

SOV/124-57-9-11035

The Fatigue Life of Crankshafts Manufactured From High-Strength Cast Iron (cont.)

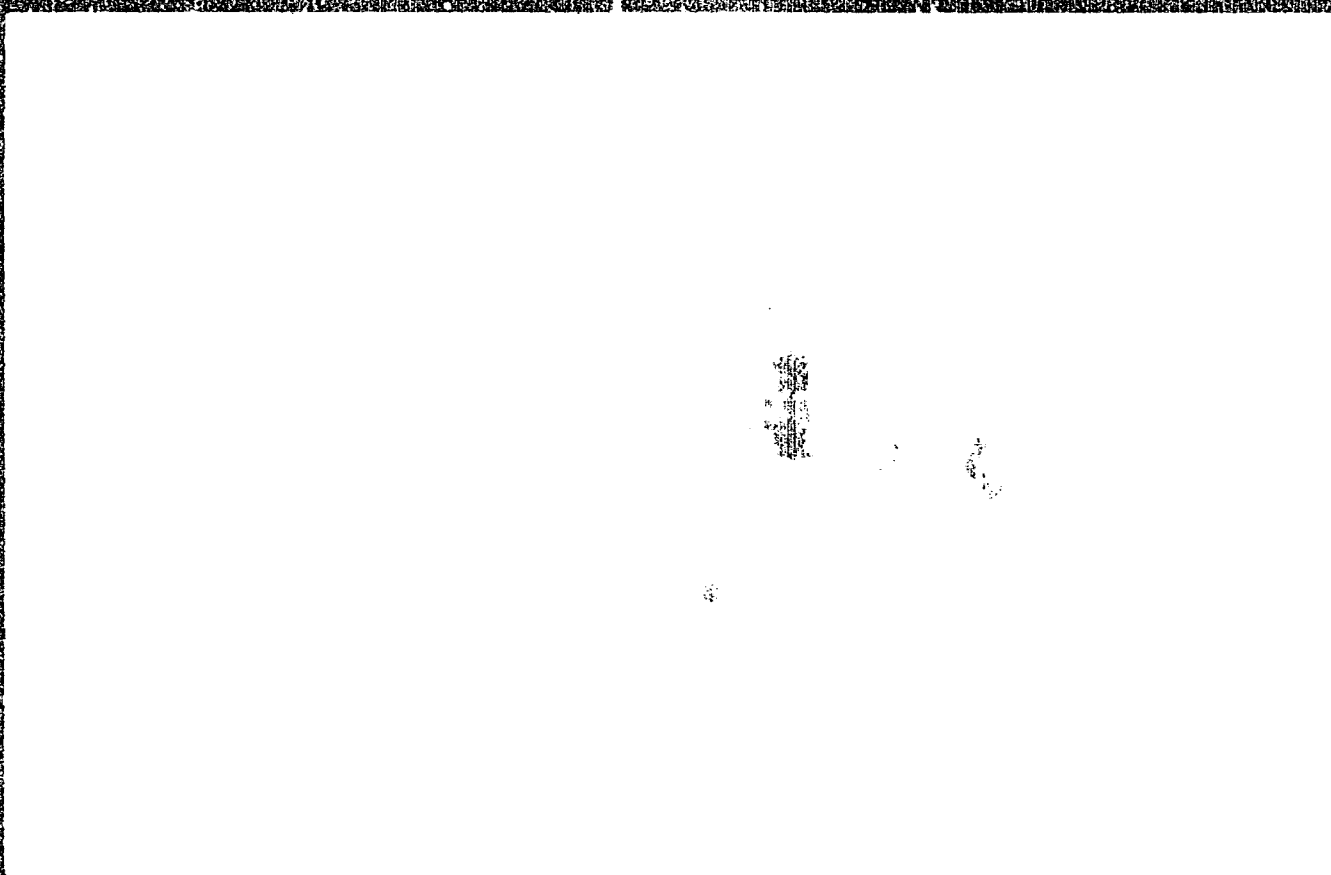
journals increased substantially the endurance of both steel and cast-iron shafts, raising it to values obtained from non-case-hardened shafts with roll-worked fairings. Under correct case-hardening or cold-hammering procedures no distortion was observed on straight (axisymmetrical) shafts. Considerable distortion can result on crankshafts but it can be eliminated effectively by the method of localized cold-hammering of the crank arms.

V. K. Pereverzev

Card 2/2

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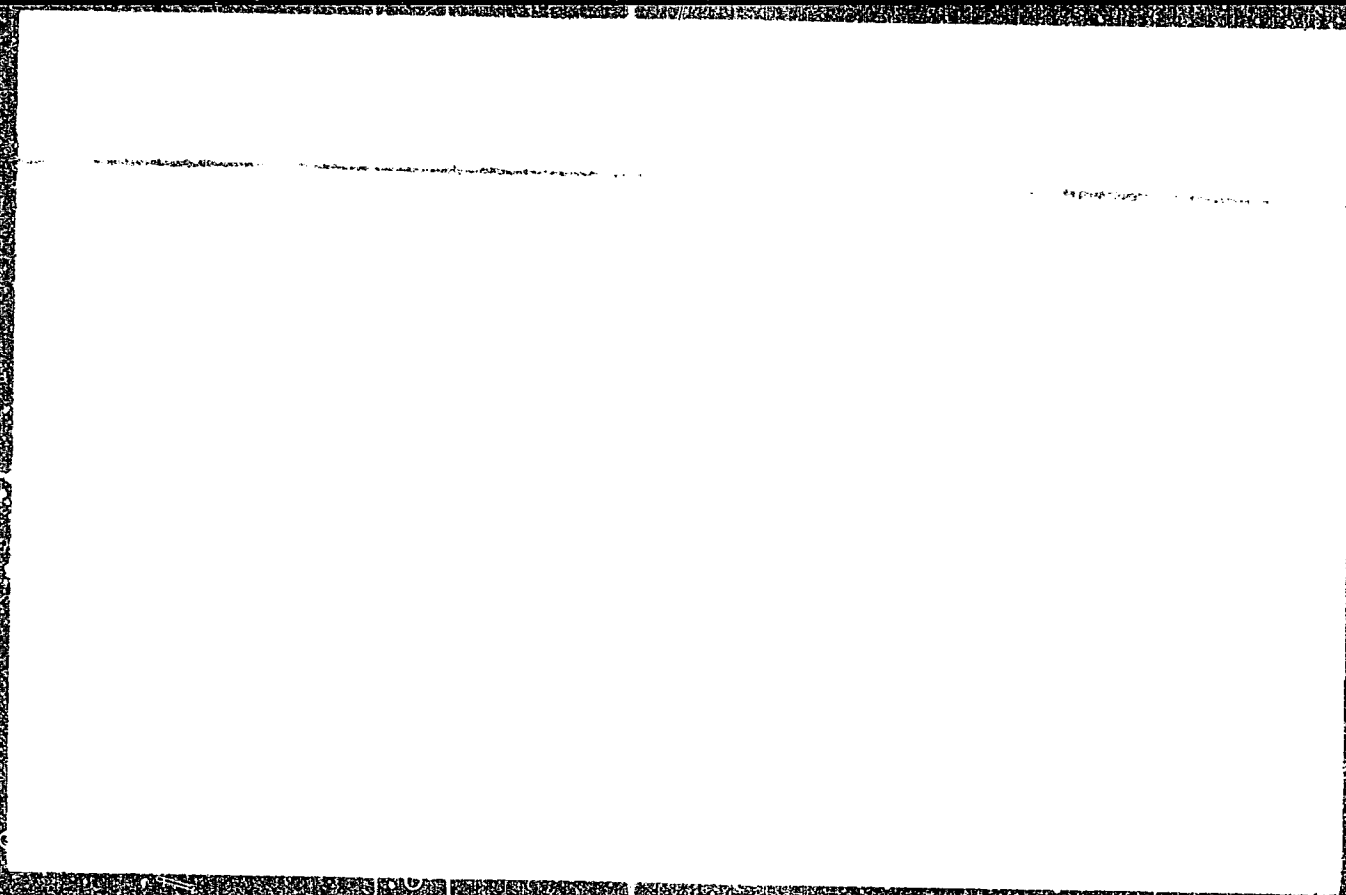


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KUDRYAVTSOV, I.V., doktor tekhnicheskikh nauk, professor; SAVVINA, N.M.;
BARANOVA, N.B., kandidat tekhnicheskikh nauk; BALABANOV, N.M.;
BOGACHEV, I.N., doktor tekhnicheskikh nauk, professor, rezensent;
KLOCHNEV, N.I., kandidat tekhnicheskikh nauk, redaktor; SIROTIK,
A.I., inzhener, redaktor izdatel'stva; MATVEYINA, Ye.N.,
tekhnicheskii redaktor

[Structural strength of nodular cast iron] Konstruktsionnaia
prochnost' chuguna s sharovidnym grafitom. Moskva, Gos.
nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1957. 158 p.
(Cast iron) (MLRA 10:6)

137-58-1-2007

137-58-1-2007

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 1, p 271 (USSR)

AUTHORS: Yatskevich, S. I., Balabanov, N. A.

