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PETRAYTITE, I.K. (Shyaulyay)

Some connections between the school courses in astronomy and mathematics. Mat.v shkole no.5:36-39 S-O '62. (MIRA 15:12)
(Mathematics--Study and teaching)
(Astronomy--Study and teaching)

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PETRAZHILKA, V.

Prospects in the Utilization of Atomic Power for the Generation of Electric Power (by a Member of the Czechoslovak Academy of Sciences). Elektroenergiya (Electric Power), #7-8:5:Jul-Aug 55

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001240

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

S/124/61/000/012/029/038
D237/D304

11.7350

AUTHOR: Petrazhitskiy, G. B.

TITLE: Experimental investigation of drop evaporation at high temperatures and pressures

PERIODICAL: Referativnyy zhurnal, Mekhanika, no. 12, 1961, 106, abstract 12B741 (Tr. Odessk. un-ta, Ser. fiz. n., 1960, 150, no. 7, 125-136)

TEXT: The results are given of a large number of experiments performed by the author on drop evaporation of a number of liquids (water, ethyl alcohol, petroleum) at high pressures (up to 40 atm.) and elevated temperatures of the surrounding medium (up to 500°C). Experimental results are tabulated in terms of rate of change of surface of the drop v. experimental conditions. 4 references. [Abstracter's note: Complete translation.] /B

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S/124/61/000/012/030/038
D237/D304

11.7350

AUTHOR: Petrazhitskiy, G. B.

TITLE: Determining heat transfer in a drop by the boundary layer method

PERIODICAL: Referativnyy zhurnal, Mekhanika, no. 12, 1961, 106, abstract 12B742 (Tr. Odessk. un-ta, Ser. fiz. n., 1960, 150, no. 7, 137-160)

TEXT: Application of known methods of boundary layer theory permitted the author to calculate, under some definite assumptions, the intensity of heat transfer on the surface of evaporating drop for the case of laminar flow. Processing of data mentioned in the former work (ref. 12B741) shows a satisfactory correspondence between theoretical and practical results, and the author mentions good agreement of his data with those obtained by other authors. Specific experimental conditions (high pressures) did not allow the author to explain more widely

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D237/D304

Determining heat transfer...

the influence of a transverse flow of a surrounding medium on the heat transfer intensity. 19 references. [Abstracter's note: Complete translation.]

Card 2/2

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

S/081/61/000/019/014/085
B101/B147

11.7350

AUTHOR: Petrazhitskiy, G. B.

TITLE: Evaluation and generalization of test results concerning evaporation of drops

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 19, 1961, 48, abstract 19B373 (Tr. Odessk. un-ta, Ser. fiz. n., v. 150, no. 7, 1960, 161-186)

TEXT: The author studied experimental data of the evaporation of water drops, drops of 96 % ethyl alcohol, and of TC-1 (TS-1) fuel at 90-500°C, 11-61 atm, Reynolds number Re = 115-450, and ratio between vapor pressure drop and total pressure: $\Delta p/p = 0.02-0.23$. The test results are expressed by the equation: $Nu' = 2 + 0.42\ Re^{0.56} Pr'^{0.33} (1 + \Delta p/p)(\mu_g/\mu_v)^{0.22}$. Here, Nu' is the Nusselt criterion for diffusion, Pr' is the Prandtl criterion for diffusion, μ_g is the molecular weight of the gas in which evaporation takes place, μ_v is the molecular weight of the vapor. It was

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Evaluation and generalization of...

shown that the temperature of the evaporating drop was independent of the rate of the flow streaming around the drop; the temperature can be calculated from the conditions of evaporation of an immobile drop. Results of calculations agree with the experimental data with an accuracy of 3-5 %. [Abstracter's note: Complete translation.]

Card 2/2

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PETRAZHITSKIY, G.B., kand.tekhn.nauk; POLEZHAYEV, V.I., inzh.

Engineering method of analyzing nonstationary processes of heat conductivity in thin multiple-layer walls. Teploenergetika 9 no.2:73-76 F '62. (MIRA 15:2)

(Heat--Conduction)

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

S/096/62/000/002/006/008
E031/E584

26 5100

AUTHORS: Petrazhitskiy, G.B., Candidate of Technical Sciences and Polezhayev, V.I., Engineer

TITLE: An engineering method of calculating the non-stationary heat conduction in thin sandwich walls

PERIODICAL: Teploenergetika, no.2, 1962, 73-76

TEXT: An absolutely stable finite difference scheme is proposed for the one-dimensional heat conduction equation in which, for given Δx, the size of the time step is only bounded by the permissible error of the approximation resulting from the replacement of the differential equation by finite difference equations. An implicit finite difference relation for the temperature on the boundary corresponding to boundary conditions of the third kind can be obtained from the equation of heat balance for a boundary layer of thickness $\Delta x/2$ calculated for the next time step. A direct method of solving the resulting system of algebraic equations is described. The method is applicable in the case of radiation from the boundaries and methods of linearising the radiative terms are discussed. In

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this case the finite difference equations are not absolutely stable. There are two figures and 8 references: 7 Soviet-bloc and 1 a Russian translation of a non-Soviet publication

/B

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

ACC NR: AT7000299 SOURCE CODE: UR/3142/60/150/007/0125/0136

AUTHOR: Petrazhitskiy, G. B.

ORG: None

TITLE: Experimental investigation of vaporization of drops at high temperatures and pressures

SOURCE: Odessa. Universitet. Trudy, v. 150. Seriya fizicheskikh nauk, no. 7, 1960. Voprosy ispareniya i goreniya v dispersnom vide (Problems of evaporation and combustion in the dispersed state), 125-136

TOPIC TAGS: vaporization, combustion chamber, liquid fuel, HIGH TEMPERATURE EFFECT, PRESSURE EFFECT

ABSTRACT: The article contains a brief description of experimental research to obtain data on vaporization of liquid drops in a stream of gas under high pressure and temperature conditions. Heat transfer and mass exchange between the drops and the gas flow were studied by vaporizing water, 96% ethyl alcohol and TS-1 fuel in a stream of air at pressures from 10 to 60 gauge atmospheres and temperatures ranging from 90 to 500°C. Water was also vaporized from the surface of a porous sphere at atmospheric pressure in a gas flow held at a constant temperature of approximately 2800°C. A detailed description is given of the experimental equipment used for producing the necessary high pressures and temperatures. The experiments were conducted by holding

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some parameters constant while varying others. The results are tabulated. These numerical data may be useful for designing combustion chambers for jet engines, as well as in many processes of the chemical and power industries. Orig. art. has: 4 figures, 8 tables.

SUB CODE: 20, 21/ SUBM DATE: None/ ORIG REF: 004

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001240

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

ACC NR: AT7000300 SOURCE CODE: UR/3142/60/150/007/0137/0160

AUTHOR: Petrazhitskiy, G. B.

ORG: None

TITLE: Use of the boundary layer method for calculating heat transfer to a drop

SOURCE: Odessa. Universitet. Trudy, v. 150. Seriya fizicheskikh nauk, no. 7, 1960. Voprosy ispareniya i goreniya v dispersnom vide (Problems of evaporation and combustion in the dispersed state), 137-160

TOPIC TAGS: boundary layer problem, laminar heat transfer, flow analysis

ABSTRACT: A method based on laminar boundary layer theory is proposed for calculating heat transfer to a drop assuming that the boundary layer on the surface of the combustion chamber in a jet engine maintains a laminar form during motion of the drop. The procedure involves exact solutions of the boundary layer equations for streams with power-law distribution of velocity in the external flow. The method may be extended to the case where the drop differs from spherical shape, as long as axial symmetry is maintained. Consideration is given to the effect which transverse flow, variations in physical constants and longitudinal pressure gradient have on the heat transfer coefficient. A comparison with theoretical data shows that the proposed method for calculating heat transfer coefficients gives somewhat overstated values for the ratio

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ACC NR: AT7000300

of the average Nusselt number on the surface of the drop to the square root of the Reynolds number for the critical point on the leading edge of the sphere. An explanation is given for this discrepancy. It is shown that the rate of drop vaporization at high flow temperatures increases with external pressure when the Reynolds number for the critical point on the leading edge of an axially symmetric drop is held constant. At the same time, the rate of vaporization becomes less dependent on temperature. Orig. art. has: 14 figures, 76 formulas.

SUB CODE: 20 / SUBM DATE: None/ ORIG REF: 010/ OTH REF: 009

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

ACC NR: AT7000301 SOURCE CODE: UR/3142/60/150/007/0161/0186

AUTHOR: Petrazhitskiy, G. B.

ORG: None

TITLE: Analysis and generalization of the results of experimental investigation of drop vaporization

SOURCE: Odessa. Universitet. Trudy, v. 150. Seriya fizicheskikh nauk, no. 7, 1960. Voprosy ispareniya i goreniya v dispersnom vide (Problems of evaporation and combustion in the dispersed state), 161-186

TOPIC TAGS: vaporization, boundary layer problem, laminar heat transfer, Reynolds number, Nusselt number, Prandtl number

ABSTRACT: Experimental data on vaporization from drops are used for derivation of molecular heat and mass transfer equations in the boundary layer in terms of the specific heat and the coefficients of thermal conductivity and diffusion at constant pressure where the average temperature of the boundary layer is taken as the controlling temperature. The coefficient of kinematic viscosity for the parameters of the oncoming flow was calculated at ambient temperature. The latent heat of vaporization and partial vapor pressure on the surface of the drop were reduced to the surface temperature. It is shown that drop temperature is strongly affected by the physical properties of the fluid, flow temperature, ambient pressure and vapor concentration

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ACC NR: AT7000301

of the given fluid in the gas surrounding the drop. The mthods of dimensional analysis are used for finding a generalized relationship for drop vaporization assuming that physical constants and experimental conditions are independent of temperature and concentration. Analysis of experimental data on water vaporization at constant temperature and pressure gives the following relationship between the Nusselt diffusion number and the Reynolds number: $Nu'=2+C\cdot Re^{0.56}$, which shows a deviation of less than 6% from the experimental data. The constant C depends on the temperature and pressure at which the experiments are conducted. The relationship between the Nusselt diffusion number, the Reynolds number and the Prandtl diffusion number for water is given by the formula: $Nu'=2+0.46\cdot Re^{0.56}\cdot Pr^{0.33}(1+\Delta p/p)$, which shows a deviation of less than 6.5% from the experimental data. The corresponding formulas for 96% ethyl alcohol and TS-1 fuel have constant coefficients of 0.39 and 0.29 respectively. The effects of flow temperature and pressure on the rate of drop vaporization are analyzed and a formula is derived for calculating the time required for total vaporization of a drop. Orig. art. has: 18 figures, 7 tables, 32 formulas.

SUB CODE: 20/ SUBM DATE: None/ ORIG REF: 009/ OTH REF: 005

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

J. PETRBOK

"The river pearl oyster in our country (Margaritana margaritifera Linne). p. 43. (CASOPIS; ODDIL PRIRODOVEDN[illegible], Vol. 121, no. 1, 1952, Prague, Czechoslovakia)

SO: Monthly List of East European Accessions, L.C., Vol. 2 No. 7, July 1953, Uncl.

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRBOK, J.

Petrbok, J. Stratigraphic chronology and fauna of Tardenoisian layers in the Macanske Vrsky highlands of the Sered area in Slovakia. p.33.

Vol. 10, no. 1, 1955 BIOLOGIA Bratislava, Czechoslovakia

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 5, No. 2 February, 1956

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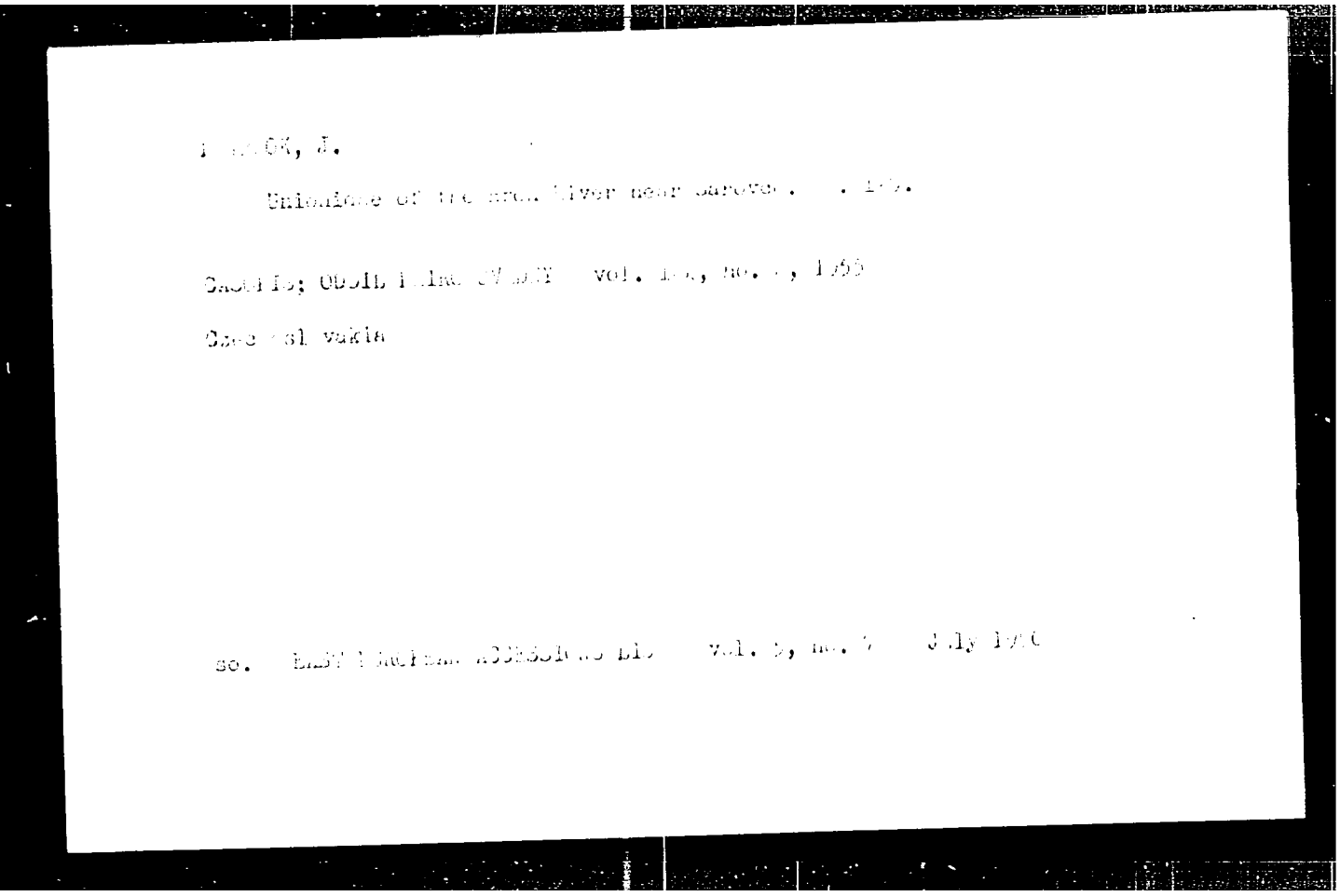

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

J. PETRBOK

"Mollusks of Prachatice and its nearest environs. p. 44. (CASOPIS; ODDIL PRIRODOVEDNY, Vol. 121, no. 1, 1952, Prague, Czechoslovakia.)

