"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

BEROVIC, N.; BORELI, F.; DRAGIN, R.

Absolute measurement of fast neutron flux in the reactor RA.
Bul Inst Nucl 12:1-6 O '61.

1. The Institute of Nuclear Sciences "Boris Kidrich," Department of Physics, Vinca.

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Borelli, F. M.

Ellen Thielen
1-RMC

YUGO

537.542 : 621.318.573

1420. A 59 channel amplitude analyser. F. M. BORELLI. *Bull. Inst. Nuclear Sci. "Boris Kidrich"*, 3, 63-93 (Aug., 1953).

An analyser of the Wilkinson type [Abstr. 7325 (1950)] is described. The output stage is modified to improve counting rate. On a specially constructed register the growth of the spectrum can be observed directly. A.

RMC

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BORELI F.

V 269

ENERGY MEASUREMENTS WITH A PLASTIC SCINTILLATOR. F. Borell and B. Grimeland (Inst. of Nuclear Sciences "Boris Kidrichl, Belgrade, Yugoslavia). Nuovo cimento (10), 2, 336-9(1955) Aug.

NU

Plastic scintillators consisting of tetraphenyl-butadiene dissolved in polystyrene were studied. The connection between pulse height and particle range for α particles in the scintillators is given. The scintillator characteristics as a neutron detector were studied with 2.5-Mev neutrons, and the resulting proton pulse height and energy distributions are given. Results indicate that resolution is better with anthracene crystals, but that plastic scintillators are advantageous in that they may be obtained in larger sizes. (B.J.H.)

1

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BORELI, FEDOR

1915

NEUTRONS PRODUCED IN THE BOMBARDMENT OF BERYLLIUM BY DEUTERONS. Fedor Borell and Branislav Lalovic (Boris Kidrich Inst. of Nuclear Sciences, Belgrade). Nature 176, 1021(1955) Nov. 26.

Measuring techniques and energy curves for the neutron yield from the $Be^9(d,n)B^{10}$ reaction are given. (D.K.B.)

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BORELI, FEDOR M.

Distr: 4E2c(m)

19

21 ✓ Thorium fission chamber. Fedor M. Boreli (Boris Kidrich Inst. Nuclear Sci., Belgrade, Yugoslavia). *Bull. Inst. Nuclear Sci. Boris Kidrich* (Belgrade) 10, 25-6(1960).—A soln. contg. 3.3 mg. purified $Th(NO_3)_4$/ml. EtOH (freshly prepd. each time to avoid hydrolysis) was used to paint 0.02-mm. thick Pt foil which was then baked for 2 min. at 850°. The foil was then rubbed with optical paper and repainted with the soln. and rebaked. The $ThO_2$ layer formed on the foil was 1.1 mg./sq. cm. The prepd. foil was placed in a fission chamber consisting of an Al tube with a brass head sealed with a Teflon gasket and through which passed the anode connector and filler gas (Ar at 3 atm. contg. 6% $CO_2$). The applied voltage was 500 v. The fission chamber, which performed well in fast-neutron-flux measurement had an efficiency of $1.5 \times 10^{-3}$ fission/sec./neutron/sq. cm.-sec. R. J. Richardson

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mjc (jd) (jg)

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BORELI, F.; BEROVIC, N.; ALEKSIC, M.; LAZAREVIC, V.

The measurement of fast neutron spectra at high reactor powers. Bul Inst Nucl 14 no. 4: 255-258 O '63.

1. Department of Physics, Boris Kidric Institute of Nuclear Sciences, Beograd-Vinca.

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BORELI, M.

"Asbestine and serpentine flour as a good filler for asphalt concerete."

p. 73 (Put I Saobracaj) No. 5/6, May/June 1957
Belgrade, Yugoslavia

SO: Monthly Index of East European Accessions (EEAI) LC. Vol. 7, no. 4, April 1958

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BORELJ, M.

Methods for research into underground steams with special reference to the Mavrovo Dam. p.43

BELGRADE Hidrotehnicki institut "Inzenjer Jaroslav Cerni." SAOPSTENJA. TRANSACTIONS. Beograd, Yugoslavia

No. 2, 1955

SOURCE: East European List (EEAL) Library of Congress, Vol. 6, No. 1, January 1957

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BORELI, M.

TECHNOLOGY

Periodical: SAOPSTENJA. TRANSACTIONS. No. 13, 1958.

BORELI, M. Hydraulic problems in the evacuation of superfluous water by means of spillways. p. 9.

Monthly List of East European Accessions (EEAI) LC, Vol. 8, no. 3
March 1959 Unclass.

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BORELI, Mladen, dr. ing.; BRKIC, Dusan, ing.

Solving problems of potential flowings by the method of tangental polygons and approximative equations for singularities for the application in case of the flowing toward a trapezoid canal. Vodoprivreda Jug 2 no.7/8:224-232 '59. (EEAI 10:1)

1. Gradevinski fakultet, Beograd (for Boreli). 2. Hidrotehnicki institut "Ing. Jaroslav Cerni," Beograd (for Brkic)
(Laplace transformation) (Differential equations)
(Hydraulics) (Canals) (Water)

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9"

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1. Gradevinski fakultet, Beograd (for Boreli. 2 Hydrotehnicki institut "Ing. Jaroslav Cerni," Beograd.
(Water) (Differential equations)
(Riemann surfaces) (Rain and rainfall)
(Hydraulics)

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The recharge of aquifers from river waters. Saop Inst vodopr Cerni 9 no.22:29-37 '62.

1. Clan Redakcionog odbora, "Saopstenja. Transactions" (for Vukovic).

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Filtration toward a drain system. Saop Inst vodopr Cerni 9 no.22:39-50 '62.

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BORELOWSKI, Z.

On a modification of Weyssenhoff's homogeneous variational principle with higher derivatives. Acta physica Pol 20 no.8:619-632 '61.

1. Institute of Theoretical Physics, Jagellonian University, Krakow.

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Homogeneous variational principle with third order derivatives in the special theory of relativity. Acta physica Pol 21 no.6: 609-635 Je '62.

1. Jagellonian University, Krakow.

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BORELOWSKI, Zbigniew; SREDNIAWA, Bronislaw

Realtivistic bipoint as the model of elementary particle.
Acta physica Pol 25 no. 4:609-616 Ap '64.

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Borelskii, A. A., and Naumov, I. S. INSULATION OF THE REVERBERATORY FURNACES OF THE KRASNOURALSK COPPER SMELTER. *Tsvetnye Metal.*, 1940 [3] 73-77.—Cu smelting at the Krasnouralsk plant is carried on in two reverberatory furnaces using pulverized fuel and handling drossing material was Dinas brick, but large heat losses occurred due to cracks and fissures. The furnace arch was insulated with a mixture of 90% zonolite and 10% water glass. The sealing cement contained 50% finely ground zonolite, 25% glass fines, and 25% water. The walls were insulated with a mixture containing 70 quartz river sand, 14 refractory clay, 10 water-glass solution (1:1), and 6% asbestos. The capacity of solid charge increased from 3.16 to 3.24 tons per 24 hr., but the greatest saving obtained was in a reduction of the specific fuel consumption from 16.83 to 14.55%.

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NAZARCHUK, T.N.; POPOVA, O.I.; KUGAY, L.N.; DZERZHANOVSKAYA, Ye.V.; KABANNIK, G.T.; BOREMSKAYA, S.F.; CHUGUNNAYA, N.K.

Analysis of rare alloys with certain metals and oxides. Zhur. anal. khim. 19 no.8:980-984 '64.

(MIRA 17:11)

1. Institut metallokeramiki i spetsial'nykh splavov AN SSSR, Kiyev.

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BORENKO, P.I.

Use of terrestrial stereophotogrammetric surveys in exploring mountainous areas. Geod. i kart. no.7:37-40 Jl '60. (MIRA 13:9)
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Petr Andreevich Volkov; obituary. Izv. AN SSSR. Ser. geol. 23 no.4: 103 Ap '58. (MIRA 11:6)

(Volkov, Petr Andreevich, 1889-1957)

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CIESIELSKI, Wieslaw, mgr., inz.; BORENNTAEDT, Wladyslaw, mgr., inz.; MALINOWSKI, Ryszard, mgr., inz.

One of the planned summit pump power stations in Poland. Gosp wodna 22 no. 3:97-100. Mr '62

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BORENSHTEYN, M.S.