TITLE: Modernization of Resonance-type Fatigue Testing Machines
(Modernizatsiya rezonansnykh ustalostnykh mashin)

PERIODICAL: V sb.: Vopr. konstrukts. prochnosti stali. Moscow, Mashgiz, 1957, pp 224-227

ABSTRACT: A description is presented of the modernization of resonance machines for bending-fatigue tests, and also for alternating torsion of large specimens (S), up to 50 mm diameter, of crankshafts and other machine parts and assemblies. To avoid vibration of the foundation, the rigid hinged mounting has been replaced by a suspension consisting of two spiral springs. To preserve the stability of the machine during operation, guy cables are employed. These are connected to the foundation via stanchions, the flexibility of which is adequate to provide freedom of vibration of the system. The result of this modernization made it possible completely to eliminate shaking of the foundation when the machine was in operation; in fact, the need for a massive foundation was entirely eliminated. The method of measuring

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137-58-1-2007

Modernization of Resonance-type Fatigue Testing Machines

deformation of the S by the shift in a band of light on a measuring scale was substituted by a new one, in which special plates (P) were placed on the upper and lower beams (B) of the machine, as far as possible from the center of vibration of the beams. One-half of the surface of each P was painted black and the other white. The P was mounted on the B so that the white P on the lower B was located opposite the black P on the upper B. As mass vibration occurred, a strip of gray color appeared clearly on the P. The width of this strip was equal to twice the amplitude of vibration of the B at the point where the P was located and was proportional to the amplitude of deformation of the S. A micrometric microscope, accurate to 0.01 mm, was employed to measure the semi-width of the gray bands. It is recommended that the moment when fatigue cracks appear be recorded by means of a change in the rate of rotation of the unbalanced mass of the vibrator (which is highly dependent on the rigidity of the S being tested), without changing the magnitude of the vibrational amplitude.

L. G.

1. Test vehicles--Revision

Card 2/2

KUDRYAVTSEV, I.V., doktor tekhnicheskikh nauk, professor; BALABANOV, M.A.,
kandidat tekhnicheskikh nauk.

Strengthening stepped shafts by embossing chamfers. Stroi.
dor.mashinostr. 2 no.7:32-34 J1 '57. (MLRA 10:7)
(Shafts and shafting)

^A
BALABANOV, N., mladshiy nauchnyy sotrudnik, kand. tekhn. nauk; SHUL'KEVICH, A.

Increasing the durability of steel parts. Izobr. i rats. no. 8:33
Ag '58. (MIRA 11:9)

1. TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya (for Balabanov). 2. Zamestitel' nachal'nika otдела TSentral'nogo nauchno-issledovatel'skogo instituta tekhnologii i mashinostroyeniya (for Shul'kevich).
(Steel--Hardening)

SOV/129-58-11-8/13

AUTHORS: Kudryavtsev, I. V., Doctor of Technical Sciences, Professor,
and Balabanov, N. A., Candidate of Technical Sciences

TITLE: New Method of Treatment of Contact Surfaces of Machine
Components (Novyy sposob obrabotki kontaktnykh
poverkhnostey detaley mashin)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, Nr 11,
pp 44-50 (USSR)

ABSTRACT: A new surface treatment of steel components was developed
by I. V. Kudryavtsev and N. A. Lopatinskiy, TsNIITMASH
(Author's Certificate Nr 103959) which permits simultan-
eously improving the fatigue strength of the component
and the shear strength of the contact surfaces.
Essentially the method consists of work hardening the
surface by numerous hammer impacts, as a result of which
a relief is produced in the form of striae with depths
of 0.5 to 1 mm and larger. Micro and macro cuts
reproduced in Fig.1 show that this treatment produces
a fibre distribution which is favourable from the point
of view of the strength; in the surface layer the hardness
is considerably increased (up to 40%) and favourable
Card 1/3 residual compressive stresses (up to 60 kg/mm²) are

SOV/129-58-11-8/13

New Method of Treatment of Contact Surfaces of Machine Components

generated. This method of treatment contact surfaces is applied in thick wall frameworks of large hydraulic presses built at the Novokramatorsk Works. At TsNIITMASH strength tests were made on thus treated surfaces of flat models. In these, an increase of the relative resistance to shear of the contact surfaces as a result of the relief formation and increased fatigue strength were detected. The models, made of "Steel 3", were tested for shear and fatigue. On the basis of the obtained results, the following conclusions are arrived at:

1. The developed new method of surface treatment, which consists of work hardening and producing a relief at the surface by means of special hammers, results in a simultaneous increase of the fatigue strength and the resistance to relative shear of the components in contact. The resistance to shear increases by tens of times, whilst the fatigue strength increases to double and more.
2. The new method of treatment of contact surfaces has been successfully applied for thick walled frame structures of powerful hydraulic presses; as a result of this, the rigidity of the assembled frame structure increased

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New Method of Treatment of Contact Surfaces of Machine Components

considerably and its carrying capacity increased to more than double.

3. The developed treatment of contact surfaces is recommended for a large number of components of machines and structures which are subjected to long duration alternating stresses and are required to have a sufficiently high rigidity; such components comprise housing frames of large machines which are assembled from several components, base plates for presses, load bearing plates of frames, etc.

4. The here described investigations provide a justified evaluation of the performance of the proposed new method of surface treatment and also provides a possibility of selecting treatment regimes for soft engineering carbon steels. There are 6 figures, 7 tables.

ASSOCIATION: TsNIITMASH

- | | | |
|--------------------|---------------------------|----------------------|
| 1. Steel--Surfaces | 2. Steel--Hardening | 3. Surfaces--Testing |
| equipment | 4. Surfaces--Test results | |

Card 3/3

BALABANOV, N.A.

25(2,5)

PHASE I BOKE EXPLOITATION

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Technical by machine-aided/developed/early industrial technology 1

Perestroika production elementor constructively 1 detail media
[increasing the strength of construction and machine elements]
Moscow, Nauka, 1979. 210 p. (Series: Test Series/Am. 91)
3,500 copies printed.

Author: I. V. Kuznetsov, Doctor of Technical Sciences,
Professor, Ed. (Leningrad); G. B. Shubin, Engineer, Tech.
Ed. V. D. El'kin; Assistant Ed. for Literature on Transport
Machine Building (Moscow); N. A. Ponomarev, Engineer.

Purpose: This collection of articles is intended for designers,
process engineers, and scientific research workers in the
machine-building industry.

Content: The collection contains papers dealing with experimental
work done recently by TALLINIAN. The experiments are concerned
with the practical use of surface work hardening in industry.
Industrial practices intended to increase fatigue strength and
service life of machine parts and constructional elements are
discussed. Several articles are devoted to problems of in-
creasing the fatigue strength of machine parts by work hardening.
Industrial practices of work hardening in external burn-
ishing of large machine parts are presented. Tools and fixtures
used for surface work hardening are described. No personalities
are mentioned. References follow each article.

Author: I. V. Kuznetsov, Doctor of Technical Sciences, D. A. Shubin,
and N. A. Ponomarev, Engineer, Practice at the Leningrad
Kremlevskiy machinebuilding factory (Kremlevskiy New Machine-
Building Plant) in External Burnishing of Large Machine Parts
With Rollers

The technique of conducting experiments, the geometry of the
tool, the principles of selecting the burnishing regime and
the devices used are described and illustrated. A table with
diagrams of burnished machine parts and data on effects of
burnishing is presented.

Author: I. V. Kuznetsov, and N. A. Ponomarev, Candidates of Technical
Sciences, Work Hardening of Stepped Shafts by Fillet Peening 133
Results of fatigue tests on stepped steel shafts are analyzed.
Comparisons are drawn between shafts work-hardened by fillet
peening and shafts not subjected to any work-hardening process.
Fillet peening was accomplished on a milling machine with a
special attachment having a spring-actuated striking pin with
a spherically rounded end.

Author: I. V. Kuznetsov, Increasing the Life of Metallurgical
Machinery Parts by External Burnishing With Rollers 123

Constructive of the burnishing devices used are
described, and some problems connected with the technique
of burnishing are discussed. Results of testing burnished
surfaces in operation are presented.

KUDRYAVTSOV, I.V., doktor tekhn.nauk; BALABANOV, N.A., kand.tekhn.nauk

Strengthening stepped shafts by chasing hollow chamfers.
[Trudy] TSHIITMASH 91:113-122 '59. (MIRA 12:8)
(Shafting) (Hard facing)

GOL'TSOV, V.; BALABANOV, P.

To petroleum workers of the Caspian Sea. Grashd.av 17 no.9:18-19
S '60. (MIRA 13:9)

1. Spetsial'nyye korrespondenty zhurnala "Grashdanskaya aviatsiya."
(Caspian Sea region—Aeronautics, Commercial)

IVANKOV, N.I.; BALABANOV, P.V.