SO: Monthly List of East European Accessions, L.C., Vol. 2 No. 7, July 1953, Uncl.

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001240

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRBOK, Jaroslav

SURNAME, Given Names

Country: Czechoslovakia

Academic Degrees: /not given/

Affiliation: /not given/

Source: Prague, Casopis pro Mineralogii a Geologii, Vol VI, No 2, 1961, pp 203--206.

Data: "A Study in the Quarternary Period of the Trans-Carpathian Ukraine."

GPO 981643

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001240

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRDIK, M.

"Sintered Carbide As a Construction Material." p. 834 (STROJIRENSTVI, Vol. 3, No. 11, Nov. 1953) Praha, Czechoslovakia

SO: Monthly List of East European Accessions, Library of Congress, Vol. 3, No. 4, April 1954. Unclassified.

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

Distr: 4E2c

Preparation of sintered carbides. A. Petrilik, V. Dufek, and J. Uchytil. *Silikáty* 2, 117-21 (1958).—Two procedures (A and B) for producing sintered tungsten carbide from the same starting materials (WO_3, cobaltous formate, and C black) were compared. In A a coarser W and finer Co was used, the grinding (94% WC, 6% Co) was carried out dry (wet grinding in B), the powder was compacted under 2 tons/sq. cm. (0.25 tons/sq. cm. in B), baked for 33 min. at 600° and 33 min. at 840° (70 min. at 840° in B), heated more rapidly to the sintering temp., sintered 100 min. (35 min. in B), and cooled more rapidly to 1000–1200° than in B. The hardness, flexing strength, d., elec. resistivity, and linear contraction of the products were compared. Wet grinding and sintering according to A improved all characteristics. The flexing strength was raised by high-pressure compacting. Use of coarse-grained WC and fine-grained Co raised the product d. The quality of tools made from the product rose with a decreasing elec. resistivity. The grain size of the product was detd. by that of the WC used, but the sintering procedure A led to finer grain. A statistical analysis of the effects of the variables and their mutual interactions was presented. H. Morawitz

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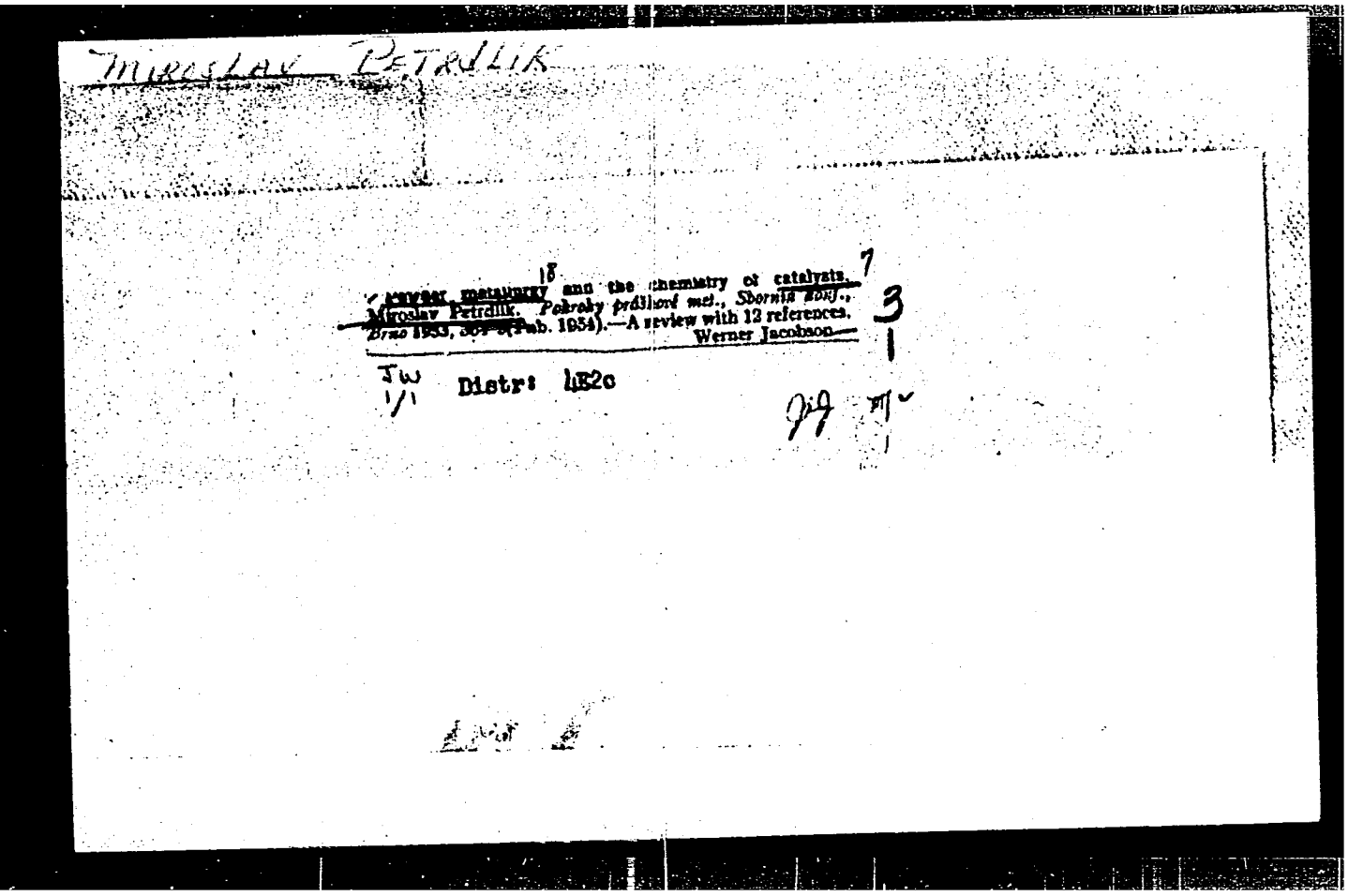

Miroslav Petrdlik

18 7

Powder metallurgy and the chemistry of catalysts. Miroslav Petrdlik. *Pokroky práškové met., Sborník konf., Brno* 1953, 36[illegible] (Pub. 1954).—A review with 12 references. Werner Jacobson

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JW
1/1

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

The importance of tantalum carbide in hard-metal production. Miroslav Petrdlík and Vladimír Dufek. *Neue Hütte* 3, 483–9(1958).—The influence of TaC on the cutting performance, flexural strength, hardness, d., resistivity, and oxidation resistance of hard metals was examd. Results showed that a 2% addn. of TaC to a WC-Co alloy made from WC powder of normal grain size (vol. 26.1 cc./100 g.) improves the cutting performance on cast iron about 10%, but reduces the flexural strength somewhat. A 4% addn. of TaC to WC-TiC-Co alloys improves the cutting performance about 20% and increases the oxidation resistance considerably, but leaves essentially unchanged the flexural strength. The use of fine-grained WC powder (vol., 42.6 cc./100 g.) in prepg. the WC-TiC-Co alloy improves the cutting performance to about the same extent as does the addn. of 4% TaC. Use of fine-grained WC powder together with 4% TaC in the alloy gives the max. cutting performance. J. G. Searles

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRDLIK, M.; DUFEK, V.

Contribution to the study of the sintering phase of cemented carbides. p. 786.

HUTNICKE LISTY. (Ministerstvo hutniho prumyslu a rudnych dolu a Ceskoslovenske vedecka technicka spolenost pro hutnictvi a slevarenstvi) Brno, Czechslovakia. Vol. 14, no. 9, Sept. 1959.

Monthly list of East European Accessions (EEAI) LC, vol. 9, no. 1, Jan. 1960.

Uncl.

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PETRDLIK, Miroslav; SHTROBL, Yaroslav [Strobl, Jaroslav]

Sintered steel alloyed with copper, nickel, and carbon.
Porosh.met. 2 no.1:88-91 Ja-F '62. (MIRA 15:8)

1. Institut poroshkovoy metallurgii, Praga.
(Powder metallurgy)

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRDLIK, Miroslav, inz.

Production of spongy iron powder from the waste pickling solutions. Hut listy 17 no.4:256-259 Ap '62.

1. Vyzkumny ustav pro praskovou metalurgii, Vestec u Prahy.

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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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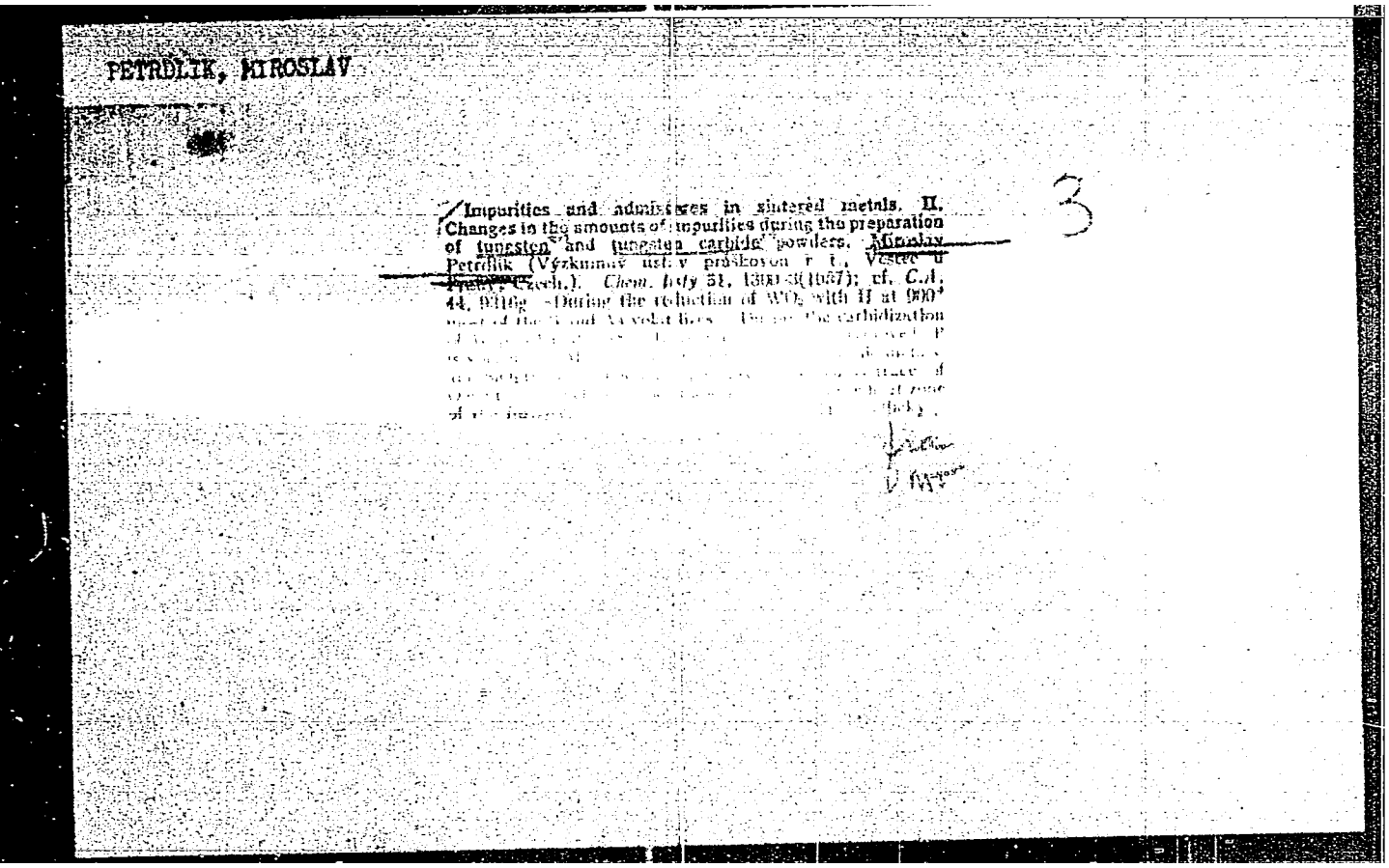

PETRDLIK, MIROSLAV

3

Impurities and admixtures in sintered metals. II. Changes in the amounts of impurities during the preparation of tungsten and tungsten carbide powders. Miroslav Petrdlik (Výzkumný ústav práškovou r. t., Vestec u Prahy, Czech.). *Chem. listy* 51, 1300-3(1957); cf. *C.A.* 44, 9316g. During the reduction of WO_3 with H at 900° most of the S and As volatilizes. During the carbidization [illegible]

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001240

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRBLIK, M.

"Lazarus Ercker of Schreckenfels."
Hutnicke Listy, Brno, Vol 9, No 5, May 1954, p. 295

SO: Eastern European Accessions List, Vol 3, No 10, Oct 1954, Lib. of Congress

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001240

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRDIK, M.

"A contribution to the theory and practice of milling metal powders in ball mills." p. 297
(Hutnicke Listy Vol. 8, no. 6, Juhe 1953. Brno.)