Results of treating erosion of the cervix uteri by the diathermocoagulation method. Zdrav. Kazakh. 22 no.5:23-26 '62. (MIRA 15:6)

1. Iz kafedry akusherstva-ginekologii lechebnogo fakul'teta (zav. - prof. K.D. Utegenova) Kazakhskogo meditsinskogo instituta.
(UTERUS--DISEASES) (ELECTROSURGERY)

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

USSR/Soil Cultivation. Physical and Chemical Properties of Soils. J-2

Abs Jour: Ref. Zhur-Biologiya, No 1, 1958, 1215

Author : Borenshteyn, S.N.
Inst : Moscow Agricultural Acad imeni K.A. Timiryazev
Title : The Reaction, Water, and Nutritive Regime of the Soil of the Bottom Lands of the Moscow River on a Plot of the Sovkhoz "Faustovo."

Orig Pub: Doklady Mosk. s.-kh. akad im. K.A. Timiryazev, 1956, 1, No 26, 91-95.

Abstract: No abstract.

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

BORNSHTEYN, YU. P.: "Investigation of the mechanism of automatic equipment and increasing its productivity". Leningrad, 1955. Min Higher Education USSR. Leningrad Correspondence Industrial Inst. (Dissertation for the Degree of Candidate of TECHNICAL Sciences)

SO: Knizhnaya Letopis' No. 51, 10 December 1955

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

S/146/60/003/006/013/013
B012/B060

AUTHOR: Borenshteyn, Yu. P.

TITLE: Two-parameter Mechanism of an Instrument for Recording Kinematic Characteristic Curves of Operating Machines

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Priborostroyeniye, 1960, Vol. 3, No. 6, pp. 120 - 126

TEXT: A study has been made of a five-bar linkage with two degrees of mobility (Fig.1). Point C is thus allowed, at a proper ratio of independent parameters (angular velocities $\omega_\varphi$ and $\omega_\gamma$) of the mechanism versus one another, to describe a prescribed trajectory. If point C is connected to an element of another mechanism, and is designated as the guiding point, the change of the angular velocities of the cranks $O_1A$ and $O_2B$ will then depend in a determined manner on the trajectory of point C. Such a mechanism can therefore be used for recording kinematic characteristic curves of operating machines. Analysis and synthesis of this mechanism are given here. For a simplification, the length $l_5$ is

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assumed to be equal to zero and $l_1=l_2=l_3=l_4=l$ (Fig.2). Relationships between the coordinates of point C and the lengths of the element are determined. Since the projections of point C are represented as harmonics, the method of vectors rotating in opposite directions, as suggested by Professor M. V. Semenov (Ref.2) can be used for the construction of the trajectory of point C. Fig.3 shows the trajectories of point C for different values of parameter k (number of harmonics). Then, in accordance with M. V. Semenov (Ref.1) the trajectory and hodograph of the velocities of point C are determined for k=2, and $\varphi=60^\circ$. Finally, the reproduction of a determined trajectory is examined. For this purpose, the relation between the angular velocities $\omega_\varphi$ and $\omega_\gamma$, which ensures the motion of point C according to trajectories of determined equations is established. The publication of this article was recommended by the kafedra teorii mekhanizmov i mashin (Department for the Theory of Mechanisms and Machines). There are 5 figures and 2 Soviet references.



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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

Two-parameter Mechanism of an Instrument for Recording Kinematic Characteristic Curves of Operating Machines

S/146/60/003/006/013/013
B012/B060

ASSOCIATION: Severo-zapadnyy zaochnyy politekhnicheskiy institut (Northwestern Polytechnic Correspondence Institute)

SUBMITTED: April 21, 1960

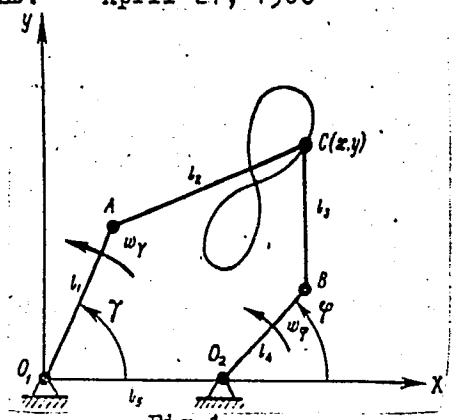


Fig.1

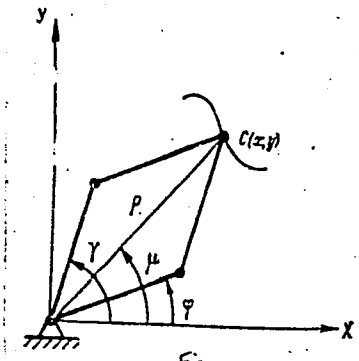


Fig.2

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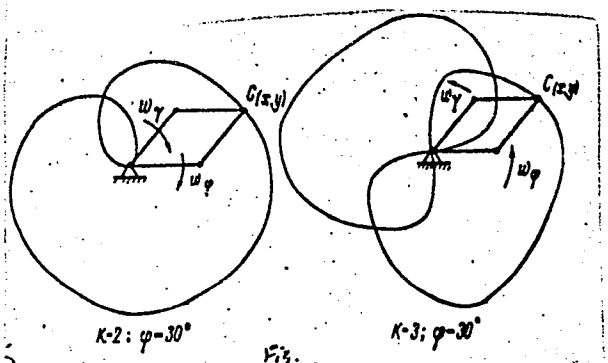
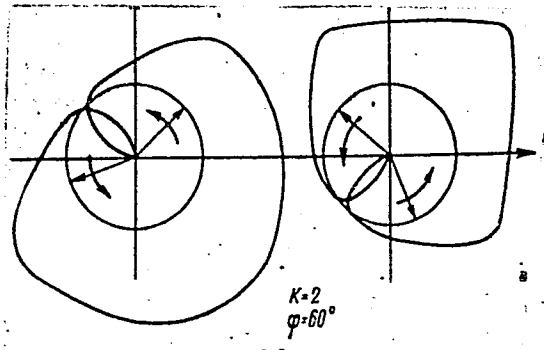



Фиг. 3

Fig.3




Фиг. 4

Fig.4

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

BORENSHTEYN, Yu.P.

Mechanism of the device used for determining errors in manufactured cam profiles. Izv.vys.ucheb.zav.; prib. 5 no.1: 106-109 '62. (MIRA 15:2)

1. Severo-zapadnyy zaochnyy politekhnicheskiy institut. Rekomendovana Obshchetekhnicheskoy sektsiyey Yubileynoy nauch-tekhnicheskoy konferentsii Severo-zapadnogo zaochnogo politekhnicheskogo instituta.
(Cams—Testing)

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

BORENSHTEYN, Yu.P.

Mechanism for the realization of functions of two independent variables. Izv.vys.ucheb.zav.; prib. 5 no.3:150-155 '62. (MIRA 15:8)

(Analog computers)

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L 8117-66 EWT(d)/EWT(m)/EWP(v)/EWP(t)/EWP(k)/EWP(h)/EWP(b)/EWP(1) JD

ACC NR: AP5025425 SOURCE CODE: UR/0145/65/000/007/0037/0042

AUTHOR: Borenshteyn, Yu. P. (Candidate of technical sciences, Docent)

ORG: none

37
B

TITLE: Mechanism for machining parts of complicated configuration

SOURCE: IVUZ. Mashinostroyeniye, no. 7, 1965, 37-42

TOPIC TAGS: metalworking, metalworking machine, contouring mechanism, profiling mechanism

ABSTRACT: The synthesis of a seven-link, two-input plane mechanism (of the Assur group) to follow an arbitrary trajectory is considered. A mechanism of this type could be used to move the tool during contouring of complicated parts. The mechanism (see Fig. 1) can provide any trajectory by proper choice of the cams M and N. The relationships between the cam radii $\rho$ and $\mu$ and the coordinates x and y are given by

$$\left.\begin{aligned} \rho^2 &= x^2 + [y - (l_1 + p)]^2 \\ \mu^2 &= (x - l_0)^2 + [y - (l_1 + p)]^2 \end{aligned}\right\}.$$

Complete solution of these equations becomes quite tedious, but a solution for a

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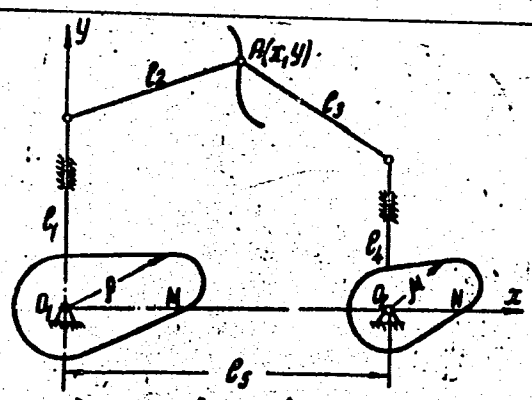