Work practice in organizing socialist competition to greet the
22d Congress of the CPSU in the proper way. Razved. i okh. nedr
27 no.9:55-56 S '61. (MIRA 17:2)

1. Shakhtinskaya geologorazvedochnaya partiya i Volgo-Donskoy
territorial'nyy komitet professional'nogo soyuza rabochikh geologo-
razvedochnykh rabot.

BALABANOV, S.

H

BULGARIA/Electronics - Electron and Ion Emission.

Abs Jour : Ref Zhur Fizika, No 1, 1960, 1456

Author : Nadjakov, G., Vassiliev, V., Balabanov, S.

Inst :

Title :

On the Work Function of Gold and Aluminum During Vacuum-Air Transition

Orig Pub : Dokl. Bulg. AN 1958, 11, No 6, 461-464

Abstract

: A method of contact difference of potential was used to measure the work function of freshly evaporated gold and aluminum in vacuum and in air with respect to old gold, passivated in air, taken to serve as a standard. The work function of the gold standard ϕ_{Au} was assumed to be 4.8 ev (its average value, obtained in several other experimental investigations). By measurement in vacuum, values $\phi_{Au} = 4.48$ and $\phi_{Al} = 3.15$ ev were obtained. The variation of the work function with time in air for gold and aluminum

Card 1/2

- 74 -

NADZHAKOV, G., akad.; BALABANOV, S.

Influence of water vapors on photoelectret state. Doklady BAN
16 no.1:19-22 '63.

1. Chlen Redaktsionnoy kollegii, "Doklady Bolgarskoy Akademii
nauk" (for Nadzhakov).

NADZHAKOV, G., akad.; BALABANOV, S.

Capturing adsorption ions on the sulfur surface. Doklady BAN
16 no.6:585-588 '63.

1. Chlen Redaktsionnoy kollegii, "Doklady Bolgarskoy akademii
nauk (for Nadzhakov).

NADJAKOV, G. [Radzhakov, G.], akad.; BALABANOV, S.; KITOV, A.

Influence of the relief of the support on the work support of
thin metallic layers. Doklady BAN 17 no.6:545-548 '64.

BALABANOV, S.

Surface P-type photoconductivity and surface field effect in
monocrystal cadmium sulfide. Doklady BAN 17 no.11:1001-1004
'64.

1. Institute of Physics of the Bulgarian Academy of Sciences,
Submitted July 10, 1964.

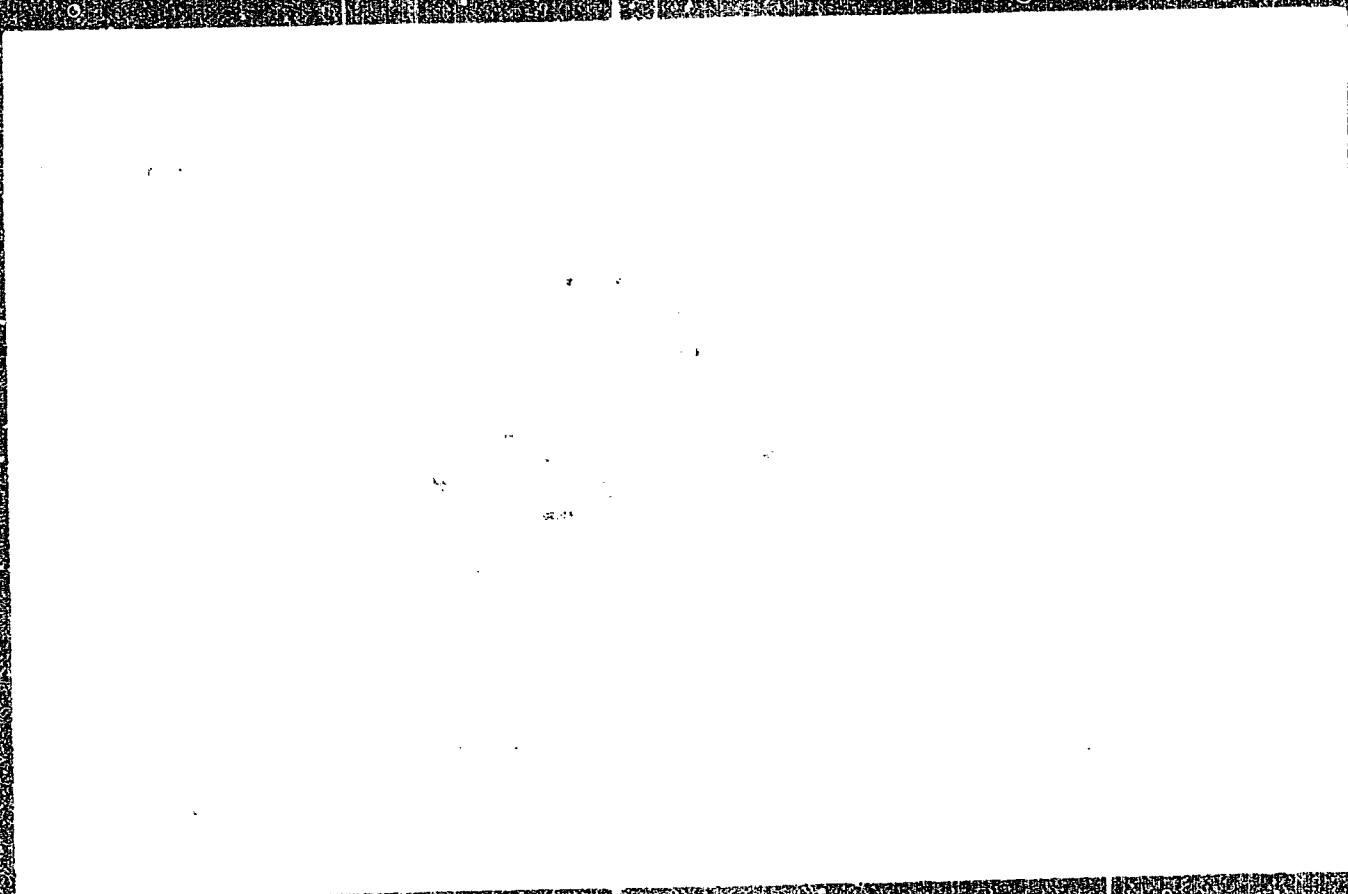
BALABANOV, S.; DRAGNEV, T.; MARKOV, P.; NANEV, K.

Third National Conference on Physics. Fiz mat opisani BAN
7 no.3:226-229 '64.

reduces the contrast between the two surfaces at short wavelengths but not at longer ones. The effect was found to be highly sensitive to the surface of the

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BULGARIA/Electricity - Semiconductors

3-3

Abs Jour : Ref Zhur - Fizika, No 12, 1958, No 27880

Author : Nadjakov G., Androjtschin R., Balabanov St., Stanislavova J.
Inst : Physics Institute, Bulgarian Academy of Sciences, Sofia,
Bulgaria.

Title : Comparative Investigations of the Longitudinal and Trans-
verse Photovoltaic Effects in Samples of Cadmium Sulfide
Obtained by Evaporation.

Orig Pub : Dokl. Bolg. AN., 1957, 10, No 4, 277-280

Abstract : The authors have investigated the principal characteristics
of the photovoltaic effect in specimens of CdS, obtained
by evaporation, with different (Al and Au) electrodes in the
case of longitudinal and transverse illumination (relative
to the electrodes). Data are given on the dependence of
the photo emf and the photocurrent i on the intensity I .
It is shown that in most cases the photovoltaic effect has
the same features: i depends on I linearly, and the depen-
dence of \mathcal{E} on I is described by a curve that has saturation.
No rectifying effect was observed. In all cases the photo

Card : 1/1 emf is of the purely barrier type.

BALABANOV

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TA
1/1
Work function of gold and aluminum during vacuum-air transition. G. Nadzhakov, V. Vasilev, and St. Balabanov. *Compt. rend. acad. bulgare sci.* 11, 461-4 (1988) (in English).
The contact potential difference, CPD, between a freshly evap. Au or Al surface and a passivated Au surface is measured in vacuum and after the admission of air. For Au in vacuum, the CPD = 0.3 v., giving a work function ϕ_{Au} = 4.48 e.v., and after the admission of air, ϕ approaches 4.8 e.v., the value for passivated Au. For Al, ϕ_{vac} = 3.15 e.v., and ϕ_{air} = 3.6 e.v. Measurements of the CPD of passivated metals after evacuation indicated a small increase in ϕ of 0.02-0.03 e.v. For Ag and Al slightly greater increases occurred (0.03-0.04 e.v. and 0.05-0.06 e.v.) while for Cr, ϕ decreased by 0.02-0.05 e.v. Readmission of air restored the original values; this indicated a reversible change. When the same metal was evapd. on the test and reference surfaces, no CPD was observed during either air-vacuum or vacuum-air transitions. Frances D. Collins.