SO: Monthly List of East European Accessions, Vol. 3, No. 2, Library of Congress, Feb. 1954
Uncl.

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001240

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRDLIK, M.

"A Contribution to the Theory and Practice of Milling Metal Powders in Ball Mills," p. 241.
(Hutnicke Listy, Vol.8, No.5, May 1953, Brno.)

SO: Monthly List of East European Accessions, Vol.2, No.9 Library of Congress, September 1953, Uncl.

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001240

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRDLIK, M.

"Properties of Metal Powders Reduced by Hydrogen at Low Temperatures," p. 252. (Hutnicke Listy, Vol.8, No.5, May 1953, Brno.)

SO: Monthly List of Russian Accessions, East European Vol.2, No.9 Library of Congress, September 1953, Uncl.

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001240

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRDLIK, M.

Journal of the Iron and Steel Inst.
June 1954
Powder Metallurgy

Properties of Metal Powders Reduced by Means of Hydrogen at Low Temperatures. M. Petrdlik. (*Hutnicki Listy*, 1953, 8, (5), 253–254). [In Czech]. Cobalt, iron, and copper powders formed by reduction in hydrogen at comparatively low temperatures were found to have good sintering properties. Higher oxygen contents, resulting from low-temperature reduction, did not affect sintering adversely under certain conditions.—P. P.

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRDLIK, M.
PETRDLIK

Journal of the Iron and Steel Inst.
June 1954
Powder Metallurgy

Contribution to the Theory and Practice of Grinding Metal Powders in Ball Mills. M. Petrdlik. (*Hutnicki Listy*, 1953, 8, (5), 241-248; (6), 297-301). [In Czech]. The development of ball mills for the production of metal powders, and the theory and practice of grinding powders are discussed.

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PETRDLIK, MIROSLAV

CZECH

*Properties of Metal [Cobalt, Copper, and Iron] Powders Reduced by Hydrogen at Low Temperatures. Miroslav Petrdlik. *Hutnicke Listy*, 1953, 8, 252-254; *C. Abs.*, 1955, 49, 2907.—[In Czech]. P. obtained powdered Co, Cu, and Fe by H reduction of Co formate and oxide, Cu citrate, &c. The powder obtained was subjected to a pressure of 4 tons/cm.^{2} and sintered for 1 hr. as follows: Co at 1000°, Cu at 850°, and Fe at 1100° C. Best results were obtained when reduction was carried out at low temp. When the reduction temp. was too high, the particles increased in size owing to condensation and their surface smoothed out owing to self-diffusion; this, in turn, decreased the rate of sintering. Reduction to Co was carried out at 300°–900° C.; reduction at 300° C. resulted in Vickers hardness of the product of 199 (from Co formate) and 284 (from Co oxide) and reduction at 700° C. resulted in a hardness of 68. Reduction to Cu was effected at 450°–800° C. Although the powder obtained at 450° C. contained 3·86% O and at 800° 0·03%, the sinterability of the powdered Cu was highest when reduction was carried out at, or only slightly above, 450° C. The same applied to Co and Fe. As to the C content, P. found that the lower the reduction temp., the greater the C content in the final product (C originated from the organic salts); e.g. the product obtained from Cu reduced at 450° and 700° C. contained C 1·23 and 0·01%, resp.

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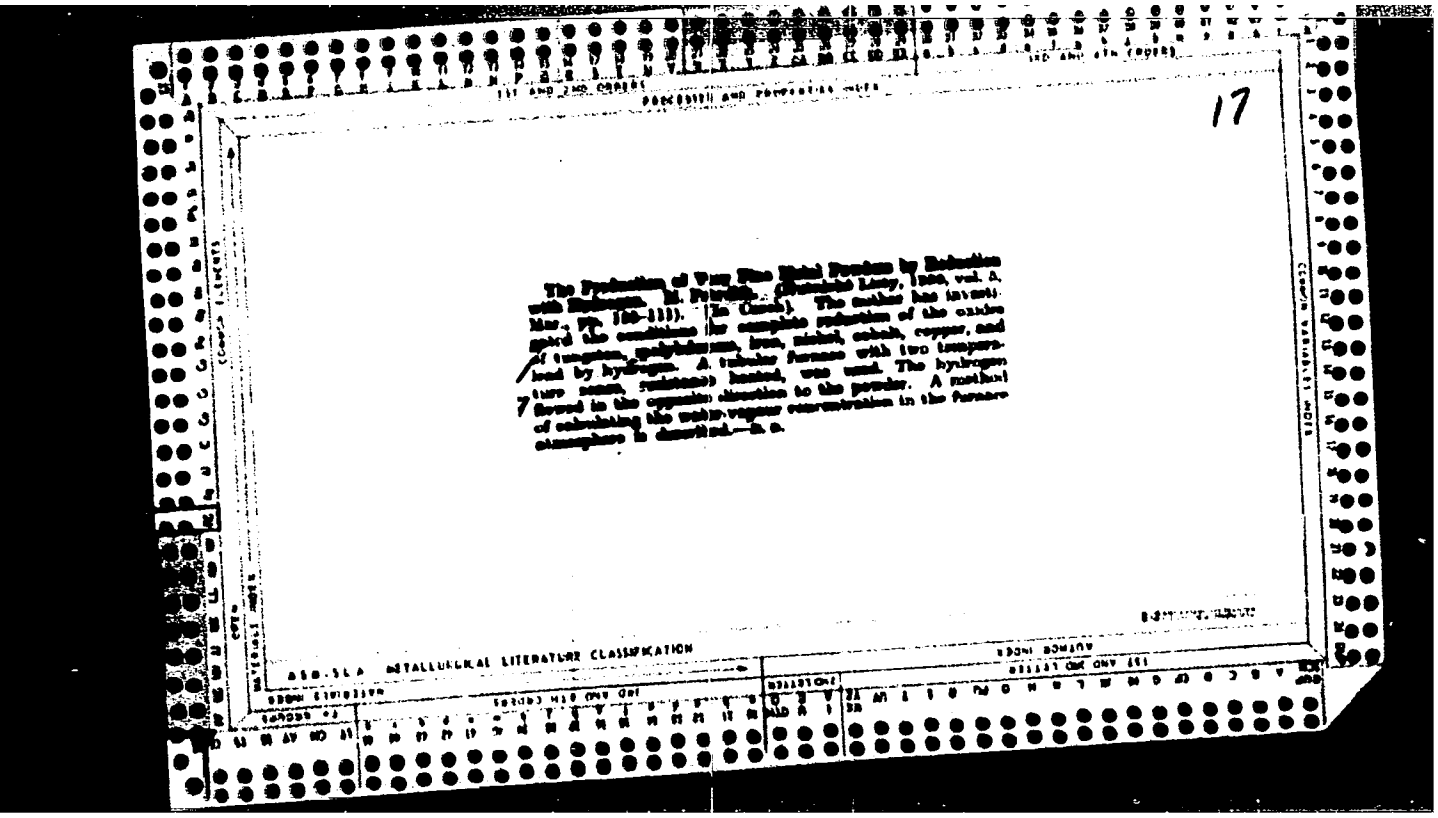

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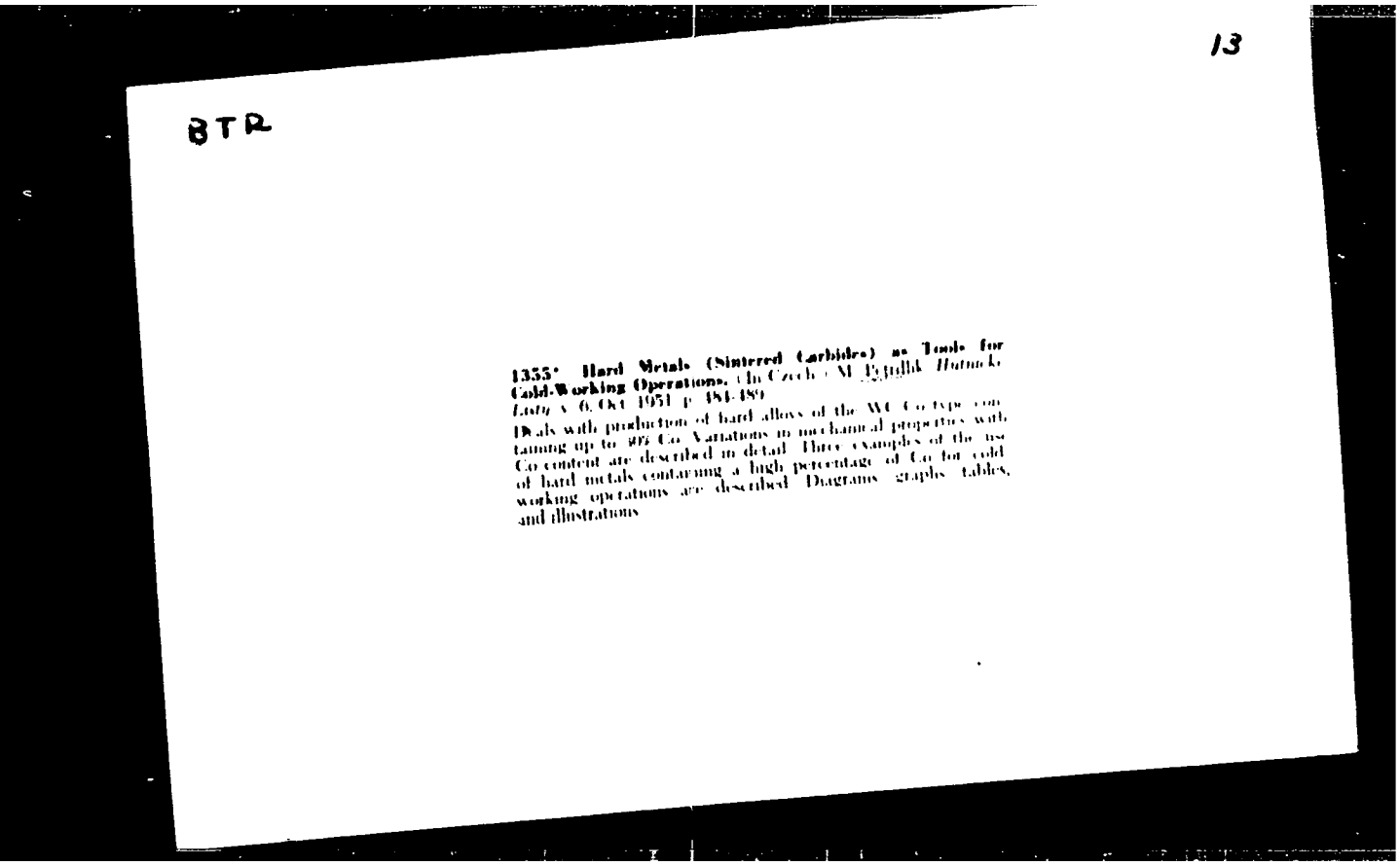

13

BTR

1355* **Hard Metals (Sintered Carbides) as Tools for Cold-Working Operations.** (In Czech.) M. Pytlík. *Hutnické Listy*, v. 6, Oct. 1951, p. 484-489.

Deals with production of hard alloys of the WC-Co type containing up to 40% Co. Variations in mechanical properties with Co content are described in detail. Three examples of the use of hard metals containing a high percentage of Co for cold working operations are described. Diagrams, graphs, tables, and illustrations.

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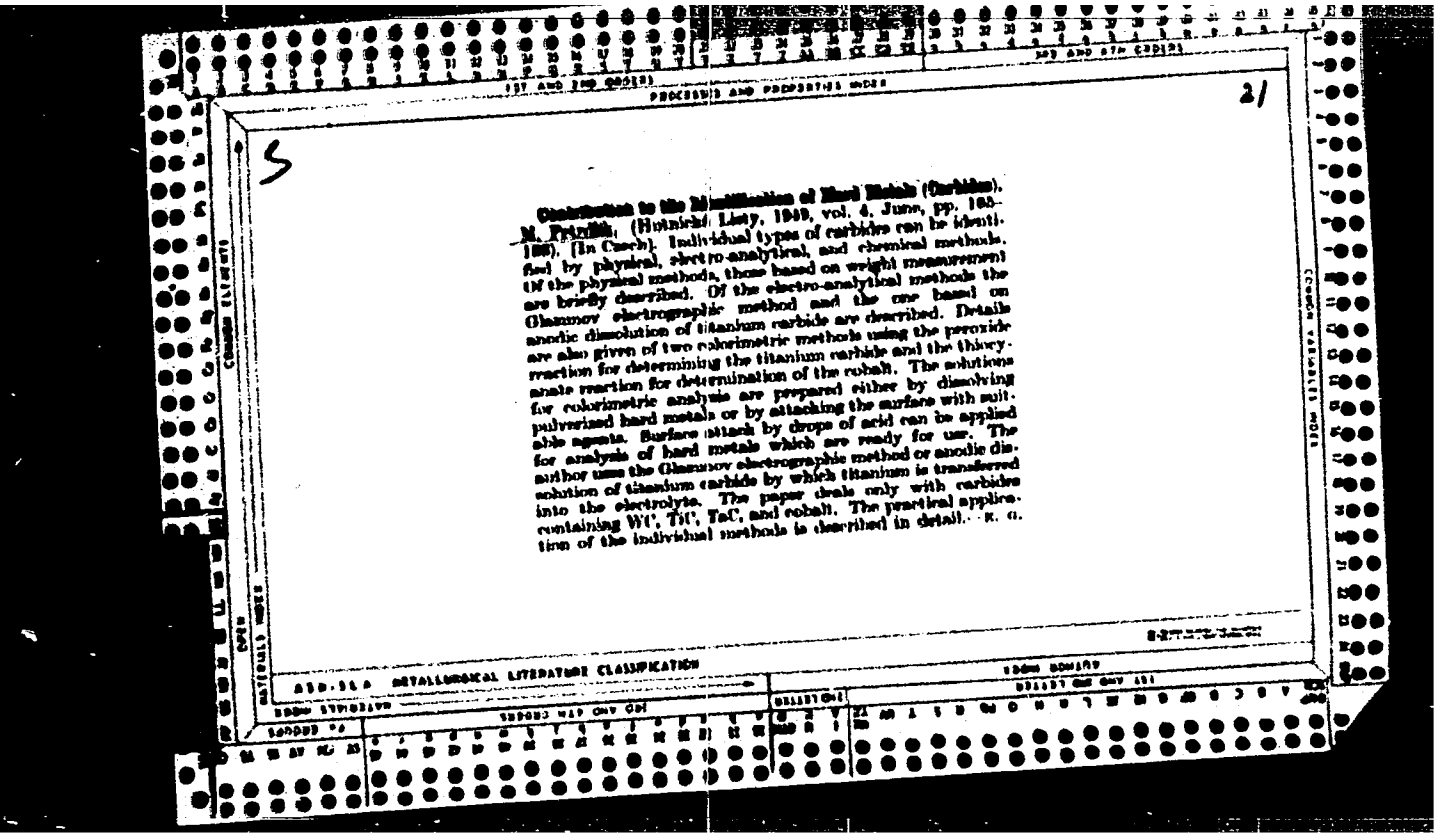
1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