Fig. 1. Linkage geometry

simplified version with $l_5 = 0$, $l_2 = l_3$ (see Fig. 2) becomes

$$x = \sqrt{r_2 - \left(\frac{l_4 - l_1 + \mu - \rho}{2}\right)^2}.$$

$$y = \frac{l_4 + l_1 + \rho + \mu}{2}.$$

The choice of linkage parameters for this latter case is demonstrated for three sample trajectories: x = a(line), y = b(line), and

$$(x - a)^2 + (y - b)^2 = R^2$$

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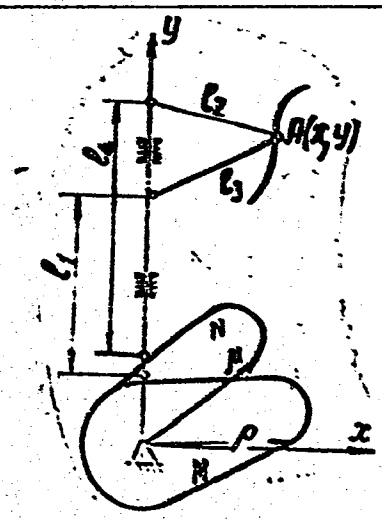


Fig. 2. Modified linkage geometry

(circle). In each case the equations for x and y in terms of the linkage parameters are substituted in the desired trajectory equation, and relationships for $\rho$ and $\mu$ are obtained in terms of a combination of the linkage lengths. Additional conditions such as fairly constant velocity along the trajectory can then be used to determine individual linkage lengths. This paper was presented by Professor M. V. Semenov, Doctor of technical sciences, Northwest Correspondence Polytechnic Institute (Severo-

Card 3/4

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zapadnyy zaochno politekhnicheskiy institut). Orig. art. has: 10 formulas and 2 figures.

SUB CODE: II/ SUBM DATE: 02Feb63

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

BORENSZTAJN, D.; KURYLOWICZ, W.

Preparation of concentrated vitamin $B_{12}$ from ferment liquids of Streptomyces. Med. dosw. mikrob. 4 no.4:483-518 1952. (CLML 23:4)

1. Of the National Institute of Hygiene, Warsaw.

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

BORENSZTAJN, D;GAWENDA-DZIERZYNSKA, I;KORZYBSKI, T;KOWSZYK, Z;KURYLOWICZ, W;NIEDZWIECKA-TRZASKOWSKA, I.

Properties of nonspecific penicillin manufactured in Poland. Polski tygod. lek. 7 no.7-8:177-181 18 Feb 1952, (CLML 22:2)

1. Of the National Institute of Hygiene in Warsaw.

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

BORENSZTAJN, D.

Comparative study of biological methods of determination of vitamin $B_{12}$. Polski tygod. lek 7 no. 16:466-470 21 Apr 1952. (CLML 22:4)

1. Of the National Institute of Hygiene in Warsaw.

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

BORENSZTAJN, D.; KURYLOWICZ, W.

Preparation of vitamin $B_{12}$ concentrates through fermentation. Polski tygod. lek. 7 no. 20:650 19 May 1952. (CLML 22:5)

1. Of the National Institute of Hygiene in Warsaw.

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BORENSZTAJN, D.

Production of streptomycin on laboratory scale. Włodzimierz Kuryłowicz, Wanda Woźnicka, Dawid Borensztajn, and Izabella Miedźwiecka-Trzaskowska (Państwowy Zakład Hig., Warsaw). *Med. Doświadczalna i Mikrobiol.* 6, 1-12 (1954).—Of the 21 strains of *Streptomyces* tested for streptomycin production only the ones belonging to *S. griseus* produced the antibiotic. Autolyzed yeast ext. and corn ext. are the best N source. NaCl, $CaCO_3$, and $KH_2PO_4$ are essential for growth. The highest yield was 1750 g./ml.

I. Z. Roberts

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BORENSZTAJN, D.

Simultaneous production of vitamin $B_{12}$ and antibiotics, especially of streptomycin, by using the fermentation method. Dawid Borensztajn (Państwowy Zakład Hig., Warsaw). [illegible] *Mikrobiol.* 6, 25-30 (1954).—Of the ten strains of *Streptomyces*, which all produce vitamin $B_{12}$, only *S. griseus* 3-175 produces also streptomycin (1). No vitamin $B_{12}$ was found in *Penicillium* cultures. *S. venezuelae*, *S. aureofaciens*, *S. rimosus* produce vitamin $B_{12}$ and chloramphenicol, Aureomycin, and Terramycin, resp. By continuous selection of *S. griseus* a strain producing over 1000 mg./ml. I and 0.55 $\gamma$/ml. vitamin $B_{12}$ was isolated. I. Z. Roberts

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Borenszfajn, Dawid

Determination of vitamin $B_{12}$ in the growth medium of Streptomyces griseus and liver extracts by use of Escherichia coli mutants and plate method chromatography. Dawid Borenszfajn (Państwowy Zakład Hig., Warsaw). ~~Arch. Immunol. i Mikrobiol.~~ 6, 37–40(1954); cf. C.A. 47, 4551f. —An *E. coli* mutant resistant to streptomycin is used (Harrison, *et al.*, C.A. 46, 3115a). Good results are obtained when *S. griseus* fermentation broth is tested. Liver exts. contain another growth factor beside vitamin $B_{12}$ which has to be chromatographically sepd.: $H_2O$-satd. BuOH seps. (48 hrs., 37°) vitamin $B_{12}$ (210 mm. movement), vitamin $B_{12}$ (72 mm.), and the liver factor (44 mm.). I. Z. R.

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BORENSZTAJN DAWID

Aureomycin production in the laboratory and on a pilot-plant scale. Włodzimierz Kurylowicz, Izabella Niedźwiecka-Trzaskowska, Dawid Borensztajn, and Wanda Woźnicka (Państwowy Zakład Hig., Warsaw). *Med. Doświadczalna i Mikrobiol.* 6, 51-63 (1954).—Best sporulation, and at the same time best antibiotic production, is obtained when *Streptomyces aureofaciens* is grown in a medium contg. asparagine, 0.0001%, $CoCl_2$, agar, beef ext., phosphate, and glucose. In pilot-plant production (van Dyck and Somer (*C.A.* 47, 1774*c*)) highest yields are obtained with an inoculum from an asparagine culture, 320-540 γ/ml. were obtained. I. Z. Roberts

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Borensztajn, D.

POLON

Increase in oxytetracycline production by Streptomyces rimosus. Dawid Borensztajn and Jadwiga Wolf (Państwowy Zakład Hig., Warsaw). *Med. Doświadczalna i Mikrobiol.* 7, 125-34(1955).—Ultraviolet irradiation and treatment with N mustards produced *Streptomyces rimosus* mutants which yielded 1000 γ/ml. oxytetracycline when grown in a lab. shaker and av. 1500 γ/ml. when grown in stainless steel tanks (30-150-l. capacity). The lyophilized mutants were stable for at least 6 weeks. I. Z. Roberts

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BORENSZTAJN, DAWID

POLON

Laboratory and pilot-plant production of oxytetracycline. Dawid Borensztajn and Jadwiga Wolf (Państwowy Zakład Hig., Warsaw). *Med. Doświadczalna i Mikrobiol.* 7, 135-54 (1955).—Oxytetracycline (I) was produced in 30-l. and 150-l. tanks by *S. rimosus* mutant (cf. *C.A.* 49, 11088c) in Van Dyck and De Somer medium (*Antibiotics & Chemotherapy* 2, 4(1952); *C.A.* 47, 1774c) substituting arachis oil (II) for sucrose. II was added at 0, 36, 48, 60, and 72 hrs. of fermentation, giving a final 1.5% II. The temp. was 26 ± 2°; optimum time 120 hrs., av. yield 1537 γ/ml., starting pH 7-7.8, final pH 6.8-8.9. To isolate I, the culture acidified to pH 1.5 was filtered, filtrate adjusted to pH 9-9.5, I salted out with 25% NaCl-10% BuOH, the ppt. dried at 40° dissolved in MeOH plus $CaCl_2$-satd. MeOH (5:1), filtered, and pptd. by adding concd. HCl.

I. Z. Roberts

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WOLF, Jadwiga; BORENSZTAJN, Dawid.

Method of isolation of vitamin B 12-producing microorganisms.
Med.dosw.mikrob. 7 no.2:187-190 1955.