36800

8/137/62/000/004/082/201
A052/A101

18.8100
AUTHORS: Nadzhakov, G., Balabanov, St., Dzhurova, V.

TITLE: The effect of gas discharge on the contact potential of metal surfaces

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 4, 1962, 8, abstract 4151
("Dokl. Bolg. AN", 13, no. 6, 1960, 673 - 676, English summary)

TEXT: The effect of gas discharge on the contact potential U_0 of Au, In and Ga was investigated. The samples were produced by evaporating these substances on a brass sublayer, and after several days' air exposure they were placed in the gas discharge tube. After the termination of gas discharge, taking place at 10 mm mercury column, the difference ΔU_0 between the investigated sample and the reference Au-electrode was measured. A noticeable effect of gas discharge on ΔU_0 was found, as well as a considerable asymmetry in the change of ΔU_0 depending on the sign of voltage applied to the sample. On the basis of the results a conclusion is drawn that at a discharge a predominant adsorption of

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The effect of gas discharge on...

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A052/A101

negative ions takes place, which is also found in experiments without a constant voltage.

I. Dykman

[Abstracter's note: Complete translation]

Card 2/2

24.7700

S/058/62/000/003/085/092
A061/A101

AUTHORS: Nadzhakov, O., Balabanov, St., Dzhurova, V.

TITLE: Effect of gaseous discharge on the contact potential of metal surfaces

PERIODICAL: Referativnyy zhurnal, Fizika, no. 3, 1962, 56, abstract 3Zh344, ("Izv. Fiz. in-t s ANEB", 1961, v. 9, no. 1, 69-79, Bulgarian; Russian, English summary)

TEXT: The article is a more detailed description of a previously published investigation by the same authors (see RZhFiz, 1961, 11Zh68). There are 16 references.

[Abstracter's note: Complete translation]

JB

Card 1/1

24.7050

42255

B/503/61/009/001/004/007
B125/B102

AUTHORS: Nadzhakov, G., Academician, Balabanov, St., and Dzhurova, V.

TITLE: The effect of gas discharge on the contact potential of a metal surface

SOURCE: Bulgarska akademiya na naukite. Fizicheski institut.
Izvestiya na Fizicheskiya institut s ANEB. v. 9, no. 1,
1961. 69-79

TEXT: The variations in contact potential of metal surfaces (Au, Al, In, Ga) are studied by the modified Zisman method of measuring the contact potential difference near a gas discharge. The gas (10 mm Hg) was ionized by means of a Tesla transformer, making it possible to study the adsorption effects when several volts of direct current are applied. The contact potential of the surfaces under examination in the first series of experiments changed by more than 300 mv within 10 sec. The sample was earthed near the discharge of gas. This completely reversible process seems to be caused by ion sorption. In the second series of experiments a constant voltage of ± 4 v (with respect to the earthed part) was applied. The contact potential in this case can change by 2000 mv. The contact
Card 1/2

The effect of gas discharge on...

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B125/B102

potential of the indium samples changes seven times as much when negative ions are adsorbed than when positive ions are adsorbed. The electro-adsorption of positive and negative ions is best in gallium samples. The change in contact potential decreases with time: $|\Delta U_c| = \Delta U_{c_0} (1 + at)^{-n}$ where ΔU_{c_0} is the initial value of this change. Here n depends neither on the time of electro-adsorption nor on the charge of the ions, but the parameter a depends on both. The changes in contact potential are greater by 30-50% when the metals studied here are fused to a polished brass backing than when they are fused to one another. There are 6 figures and 1 table.

ASSOCIATION: Fizicheski institut s ANEB pri BAN (Physics Institute of the ANEB at the BAN)

SUBMITTED: October 12, 1960

Card 2/2

NADZHAKOV, G., akad; BALABANOV, S.

Formation of the surface photoelectric state in gas discharge.
Doklady BAN 15 no.4:361-364 '62.

1. Chlen Redaktsionoy kollegii, "Doklady Bolgarskoy akademii nauk"
(for Nadzhakov).

NADZHAKOV, G., akad.; ANDREICHIN, R., d-r; BAIABANOV, St.
STANISLAVOVA, IV.

Presence of a locking layer in the transversal photovoltaic effect in evaporated cadmium sulfide. Izv fiz atom BAN 9 no.2:17-23 '62.

1. Chlen na Redaktsionnata kolegiia i otgovoren redaktor, "Izvestiia na Fizicheskiiia institut s ANEB" (for Nadzhakov). 2. Chlen na Redaktsionnata kolegiia, "Izvestiia na Fizicheskiiia institut s ANEB" (for Andreichin).

BALABANOV, Stefan K.

Electrophotography. Priroda Bulg 12 no. 4: 68-73
Jl-Ag '63.

BALABANOV, St.

All-Union Conference on Semiconductor Components.
Spisanie BAN 8 no. 4: 54-56 '63.

BALASANOV, T.

"Production of Bituminous Materials." p. 14,
(LEKA PROMISHLENOST, Vol. 3, No. 2, 1954, Sofiya, Bulgaria)

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4
No. 5, May 1955, Uncl.

BALABANOV, T. R.

BULGARIA/Chemical Technology. Chemical Products I-23
and Their Application. Synthetic polymers. Plastics.

Abs Jour: Ref Zhur-Khimiya, No 3, 1957, 9850

Author : Balabanov, T. R.

Inst : Not given

Title : The Production of Asphalt-Impregnated Insulation
Materials

Orig Pub: Loka prom-st, 1954, No 2, 14-15 (in Bulgarian)

Abstract: Felting of medium porosity (animal fibers or
asbestos) is impregnated with a mixture of asphalt
and (in % of the asphalt) crude petroleum 7,
resin 2.5, toluene 2, and kerosene 3. The
mixture is heated to 100° with careful mixing and
the felting is immersed for 0.25-0.6 min until
it is fully impregnated, after which it is com-
pressed between smooth rollers at a pressure
of 3kg/cm². A film of water is maintained over
the rolls in order to avoid sticking. Wool

Card 1/2

BALABANOV, Ustin Grigor'iyavich-

[Analysis of the management of collective farms] Analiz khosiaistvennoi
deiatel'nosti kolkhosa. [Saratov] Saratovskoe knizhnoe izd-vo, 1957.
58 p. (MIRA 11:11)

(Collective farms)

F

COUNTRY : BULGARIA
 CATEGORY : Microbiology. Microbes Pathogenic for Man and
 Animals. Pathogenic Fungi and Actinomycetes
 ABS. JOUR. : RZhBiol., No. 3 1959, No. 10244
 AUTHOR : Popov Lyuben, Balabanov Vasil
 INST. : Bulgarian Academy of Sciences
 TITLE : Epidermomycosis and Their Pathogens in Bulgaria in
 Recent Years
 ORIG. PUB. : Izv. Otd. biol. i med. n. B'lg. AN, Ser. eksperim.
 biol. i med., 1957, No 2, 165-174
 ABSTRACT : No abstract.

Card: 1/1

73

BAIBANOV, V.

Transitory form of the family Dermatophyta and its taxonomic
and epidemiologic significance. Izv. mikrob. inst., Sofia no.11:
235-248 '60.
(DERMATOMYCOSIS)

GEORGIEV, G.; BALABANOV, V.

On certain frequent side-effects in antibiotic therapy. Suvrem.
med., Sofia no.8:84-92 '59.

1. Is Katedrata po koshni i venericheski bolesi pri VMI - Sofia.
Zav.katedrata: prof. L. Popov.
(ANTIBIOTICS eff.inj.)

BALABANOV, V.

Balabanov, V., Dimitrova, E., "Antagonistic Action of Volatile Fractions of Horse-Radish (*Cochlearia Armorata* L.) on Mycosis Agents." p.283 (Izvestiia, Vol.2, 1951, Sofiya.)

SO: Monthly List of East European Accessions, Vol.3, No.3, Library of Congress, March 1954, Uncl.

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CZECH

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SALABANOV, V.