21

S



Contribution to the Identification of Hard Metals (Carbides).
M. Petrdlik. (Hutnické Listy, 1949, vol. 4, June, pp. 185-188). [In Czech]. Individual types of carbides can be identified by physical, electro-analytical, and chemical methods. Of the physical methods, those based on weight measurement are briefly described. Of the electro-analytical methods the Glazunov electrographic method and the one based on anodic dissolution of titanium carbide are described. Details are also given of two colorimetric methods using the peroxide reaction for determining the titanium carbide and the thiocyanate reaction for determination of the cobalt. The solutions for colorimetric analysis are prepared either by dissolving pulverized hard metals or by attacking the surface with suitable agents. Surface attack by drops of acid can be applied for analysis of hard metals which are ready for use. The author uses the Glazunov electrographic method or anodic dissolution of titanium carbide by which titanium is transferred into the electrolyte. The paper deals only with carbides containing WC, TiC, TaC, and cobalt. The practical application of the individual methods is described in detail.—K. G.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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Met. Rev.
1952

Q - Mechanical Properties
and Test Methods:
Deformation

121-Q. **Hard Metals (Sintered Carbides) as Tools for Cold Working Operations.** (In Czech.) M. Petrdlik. *Hutnické Listy*, v. 6, Oct. 1951, p. 434-439.

Production of hard alloys of the WC-Co type containing up to 30% Co. Variations in mechanical properties with Co content. Three examples of the use of hard metals containing a high percentage of Co for cold working operations. Diagrams, graphs, tables, and illustrations. (Q general, T5, C-n)

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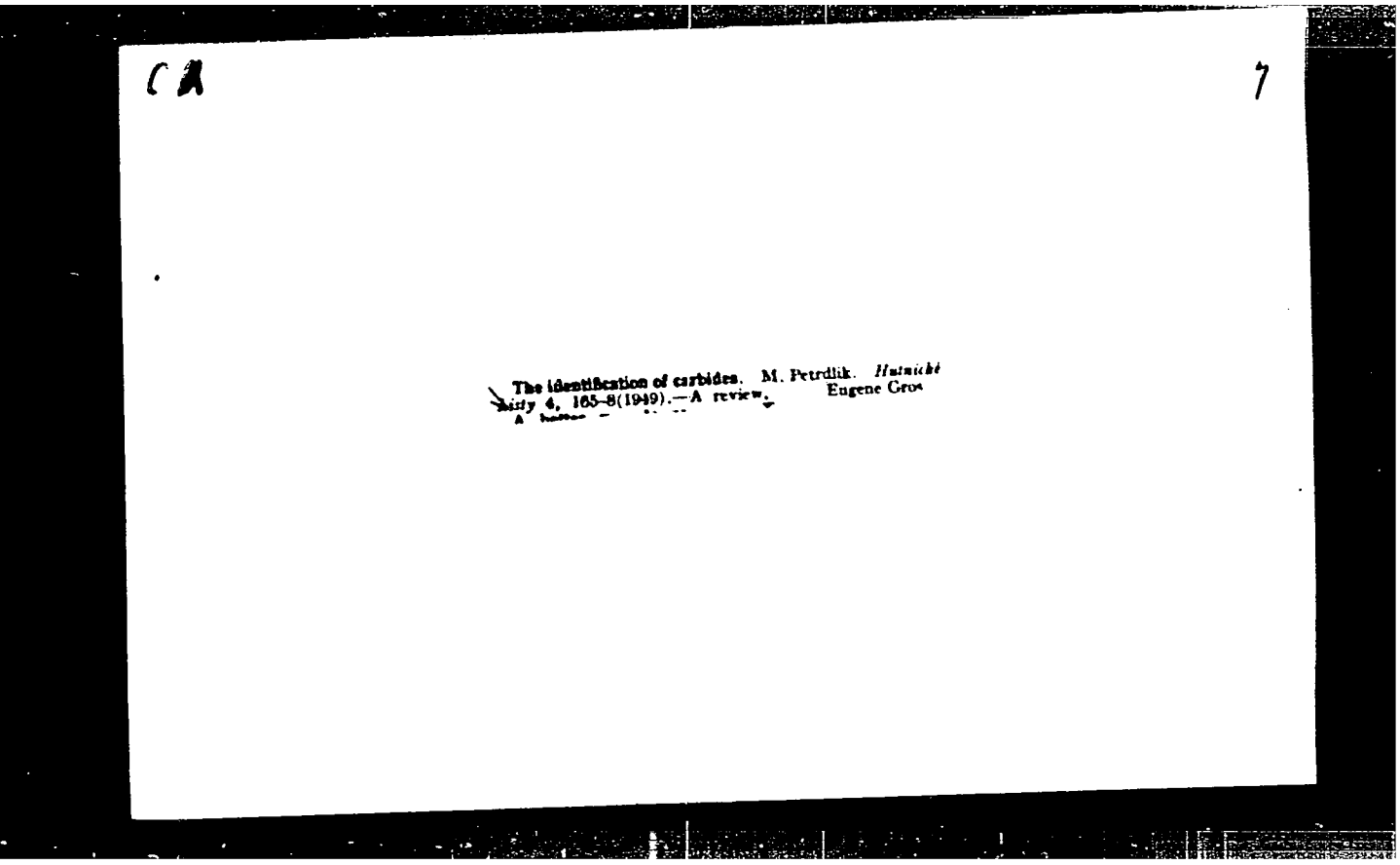

CA 7

The identification of carbides. M. Petrdlik. *Hutnické listy* 4, 165–8(1949).—A review. Eugene Gros

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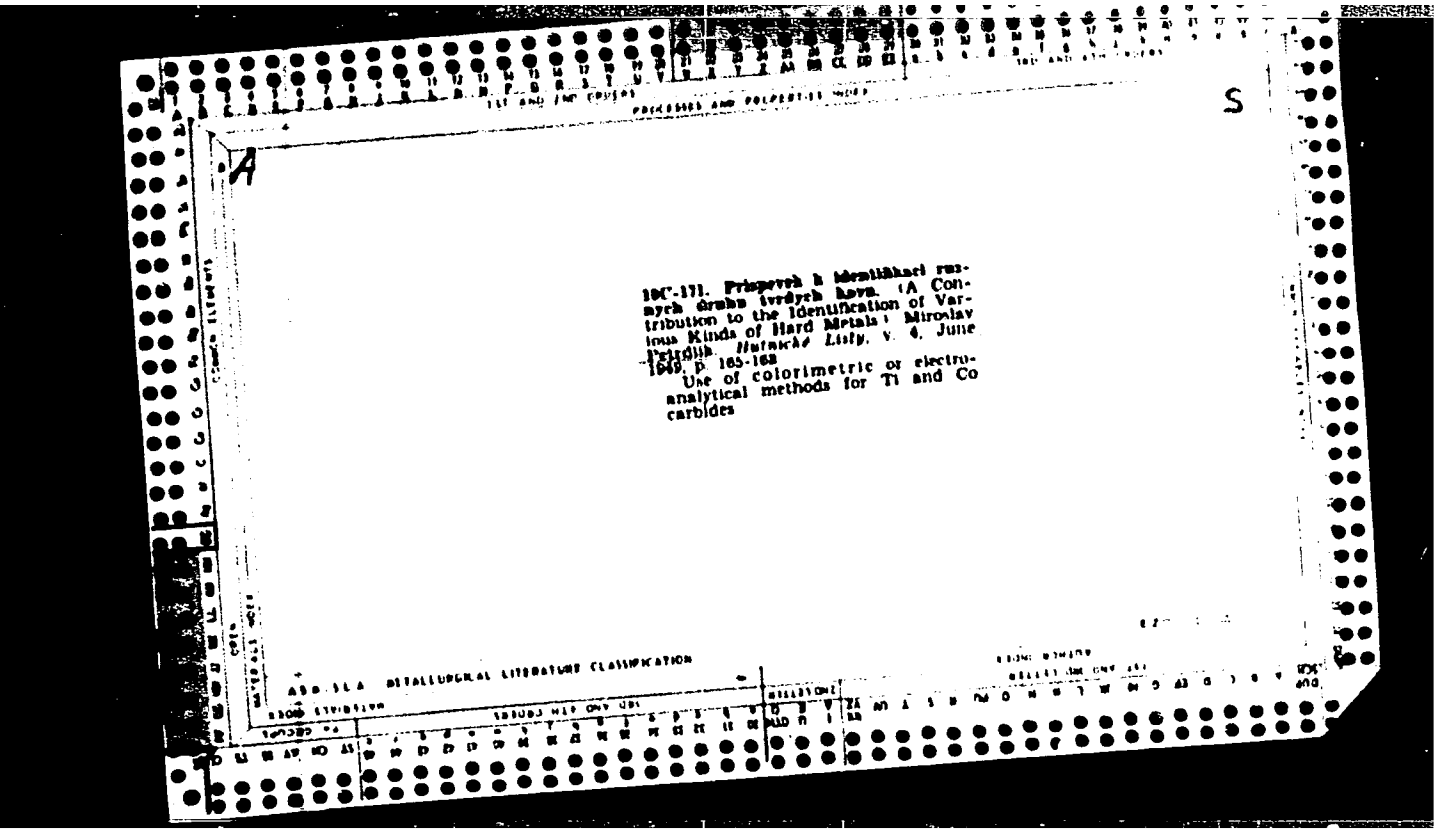

PROCESSES AND PROPERTIES INDEX

A

S

10C-171. Prispevek k identifikaci ruznych druhu tvrdych kovu. (A Contribution to the Identification of Various Kinds of Hard Metals.) Miroslav Petrdlik. *Hutnické Listy*, v. 4, June 1949, p. 165-168

Use of colorimetric or electroanalytical methods for Ti and Co carbides

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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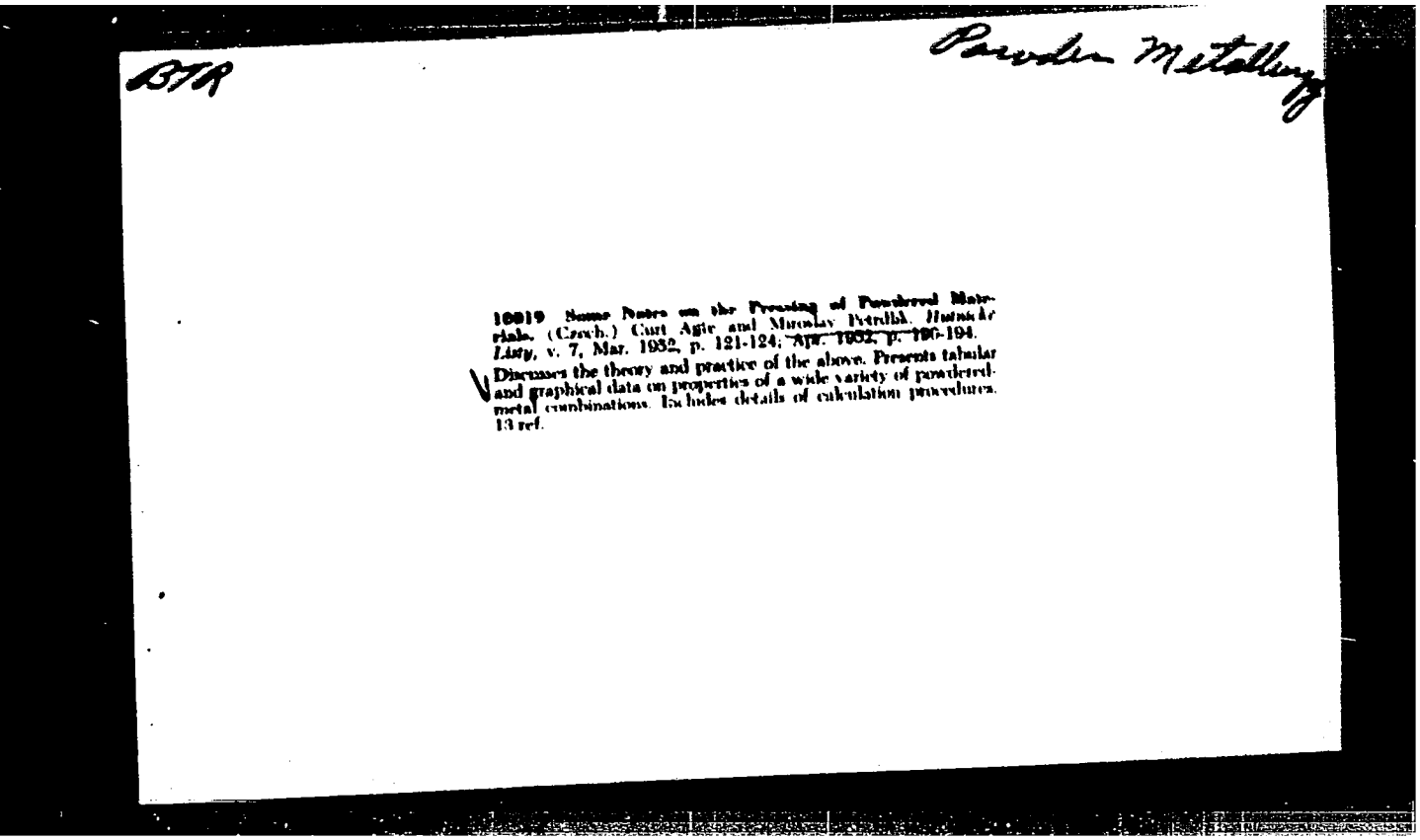

BTR

Powder Metallurgy

10819 Some Notes on the Pressing of Powdered Materials. (Czech.) Curt Agte and Miroslav Petrlik. *Hutnické Listy*, v. 7, Mar. 1952, p. 121-124; Apr. 1952, p. 190-194.