1. Z Panstwowego Zakladu Higieny w Warszawie.
(VITAMIN B12, preparation of,
isolation of Streptomyces prod.vitamin B12)
(STREPTOMYCES,
vitamin B12-prod. strains, isolation)

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

OSTROWSKA-KRYSIAK, Barbara; WOLF, Jadwiga; PIECHOWSKA, Miroslawa; BORENSZTAJN, Dawid, oraz wspol. tech. Teresa Kolasa

Studies on production of erythromycin. Med. dosw. mikrob. 10 no.2: 165-174 1958.

Antibiotyków

1. Z Zakladu ~~Leczniczych~~ PZH w Warszawie.
(ERYTHROMYCIN, preparation of, fermentation technic (Pol))

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PIECHOWSKA, Miroslawa; OSTROWSKA-KRYSIAK, Barbara; WOLF, Jadwiga; BORENSZTAJN, Dawid; Wspolpr. tech. Teresa Kolasa

Studies on production of erythromycin; chemical and analytical parts. Med. dosw. mikrob. 10 no.2:175-183 1958.

1. Z Zakladu Antybiotykow PZH w Warszawie.
(ERYTHROMYCIN, preparation of.
chem. & analytic aspects (Pol))

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

BORES, B., inz., dr.

"Thermal reinforcement of non-hardenable carbon steel" by Z.N. Krasilscikov, N.V. Smidt, Svac, J.N., N.T. Pavlenko and S.J. Nocepurenko. Reviewed by B. Bores. Hut listy 17 no.3:214-215 Mr '62.

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

BORES, Bohumir, inz., dr.

"Steel ingot" by V.A. Jefimov. Reviewed by Bohumir Bores. Hut listy 17 no.4:259 Ap '62.

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

BORES, B., dr., inz.; CERNY, V., inz.; TEINDL, J.; PANT, P., inz.; KREMER, R.; PETRDLIK, Miroslav, inz.; REDR, M.

Informations on metallurgy. Hut listy 17 no.8:598-608 Ag '62.

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

BORES, B., inz., dr.

"Mechanization and automation of thermal treatment" by K.N. Sokolov. Reviewed by B. Bores. Hut listy 17 no.9:675 S '62

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

BORES, B., inz. dr.

"Russian-Czech technical dictionary" by V.S.Petrov, S.A.Tulin. Reviewed by B.Bores. Hut listy 18 no.6:415 Je '63.

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

BORES, B., inz.dr.

What is prepared by the State Scientific and Technical Publishing House for Literature on Ferrous and Non-ferrous Metallurgy. Hut listy 18 no.11:833-835 N'63.

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

BORES, Bohumir, dr. inz.

"Development of steel production in oxygen converters" by N. I. Petrov, M.P. Kvitko. Reviewed by Bohumir Bores. Hut listy 19 no. 2: 135-136 F '64.

"Protection from overheating in hot precesses" by L. A. Gluskov [Glushkov, L. A.]. Reviewed by Bohumir Bores. Ibid.: 150.

"Secondary use of refractory materials" by V. M. Nikulin. Reviewed by Bohumir Bores. Ibid.: 151.

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

BORES, B., inz. dr.

"Progress of steel production in oxygen converters" by N. I. Perlov, M. P. Kvitko. Reviewed by B. Bores. Hut listy 19 no. 4:303 Ap '64.

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L 20817-66 EWP(t) IJP(c) JD/JG

ACC NR: AP6012018 SOURCE CODE: CZ/0057/65/000/004/0174/0175

34
B

AUTHOR: Bores, Bohumir (Engineer; Doctor)

ORG: none

TITLE: Production and casting of alloy steels

SOURCE: Hutnik, no. 4, 1965, 174-175

TOPIC TAGS: metal casting, stainless steel, metallurgic furnace, alloy steel, structural steel, bearing steel, steel macrostructure, degassing

ABSTRACT: Production of stainless steels, structural alloy steels, tool and bearing alloy steels is described. Production of bearing steel containing 0.7% Mn in acidically operating Martin furnaces is discussed; its casting, macrostructure control of rolled product by the thermoelectrical method, and deoxidation with Ce are discussed. Using of Ce for deoxidation increased the productivity by 9%. [JPRS]

SUB CODE: 13, 11 / SUBM DATE: none / SOV REF: 001

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BORES, FRANTISEK

Normativy hmotne zainteresovanosti v Ceskoslovenskem prumyslu. Praha, Statni Nakladatelstvi Politicke Literatury, 1961.
102 p. tables. (Vyzkumny Ustav Narodohospodarskeho Planovani)
Bibliographical footnotes.

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

BORES, J.

Severe burns caused by roentgen irradiation. Rozhl.chir. 29 no.11:456-458 1950. (CIML 20:7)

1. Of the Roentgenological Department of the Hospital in Tabor.

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

BORES, Jan (nemocnice OUNZ Tabor)

Experiences with seriographic arthrography of the knee with skiascopic control. Cesk. rentg. 12 no.3:179-181 Sept 58.

1. Rtg odd. OUNZ v Tabore.
(KNEE, radiography
seriographic arthrography with skiascopic control (Cz))

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

Jan
BORES, dr.; PRAZAK, dr.

Pyeloscopy with werography in renal and urinary tumors. Cesk.rentg. 9 no.4:157-159 Nov 55.

1. Rtg Oddel. a chir. oddel. OUNZ Tabor
(URINARY TRACT, neoplasms,
diag., serioscopic pyelography)

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

BORES, J.; DVORAK, K.

Primary or idiopathic pulmonary hemosiderosis. Cesk. rentgenol. 16 no.1:54-59 F '62.

1. Rtg a interni oddeleni OUNZ Tabor.
(HEMOSIDEROSIS radiography) (LUNG DISEASES radiography)

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

BORES, J.

Dextrolateral localization of the large intestine. Cesk. gastroent. vyz. 17 no.1:20-22 Ja '63.

1. Ustredni rentgenologicke odd. nemocnice OUNZ v Tabore, prednosta MUDr. J. Bores.
(INTESTINE, LARGE) (ABNORMALITIES)
(LAPAROTOMY) (OMENTUM)

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L 3207-66

ACCESSION NR: AR5012249 UR/0058/65/000/003/D031/D031

SOURCE: Ref. zh. Fizika, Abs. 3D224

AUTHORS: Boresevich, N. A.; Zalesskaya, G. A.

TITLE: Investigation of the temperature dependence of the intensities of infrared absorption bands of the fundamental oscillations of molecules in vapors

CITED SOURCE: Tr. Komis. po spektroskopii. AN SSSR, vyp. 1, 1964, 721-730

TOPIC TAGS: temperature dependence, infrared spectrum, absorption band, molecular vibration, vapor

TRANSLATION: A procedure is developed for measuring the infrared absorption spectra of substances that are difficult to sublimate. The temperature dependence of the integral sensitivity of the absorption band of the valence vibrations of groups CH, NH, and $NH_2$ is investigated. With increasing temperature, a shift of the bands to the long-wave region of the spectrum is observed. The half-width of the bands increases in this case, with simultaneous decrease in the intensity at the maximum. The integral intensity increases with the increasing temperature. See also RZhFiz, 1964, 12D214

SUB CODE: OP, NP ENCL: 00

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PROCESSES AND PROPERTIES INDEX

Ca

2

**Dependence of the catalytic activity of vanadium pentoxide on its mode of combination with silica.** I. E. ADADUROV AND G. K. BORESKOV. *Ukrainskii Khim. Zhur.* 4, Tech. Pt., 259-66(1929); cf. *C. A.* 24, 3610.—$V_2O_5$ deposited on dehydrated silicic acid has a greater catalytic action on the oxidation of $SO_2$ than in the absence of silica; at the optimum temp. of 400°, 97.85% oxidation is effected. If V is pptd. together with silicic acid and the resultant gel is dried, 99.4% yields of $SO_3$ are obtained, at a rate of flow of gas (contg. 6.2-7.0% $SO_2$) of 60 cc./sec., at 400°. The second type of catalyst probably contains V zeolite. B. C. A.

