnologiya topliv i masel, 1961, No.8, pp. 59-63

TEXT: The VNII NP (All-Union Scientific Research Institute of the Petroleum Industry) is developing molecular sieve adsorbents and in this connection it was necessary to develop a method for assessing the quality of samples of molecular sieves. The method is based on the possibility of chromatic separation on molecular sieves of such components as oxygen and nitrogen, which are not separated by other adsorbents. The instrument used was a standard chromatograph type ХЛ-3 (KhL-3) which was described in an article by P.A. Frolovskiy (Ref.4: Khimiya i tekhnologiya topliv i masel, No.7, 1961, pp. 44-49). Samples of molecular sieve were charged into the chromatograph column, which was 1 m long, 6 mm in diameter, with a thermostat temperature of 40-45 °C.

Card 1/3

26524
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E194/E135

Checking the quality of synthetic ...

Hydrogen was passed at a rate of 120 mℓ per minute and argon at 40 mℓ per minute. The weight of zeolite in the column was 2½ g The tests were made with a standard four component gas mixture:

Oxygen	2.0 - 4.0 % volume
Nitrogen	7 5 - 15.0 % volume
Methane	60.0 - 65.0 % volume
Carbon monoxide	21.0 - 25.0 % volume

Linde molecular sieves grade 5Å (5A) gave clear separation of all components of this mixture under the stated conditions in three minutes. Each newly synthesized specimen of zeolite was tested under analogous conditions to obtain identical chromatograms in analysing this gas mixture. This method of checking molecular sieves is simple and quick. A considerable number of zeolite samples were tested in various stages of synthesis and those which gave good results in gas adsorption chromatography were also good in other analyses such as X-ray analysis and determination of water content. In order to compare the degree of activity of different samples certain chromatographic parameters were worked out, namely, the retention volume, the Henry coefficient and the separation factor, all of which are very suitable for general

Card 2/3

Checking the quality of synthetic ... 26524
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characterisation of adsorbents. The gas chromatography method was also used to check qualitative changes in adsorbents during the process of heat treatment. Reactivation by heat treatment was carried out at various temperatures: results were good at 650 °C, better at 700 °C, but raising the temperature to 800 °C decreased the activity of the molecular sieve.
There are 3 figures, 2 tables and 8 references: 4 Soviet and 4 English. The English language references read:
Ref.1: Petroleum Refiner, Vol.38, No.37, 136-140, 1957.
Ref.3: S.A. Green, M.L. Moberg, E.M. Wilson. Anal. Chem. No.9, 1369-1370.
Ref.5: R.M. Barrer. Brenst Chem. B.C. Vol.35, 21/22.
Ref.2: R. Miltor. Adsorbents of the Molecular-sieve Type. American Patent No. 2882244, 14.4.59.

ASSOCIATION: VNII NP

Card 3/3

L 45966-66 EWT(l)/EWT(m) SCTB JKT/DD/RD/JT/GD/JXT(CZ)
ACC NR: AT6030697 SOURCE CODE: UR/0000/66/000/000/0081/0084

AUTHOR: Cherkasov, V. K.; Ushakova, G. S.; Piguzova, L. I.; Devyatko, A. V.; Mokhov, V. G.; Solov'yev, V. I.; Portnova, K. M.; D'yakonov, R. V.; Martynova, R. A.; Ratts, L. B.

ORG: none

TITLE: The possibility of using the multifunctional properties of zeolites in a physical and chemical air-regeneration system

SOURCE: Konferentsiya po kosmicheskoy biologii i meditsine, 1964. Materialy. Moscow, Inst. mediko-biol. problem, 1966, 81-84

TOPIC TAGS: life support system, closed ecological system, space biology

ABSTRACT: A physical-chemical air "regeneration" system which has been proposed for manned spaceflight is shown in Fig. 1. In this system CO_2 is removed from cabin air by adsorption on zeolite. The carbon dioxide then undergoes vacuum desorption from the zeolite and passes through a CO_2 collector to the catalytic reactor, where it is reduced with hydrogen from the electrolyzer to water and methane. The water returns to the electrolyzer and is broken down into oxygen (used for human respiration) and hydrogen. The disadvantages of this method are the difficulties of creating a vacuum on board a spacecraft and the additional electrical energy required to operate the CO_2 collector. Studies have shown that specially treated B-zeolite