Discusses the theory and practice of the above. Presents tabular and graphical data on properties of a wide variety of powdered-metal combinations. Includes details of calculation procedures. 13 ref.

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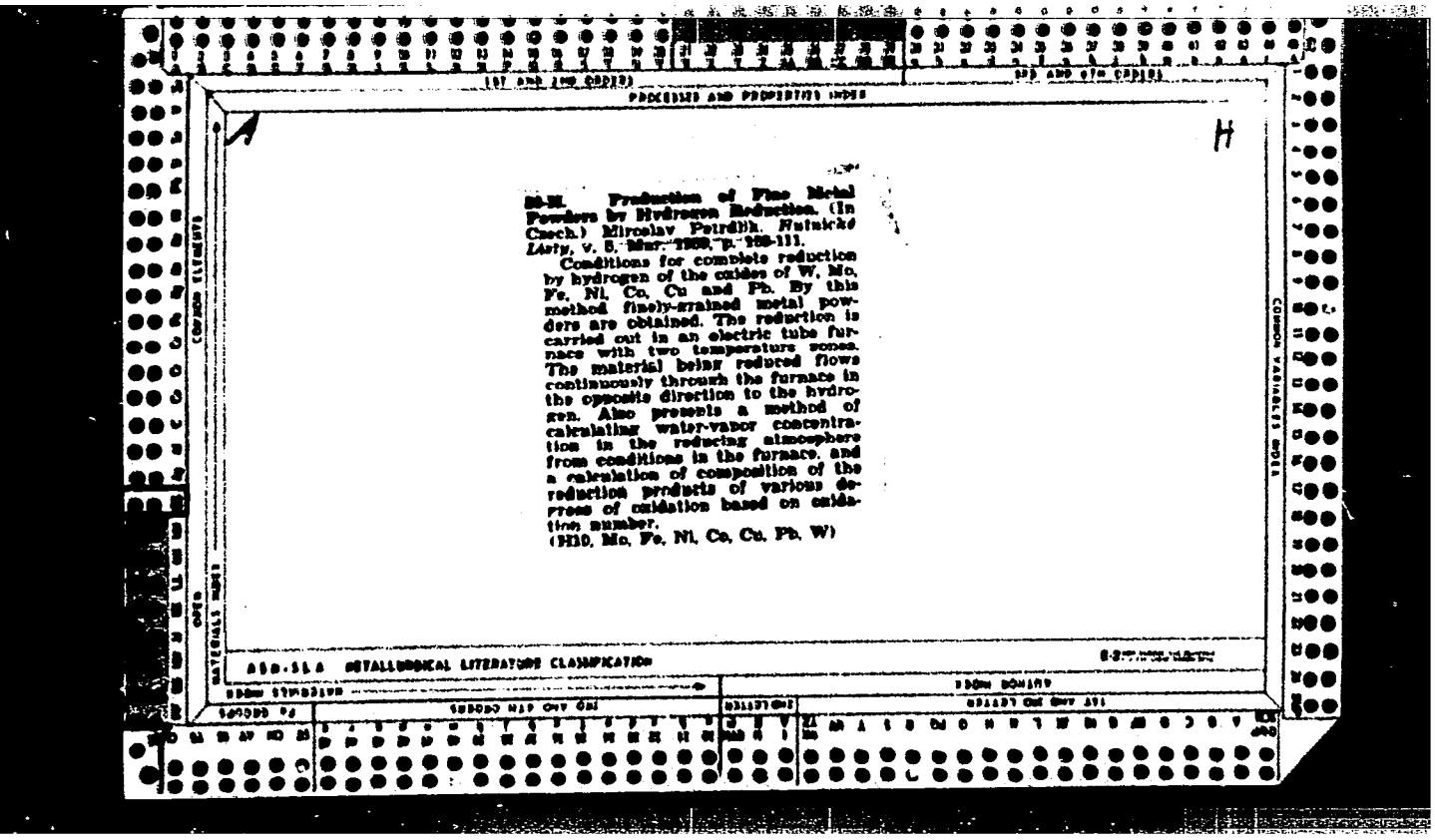

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

A

H

[illegible]. Production of Fine Metal Powders by Hydrogen Reduction. (In Czech.) Miroslav Petrdlik. *Hutnické Listy*, v. 5, Mar. [illegible], p. [illegible]-111.

Conditions for complete reduction by hydrogen of the oxides of W, Mo, Fe, Ni, Co, Cu and Pb. By this method finely-grained metal powders are obtained. The reduction is carried out in an electric tube furnace with two temperature zones. The material being reduced flows continuously through the furnace in the opposite direction to the hydrogen. Also presents a method of calculating water-vapor concentration in the reducing atmosphere from conditions in the furnace, and a calculation of composition of the reduction products of various degrees of oxidation based on oxidation number.

(H10, Mo, Fe, Ni, Co, Cu, Pb, W)

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

COMMON ELEMENTS

COMMON VARIABLES INDEX

MATERIALS INDEX

AUTHOR INDEX

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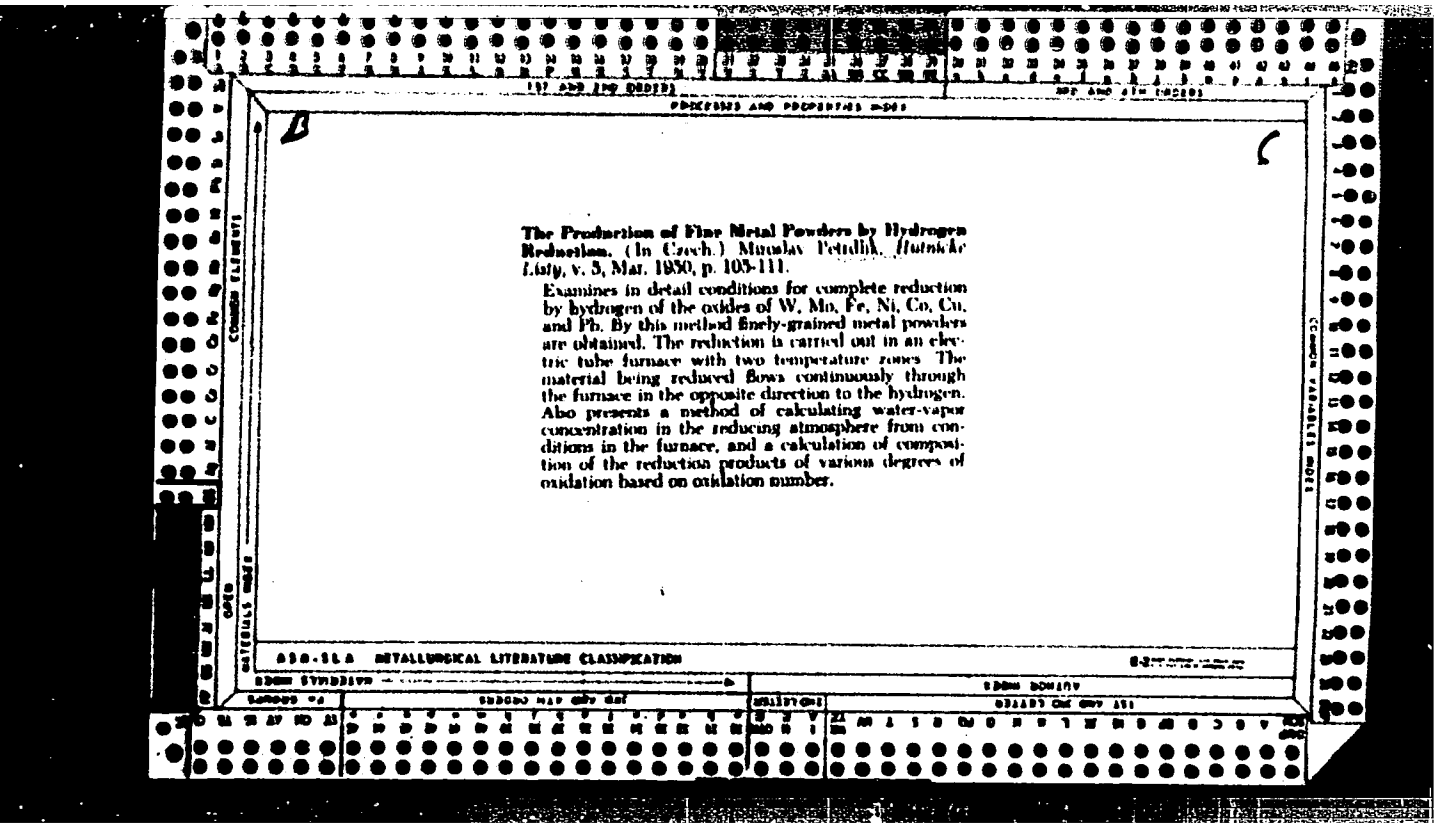

The Production of Fine Metal Powders by Hydrogen Reduction. (In Czech.) Miroslav Petrdlík. *Hutnické Listy*, v. 5, Mar. 1950, p. 103-111.

Examines in detail conditions for complete reduction by hydrogen of the oxides of W, Mo, Fe, Ni, Co, Cu, and Pb. By this method finely-grained metal powders are obtained. The reduction is carried out in an electric tube furnace with two temperature zones. The material being reduced flows continuously through the furnace in the opposite direction to the hydrogen. Also presents a method of calculating water-vapor concentration in the reducing atmosphere from conditions in the furnace, and a calculation of composition of the reduction products of various degrees of oxidation based on oxidation number.

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CA

The production of very fine grain metal powders by reduction with hydrogen. Miroslav Petrdlik (Děčín, Czech.). *Hutnické Listy* 5, 105-10([redacted], 110-11) (1950).—P. has investigated the conditions for complete reduction of the oxides of W, Mo, Fe, Ni, Co, Cu, and Pb by H. It is possible by this method to obtain metal powders of very fine grain sizes. A tubular furnace with 2 temp. zones, heated electrically by resistance spirals, was used. The material to be reduced was passed through the furnace in an opposite direction to that of the flow of the reducing H. A description is given of a method of calcg. the water vapor concn., based on the actual conditions prevailing in the continuously working furnace, and of a method of calcg. the compn. of the intermediary reduction products for various degrees of oxidation, based on the oxidation no. The paper also gives information on the influence of all factors on the reduction of W oxide in a continuously working tubular lab. furnace. The test equipment and test conditions are fully described, and the results are plotted and tabulated. H. Gross

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRDLIK, Miroslav, inz.; BORN, Milan, inz.

Effect of impurities in sintered steel. Hut listy 19 no. 6:413-420 Je '64.

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

KUBELIK, J.; PETRDLIK, M.

The problem of iron dust production in Czechoslovakia; discussion.
Hut listy 16 no.6:429 Je '61.

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRDLIK, M.; DUFEK, V.; UCHYTIL, J.

"Selection of the most suitable technology of sintered G_1 carbides from technological processes applied in two plants. p. 197."

SILIKATY. Praha, Czechoslovakia. Vol. 2, no. 3, 1958,

Monthly list of East European Accessions (EEAI), LC, Vol. 8, No.6 , Jun 59, Unclas.

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

CZECH/34-59-9-8/22

AUTHORS: Petrdlík, Miroslav, Engineer and Dufek, Vladimir, Engineer

TITLE: Contribution to the Study of the Sintering Phase of Cemented Carbides

PERIODICAL: Hutnické listy, 1959, Nr 9, pp 786-790

ABSTRACT: In this preliminary report the authors describe the used method of studying the sintering phase and the influence of this phase on the final properties of the cemented materials used in the experiments. A certain disadvantage of this process is the fact that the sintering phase is studied in an isolated form without the presence of the main carbide framework which could be produced by a somewhat different method of crystallization and which would quite definitely manifest itself in the final properties of the cemented carbide components. Therefore, the arrived at conclusions should be verified on sintered carbides produced by ordinary methods using sintering media which proved most suitable in the here described tests. In these, the authors investigated the properties of an "artificial sintering substance", i.e. a fused cobalt alloy, the composition of which was chosen to correspond with the ideas of the author on the

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Contribution to the Study of the Sintering Phase of Cemented Carbides

desired composition of the sintering phase in sintered carbides currently used in machining and fabricating. Such tests can also be applied for studying the effect of certain additional carbide admixtures, which have a pronounced influence on the properties of the sintering phase. As examples, the authors describe the application of this method to the study of crystallization of Co-WC systems with various CO/WC ratios (50, 33, 45% WC) and Co-WC systems, some containing additionally TiC, TaC, Cr_3C_2 and VC. On the basis of the obtained results, the authors conclude that the composition and the crystallization of the sintering phase cannot be allowed to be governed by random manufacturing conditions and that it is necessary to study systematically the phenomena occurring in these three ranges, which are diagrammatically outlined in Fig 10, p 789. This is a sketch representing the crystallization of the sintering phase in the cavity of a carbide and consists of intrazonal, monozonal and polyzonal ranges of crystallization. The authors believe

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Contribution to the Study of the Sintering Phase of Cemented Carbides

that systematic study of the relevant phenomena could lead to a substantial improvement in the properties of commercially important cemented carbides, to advantages in alloying with substances which dissolve in the sintering phase, thereby ensuring better mechanical properties. That success can be achieved in this way is proved by the favourable results obtained with the Czech produced universal sintered carbide, which is alloyed with a small quantity of Cr_3C_2 which, during the process of sintering, passes into the cobalt sintering phase. There are 11 figures (including 10 microphotographs), 2 tables and 36 references, 12 of which are Czech, 9 German, 8 Soviet and 7 English.

ASSOCIATION: Výzkumný ústav pro práškovou metalurgii, Vestec u Prahy (Research Institute for Powder Metallurgy, Vestec, Nr Prague)

SUBMITTED: January 13, 1959

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001240

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRDLIK, M.