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PROCESSES AND PROPERTIES INDEX

**Deposition of vanadium pentoxide precipitate as catalyzer on chamotte as carrier.** I. E. ADADUROV AND G. K. BORESKOV. *J. Chem. Ind.* (Russia) 6, 208-9(1929).—Good results are obtained with $V_2O_5$ as catalyzer when chamotte is used as carrier. To deposit a ppt. of $V_2O_5$ on chamotte, an $NH_4VO_3$ soln. is acidified by HCl without using an excess of the acid and then cautiously boiled with chamotte. Pptn. is incomplete even after boiling 1.5 hrs.; the soln. contains 5-20% $V_2O_5$. BERNARD NELSON

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206310019-9

PROCESSES AND PROPERTIES INDEX

**Precipitation of ferro-vanadium catalyzer on chamotte.** I. E. ADADUROV AND G. K. BORESKOV. *J. Chem. Ind.* (Russia) 6, 1365-7(1929). $V_2O_5$ as catalyzer can be activated on being pptd., together with $Fe_2O_3$, on chamotte. This complex catalyzer has the advantage over $V_2O_5$ of being very stable toward high temps. When a $Fe^{+++}$ salt is added to a soln. of $NH_4VO_3$ a fine light-yellow amorphous ppt. is obtained, which, after being dried at 105°, analyzes $4V_2O_5 Fe_2O_3 4H_2O$. This ppt. can be dissolved in the cold on adding a small quantity of $H_2SO_4$, but it reppts. on heating. If the soln. is heated in presence of pieces of chamotte, the latter retains some of the ppt., though most of the pptn. takes place outside the chamotte. The best results are obtained by operating with 20 g. $NH_4VO_3$ soln. contg. 0.1707 g. $V_2O_5$, pptg. with 1.94 g. $FeCl_3$ (1 equiv.), redissolving the ppt. with 7.70 g. $H_2SO_4$ (4 equivs.), heating and stirring with 10 g. chamotte in irregular pieces and finally washing the chamotte with 40 cc. cold water. In this case 0.1655 g. $V_2O_5$ becomes fixed on chamotte. The ppt. formed out side chamotte may be redissolved in as little HCl as possible, neutralized on cooling with $NH_4OH$, and adding 4 equivs. of $H_2SO_4$, after which the soln. can be used again for pptg. $4V_2O_5 Fe_2O_3 4H_2O$ on chamotte.

BERNARD NELSON

METALLURGICAL LITERATURE CLASSIFICATION

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CA

**Vanadium catalyst.** I. E. Adadurov and G. K. Boreskov. *Zhur. Prikladnoi Khim.* 3, 11-20(1930).—A V $H_2SO_4$ catalyst is prepd. from a mixt. of Na or K silicate, Na or K vanadate and Na or K stannate solns. which are neutralized by adding small portions of $H_2SO_4$; the whole is heated to 50-70°. The ppt. is filtered, pressed, dried and finally brought gradually up to the contact temp. The catalyst so prepd. has considerable mech. strength. It gives 99% conversion of a gas contg. 7% $SO_2$ at a velocity of 100 cc. per min., temp. 400°, and length of the contact layer 20 cm. The chem. compn. of this catalyst after contact was $SiO_2$ 23.3, $SnO_2$ 9.9, $V_2O_5$ 5.2, $SO_3$ 29.4. This catalyst is immune against $H_2O$, $As_2O_3$, HCl, HF, etc. The conversion curve for this catalyst below 400° is lower than that for zeolites of Pd and for elementary Pt. The $SO_2$ does not need to be treated and dried before contact. This catalyst can stand temps. up to 1000° without noticeable deterioration.

A. A. B.

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PROCESSES AND PROPERTIES INDEX

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**Deposition of silver metavanadate precipitate on chamotte.** I. E. Adaburov and O. K. Boreskov. *J. Chem. Ind.* (Russia) 6, 805-7(1930).—Direct deposition of $AgVO_3$ gives unsatisfactory results. Indirect deposition is done by depositing $V_2O_5$ on chamotte (see preceding abstract), then boiling the latter on a steam bath for 30 min. To prevent part of the $V_2O_5$ from passing into soln. and also its pptn. as $AgVO_3$ outside the chamotte, AcONa is added. The catalyzer thus prepd. contains $V_2O_5$ 0.86 and $Ag_2O$ 1.7%; it is not altered on heating to 675° and does not melt and penetrate the pieces of chamotte.

Bernard Nelson

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1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

0 IX

13

**Catalytic gas reactions.** G. K. Boreskov. Russ. 28,207, Dec. 6, 1931. Gas reactions are carried out in the presence of a finely divided catalyst suspended in the gas.

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Complex vanadium catalysts showing high volumetric velocities. I. R. ABADUROV, G. K. BORESKOV AND M. A. GLINSKAYA. *J. Applied Chem. (U. S. S. R.)* 4, 611–20(1931); cf. *C. A.* 26, 3010.—Catalysts capable of converting at 450° more than 99% $SO_2$ into $SO_3$ should be always considered as high-grade ones. Low volumetric velocity must be attributed to their poor prepn. and can be improved by increasing the dispersion of the catalyst, adding more of the inert material, or introducing an activator. The radiation theory of catalysis was confirmed. V. KALICHEVSKY

Zhur. Prik. Khim.

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1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

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**The fixation of vanadium by the preparation of complex vanadio-zeolite catalysts and their properties.** I. E. Adadurov, G. K. Boreskov and Z. M. Lisyanskaya. *Chem. Ind.* (Moscow) 8, 601-12(1931).—Ordinary V zeolites are good catalysts for $SO_2$ oxidation, but the V can be washed out with water. Purification of the catalyst is difficult. To fix V in an insol. form, a mixt. of solns. of $(NH_4)VO_3$, $K_2SnO_3$ (from the fusion of metastannic acid with excess KOH), and water glass, in the approx. proportions 5% $V_2O_5$, 15% $SnO_2$ and 30% $SiO_2$, is warmed to 70° and neutralized with 81-90% of the theoretical amt. of HCl. The resulting ppt. is washed with not more than 500 cc. of water per 50 g. of catalyst and dried at room temp. for 24 hrs., then in the catalytic tube. It should be light yellow, as darker ppts. are poorer catalysts. The Sn is more important in holding the V than is the Si, and the Sn and V should be present in amts. approx. expressed by the formula $4SnO_2 \cdot V_2O_5 \cdot Na_2O \cdot xH_2O$. At 400°, and a rate of flow of 150 cc. per min. of a gas stream contg. 6.5-10% $SO_2$, 99.5% conversion to $SO_3$ occurs. On long standing, the catalytic activity of the substance decreases slowly.

H. M. Leicester

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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1ST AND 2ND ORDERS

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3RD AND 4TH ORDERS

ca

2

**Calculation of the velocity of contact oxidation of ammonia.** G. K. Boreskov. *J. Applied Chem.* (U. S. S. R.) 5, 163-72(1932).—The following formula is derived for calcg. the velocity of oxidation of $NH_3$ on a Pt gauze: $\log t = (E/2.3RT) + \log \log C_{NH_3}P + c$, where $t$ = time of contact, $E$ = heat of activation, $R$ = gas const., $T$ = abs. temp., $C_{NH_3}$ = vol. % $NH_3$ in original mixt., $P$ = total pressure, $c$ = const. The heat of activation was calcd. as 17,350 cal. per mol. A table calcd. from the above formula shows the optimum time of contact at different concns. and temps. V. K.

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Ca

**The kinetics of the contact oxidation of sulfur dioxide.** G. K. Boreskov and V. P. Pligunov. *J. Applied Chem.* (U. S. S. R.) 6, 785-96(1933).—A method for the isothermal operation of the process of oxidation of $SO_2$ is presented. The influence on the velocity of the $SO_2$ oxidation in the presence of the V catalyst, of the time of contact and the compn. of the gas mixt. is studied, and the applicability of the Taylor-Lener equation to the above procedure is shown. The influence of the temp. on the velocity of the oxidation is shown, and the apparent heat of activation is calcd. as 20,000 cal. for high and 55,000 cal. for low temps., the breaking point of the curve being at 440°. The results obtained were checked with the known results for Pt catalysts. For temps. in excess of the breaking point the process is almost identical for Pt and for V catalysts. When the temp. is below the breaking point the oxidation velocity in the presence of V catalyst decreases rapidly, in accordance with the sharp increase of the apparent activation temp., up to 50,000 cal. At this temp. interval the total velocity of the process is detd. by the velocity of freeing of the catalyst surface from the $SO_3$ formed, which increases rapidly with increase in temp. Formulas and diagrams permitting the detn. of the max. curves for the changes of temps. alongside the catalyst layer are presented. A. A. Boehtlingk

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B-I-8

BC

Carboniferous pyrites in the manufacture of concentrated sulphuric acid, using vanadium catalysts. G. K. Boreskov and T. I. Sokolova (J. Chem. Ind. Mosc., 1934, 10, No. 6, 18—22).—The gases ($CO_2$, CO, $H_2S$, $CS_2$, and hydrocarbons) obtained by roasting carboniferous pyrites (I) do not inactivate V catalysts. The optimum [$SO_2$] in the reaction gas falls from 7-4% for C-free (I) to 4-4% for (I) containing 15% C. R. T.