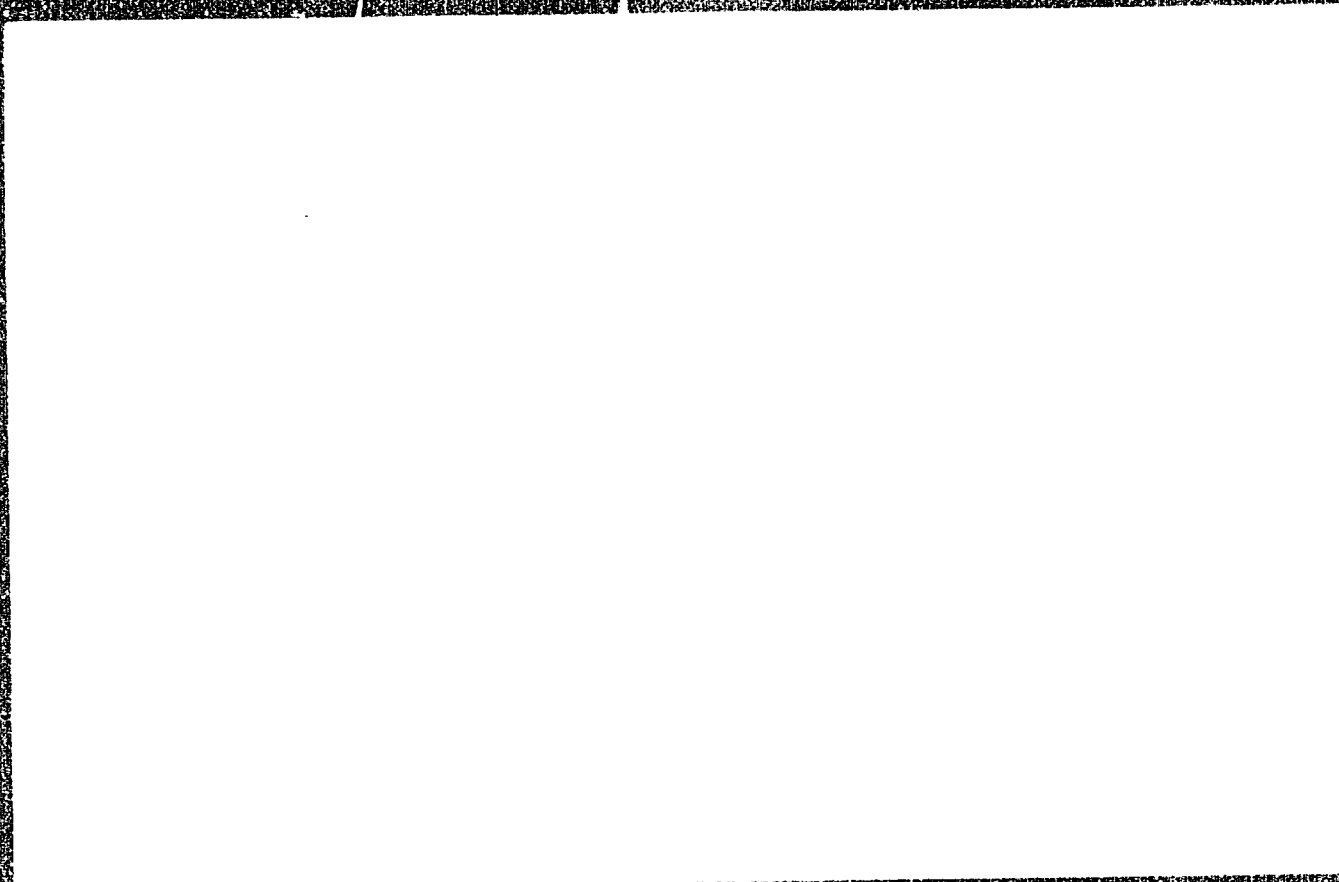
Theoretical basis for heat regeneration in industrial furnaces. p. 202.
(HUTNIK, Vol. 7, No. 6, June 1957, Praha, Czechoslovakia)

SO: Monthly List of East European Accessions (EEAL) LC, Vol. 6, No. 12, Dec 1957. Uncl.

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GEORGIEV, G.; BALABANOV, V.

Side effects in occupational contact and therapeutic use of antibiotics.
Nauch. tr. vissh. med. inst. Sofia 40 no.3:193-212 '61.

1. Predstavena ot prof. L. Popov Rukovoditel na Katedrata po kozhni
i vernericheski zaboliavania.

(ANTIBIOTICS toxicol)

Z/032/61/011/002/002/013
E073/E535

AUTHOR: Balabánov, V., Professor Engineer

TITLE: Improving the Efficiency of Large Capacity Annealing
Furnaces

PERIODICAL: Strojírnoství, 1961, Vol.11, No.2, pp.95-100

TEXT: A considerable part of the annealing furnace capacity at present available in forging and hardening shops in Czechoslovakia has been in operation for a number of years and has a low efficiency. The author deals with means of improving the efficiency and compares the relevant figures of the some of the furnaces at present in operation with furnaces which have been modernized in accordance with designs put forward by the author of this paper. The heat consumption is mainly governed by the heating duration and the rate of utilization of the furnace space. Practical examples are quoted from the paper of G. Prieur and G. Fechner (Ref.1; Stahl u. Eisen, No.2, 1956, pp.78-81) showing that great savings in the heat consumption can be achieved by cutting down on unnecessarily long or repeated annealing. Equally, quite a considerable drop in the heat consumption results from

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Z/032/61/011/002/002/013
E073/E535

Improving the Efficiency of Large Capacity Annealing Furnaces

increasing the weight of the charge. Fig.2 shows a graph of the specific heat consumption, kcal/kg as a function of the specific throughput of the trolley surface, kg/m²h. This has been plotted on the basis of literary data and practical experience of the author. The full line curve relates to good quality older furnaces (regenerative furnaces without or with very little air pre-heating), the bottom dashed line curve gives the reduced heat consumption which can be achieved in newer furnaces. Furnaces for large forgings (rotors, pressure vessels etc.) have a low throughput, 5 to 15 kg/m²h, however modern the furnace. The losses of the furnace itself can be sub-divided into (a) the heat lost through the furnace refractory, which can be reduced by better insulation of the walls, roof and trolleys and (b) heat losses due to heat accumulation in the refractory; these will be the larger the greater the temperature amplitude during a single heating cycle and the shorter the duration of the heating cycle and they can be reduced primarily by using porous refractories. Heat losses and heat accumulation are compared for 385 and 505 mm thick walls of

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Improving the Efficiency of Large Capacity Annealing Furnaces

ordinary firebrick and porous firebrick of a specific weight of 1100 kg/m^3 for the steady state conditions at a temperature of 850°C . The heat conductivity of the porous firebrick at 0°C is $0.31 \text{ kcal/m h } ^\circ\text{C}$ as compared to 0.75 for the compact firebrick. The heat accumulation (kcal/m^2) dropped from $131\ 870$ to $69\ 930$ in the case of substituting porous firebrick for normal firebrick for a total wall thickness of 505 mm , of which the thickness of the firebrick was 380 mm . The heat consumption in an older type regenerative annealing furnace, Fig.4, is compared with that of a more modern furnace designed by the author, Fig.3. The latter was used for annealing medium size forgings, particularly locomotive driving axles. The furnace is fired with producer gas of 1500 kcal/m^3 . The useful dimensions of the trolleys are $4.49 \times 3.1 \text{ m}$. The compared two furnaces have virtually the same useful dimensions. The annealing time for the older furnace is longer due to the fact that the heating up of the refractory takes longer. In spite of the fact that the older furnace is equipped with regenerators for air pre-heating and in the new furnace no air pre-heating is used at all,

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Improving the Efficiency of Large Capacity Annealing Furnaces

the specific heat consumption in the new furnace is 269 kcal/kg as compared to 306 in the old one. If air pre-heating would be used in the newer furnace, the heat consumption could be reduced still further to 226 kcal/kg, i.e. to 74% of the heat consumption of the older furnace. The author also compared the heat consumption of a further furnace of his own design, Fig.5, a recirculation annealing furnace (1 - recuperators, 2 - base), with the furnace, Fig.4. The main aim of the design of the furnace, Fig.5, was to achieve an equal temperature distribution along the height of the furnace with a minimum number of burners. The gas burners are fitted in the top part of the side walls, the flame is directed along the walls downwards. At the bottom part deflection surfaces are placed which change the direction of the combustion products so that these flow under the charge. The temperature of the combustion products drops to such an extent that the bottom part of the charge is no longer over heated. Practical experience has shown that very uniform heating of the entire charge is obtained in furnaces of this design. Another feature of this furnace is that each burner has its own recuperator. This is particularly favourable

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Improving the Efficiency of Large Capacity Annealing Furnaces

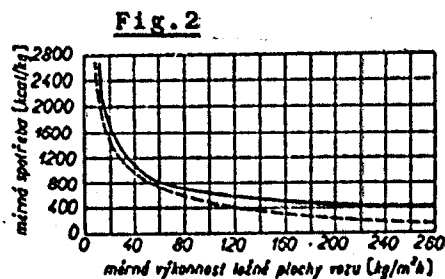
for large furnaces, since distribution of hot air and the resulting heat losses and also insulation of long piping is dispensed with. The recuperator is very simple and can be easily replaced. Due to long annealing times, porous refractories have not been used in this furnace. The comparison is made for a forging of a high pressure boiler, weighing 35 tons, a hollow cylinder 14.6 m long, about 0.8 m diameter and a wall thickness of about 80 mm. In this case the material was heated to 650°C over a period of 13.75 hours, soaked at this temperature for eight hours. The temperature was then increased gradually to 880°C over a period of 33 hours and then this temperature was maintained for 13 hours. There are 5 figures, 3 tables and 6 references: 2 Czech and 4 non-Czech.