"Impurities and admixtures in sintered metals, II Changes in the amounts of impurities during the preparation of tungsten and tungsten carbide powders. p. 1300"

P. 1300 (Chemicke Listy, Vol. 51, no. 7, July 1957, Praha, Czechoslovakia)

Monthly Index of East European Accessions (EEAI) LC, Vol. 7, No. 7, July 1958

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRDLIK, M

CZECHOSLOVAKIA / Chemical Technology, Chemical Products and Their Application, Part 2. - Elements, Oxides, Mineral Acids, Bases, Salts. - Other Elements, Oxides, Mineral Acids, Bases, Salts. H

Abs Jour: Ref Zhur-Khimiya, No 18, 1958, 61503.

Author : Miroslav Petrdlik.
Inst. : Not given.
Title : Impurities and Admixtures in Sintered Metals. I. Changes of Impurity Contents at Preparation of Tungsten and Tungsten-Carbide Powders.

Orig Pub: Chem. listy, 1957, 51, No 7, 1300 - 1303.

Abstract: The author studied the behavior of some impurities (Na_2O, MgO, CaO, SiO_2, Fe_2O_3, Sn, S, P and As) at the reduction of WO_3 with hydrogen at the temperature of about 900° and found that the major part of S and As present as im-

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CZECHOSLOVAKIA / Chemical Technology, Chemical Products and Their Application, Part 2. - Elements, Oxides, Mineral Acids, Bases, Salts. - Other Elements, Oxides, Mineral Acids, Bases, Salts. H

Abs Jour: Ref Zhur-Khimiya, No 18, 1958, 61503.

Abstract: purities evaporates at that occasion. Other admixtures, viz. P, SiO_2, MgO and CaO, evaporate at the temperature of about 1500°, when tungsten powder converts into tungsten carbide during the process of carbide formation. The oxides of alkali-earth methals are reduced to metals by carbon or tungsten carbide at the carbide formation; SiO_2 is reduced to SiO. These substances (admixtures), which are volatile at the carbide formation temperatures, escape from the product. They get into contact with the traces of O_2 in the electrolytic hydrogen (pro-

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

CZECHOSLOVAKIA / Chemical Technology, Chemical Products and Their Application, Part 2. - Elements, Oxides, Mineral Acids, Bases, Salts. - Other Elements, Oxides, Mineral Acids, Bases, Salts. H

Abs Jour: Ref Zhur-Khimiya, No 18, 1958, 61503.

Abstract: ducing the protective atmosphere), oxidize again, and settle in the fire zone of the furnace, where they produce the so-called veils. The reaction conditions and a table showing the admixture contents before the reaction, after the reduction and after the carbide formation are presented. (Part I: Petrdlik M. Sbornik vyzkumnych praci ministerstva huti a dolu. SNTL, Praha 1957).

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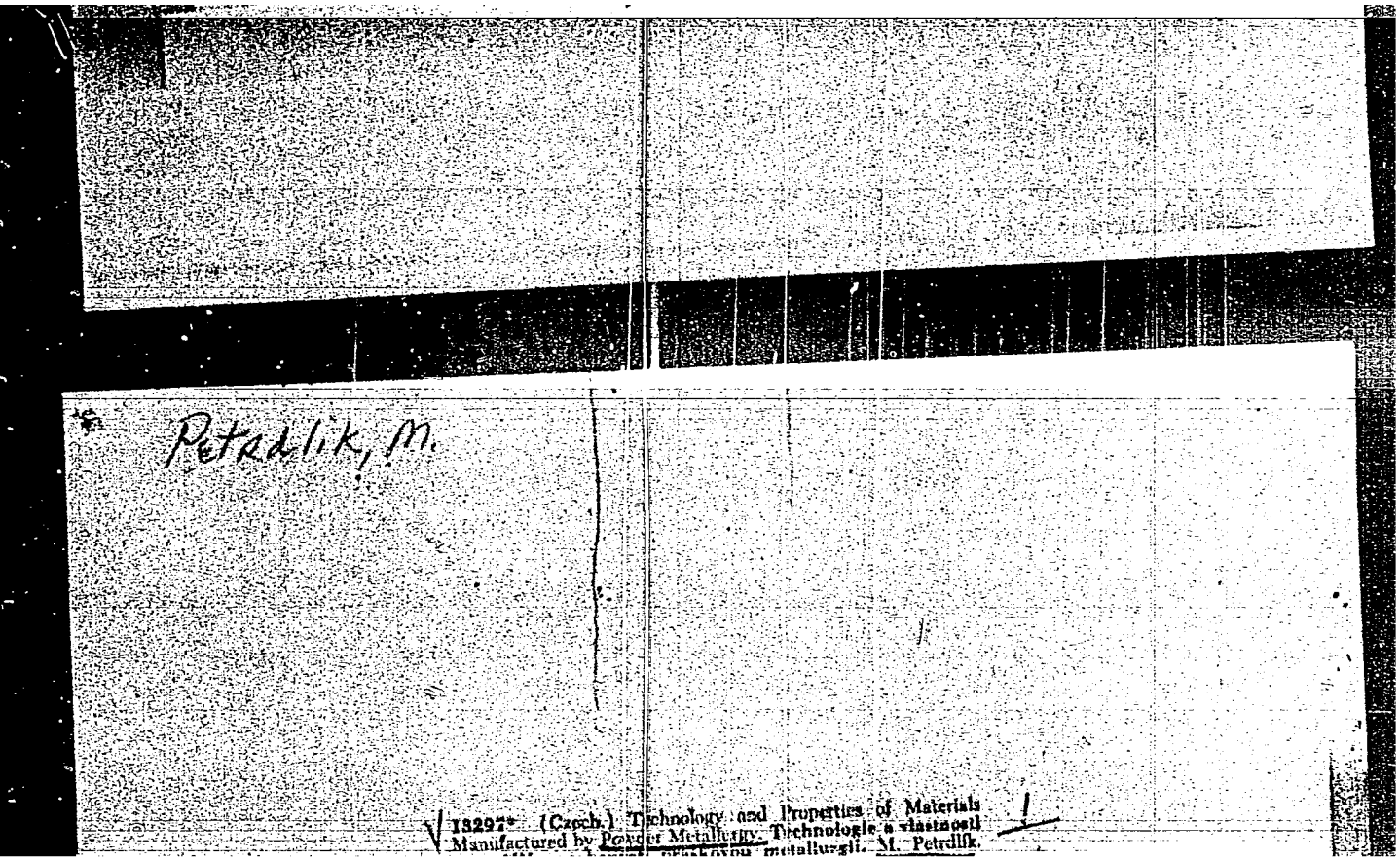

Petrdlik, M.

13297* (Czech.) Technology and Properties of Materials Manufactured by Powder Metallurgy. Technologie a vlastnosti [illegible] metalurgii. M. Petrdlik.

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRDLIK, M.

Theoretical studies on the pressing of powdered metals according to M.I. Balshin. p. 17.
SOVETSKA VEDA: HUTNICTVI, Prague, Vol. 3, no. 1, 1954.

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 5, No. 6, June 1956. Unclas.

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRDLIK, M.

Dufek, V. Effect of carbon on the quality of carbides sintered by the WC-Co system. p. 528.
HUTNICKE LISTY, Brno, Vol. 10, no. 9, Sept. 1955.

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 5, No. 6 June 1956, Uncl.

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRENCHUK, O. P.

AUTHOR: Gayevskaya, G. N.

50-2-22/22

TITLE: Conference of Young Experts of the Main Geophysical Observatory imeni A. I. Voyeykov (Konferentsiya molodykh spetsialistov Glavnoy geofizicheskoy observatorii im. A. I. Voyeykova)

PERIODICAL: Meteorologiya i Gidrologiya, 1958, Nr 2, pp. 61-61 (USSR)

ABSTRACT: This conference took place from October 28th - 29th, 1957; assistants of the Leningrad University, of the Arctic Scientific Research Institute, of the All-Soviet Institute for Plant Breeding and others took part in it. Lectures were held by young scientists of the conference. A. S. Grigor'yeva's lecture on "the Horizontal Synchronizing Pulse in the Atmosphere" dealt with the computation of the atmospheric coefficient on various isobar surfaces with reference to the air current.
L. P. Spirina's lecture dealt with the forecasts of the monthly temperature anomalies with reference to the inertia laws. N. A. Timofeyev reported on the calculations of show melting. On the strength of the known laws by Prandtl and of the stage law by D. L. Laykhtman, a formula for the

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computation of the heat-exchange between snow surface and atmosphere with reference to thermal layer formations was obtained and the computation nomographs were represented.

The lecture of Petrenchuk, O. P. "The Frontal Structure of Anticyclones" dealt in detail with the structure of mobile and steady anticyclones as well as with the structure of the troposphere above these. O. I. Golikova reported on the measurement of spectral coefficients of brightness on laboratory conditions.
Mrs. O. I. Golikova ("The Earth Radiation Meter with Wind Shield Filter") and E. I. Gulyayev ("Methods of Observation of the Plant-Physiolcgical Radiation") reported on the development of new actinometric apparatus and the perfection of the existing devices. A method for the detection of the radiation balance according to certain measured values of the summary radiation was suggested by L. N. D'yachenko in his lecture "On the Connection between the Radiation balance and the Total Radiation".
R. L. Kagan reported on a better approximated solution of the equation of the light dispersion according to the method of

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1.1600

S/226/62/000/001/013/014
I003/1201

Authors: Petrdlik, Miroslav and Shtrobl, Yaroslav.

Title: SINTERED STEEL ALLOYED WITH COPPER, NICKEL AND CARBON.

Periodical: *Poroshkovaya metallurgiya*, no. 1(7), 1962, 88-92

Text: The authors studied the effect of the addition of nickel, copper and carbon powders to steel powder on the properties of the resulting sintered alloy. The effect of various alloying elements is shown on a three-dimensional diagram representing the dependence of tensile strength and hardness of the sintered alloys on their content of alloying elements. The addition of nickel raises the strength of sintered steel, especially in the presence of copper. A metallographic investigation showed that the structure of these alloys consisted chiefly of ferritic grains. The addition of copper inhibits the grain growth of ferritic grains and promotes the growth of the iron-nickel phase. There are 2 diagrams, 3 micro-photographs and 1 table. Ref. includes no 7 S. R. Crooks, Metal Progress, 74, 6, 68, 1958.

Association: Institut poroshkovoy metalurgii, Praga (Institute of Powder Metallurgy, Prague).

Submitted: August 20, 1961

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1.1600 1908, 1454 Z/013/60/000/002/001/001
9.2150 D007/D102

AUTHORS: Dufek, Vl., Engineer, and Petrdlík, M., Engineer

TITLE: Hot-pressed semiconductive ignitron ignitors

PERIODICAL: Sklář a keramik, no. 2, 1960, 44 and 46

TEXT: The article describes a method of boron carbide ignitron ignitors production which combines pressing of the powered semiconductive material, and subsequent firing in a non-oxidizing medium, with simultaneous bonding of the ceramic body to the metal stem. This pressure-sintering, or hot-pressing method, so far only seldom used in the ČSSR, was applied by the Výzkumný ústav pro práškovou metalurgii (Research Institute for Powder Metallurgy) in Vestec to the production of an ignitron to be installed in an electronic welding apparatus developed by the Výzkumný ústav zváračský (Welding Research Institute) in Bratislava. The boron carbide ignitor (Fig. 1) consists of a ceramic body which extends into a mercury pool and a molybdenum stem for current admission. In production tests, the two conventional methods, i. e., pressing and firing, were combined into

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Hot-pressed semiconductive...

a single process by using a resistance-heated graphite die (Fig. 2). The heating current was applied to the graphite electrodes of the die thru water-cooled copper terminals from a 15 kVA variable-voltage transformer, with the secondary voltage adjustable in 0.1 V intervals within a range of 3 - 12 V. The boron carbide body was heated and simultaneously pressed by a double-sided hydraulic press, with the pressure applied to both the male and female dies. To avoid short circuits within the press frame, at least one die must be insulated by a porcelain plate. The temperature of the graphite die was measured externally with an optical pyrometer. When the desired temperature was reached, it was kept constant within $\pm$ 5°C for a certain time by adjusting the transformer voltage. After this time, the current was cut-off and the pressure released. The sample was left in the die to cool off. As the last operation of the pressing process, the pressure on the female die was increased to achieve a complete filling of the die cavity resulting in a perfect shape of the ceramic body requiring no additional grinding. Temperatures of 2,500°C and more can be achieved with the equipment used, but pres-

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Hot-pressed semiconductive...

sures are limited by the strength of the graphite dies and should not exceed 150 kg/cm^2 at surfaces perpendicular to the pressing direction. Pressures were precisely measured with gages installed on both cylinders. Production tests were performed with semiconducting materials containing boron carbide (of East-German and Soviet origin, both of similar quality) mixed with aluminum silicate $Al_2O_3 \cdot 3SiO_2$ (a product of Merck). Optimum composition was found to be 55% B_4C, 35 - 40% $Al_2O_3 \cdot 3SiO_2$, and 5 - 10% ZrO_2; optimum sintering temperature (measured on the surface of the graphite die) was 1,320 - 1,340°C to be maintained for 2 minutes. To test the quality of the ignitors, ignitrons were ignited by the discharge of a 1 microfarad capacitor, and the adequacy of ignitors for use with ignitrons was established by measuring the dependence of ignition voltage on electrode immersion in mercury. The regularity of ignition was checked by comparison on an oscillograph. The ignition voltage, adjusted to the limit of dependable ignition at each immersion, was measured with a peak voltmeter. Measuring data, as

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Hot-pressed semiconductive...

obtained with these ignitrons, are listed in Table II. The properties of the Czechoslovak ignitrons are similar to those of a Phillips ignitron. In conclusion, the author states that pressure sintering proved a suitable method of producing intricate ceramic bodies. The products proved successful in tests and enabled the building of an operational, all-metal welder ignitron at the VÚS in Bratislava. There are 3 figures, 2 tables and 2 references: one from the Soviet bloc. The reference to the English-language publication reads as follows: USA, pat. 2, 456.891, December 1948.