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CA

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**Active vanadium catalysts for manufacture of sulfuric acid.** G. K. Boreskov. *Sborn. Trud. Ukrain. Chim. Inst. Odessa* **1935**, No. 1, 8-48; cf. *C. A.* **30**, 3172[8].—$SnCl_4$ is added to a soln. of Na silicate and $KVO_3$ (60-70°), to a faintly alk. reaction, when about 80% of the V is pptd. as a K V Sn zeolite. $BaCl_2$ is then added, when the remaining V is pptd. The ppt. has the compn. $K_2O.2BaO.8SiO_2.2SnO_2.V_2O_5$ (I) (B. O. V. catalyst). A second catalyst (II) is obtained by adding aq. KOH to $Ca(VO_3)_2$, followed by K silicate, and pptn. is effected by adding aq. $AlCl_3$ and $BaCl_2$, as above. I and II give 95-97% conversion of $SO_2$ into $SO_3$, at optimum temp. of 450° and 430°, resp.; they retain full activity after 27 months of action, and are not inactivated by $H_2O$, CO, $CO_2$, $H_2S$, $CS_2$, HCl, $SeO_2$, or light and heavy hydrocarbons. The [As] necessary to inactivate is 80,000 times greater than in the case of Pt catalysts. The activation temp. rises abruptly at temp. less than the optimum for both catalysts. **Replacement of tin in B. O. V. vanadium catalyst.** G. K. Boreskov and M. A. Gumins'kaya. *Ibid.* 70-87.—The activity of catalysts of the compn. $0.9K_2O.1.4BaO.12SiO_2.V_2O_5$ is less than, and that of those contg. Al in place of Sn greater than, that of I, while the cost is less.

B. C. A.

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**Vanadium catalyzers for sulfuric acid production.** G. K. Boreskov. *Trans. VI Mendeleev Congr. Theoret. Applied Chem. 1932*, 2, Pt. 1, 150-66(1935).—The catalyzer "POV" (Ba-Sn-V) is a synthetic product of a complex structure consisting of $V_2O_5$ and $SnO_2$ as activator in the const. part and two activators (Ba and K oxides) in the exchangeable part. This zeolite-like combination raises by 200 times the velocity const., which is 20 for $V_2O_5$. The velocity of oxidation of $SO_2$ to $SO_3$ is directly proportional to the concn. of the former and inversely proportional to the square root of the concn. of the latter. The velocity consts. fall quickly below 440°, owing to the formation of V sulfoxide. The poisoning of the catalyzer by As, etc., takes place, but much less than in the case of Pt catalyzers, which simplifies the problem of cleaning the gases and permits use of low-grade raw materials. Se is practically harmless. E. R. Stefanowsky

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CR

**Genesis of catalysts.** G. K. Boreskov. *J. Phys. Chem.* (U. S. S. R.) 6, 235-42(1935).—Considering the relation between catalytic activity and the phys. structure of catalysts, B. emphasizes the significance of the spots in the crystal lattice as active spots for catalysis. By preventing restoration as by addn. of other substances or by means of deposition on a carrier, the activity of the catalyst is conserved. Zelikov

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B-I-8

**Standard method for determining the activity of contact catalysts for the sulphuric acid industry.** G. K. Borzerov, M. A. Gumenka, and V. P. Plegunov (Ukrain. Chem. J., 1935, 10, 446—449).—Apparatus is described, by means of which the activity ($k$) of a V catalyst is determined at 475° from the formula $k = a^{\frac{1}{2}}/t(x_m^{\frac{1}{2}} \log (x_m^{\frac{1}{2}} + x^{\frac{1}{2}})/(x_m^{\frac{1}{2}} - x^{\frac{1}{2}}) - 2x^{\frac{1}{2}})$ where $a$ is the initial $[SO_2]$, $x_m$ and $x$ are the max. theoretical degree of conversion and that actually found at a given moment, and $t$ is the duration of contact (= vol. of catalyst × vol. of gas passing through the catalyst per sec.). R. T.

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CA

**Kinetics of the oxidation of nitrogen oxide on activated charcoal.** G. K. Boreskov and S. M. Shogam. *J. Phys. Chem.* (U. S. S. R.) 8, 306-25(1936).—The rate of oxidation of NO by $O_2$ on activated charcoal at 15° is given by the equation $-\frac{dC_{NO}}{dt} = K\frac{C_{NO}^{1.5}C_{O_2}}{C_{NO_2}^{0.5}}$. $CO_2$ does not affect the rate of the reaction, while $H_2O$ vapors strongly reduce the rate at 100° to 120° indicating a heat of adsorption of $H_2O$ on charcoal of 10,000 cal./mole. For 3% NO mixts. the max. rate of reaction occurs at 70°, the energy of activation changing from 3200 cal. at 15° to 0 at 70° and to −3400 cal./mole at 120°. F. H. Rathmann

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**Calculations for a tubular contact apparatus for the oxidation of sulfur dioxide.** G. K. Borzykov and M. G. Slin'ko. *J. Chem. Ind.* (Moscow) 13, 221-5, 287-94 (1936).—The best operating conditions for a planned new app. are calcd. H. M. Leicester

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The kinetics of the oxidation of sulfur dioxide. G. K. Boreskov and V. P. Pigunov. J. Chem. Ind. (Moscow) 13, 422-3(1936). The work of Makishov and Arkhipov (C. A. 28, 7127e) is criticized. H. M. Leicester

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B-I-P

**Optimum concentration of sulphur dioxide in the contact process of sulphuric acid production.** G. K. Boreskov and T. I. Sokolova (J. Chem. Ind. Russ., 1937, 14, 1241—1250).—The velocity of oxidation of $SO_2$ at a V catalyst at 470° is $\propto [O_2]$, $[SO_2]^{0.8}$, and $[SO_3]^{-0.6}$, over the range $SO_2$ 3·7—22·9 and $O_2$ 6·5—40%. The energy of activation is calc. to be 23,000 g.-cal. The optimum $[SO_2]$ varies with the $[O_2]$, and this with the nature of the source of the $SO_2$; thus for ordinary pyrites gas max. oxidation is obtained with 7%, for carboniferous pyrites with 5—6%, according to the C content, and for S with 8·2% $SO_2$. Higher concns. of $SO_2$ can be used provided that the gas mixture is enriched with $O_2$. R. T.

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**Reclaiming spent vanadium catalysts.** Nauchnyi Institut po Udobreniyam i Insektofungisidam (inventors, G. K. Boreskov and N. A. Guminskaya). Russ. 55,615, Aug. 31, 1939. The spent catalyst is heated with carbonates, silicates or chlorides of alkali metals, and pressed into tablets.

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**Improvements in the production of sulfuric acid by the contact method.** G. K. Boreskov. *Nauch.-Issledovatel. Inst. Udobreniyam i Insektofungisidam Ya. V. Samoilova* (Moscow) 1939-39, 81-4(1939); *Khim. Referat. Zhur.* 1940, No. 5, 85-6.—Results of catalysis investigations during 1937-9 are discussed. The main disadvantages of the V contact masses are: small activity at a low temp., lower activity in the production process and increased hydraulic resistance. The activity of the contact mass is decreased by temporary overheating at temps. above 600° and by the condensation of $H_2SO_4$ and $FeSO_4$. In 1938, a contact mass in the form of tablets, with a higher porosity, was prepd. This mass offers a smaller hydraulic resistance. A contact mass with a higher thermal stability, and active at temps. below 425°, has been developed. Several problems of the kinetics of the transformation of $SO_2$ into $SO_3$ were solved and a kinetic equation for calcg. the necessary amts. of contact mass was derived. A method for transforming $H_2S$ into contact acid and a process for obtaining $H_2SO_4$ by the condensation of $SO_3$ with water vapors were developed. W. R. Henn

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B. Ab.