ASSOCIATION: VŠB, Ostrava

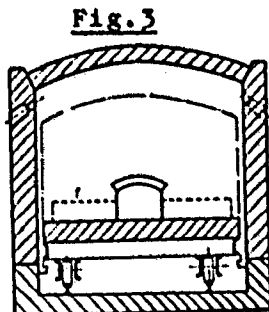
Card 5/7

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E073/E535

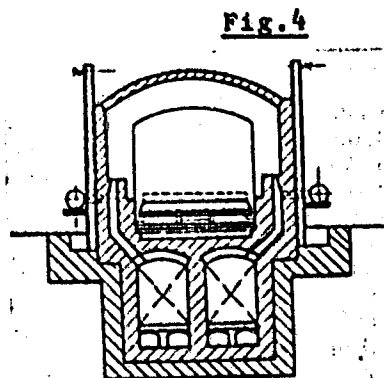
Improving the Efficiency of Large Capacity Annealing Furnaces



Obr. 2. Vliv mírné výkonnosti peči na spotřebu tepla



Obr. 3. Žhací pec
1 - podstavec pro materiál



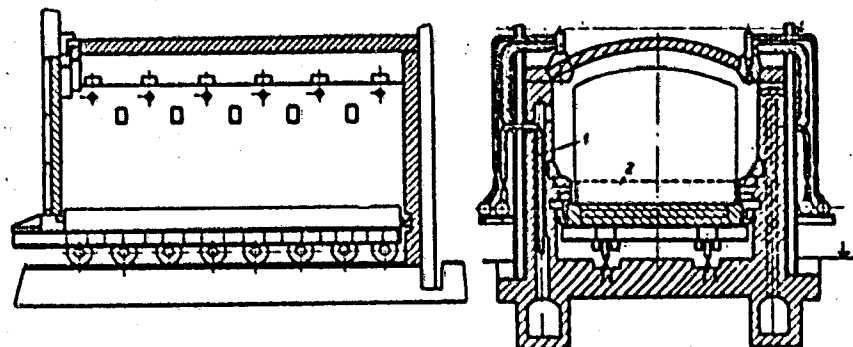
Obr. 4. Regenerativní žhací pec

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E073/E535

Improving the Efficiency of Large Capacity Annealing Furnaces

Fig. 5



Obr. 5. Recirkulační systém pro
1 - rekuperátor; 2 - podstavce

Card 7/7

BALABANOV, Vladimir, prof., ins.

The development of soaking furnaces. Hut listy 17 no.11:775-779 N '62.

1. Vysoka skola banska, Ostrava.

RALABANOV, Vladimir, prof., ins.

Problem of water-cooling equipment for charging doors and frames
of open hearth furnaces. Hut listy 18 no.7:471-475 J1 '63.

1. Vysoka skola banska, Ostrava.

PESHEV, I.; BALABANOV, V.

Changes in the lungs probably caused by trichophytosis. Vest.
rent. i rad. 38 no.5:68-69 S-0'63 (MIRA 16:12)

1. Iz kafedry rentgenologii i radiologii (rukovoditel' - prof.
A.Nikolayev) i kafedry kozhnykh i venericheskikh bolezney
(rukovoditel' - prof. L. Popov) Vysshego meditsinskogo insti-
tuta, Sofiya.

BALABANOV, Vladimir, prof. inz.

Determination of heating furnace main parameters and their
practical importance. Hut listy 19 no. 2: 94-98 F '64.

BALABANOV, Vladimir, prof. inz.

Flue ducts for industrial furnaces. Energetika Cz 15 no.3:117-
120 Mr '65.

BALABANOV, V.

Ungual saprophytosis caused by Scopulariopsis brevicaulis.
Nauch. tr. vissh. med. inst. Sofia 41 no.8:99-105 '62.

1. Predstavena ot prof. L. Popov.
(NAILS) (MYCOSES)

BALABANOV, V., insh.(Kurgan)

Using shallow lakes in supplying water to populated areas.
Zhil.-kom.khoz. 10 no.4:21-23 '60. (MIRA 13:6)
(Water supply) (Lakes)

BALABANOV, V., prof., ins. (Ostrava-Zabreh)

New types of mobile drying kilns for casting molds. Strojirenstvi
13 no.10:729-733 0 '63.

1

16(1) 16.400

AUTHOR: Balabanov, V.A.

SOV/155-58-4-1/34

TITLE: On the Question Concerning the Stability of the Eigen Elements of Non-Linear Operators (K voprosu ob ustoychivosti sobstvennykh elementov nelineynykh operatorov)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Fiziko-matematicheskiye nauki, 1958, Nr 4, pp 3 - 8 (USSR)

ABSTRACT: The author considers a non-linear operator from a Banach space into the conjugate space. It is supposed that the operator possesses an eigen element in the sense of Teitlanadse [Ref 4] on a manifold defined by a quadratic functional. The author investigates the stability of this eigen element with respect to the mentioned manifold for small perturbations of the operator. The obtained results can be interpreted as conditions for the stability of the critical value of the functional. The results of L.A. Lyusternik are essentially used. There are 7 references, 6 of which are Soviet, and 1 American.

ASSOCIATION: Tbilisskiy gosudarstvennyy pedagogicheskiy institut imeni A.S. Pushkina (Tbilisi State Pedagogical Institute imeni A.S. Pushkin)

SUBMITTED: February 20, 1958

Card 1/1

BALABANOV, V.A.

One application of the theorem of implicit functions to the proper elements of nonlinear operators. Soob. AN Gruz. SSR 20 no.1:3-8
Ja '58. (MIRA 11:6)

1. Tbilisskiy gosudarstvennyy pedagogicheskiy institut im. A.S.
Pushkina. Predstavleno akademikom V.D. Kupradse.
(Functional analysis)

BALABANOV, V. A., Cand Phys-Math Sci (diss) -- "Some problems of the stability of solutions of nonlinear functional equations". Tbilisi, 1960, published by the Acad Sci Georgian SSR. 5 pp (Acad Sci Georgian SSR, Tbilisi Math Inst im A. M. Razmadze and Computer Center), 150 copies (KL, No 14, 1960, 125)

BALABANOV, V.A.

Stability of the characteristic elements of potential operators.
Trudy Tbil. gos. ped. inst. 14:119-126 '59. (MIRA 15:8)
(Operators (Mathematics))

NEDIALKOV, S., ANGELOV, S., POPOV, L., TOSIKOV, A. L., PANAIOTV, P.,
BALABANOV, V.

Types of Mycobacterium tuberculosis in skin and other forms of human
tuberculosis in Bulgaria. Izv. mikrob. Inst., Sofia., Vol. 1, 1950.
p. 21-44

NAI

CLML 19, Nov., 1950

BULGARIA/Microbiology - Microorganisms Pathogenic to Humans and Animals F-3

Abs Jour: Ref Zhur - Biol., No 18, 1958, 81615

Author : Balabanov, V.

Inst : V. Chervenkov Medical Acad.

Title : Saprophytic Skin Molds and Dermatophytes.
Antagonistic and Symbiotic Relationships.

Orig Pub: Nauchni tr. Med. akad. "V. Chervenkov," 1953
(1954), 1, No. 1, 229-240

Abstract: No abstract

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47

POPKHRISTOV, P.; BOODANOV, I.; BALABANOV, V.

Antibiosis in the oral cavity. Vest.ven. i derm. no.3:56-57 My-Je '53.
(MIRA 6:7)
(Mouth--Bacteriology)

POPKHRISTOV, P.; BOGDANOV, I.; BALABANOV, V.

Antibiosis in the vagina and the female urethra. Vest.ven. i derm. no.3:
57 My-Je '53. (MLRA 6:7)

(Genitourinary organs--Bacteriology)

POPKHRISTOV, P.; BOGDANOV, I.; BALABANOV, V.

Antibiosis in the foreskin and urethra in men. Vest.ven. 1 derm. no.3:
57 My-Je '53. (MLRA 6:7)

(Genitourinary organs--Bacteriology)

POPKHRISTOV, P.; BOGDANOV, I.; BALABANOV, V.

Antibiosis in the skin. Vest.ven. i derm. no.3:57 My-Je '53. (MLRA 6:7)
(Skin--Microorganisms)

POPKHRISTOV, P.; BOGDANOV, I.; BALABANOV, V.

Antibiosis in the oral cavity as a factor of resistance of the oral
mucosa to fungous and pyococcic agents. Vest.ven. i derm. no.3:57-58
My-Je '53. (MLRA 6:7)

(Mouth--Bacteriology)

EXCERPTA MEDICA Sec.13 Vol.11/2 Dermatology, etc. Feb 57

412. BALABANOV V.A. *Antibiotikotropismus. Antibioticotropism C.R.
ACAD. BULG. SCI. 1955, 8/2 (69-71)

The author studies the morphological changes taking place on the boundary of the antagonistic interaction between different micro-organisms in vitro. In some cases of mutual antagonism he observes the tendency of the overcoming opponent to direct its growth - conidium bearers, micelia or pigment - towards its opponent, which, although suppressed, tries to resist by producing antagonistic products. Moulds show a most convincing antibioticotropism. Usually saprophytes are the stronger ones. Interaction of competing micro-organisms does not always create conditions for antibioticotropism. In this study the author presents a description of macro- and micro-antibioticotropism of *Penicillium crustosum* against *Trichophyton violaceum* and against *Sabouraudites canis*, as well as of representatives of the family dematiaceae, isolated from the skin of man, such as *hormodendron*, *alternaria*, etc. against *Microsporon aureum*, *Trichophyton violaceum* (1948); finally of *Bact. alcaligenes* sp., from man's skin, against *Epidermophyton interdigitale* and *Trichophyton rubrum* (1946). In connection with the selective action of antibiotics, the discrepancy of antagonism as a phenomenon, etc., antibioticotropism represents a topic of wider general biological interest.