ASSOCIATION: Výzkumný ústav pro práškovou metalurgii, Vestec
(Research Institute for Powder Metallurgy, Vestec).

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PETRDLIK, M.

PETRDLIK, M. Technology and properties of materials manufactured by power metallurgy. p. 101

Vol. 4, no. 3, Mar. 1956
STROJIRENSKA VYROBA
TECHNOLOGY
Praha, Czechoslovakia

So: East European Accession Vol. 6, no. 2, 1957

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001240

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRDLIK, M.

Powder metallurgy and the production of metal powder in the people's democratic countries. p. 438. (TECHNICKA PRACA, Vol. 8, No. 11, Nov 1956, Bratislava, Czechoslovakia)

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

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001240

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRDLIK, M.; DUFEK, V.; HRUSKA, J.

Optimum speed of heating and cooling in sintering hard WC-TiC-(TaC)-Co alloys. p. 617. (HUTNICKE LISTY, Vol. 12, No. 7, July 1957, Brno, Czechoslovakia)

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

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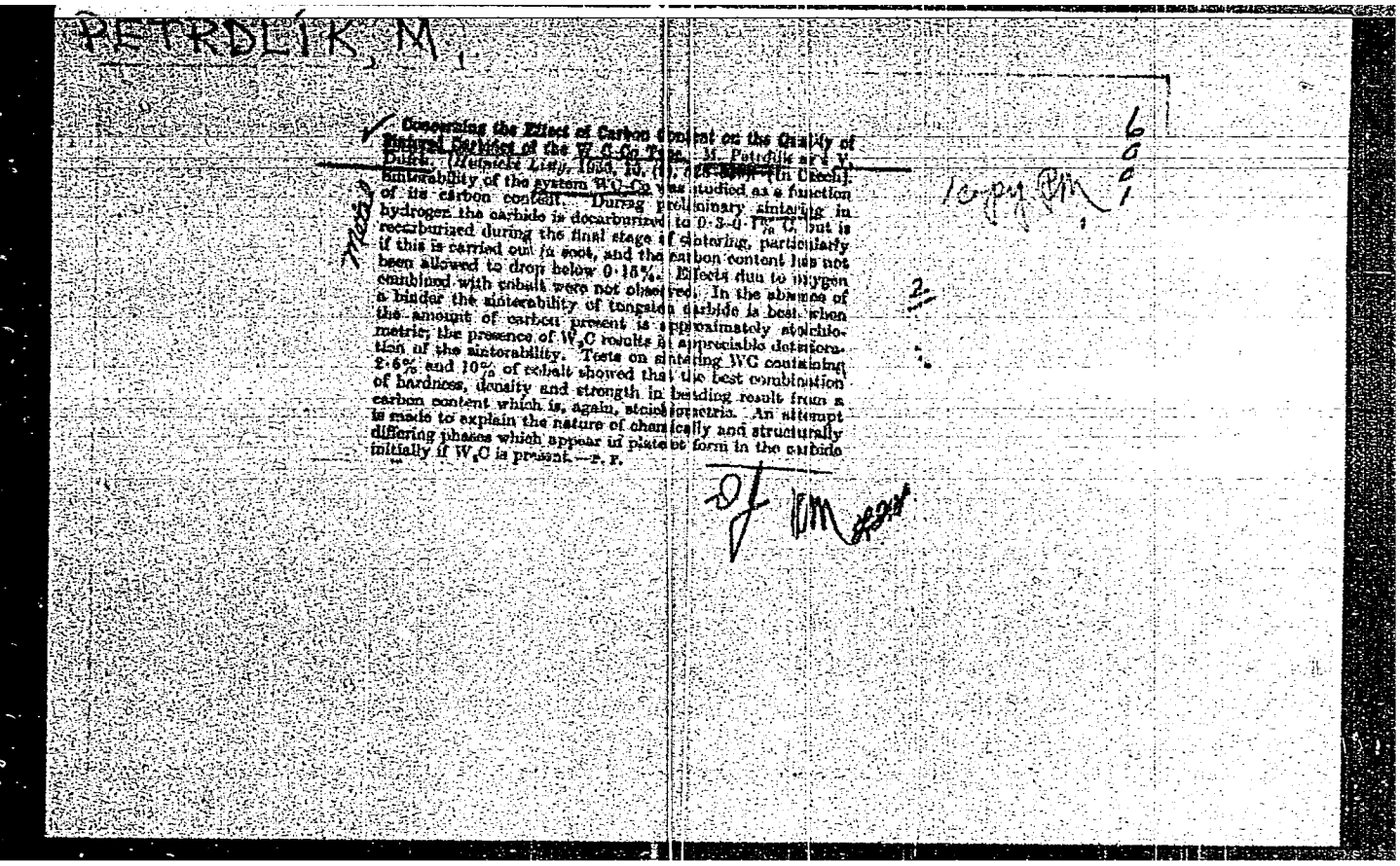

PETRDLÍK, M.

Concerning the Effect of Carbon Content on the Quality of Sintered Carbides of the W-C-Co Type. M. Petrdlík and V. Dutrh. (*Hutnické Listy*, 1955, 10, (1), [illegible]) (In Czech). Sinterability of the system WC-Co was studied as a function of its carbon content. During preliminary sintering in hydrogen the carbide is decarburized to 0·3-0·1% C, but is recarburized during the final stage of sintering, particularly if this is carried out in soot, and the carbon content has not been allowed to drop below 0·15%. Effects due to oxygen combined with cobalt were not observed. In the absence of a binder the sinterability of tungsten carbide is best when the amount of carbon present is approximately stoichiometric; the presence of W_2C results in appreciable deterioration of the sinterability. Tests on sintering WC containing 2·6% and 10% of cobalt showed that the best combination of hardness, density and strength in bending result from a carbon content which is, again, stoichiometric. An attempt is made to explain the nature of chemically and structurally differing phases which appear in plate-set form in the carbide initially if W_2C is present.—P. P.

Metal

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PETRDLIK, M.

The effect of carbon on the quality of sintered carbides of the system WC-Co. Miroslav Petrdlik and Vladimir Dufek. *Hutnicke Listy* 10, [illegible]. Sintering of the system WC-Co as a function of the C content of the initial WC was studied. During preliminary sintering in a H atm., which is not in equil. with C, the decarburization of WC of 0.1-0.3% C takes place. When this decarburization does not surpass 0.15% C, the material is recarburized during the final sintering, especially when this takes place in soots or in graphite. The effect of O combined with Co upon the course of decarburization was not observed. Sinterability of WC without a binder is best when the amt. of combined C approaches the stoichiometric value. The presence of W_2C deteriorates considerably the sinterability. When testing the sinterability of the system WC-Co with 2.6 and 10% Co it was found that the best phys. properties are obtained when the C content in WC is near to the stoichiometric value. The origin of chemically and structurally different zones which appear in plates in the

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presence of W.C in the initial carbide is explained.

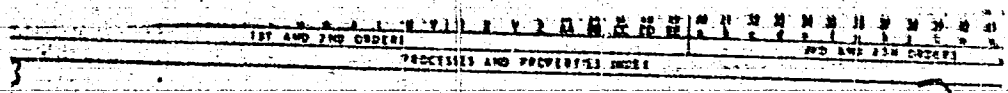
Petr Schneider

(1)

PETRDLIK, MIROSLAV

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX



2

The Production of Fine Metal Powders by Hydrogen Reduction. (In Czech.) Miroslav Petrdlik. *Hutnické Listy*, v. 5, Mar. 1950, p. 105-111.

Examines in detail conditions for complete reduction by hydrogen of the oxides of W, Mo, Fe, Ni, Co, Cu, and Pb. By this method finely-grained metal powders are obtained. The reduction is carried out in an electric tube furnace with two temperature zones. The material being reduced flows continuously through the furnace in the opposite direction to the hydrogen. Also presents a method of calculating water-vapor concentration in the reducing atmosphere from conditions in the furnace, and a calculation of composition of the reduction products of various degrees of oxidation based on oxidation number.

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

Distr: 4E2c/4E3c/4E3d

Manufacture of solid solutions of high-melting carbides, Miroslav Petrdlik. *Pokroky práškové met., Sborník konf., Brno* 1953, 480-5(Pub. 1954).—Any carbides which are isomorphous will furnish solid solns., such as TiC-VC, NbC-TaC, ZrC-HfC. The solns. are prepd. by heating together as fine powders under pressure the individual carbides, such as WC + TiC. It is preferred in this case to produce them both together in one reduction, $WO_3 + TiO_2 + 7C = TiC + WC + 5\ CO$. It is not necessary in such reductions to start with the oxides of both metals: $W + TiO_2 + 4C = TiC + WC + 2CO$, or $WC + TiO_2 + 3C = TiC + WC + 2CO$.

Werner Jacobson

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3

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PETRDLIK, MIROSLAV

22 (42)

Properties of metal powders reduced by hydrogen at low temperatures. Miroslav Petrdlik (Vyzkumny ustav pro... prikovou met., Prague). *Hutnicke Listy* 8, 252-4(1953).— P. obtained powd. Co, Cu, and Fe by reduction with H of Co formate and oxide, Cu citrate, etc. The powder obtained was subjected to a pressure of 4 tons/sq. cm. and sintered for 1 hr. as follows: Co at 1000°, Cu at 850°, and Fe at 1100°. Best results were obtained when the reduction was at low temp. When the reduction temp. was too high the particles increased in size owing to condensation and their surface smoothed out owing to self-diffusion; this, in turn, decreased their sinterability. Reduction to Co was carried out at 300-900°; reduction at 300° resulted in Vickers hardness (I) of the product 199 (from Co formate) and 284 (from Co oxide), resp., and reduction at 700° resulted in I = 68. Reduction to Cu was at 450°-800°. Although the powder obtained at 450° contained O_2 3.80 and at 800° 0.94%, the sinterability of the powd. Cu was best when the reduction was carried out at or only slightly above 450°. The same applied to Co and Fe. As to the C content, P. found that the lower the reduction temp. the greater the C content in the final product (C originated from the org. salts). E.g., the product obtained from Cu reduced at 450° and 700° resp. contained C 1.25 and 0.91, resp. P. J. H.

B2

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Petrdlik, Miroslav

662* Effect of Carbon on the Quality of Sintered Carbides of the Tungsten Carbide-Cobalt System. K otázce vlivu uhliku na jakost slinutých karbidů soustavy WC-Co. (Czech.) Miroslav Petrdlik and Vladimír Dufek. *Hutnické listy*, v. 10, no. 9, Sept. 1955, p. 528-535.

When testing the sinterability with 2.6 and 10% Co, the best hardness, specific gravity, and bending strength are obtained when C content is near the stoichiometric value. Tables, graphs, photographs, micrographs. 8 ref.

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PETRE, A.

"Fatigue of metals" by St. Nedeshan [Nadasan, St.], B. Khorovits [Horovit, B.], A. Bernat, V. Safta. Reviewed by A. Petre. Rev mec appl 8 no. 6: 1114-1115 '63.

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001240

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRE, A.

Application of electric analogies to the study of vibrations of elastic media.

P. 505 (Academia Republicii Populare Romine. Institutul De Mecanica Aplicata. STUDII SI CERCETARI DE MECANICA APLICATA. Vol. 7, no. 2, Apr./June 1956. Bucuresti, Romania)

Monthly Index of East European Accessions (EEAI) LC. Vol. 7, no. 2, February 1958

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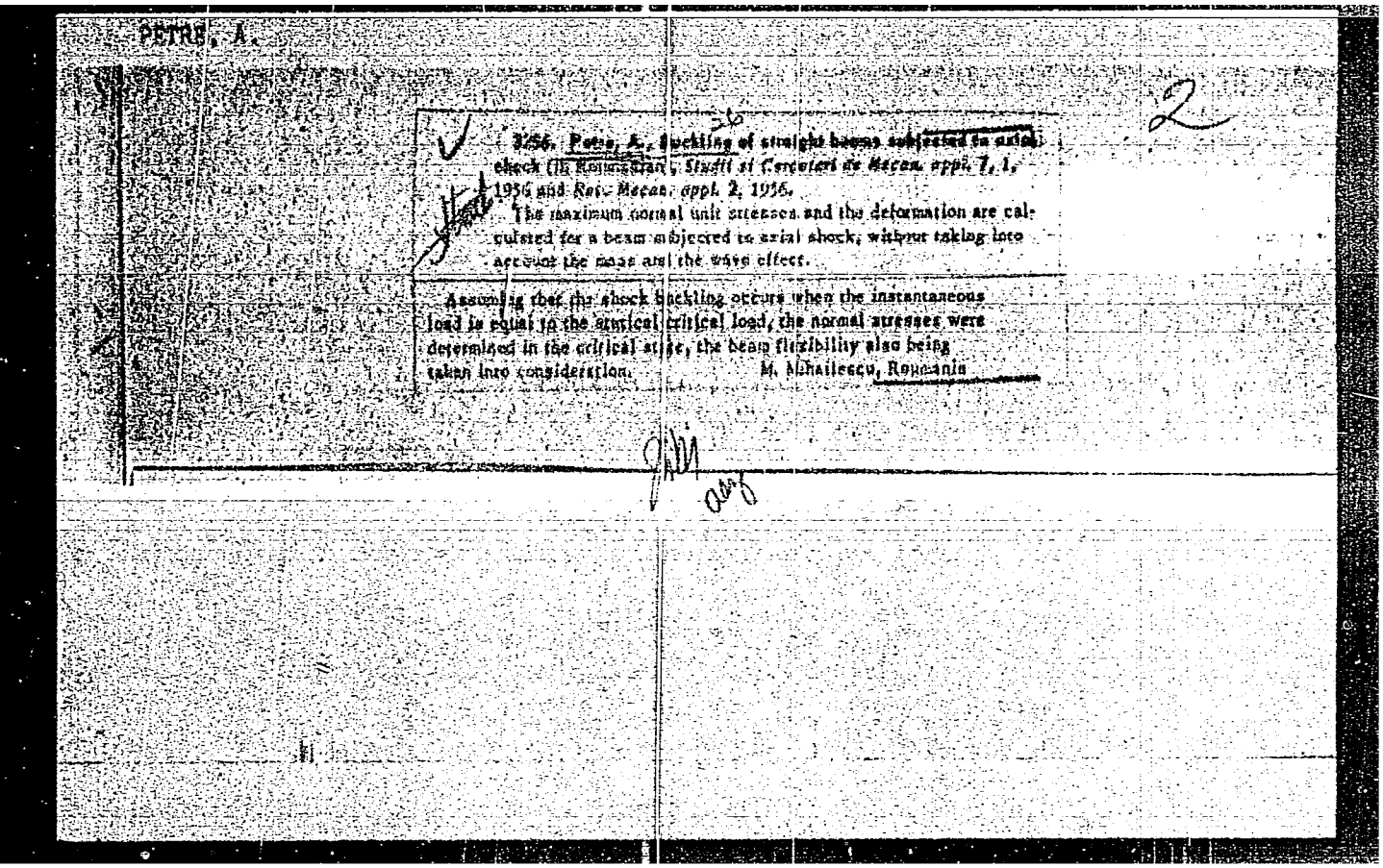

PETRE, A.