AT - 1 Reactions

**Mechanism of the oxidation of sulphur dioxide on active vanadium catalysts. I. Stability of single vanadium compounds in the conditions of the synthesis of sulphuric acid.** G. K. Boreskov and V. P. Pligunov (*J. Appl. Chem. Russ.*, 1940, 13, 329—336).—$V_2O_5$ (I), $V_2O_5$ + 0·1 $K_2SO_4$ (II), $V_2O_5$ + 0·1 $K_2O$ (III), $V_2O_5$ + 0·5 $K_2O$ (IV), $V_2O_5$ + 0·9 $K_2O$ (V), $V_2O_5$ + 1·0 $Na_2O$ (VI), $V_2O_5$ + 1·0 BaO (VII), $V_2O_5$ + 0·9 $K_2O$ + 1·9 $SiO_2$ (VIII), $V_2O_5$ + 0·9 $K_2O$ + 7·7 $SiO_2$ (IX), and $V_2O_5$ + 0·9 $K_2O$ + 35·4 $SiO_2$ (X) have been heated for 12—16 hr. at 480° in air + 5% of $SO_2$ + 5% of $SO_3$. $V_2O_5$ was partly reduced to $V_2O_4$ (probably as $VOSO_4$), and the degree of reduction increased in the order (X) < (I) < (IX) < (V) < (VI) < (VIII) < (II), (III), (IV), (VII), the reduction being complete for (II) etc. BaO was converted into $BaSO_4$, and $Na_2O$, $K_2O$, and $K_2SO_4$ gave pyrosulphates. The results disagree with Neumann's theory (B., 1935, 806). J. J. B.

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**Mechanism of oxidation of sulfur dioxide in the presence of activated vanadium catalysts. II. Influence of an admixture of salts of alkali elements and amorphous silicic acid.** G. K. Boreskov and V. P. Pligunov. *J. Applied Chem.* (U. S. S. R.) 13, 653-61 (in French, 662) (1940); cf. *C. A.* 34, 8185[4].—The catalytic activity of pure $V_2O_5$, $V_2O_5$ + amorphous $SiO_2$ (1 mol. to 8 mols., resp.), $V_2O_5$ + 0.1 mol. $K_2SO_4$ and 1 mol. $V_2O_5$ + 8 mols. $SiO_2$ + 0.1 mol. $K_2SO_4$ was investigated. Pure $V_2O_5$ did not change in compn. during catalysis, even at temps. below 500°, and the apparent energy of activation of $SO_2$ oxidation was 38,000 cal. Addn. of 8 mols. of $SiO_2$ per mol. of $V_2O_5$ did not change the character of the relation of reaction velocity and temp., but the activity at all temps. was approx. 1/10 of that with $V_2O_5$ alone. Addn. of $K_2SO_4$ to the $V_2O_5$ decreased by about 90% the velocity of oxidation at temps. below 490° and increased it at temps. above 490°. $V_2O_5$ was transformed into $VOSO_4$ at temps. below 490°. The high activity of $V_2O_5$ in the presence of $K_2SO_4$ at 485-510° is attributed to the formation of a blackish green mixt. of the compn. $SO_3$ 64.8, $V_2O_5$ 2.4, $V_2O_4$ 29.6 and $K_2O$ 3.2% (probably $VOSO_4$, $V_2O_4$, $K_2SO_4$ and $K_2S_2O_7$). Above 510°, the catalytic activity of the catalyst again decreased but slightly and the catalyst contained $VOSO_4$ and $V_2O_4$ and had a red-brown color. Therefore, $VOSO_4$ was catalytically inactive. Finally, the catalyst $V_2O_5$-$SiO_2$-$K_2SO_4$ was approx. 20 times more active than $V_2O_5$ at 440-500° and had an apparent energy of activation of 27,000 cal. Below 440°, its activity decreased and at 400° amounted to twice that of $V_2O_5$. This is attributed to increased dispersion of catalytically active substance in the presence of $SiO_2$.

A. A. Podgorny

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Rate of sorption of sulfur dioxide by vanadium pentoxide. O. K. Borushov and E. E. Ruderman. *J. Phys. Chem.* (U. S. S. R.) 14, 181-70(1940).—The $V_2O_5$ was in crystals of $10^{-4}$ cm. The initial pressure of $SO_2$ was 750 mm. Hg. Between 373° and 418° the rate v of sorption gradually decreases and becomes negligible when the sorbed amt. reaches about 0.3 cc. per 1 g. of $V_2O_5$. Between 443° and 494° v is high and almost independent of the amt. adsorbed; at 490°, e. g., it is 3 cc. per 1 g. of $V_2O_5$ per hr. $V_2O_5$ heated several times with O at 494° and evacuated takes up $SO_2$ more rapidly, both at 494° and at 300°, but an analogous treatment at 381° does not affect v. After sorption at 494° the sorbent contains the whole adsorbed amt. as $SO_3$, and an equiv. amt. of $V_2O_4$. This reduction of $V_2O_5$ cannot be a part of the catalytic oxidation of $SO_2$ in the presence of $V_2O_5$ since the rate of sorption is about one hundredth the rate of oxidation. Below 418° only adsorption on the crystal surface takes place. B. C. P. A.

Catalysis Laboratory, Sci. Res. Inst. Fertilizers and Insecto-Fungicides, Moscow.

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BC

**Mechanism of the oxidation of sulphur dioxide on oxide catalysts.** G. K. Boreskov (*J. Phys. Chem. Russ.*, 1940, 14, 1237–1246). The activity of an Fe oxide catalyst decreases below 625°, and the composition of the catalyst is $Fe_2O_3$ above 625° and $2Fe_2O_3,3SO_3$ below 600°. As Neumann and Heusler (A., 1937, I, 315) attributed the change of activity at 625° to the dissociation pressure of $Fe_2(SO_4)_3$ which is not present in the catalyst, their theory is disproved. Contrary to Neumann, $VOSO_4$ cannot be the intermediate product in the oxidation of $SO_2$ on $V_2O_5$ since the rate of formation of $VOSO_4$ is too low. The mixture $V_2O_5$ 1, $Na_2SO_4$ 0·1 mol. shows a max. activity at 500°. The mixture $V_2O_5$ 1, $Na_2SO_4$ 0·1, $SiO_2$ 8 mols. is a very active catalyst; its activity at 400—470° depends on whether this range was arrived at by heating or by cooling.

I. F. H.

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**Kinetics of the interaction between dry sulfur dioxide and nitrogen dioxide.** G. K. Boreskov and V. V. Ilarionov. *J. Phys. Chem.* (U. S. S. R.) 14, 1428-46(1940).—The gas pressure of $SO_2$-$NO_2$ mixts. was measured at room temp ($p_1$) before the reaction started, at high temp. after the equil. was reached ($p_2$), and after cooling the equil. mixt. to room temp. ($p_3$). The difference $p_2 - p_3$ cor. for the temp. difference gave the vapor pressure of the reaction product at the reaction temp.; it was 21 mm. Hg at 208° and 46 mm. at 231.5°. The difference $p_1 - p_3$ gave the compn. of the reaction product as $(SO_2)_2N_2O_5$; direct analysis confirmed this. The decrease of pressure $p$ at const. temp. $dp/dt \propto [SO_2][NO_2]$, but the kinetics above 208° are complicated by the dissocn. of $NO_2$. The energy of activation between 160° and 230° is 24,500 g.-cal. and much less below 150°. At 208° the reaction is accelerated by glass wool if some $H_2O$ is present. Probably the low activation energy below 150° is due to the heterogeneous reaction at the walls of the vessel (glass). Earlier results (Zelberlikh, *C. A.* 31, 809[9] and Kust'minych, *et al.*, *C. A.* 32, 1874[1]) gave reaction coeffs. that were $10^8$ times the new ones.

B. C. P. A.

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The basis for calculation of catalyst apparatus for reversible exothermic processes. G. K. Boreskov and M. G. Slin'ko. *J. Applied Chem.* (U. S. S. R.) 16, No. 9/10, 377-90(1943)(English summary).—Math.-theoret. design data. It is shown that for calcn. of optimum temp. it is sufficient to know the apparent activation energy of the forward reaction. Graphical and analytical methods of detn. of optimum temp. are presented. A graphic calcn. method is shown by detn. of the catalyst mass necessary for changing the degree of contact under different heat-flow conditions. G. M. Kosolapoff

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**Utilization of carbonaceous pyrite for the production of $H_2SO_4$.** O. K. Borenkov and L. G. Ritter. *Khimicheskaya Prom.* 1944, No. 2-3, 23-4.--Experience has shown that the use of carbonaceous pyrite in the manuf. of $H_2SO_4$ does not poison the catalyst. It does retard the reaction by reason of a diminution of the O content in the combustion gases. Up to 10% of C, the initial $SO_2$ concn. of the gases can be kept at 7%. The drop in yield in this case does not exceed 9%. The increased cost of production is compensated by the lower cost of the raw material. When the C content exceeds 10%, the initial $SO_2$ concn. must be lowered and the drop in production is too high.