POPKHRISTOV, P.; BOGDANOV, I.; BALABANOV, V.

Role of normal microflora in man and appearance of fungus and
bacterial infections following antibiotic therapy. Suvrem. med.,
Sofia 7 no.5:11-23 1956.

(ANTIBIOTICS, injurious effects,
bact. balance disord. & superinfect. (Bul))

BAZABANOV, V. A.

Morphology of the pigment -antibiosotropisme among the mold, bacteria and actinomycetes. Doklady BAN 14 no.5:531-534 '61.

1. Note presentee par A. I. Hadjioloff [Khadshiolov, A. I.] membre de l'Academie.

(Morphology) (Molds(Botany)) (Bacteria)

BALABANOV, V.A.; KASUROV, L.B.

Asteroid growth and other morphological changes of Trichophyton mentagrophytes under the action of carbon dioxide. Dermatoveny Sofia 1 no.3:5-8 '62.

1. Iz Katedrata po kozhni bolesti pri VMI, Sofia (rukov. na katedr. prof. d-r L. Popov) i Nauchno-issledovatel'skii i-t po epidemiologii i mikrobiologii, Sofia (direktor d-r VI. Kolaidziev).



BALABANOV, V. A.

Morphological effects of carbon dioxide on dermatophytes, and their taxonomic importance. Dermato vener Sofia 2 no.1:17-20 '63.

1. From the Chair of Skin and Venereal Diseases at the Higher Medical Institute, Sofia (Head of the Chair: Prof. Kr. Balabanov).

BALABANOV, V. A.

Current problems in medical mycology. *ornato veter* Sofia 2
no.1:41-48 '63.

1. From the Chair of Skin and Venereal Diseases at the Higher
Medical Institute, Sofia (Head: Prof. Kr. Balabanov).

BALABANOV, V.F.

First boreholes in Transbaikalia. Zap. Zabaik. otd. Geog.
ob-va SSSR no. 24+120-121 '64 (MIRA 19:1)

BALABANOV, V.I.

Cooperation of the ophthalmological and medical institutions in
the eradication of trachoma. Vest. oft. 73 no. 3:8-11 My-Je '60.
(MIRA 14:1)

(CONJUNCTIVITIS, GRANULAR)

BALABANOV, V.I.; KOVALEVSKIY, A.L.

Uranium prospecting from airplanes in forest regions. Atom. energ.
15 n o.5:432-434 N '63. (MIRA 16:12)

BAKIBANOV, V. M., GLASKO, V. B., GROBHEV, A. L., KUZNETSOV, V. V.,
SVESHNIKOV, A. G., SEMASHKO, N. N.,

"Study of Individual Charged Partilce Motion in "Fluted" Magnetic Fields,"

report presented at the 6th Intl. Conf. on Ionization Phenomena in Gases,
Paris, France 8-13 Jul 63

BALEBANOV, V. M., VOLKOV, B. I., GLASKO, V. B., GROSHEV, A. L., KUZNETSOV, V. V.,
SVESHNIKOV, A. G., SEMASHKO, N. N.,

"Motion of Individual Charged Particles in Helical-Symmetry Magnetic Field,"

report presented at the 6th Intl. Conf. on Ionization Phenomena in Gases,
Paris, France, 8-13 Jul 63

SHTAL'MAN, N.V.; BALABANOV, V.M.

Using the URS-55 apparatus for X-ray structure analysis in the
shop. Zav. lab. 24 no.5:649 '58. (MIRA 11:6)

1. Makeyevskiy metallurgicheskiy zavod im. Kirova.
(X rays--Equipment and supplies)

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15.8500 2209 only

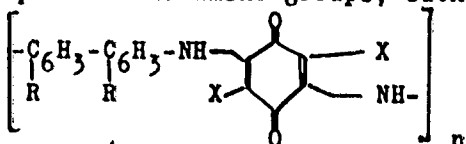
S/020/60/134/005/019/023
B004/B064

AUTHORS: Balabanov, Ye. I., Berlin, A. A., Parini, V. P.,
Tal'roze, V. L., Frankevich, Ye. L., and Cherkashin, M. I.

TITLE: Electrical Conductivity of Polymers With Conjugated Bonds

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 5,
pp. 1123-1126

TEXT: To investigate the electrical conductivity σ and its temperature dependence, the authors synthesized the following polymers: 1) Polymers with a noncyclic conjugated chain, such as polyphenyl acetylene, and its copolymers with hexine or paradiethinyl benzene; 2) polymers with benzene rings in the conjugation chain, such as polyphenylene, polyphenylene diazo compounds, polymeric-aromatic and aliphatic-aromatic compounds with quinoid and amino groups, such as



(X = H, Cl at R = H; X = H at R = COOH);

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Electrical Conductivity of Polymers With
Conjugated Bonds

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B004/B064

poly-p-phenylenediamino quinone, polyhexamethylene diamino quinone;
polyphenylene azoquinone; a polymeric triazene $[-C_6H_4-C_6H_4-NH-N-N-]_n$
and a substance (16) with a quinoimine group $[-C_6H_4-N-C_6H_4-N-]_n$; polymeric
chelate compounds of polydiphenyl aminoquinone with metals (e.g. Cu);
molecular complexes of acenaphthene with chloranil, and with a pyridonium
derivative of polyphenylene aminoquinone; 3) chelate compounds, such as tetra-
salicyl ferrocene and its polymeric chelate complexes with Fe^{2+} (21) and Be^{2+} (22); polymeric chelate complexes of percyanoethylene
with Cu^{2+} and Fe^{2+} . In all compounds, σ rose with temperature according
to the equation $\sigma = \sigma_0 \exp(-E/kT)$. σ_0 and E are constants characteristic
of each compound (Table 1). E varied from 4.6 kcal/mole (substance 16)
to 49.5 kcal/mole for polyphenyl acetylene, and reached 92 kcal/mole in
the complex compound of acenaphthene with chloranil. The treatment of the
sample influences σ_0 and E. If the polyphenyl acetylene film obtained from
the solution is pressed into tablets at 200°C, σ_0 decreases by 22 orders

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Electrical Conductivity of Polymers With
Conjugated Bonds

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B004/B064

of magnitude. Since, however, E decreases at the same time, σ remains almost constant. (σ_0 ranged from $10^{-12} \text{ohm}^{-1} \cdot \text{cm}^{-1}$ in polyphenylene to $6 \cdot 10^{51} \text{ohm}^{-1} \cdot \text{cm}^{-1}$ in the complex of acenaphthene with chloranil.) This compensation effect was observed in nearly all substances, as may be seen from the function $\log \sigma_0 = f(E)$ (Fig. 1). A change of σ_0 by 60 orders of magnitude and of E by 20 times was observed in substances of different structures. In the substances (16), (21), (22), σ was close to the electrical conductivity of organic semiconductors. In the case of polyphenyl acetylene, which is an insulator at room temperature, σ rises with rising temperature so much that, in consequence of its high σ_0 , the conductivity of many polymers is reached that are conductive already at room temperature. There are 1 figure, 1 table, and 17 references: 14 Soviet, 2 US, and 1 German.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR
(Institute of Chemical Physics of the Academy of Sciences
USSR)

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84831

Electrical Conductivity of Polymers With
Conjugated Bonds

S/020/60/134/005/019/023
B004/B064

PRESENTED: June 14, 1960, by V. N. Kondrat'yev, Academician

SUBMITTED: June 11, 1960

Card 4/4

11.7200
11.2219
15.8150

34989
S/190/62/004/003/009/023
B110/B144

AUTHORS: Berlin, A. A., Cherkashina, L. G., Balabancv, Ye. I.