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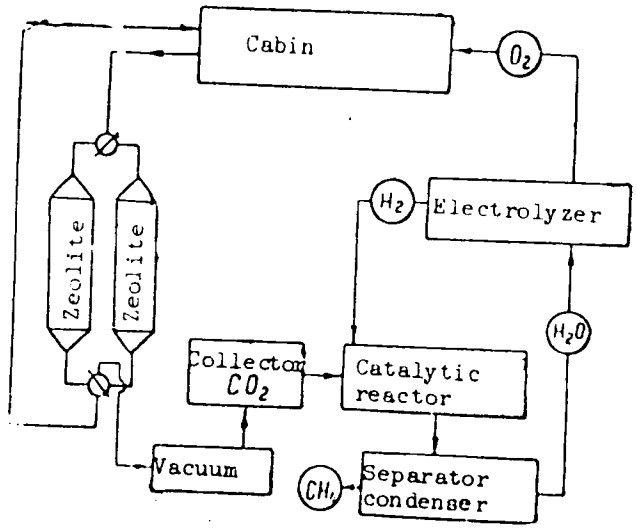

Fig. 1. Schematic diagram of a physical and chemical air "regeneration" system

can be used in such a system for both sorption and catalysis, retaining its properties through a number of cycles. An improved air "regeneration" scheme using B-zeolite is shown in Fig. 2. Cabin air is purified by passing through a B-zeolite

Card 2/3

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ACC NR: AT6030697

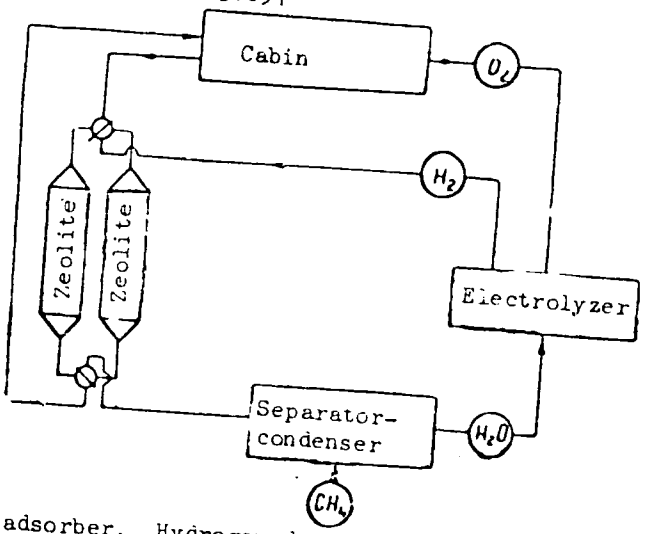

Fig. 2. Schematic diagram of a physical-chemical air "regeneration" system using B-zeolite

adsorber. Hydrogen derived from electrolysis is then passed through zeolite in a second adsorber, simultaneously desorbing CO_2 and reducing it to water and methane. The water is electrolyzed as in the first system. Temperature regulation is very important for the successful operation of this system, since a 7—12C temperature variation alters the gas conversion level by 10—15%. Orig. art. has: 3 figures. [JS]

SUB CODE: 06/ SUBM DATE: 14Apr66/ ATD PRESS: 5086

Card 3/3

BUDOVICH, B.; GAMBURG, R.; ZAKHARENKO, A.; NADEZHDINA, K., obshchestvennitsa-pensionerka; NOVIK, L.; PIGUZOVA, N.; SMIRNOVA, I.; FOMITSKAYA, [illegible], deputat Minskogo gorodskogo Soveta; BURMISTOVA, L.

Place nurseries and kindergartens under the control of women. Rabotnitsa 40 no.7:18-19 Jl '62. (MIRA 16:2)

1. Predsedatel' zhenskogo soveta stankostroitel'nogo zavoda imeni Oktyabr'skoy revolyutsii (for Budovich). 2. Predsedatel' zhenskogo soveta gomesl'skoy fabriki "Komintern" (for Gamburg). 3. Korrespondent gazety "Gomel'skaya pravda" (for Zakharenko). 4. Korrespondenty zhurnala "Rabotnitsa i syalyanka" (for Piguzova, Smirnova). 5. Korrespondent zhurnala "Rabotnitsa" (for Burmistrova).
(White Russia—Nursery schools) (White Russia—Kindergartens)

PIGUZOVA, N. [Pihuzava, N.]

Before the mausoleum. Rab.i sial. 38 no.1:6-7 Ja '62.

(Lenin, Vladimir Il'ich, 1870-1924)

FIGUROVA, V. M.

Evaluation of the base flow into rivers of the zone of ground frozen for many years. Trudy GGI no.122:87-107 '65.
(MIRA 18:9)