3256. Petre, A., Buckling of straight beams subjected to axial shock (In Romanian), *Studii si Cercetari de Mecan. appl.* 7, 1, 1956 and *Rev. Mecan. appl.* 2, 1956.

The maximum normal unit stresses and the deformation are calculated for a beam subjected to axial shock, without taking into account the mass and the wave effect.

Assuming that the shock buckling occurs when the instantaneous load is equal to the statical critical load, the normal stresses were determined in the critical state, the beam flexibility also being taken into consideration. M. Mihailescu, Romania

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PETRE, A.

An experimental verification of the classic method for computing wooden wings. p. 1303.

Academia Republicii Populare Romine. Institutul de Mecanica Aplicata. STUDII SI CERCETARI DE MECANICA APLICATA. Bucuresti, Rumania. Vol. 8, no. 4, 1957.

Monthly list of East European Accessions (EEAI) LC, Vol.8, no. 8, Aug. 1959

Uncl.

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

Petre, A.

Curved thin-walled bars. p. 1013.

Academia Republicii Populare Romine. STUDII SI CERCETARI DE MECANICA APLICATA. Bucuresti, Rumania. Vol. 9, no. 4, 1958.

Monthly List of East European Accessions (EEAL) LC Vol. 9, No. 2, January 1960.

Uncl.

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R/008/61/000/003/002/003
D218/D301

AUTHOR: Petre, Augustin

TITLE: Aeroelastic vibrations produced by alternating vortices

PERIODICAL: Studii şi cercetări de mecanică aplicată, no. 3, 1961, 511-518

TEXT: The article deals with calculating slender structures such as hanging pipelines, tall smoke-stacks, towers, etc., the radial symmetry being the main element from the aerodynamic point of view. If such a structure presents radial aerodynamic symmetry, the vibrations produced are due to the Bénard-Kármán alternating vortices. The load due to the Bénard-Kármán vortices distributed along the pipelines and normally acting at the speed of the wind, may be expressed by

$$q = \frac{\rho}{2} DV^2 c_k \sin(\omega t + \varphi), \quad (1)$$

in which ρ is the mass of the fluid's volume unity, D- the external diameter of the structure, V - the wind speed, c_k - the Kármán coefficient which may be considered : $c_k = 1$, while ω is given by:

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Aeroelastic vibrations...

$c_k = 1$,

$$\omega \approx 0{,}22\frac{2\pi V}{D} = 1{,}38\ \frac{V}{D}. \qquad (3)$$

The frequency (2) of the disturbing load (1) depends on the wind speed, hence for V_{max} = 50m/sec, one obtains:

$\omega = 69\ \frac{1}{D}\ s^{-1}$, in which D was considered in meters. The resonance danger in such conditions can not be eliminated and the whole problem is reduced to determining the maximum amplitudes and stresses. Since the vortices can progressively detach along the pipeline, the dephasing φ can be taken as continuous function $\varphi = \varphi(x)$ (3) The function $\varphi(x)$ should be selected in such a way that a distribution of the load in phase with the corresponding oscillating module should result. The author then gives the transversal displacement in which the dimensional factor is included in the unknown time functions $T_n(t)$, and the kinetic energy of the elastic system. In case of horizontal structures the motion equation has the shape of

(For (22) see next card)

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Aeroelastic vibrations...

$$\frac{d^2 T_n}{dt^2} + \omega_n^2 T_n = 0,$$

$$K_1 \frac{d^4 X_n}{dx^4} - K_2 \frac{d^2 X_n}{dx^2} + (K_3 - \omega_n^2) X_n = 0, \qquad (22)$$

in which K_1 expresses the bending rigidity, K_2 - the eventual existance of suspension cables, and K_3 - the similar effects of the elastic medium. The function X_n will generally have the shape of

$$X_n(x) = \sin \frac{\alpha_n x}{l} + A_n \cos \frac{\alpha_n x}{l} + B_n sh \frac{\beta_n x}{l} + C_n ch \frac{\beta_n x}{l}. \qquad (23)$$

In case of vertically located structures, the effect of the structure's own weight also interferes. For such structures, there results the relation

$$\frac{\partial^2}{\partial x^2}\left(EI \frac{\partial^2 \eta}{\partial x^2}\right) + \frac{\partial}{\partial x}\left(P \frac{\partial \eta}{\partial x}\right) + \mu \frac{\partial^2 \eta}{\partial t^2} = 0, \qquad (33)$$

in which P is the axial force. The author finally presents a calculation example of a horizontal cylindrical structure, suspended on both ends. There are 4 references: 3 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: R.L. Bisplinghoff, H. Ashley,

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Aeroelastic vibrations...

and R. Halfmann, Aeroelasticity, Addison-Wesley P.C., 1956.

ASSOCIATION: Institutul politehnic (Polytechnical Institute) Bucharest

SUBMITTED: February 11, 1961

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

27421
R/008/61/000/004/002/003
D238/D304

10.6300

AUTHORS: Petre, A., Stănescu, C., and Librescu, L.

TITLE: Aeroelastic divergence of box-beam wings, taking into consideration the fastening restraints

PERIODICAL: Studii şi cercetări de mecanică aplicată, 12, no. 4, 1961, 755 - 764

TEXT: The article presents a solution of the problem of aeroelastic divergence in the case of lifting surfaces of a constant cross-section, taking into consideration the spanwise moment and the effect of the fastening restraints. Starting with the hypothesis of A. A. Umanskiy [Abstracter's note: Umanskiy's hypothesis not stated], according to which the longitudinal motion u(y, s), in case of impeded twisting, is proportional to the ω (s) motion of the free twisting, the authors deduce

$$u(y, s) = \omega(s) \quad \Psi(y) \qquad (1)$$

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Aeroelastic divergence....

in which φ (s) is a function which has to be determined, while y and s are variable values along the span, and along the contour of the transversal section, respectively. On the base of this equation, and taking the method of Galerkin into consideration, the authors deduce the fundamental equation of impeded twisting

$$\bar{k}^2 \frac{d^4\varphi}{dy^4} - \frac{d^2\varphi}{dy^2} = - \frac{m_t}{GI_d} + \frac{\bar{k}^2}{GI_c} \frac{d^2 m_t}{dy^2} \qquad (.)$$

in which $\bar{k}$ is expressed by: $\bar{k} = \sqrt{\frac{EI_\omega}{\nu GI_d}}$ (?)

ν being the de-levelling coefficient defined by Ebner, GI_d the rigidity to the free twisting, φ the twisting angle, I_ω the inertia moment, and m_t the twisting moment distributed along the span.

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[Abstracter's note: the other symbols of (8) are not defined, while the Galerkin method is not stated]. Denoting the wing chord with c, the distance between the elastic axis and the line of the aerodynamic centers with e, the dynamic pressure with $q = \frac{\rho}{2} V^2$, and the gradient of the lifting curve with $\frac{dC_z}{di}$, the differential equation of the aeroelastic divergence in case of impeded twisting may be expressed by

$$\bar{k}^2 \frac{d^4\varphi}{dy^4} + \left(\frac{\bar{k}^2 q c e \frac{dC_z}{di}}{GI_c} - 1 \right) \frac{d^2\varphi}{dy^2} - \frac{qce \frac{dC_z}{di}}{GI_d} \varphi = 0 \qquad (11)$$

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Aeroelastic divergence...

Considering

$$X = \frac{b^2 q c e \frac{dC}{d\ldots}}{4GI_d} \ldots ; \quad k = \frac{4\bar{h}^2}{b^2} \qquad (13)$$

to be the zero-dimensional parameters, the equation (11) changes into

$$k\frac{d^4\varphi}{d\zeta^4} + [k(1-\nu\ldots-1]\frac{d^2\varphi}{d\zeta^2} - X\varphi = 0 \qquad (14)$$

The solution of this equation is

$$\varphi = C_1 \sin\alpha\zeta + C_2 \cos\ldots\zeta + C_3 \operatorname{sh}\beta\zeta + C_4 \operatorname{ch}\beta\zeta \qquad (15)$$

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Aeroelastic divergence...

in which α and β are expressed by:

$$\alpha = \sqrt{\frac{k(1-\nu)X - 1 + \sqrt{k^2(1-\nu)^2X^2 + 2k(1+\nu)X + 1}}{2k}},$$
$$\beta = \sqrt{\frac{-k(1-\nu)X + 1 + \sqrt{k^2(1-\nu)^2X^2 + 2k(1+\nu)X + 1}}{2k}}. \quad (16)$$

The integrating constants C_1, C_2, C_3, and C_4 amy be determined on the basis of the following two conditions: 1) The conditions:

$$\varphi = 0 \quad \text{and} \quad u = 0 \quad (18)$$

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Aeroelastic divergence...

have to be satisfied at the fastening section of the wing; and 2) the conditions:

$$M_t = 0 \quad \text{and} \quad \vartheta_y = 0 \tag{23}$$

have to be satisfied at the free end of the wing, M_t being the twisting moment. The authors finally deduce the fundamental equation of the aeroelastic divergence of single-box-beam wings of constant cross-section, taking into consideration the fastening restraints:

$$\frac{2k\nu X}{\operatorname{ch}\sqrt{\frac{1-k(1-\nu)X+\sqrt{k^2(1-\nu)^2X^2+2k(1+\nu)X+1}}{2k}}} - 1 \tag{28}$$

$$-\nu\sqrt{kX}\,[k(1-\nu)X-1]\times$$

$$\times\sin\sqrt{\frac{k(1-\nu)X-1+\sqrt{k^2(1-\nu)^2X^2+2k(1+\nu)X+1}}{2k}}\times$$

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

33739
R/008/61/000/006/001/005
D272/D304

10 6200

AUTHORS: Petre, Augustin, and Stănescu, Cristian

TITLE: Aeroelastic distribution of aerodynamic loads for lifting surfaces of constant cross-section, taking into consideration the end restraints

PERIODICAL: Studii şi cercetări de mecanică aplicată, no. 6, 1961, 1193 - 1203

TEXT: The problem of designing the structure for distribution of the aerodyanmic loads to correspond to a deformed flexible structure is discussed in the case when the flight velocity is below the critical divergence velocity. In this case the increase of the twist and of the lift are convergent, reaching a state of stable equilibrium, and the problem of finding the load distribution on a wing span, corresponding to the condition of stable equilibrium. The solution of this problem is presented starting from the equations of the theory of restrained twist of thin-walled rods with closed profile, adding the hypothesis of non-deformable cross-sec-

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Aeroelastic distribution of ...

tion. By introducing a parameter, it was possible to derive the re-
lation for the torsion pair, and that for the torsion angle. Fur-
ther derivations, after introducing the distance between the elas-
tic axis and the line of the aerodynamic centers, and the distance
between the elastic axis and the line of the gravity centers enab-
led the authors to obtain finally the differential equation which
conditions the aeroelastic distribution of the load in the span,
taking into consideration too, the effects of the end restraints
which is further simplified by dimensionless parameters and then
solved obtaining two roots. For practical cases, the ratio of the
lift distribution to that of the rigid wing has been calculated.
There are 4 figures and 3 references: 2 Soviet-bloc and 1 non-So-
viet-bloc. The reference to the English-language publication reads
as follows: R. Bisplinghoff, H. Ashley, and R. Halfman, Aeroelasti
city, Cambridge, 1955.

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRE, Augustin

"Nonlinear oscillations of the elements of machines and buildings" by N. V. Grigor'yev. Reviewed by Augustin Petre. Studii cerc mec apl 13 no.1:254-255 '62.

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001240

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRE, Augustin

On the deformation of bars with thin walls and closed profile
Studii cerc mec apl 15 no.2:325-337 '64.

1. Submitted December 9, 1963.

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001240

"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

PETRE, Augustin (Bucuresti)

Torsion buckling bars with thin surfaces under the action of axial loads, uniformly ar linearly istributed. Bull math Rum 6 no.1/2:61-78 '62. (publ. 64].

1. Submitted January 15, 1963.

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"APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00124(

L 33219-65 EWP(m)/EWG(v)/EWT(d)/EWT(l)/EWT(m)/FCS(k)/FS(m)/T-2/EWA(d)/EWA(l)/
EWP(w) Pd-1/Pe-5 EM

ACCESSION NR: AP5007847 R/0019/64/009/006/1335/1350

AUTHOR: Petre, A.; Stanescu, C. 14

TITLE: Effect of aeroelasticity on aileron effectiveness, with consideration of end restraints

SOURCE: Revue Roumaine des sciences techniques. Serie de mecanique appliquee, v. 9, no. 6, 1964, 1335-1350

TOPIC TAGS: aeroelasticity, aeroelastic effect, aileron, aileron effectiveness, end restraint

ABSTRACT: The authors present a study of aileron effectiveness for wings of constant cross-section, the wing being considered as a thin-walled rod. The differential equation of the problem is established and integrated under the assumption that the stresses normal to the cross-section, caused by torsion, are proportional to the unit axial strain. The relation between the rotation velocity of the aircraft about the longitudinal axis and the deflection of the wing ailerons for a steady-state motion is established. The reverse critical velocity may be determined from this relation. For current values of the quantities which characterize

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the thin-walled rods, the formula obtained permits simplifications and the results are expressed in terms of nondimensional parameters in tables and diagrams.

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