TITLE: Polymers with the system of conjugated double bonds and heteroatoms in the conjugation chain. XX. Synthesis and examination of basic physicochemical properties of polymeric phthalocyanines

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 3, 1962, 376-382

TEXT: The synthesis and the structural dependence of electrical, magnetic, electron and ion exchange properties were studied in polymeric phthalocyanines on the basis of tetracarboxylic acids (pyro-mellithic acid (I) and 3,3',4,4'-tetracarboxy diphenyl ester (II)) and those consisting of mixtures of these acids with phthalic anhydride. A mixture of monomer and soluble polymer in dimethyl formamide was obtained at 180-210°C and a 1 : 3 : 3.6 ratio in the presence of CuCl and NH₄MoO₄. The polymers from

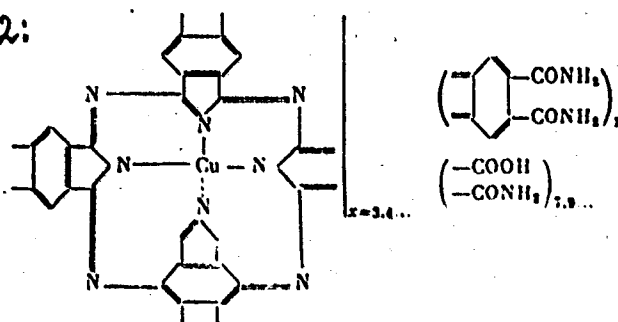
I and II consisted of two finely disperse, powdery, fractions. For I: Π-1-M (P-1-N) and T-1-M (T-1-N) precipitable from dimethyl formamide by CHCl₃, and for II: unprecipitable Π-1-P (P-1-R) and T-1-P (T-1-R). They
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Polymers with the system of ...

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were heated to 200-350°C/3 mm Hg to sublime impurities. H₂SO₄-resistant trimeric structures did not exist. Elementary analysis and equivalent weights found by potentiometric titration, showed P-2 and T-2 to be low-molecular and linearly arranged. The IR spectra of P-2 and T-2 showed bands of phthalocyanine and of primary carbonyl amine, C=O, and COOH groups. Hence:

P-2:

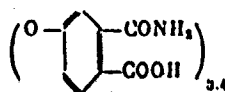
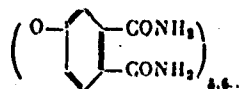
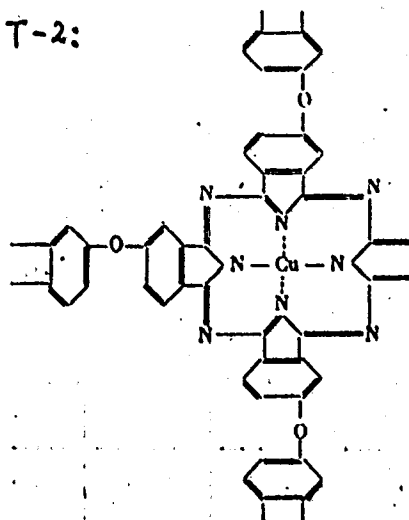


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Polymers with the system of ...

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B110/B144

T-2:



x=2,4...

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Polymers with the system of ...

S/190/62/004/003/009/023
B110/B144

P-2 and T-2 are constant in air at $\leq 350^{\circ}\text{C}$. At 375°C , thermooxidative destruction in T-2 is more intensive than in P-2 owing to the oxygen bridges contained in the former. The magnetic susceptibilities χ for P-2 at $H = 3500, 4000, 4500$ oe were $2.0 \cdot 10^{-6}$, $1.9 \cdot 10^{-6}$, and $1.8 \cdot 10^{-6}$ cgs, respectively, and $\chi = 2.1 \cdot 10^{-6}$, $1.9 \cdot 10^{-6}$, and $1.75 \cdot 10^{-6}$ cgs for T-2. Polyphthalocyanines have comparatively broad epr bands of high intensity with a distance of 100-150 oe between their maxima, and a g-factor of ≈ 2.025 . The conductivity was measured with an EMV-2 (EMU-2) amplifier at $20-200^{\circ}\text{C}$ and $< 10^{-17} \text{ ohm}^{-1} \text{ cm}^{-1}$ and at $\leq 3 \text{ kv/cm}$. The conductivity $\sigma_{300^{\circ}\text{K}}$ of P-1-N ($200-350^{\circ}\text{C}/3 \text{ mm Hg}$) subjected to heat treatment increases from 10^{-10} to 10^{-8} . The intensity of epr spectra for P-1-N and T-1-N increases. Reprecipitation of polyphthalocyanines from concentrated H_2SO_4 increased their conductivity and the intensity of epr signals. The correlation between epr signal indications and conductivity is explained as follows: "Nonactivated conductivity" exists in the "ordered regions" with broad epr bands. Transitions between these regions require activation energy. There are 4 figures and 2 tables. The most important reference to English-language publications reads as follows: W. D. Drinkard, J. C. Bailar, J. Card 4/5

Polymers with the system of ...

S/190/62/004/003/009/023
B110/B144

Amer. Chem. Soc., 81, 4795, 1959.

ASSOCIATION: Institut khimicheskoy fiziki (Institute of Chemical Physics)

SUBMITTED: February 22, 1961

Card 5/5

BALABANOV, Ye.I.; FRANKOVICH, Ye.L.; CHERKASHINA, L.G.

Electrophysical properties of polymeric phthalocyanins. *Vysokom.sped.*
5 no.11:1684-1690 N '63. (MIRA 17:1)

1. Institut khimicheskoy fiziki AN SSSR.

ACCESSION NR: AP4040482

S/0190/64/006/006/1028/1034

AUTHOR: Frankevich, Ye. L.; Busheva, L. I.; Balabanov, Ye. I.;
Cherkashina, L. G.

TITLE: Study of the semiconducting properties of polymeric copper
phthalocyanine

SOURCE: Vyssokomolekulyarnyya soedineniya, v. 6, no. 6, 1964,
1028-1034

TOPIC TAGS: copper phthalocyanine, copper phthalocyanine polymer,
organic semiconductor, semiconducting polymer, mobility determination

ABSTRACT: A study has been made of the semiconducting properties
of copper phthalocyanine polymers with no oxygen-containing side
groups synthesized earlier from aromatic nitriles (A. A. Berlin,
L. G. Cherkashina, Ye. L. Frankevich, Ye. I. Balabanov, and Yu. G.
Aseyev, Vysokomolek. soyed., 6, 832, 1964). The temperature depen-
dence of electrical conductivity and thermoelectric power were de-
termined in special equipment (described in the article): 1) in
vacuum ($5 \cdot 10^{-6}$ mm Hg) for pellet samples degassed by vacuum heat

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ACCESSION NR: AP4040482

treatment and 2) in oxygen (100 mm Hg) for samples heat treated in oxygen. The temperature dependence of conductivity obeyed the exponential law

$$\delta = \delta_0 \exp(-E/kT),$$

where $E = 0.1$ ev; in vacuum

$$\delta_{22} = (1-2) \cdot 10^{-2} \text{ ohm}^{-1} \text{ cm}^{-1},$$

The thermoelectric power was low (150 μ v/C max) and increased slowly with temperature; its sign indicated n-type conductivity. Oxygen lowered conductivity, indicating conduction electron trapping by O_2 molecules. This conductivity drop could not be reversed by removal of "weakly bound" oxygen under mild conditions (40—90C), but only by prolonged heating under severe conditions (2—3 days at 300C) which removed "strongly bound" oxygen. A new technique for determining carrier mobility in polymers is proposed which is based on the simultaneous measurement of the amount of polymer conductivity and

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of desorbed acceptor molecules by mass spectroscopy. The mobility thus measured was of the order of 10^{-2} cm²/v·sec and carrier concentration of the order of 10^{18} — 10^{19} cm⁻³. "The authors express their appreciation to A. A. Berlin and V. L. Tal'roze for their interest in this work and discussion of the results." The work was done at the Institute of Chemical Physics, Academy of Sciences USSR. Orig. art. has: 6 figures, 1 table, and 2 formulas.

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AUTHOR: Frankevich, Ye. L.; Balabanov, Ye. I.

TITLE: New effect of the rise in photoconductivity of organic semiconductors in a weak magnetic field

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 1, no. 6, 1965, 33-37

TOPIC TAGS: organic semiconductor, polynuclear aromatic hydrocarbon, photoconductivity, magnetic field

ABSTRACT: Application of a stationary magnetic field across samples of polynuclear aromatic hydrocarbons during photoconductivity measurements was found to cause a rise (Δi) in the photocurrent (i_{ph}). D-c photoconductivity was measured for thin films (3-20 μ) of anthracene or tetracene with illumination in air or vacuum at magnetic field intensities (H) of 17-3200 oersted. Δi increased with i_{ph} in such a way that at constant H , the ratio $\Delta i/i_{ph}$ remained constant at different light intensities. With increasing H , $\Delta i/i_{ph}$ increased rapidly at first, then reached saturation ($\Delta i = 4\%$ max). $\Delta i/i_{ph}$ was independent of sample orientation with respect to the magnetic field (illumination being perpendicular to the film surface). This

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was interpreted as indicating that the photocurrent rise is not associated with a specific motion of carriers through the sample but with the effect of the magnetic field on carrier generation and/or annihilation. A probable cause of the photocurrent rise was thought to be the effect of the magnetic field on exciton lifetime prior to annihilation without current carrier formation. The authors thank professors V. L. Tal'roze and L. A. Blyumenfel'd for their comments. Orig. art. has: 1 figure and 1 table. ^{44,55} _{44,55} [SM]

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