M. Howh

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CA

**Use of oxygen in the contact sulfuric acid process.** G. K. Boreskov. *Kislorod* 1944, No. 4, 16-27; cf. *C.A.* 30, 1028[1].—The use of O permits raising the efficiency of ordinary contact equipment 5-6 times. The use of O would be justified even at a cost of O considerably higher than the cost originally contemplated. M. Hosch

Cand. Tech. Sci.

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Contact process for gases of a high $SO_2$ concentration in $H_2SO_4$ plants. G. K. Boreskov and L. G. Ritter. *Khim. Prom.* 1944, No. 5, 13-15; cf. *C. A.* 38, 5049[1].—The optimum concn. of $SO_2$ to insure a max. efficiency of the contact app. is 6.7% for pyrites and 8.3% for S. This is the case, provided the capacity of the turbo-compressors does not limit the vol. of treated gas. When the capacity of the compressors has reached its limit, the only way to increase the efficiency is to raise the $SO_2$ above its optimum while the degree of contact is reduced. For pyrites, an increase in the $SO_2$ concn. from 7 to 8% raises the output by 10-12%, while reducing the degree of contact 2-3%. An increase in the concn. of $SO_2$ from 7 to 9% raises the output by 18-20%, while reducing the degree of contact by 6.5-7.5%. For S, an increase in the $SO_2$ concn. from 7 to 9% raises the output by 25-27% and increasing the $SO_2$ concn. from 7 to 11% raises the output by 44-47%, while reducing the degree of contact in the first case by 2-3 and in the 2nd by 7-8%. Plant expts. were carried out with a 8.5% gas in an app. having internal heat exchange. The temp. of the first contact layer was regulated easily. As compared to a 7% gas, the degree of contact was lowered by 2% and the efficiency rose by 18%. M. Hosch

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1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

CA

18

**Kinetics of contact oxidation of sulfur dioxide in the presence of ferric oxide.** G. K. Boreskov and T. I. Sokolova. *J. Phys. Chem.* (U.S.S.R.) 18, 87-101(1944); *A. C.A.* 40, 2943[7]. – $Fe_2O_3$ is a good catalyst for $SO_2 + {}^1/_2 O_2 \rightarrow SO_3$ above 640-70°; the min. temp. of efficiency is low when it is reached by cooling and high when reached by heating. Above 670° the catalyst shows in an x-ray examn. only the spacings of hematite; below 670° it contains up to 41% of $SO_3$ and shows addnl. spacings. The sulfated catalyst is probably a mixt. of $Fe_2O_3$ and $Fe_2(SO_4)_3$. At 680° the rate $v$ of $SO_3$ formation depends on the concn. of $SO_2(x)$, $SO_3(y)$, and $O_2(z)$ according to $v = k_1 [(x/y)^{1.5} - (1/K_2)(y/x)^{0.5}]$. The apparent energy of activation of the $SO_3$ formation is 38 kg.-cal. It is suggested that $SO_2$ is oxidized by the surface atom of O in $Fe_2O_3$ which then is reoxidized by $O_2$. B. A.

COMMON ELEMENTS

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MATERIALS INDEX

OPEN

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1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

18

CA

**Chlorine and alkali sulfates.** G. K. Boreskov and M. A. Guminskaya. U.S.S.R. 65,085, Aug. 31, 1945. Alkali chlorides, at a temp. above the m.p. of the corresponding pyrosulfates, are treated with a mixt. of $SO_3$ and $SO_2$ contg. 50-70% of the latter. The product is fused pyrosulfite and a gaseous mixt.: $2MCl + 3SO_3 \rightarrow M_2S_2O_7 + 2Cl + SO_2$. To the fusion is then added enough of the chloride to form the sulfate: $2M_2S_2O_7 + 2MCl \rightarrow 3M_2SO_4 + 2Cl + SO_2$. The gaseous mixt. is either converted to $SO_2Cl_2$, or Cl and $SO_2$ are recovered separately.

M. Hosch

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CA

2

**Relation between reaction order and energy of activation of direct and inverse reactions.** G. K. Boreskov. *J. Phys. Chem.* (U.S.S.R.) 19, 93-5(1945).—The ratio $(E_1 - E_2)/Q$ is equal to the no. of mols. of a component that take part in the transformation of one active complex, $E_1$ and $E_2$ are, resp., the energies of activation of the direct and the inverse reaction, and $Q$ is the heat of reaction. For the oxidation of $SO_2$ on Pt this ratio is 1, hence the active complex involves 1 mol. of $SO_2$. I. J. H.

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Boreskov, G. K.

Sulfur trioxide production with oxygen by the contact method. G. K. Boreskov, L. G. Ritter, and M. T. Serebrennikova. *Khim. Prom.* 1947, No. 1, 8-12.—A thermographic method of control of the $SO_2$ oxidation reaction rate was developed, based on recording the temp. rise in a catalyst layer by using a differential thermocouple. The "ignition temp." of the $SO_2$ + O mixt. (the lowest temp. of sustained reaction) is lower in O than in air. The relation between the component concn. and the reaction velocity is expressed by the kinetic equation of Boreskov and Slin'ko (*C.A.* 38, 8135). The app. design and its use are described. Bench-scale app. for $H_2SO_4$ production with $V_2O_5$ catalyst is described and the results obtained with it were confirmed by semicom. operations. Catalyst superheating is prevented by an intermediate O introduction. Tests have shown that gaseous mixts. of varying concns. can be used by this method without unduly raising the $V_2O_5$ temp. above a permissible max. The use of O increases the app. capacity 5-8 times. Liquid $SO_3$ can be produced directly in the contact installation, also high concn. fuming $H_2SO_4$, sulfinimides, Cl derivs. of $SO_2$, and other concd. products.

W. M. Sternberg

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PROCESSES AND PROPERTIES INDEX

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**Effect of heat and material transfer on the rate of contact reactions.** G. K. Boreskov. *Khim. Prom.* 1947, No. 8, 1-6, No. 9, 5-11.—In processes where a chem. reaction is brought about by passing gaseous reactants through a granular catalyst, a no. of phys. reactions take place affecting the over-all results. These can be divided into 3 main groups: (*a*) exchange reaction between the gas flowing in channels formed by the granular catalyst and the surfaces of these granules; (*b*) material and heat transfer within the granules of the catalyst, and (*c*) heat transfer between the granules of the catalyst in a direction normal to the plane of the internal heat transfer. At ordinary pressures, most industrial reactions occur in the region of turbulent flow but near the transition region. In catalytic reactions, the reactants move from the gas stream to the surfaces of the catalyst granules and the reaction product moves in an opposite direction. Accordingly, the concn. of reactants is less and the concn. of the reaction product greater at the surfaces than in the gas stream. The higher concn. of the reaction product at the surfaces is apt to lower the rate of reaction. Actually, the transfer of reactants to the surface of the catalyst dets. the over-all rate of reactions only in a few high-rate reactions. In cases where the reaction product impedes the rate of reaction, this effect is noticeable only during the first stages of the process and does not affect the over-all intensity of the process. Heat transfer within the catalyst granules is rapid, but the transfer of reactants to the inner surfaces of the granules is considerably slower than to the outer surfaces; on the inner surfaces the rate of reaction is considerably slower. The structure of the catalyst can be adjusted to the nature of the reaction taking place on its surface. For slow catalytic reactions where the rate of reaction on the inner surfaces does not vary materially from the rate of reaction on the outer surface, the most favorable is a fine-pore structure. The min. diam. of the pores should allow for a countercurrent diffusion of reactants and reaction product, and is of the order of magnitude of $10^{-7}$ cm. For medium-rate reactions where the rate on the inner surfaces is noticeably slower than on the outer, but where the transfer to the outer surface does not materially affect the over-all rate, the preferred structure of the granules is capillary, in which the diam. of the capillaries equals the length of the mean free path, i.e., around $10^{-4}$ cm. at atm. pressure and accordingly smaller as the pressure increases. For high-rate reactions, the preferred structure of the catalyst is the same as for medium-rate, but the capillaries need not extend too deep inward, since the structure of the granules inside does not affect the over-all rate of the process.

M. Hosch

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BORESKOV, G. K.

PA 58T20

USSR/Chemistry - Gases
Chemistry - Heat, Transfer

Aug 1947

"The Effect of the Processes of Transfer of Heat and Matter on the Speed of Contact Reactions," G. K. Boreskov, Dr Chem Sci, 5½ pp

"Khim Prom" No 8 p. 221-226

Discusses basic laws governing processes of transfer between gas flow in channels formed by grains of the contact mass and outer surfaces of these grains. Shows application of these principles to some catalytic reactions. Discusses various gases; ammonia, phenol, naphthalene, in connection with this process.

[redacted]

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