MAZANEC KAREL

1586. Study of the Effect of Tungsten on the Rate of Nucleus Formation and on Velocity of Ferrite Growth. Studium vlivu wolframu na rychlost vzniku zarodku a rychlost rustu ferritu. (Czech.) Karel Mazanec and Ales Kaliyoda. Hutnicke listy, v. 10, no. 10, Oct. 1955, p. 580-587.

Effect of W, in two structural Cr-W-V steel crystallizations, caused both crystallization parameters to decrease in the temperature ranges of 850 to 740 C, and also reduces C diffusion in austenite. Graphs, tables, micrographs. 19 ref.

MAZANEC, K.

Distr: 4F1

Testing the Weldability of Age-Hardening Low-Alloy Steels.
K. Mazanec and K. Pawera. (Zvdranie, 1950, 5, (6), 166-167).
[In Czech]. A new cracking-test developed for use with
welded stock thicker than 1½ in. is described. This was
found suitable by correlating with results obtained in practice.

welded stock thicker than 1½ in. is described. This was
found suitable by correlating with results obtained in practice.

MAZANEC, KAREL

Application of microanalytical methods in the study of the
isothermal disintegration of austenite, by Josef Čadek and
Karel Mazanec. Hutnické listy 3, 216-22(1957).—A dis-
cussion with 28 references.   Petr Schneider

Mazanec K.

On the Weldability of Alloy Steels Insensitive to the Effect of Hydrogen. K. Mazanec and E. Tuwora. (Zvárenie, 1957, 6, (9), 181–184). [In Czech]. An electrode was developed for use with special chromium steels as utilized in high-temperature hydrogenation plant. The nominal composition of the metal end of the electrode is 0·22% C, 0·49% Mn, 0·37% Si, 0·013% P, 0·014% S, 0·10% Ni, 3·13% Cr, 0·25% Mo and 0·47% V. Welding technology, heat-treatments, mechanical tests and metallurgical aspects of welding seamless tubes with the electrode are discussed, and optimum conditions are stated. The results obtained were entirely satisfactory.—E.E.
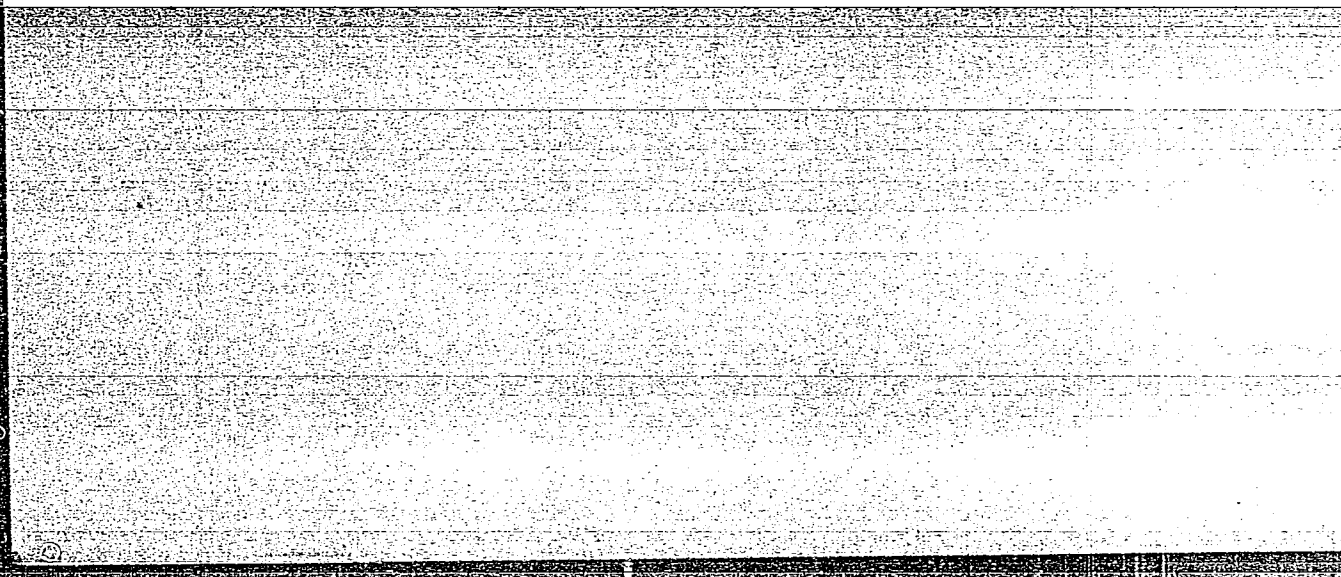
MAZANEC, F

Weldability of self-hardening low-alloy cast steel.

P. 159 (PRZEGLAD SPAWALNICTWA) (Warszawa, Poland) Vol. 9,no.6, June 1957

SO: Monthly Index of East European Accession (EEAI) LC Vol. 7, No. 5. 1958

MAZANEC, K

12688. (Czech.) A Study Concerning the Influence of Tungsten on the Magnitude of the Interlamellar Distance of Pearlite, Studium vlivu wolframu na velikost mezilamelární vzdálenosti perlitu. Karel Mazanec. Hutnické Listy, v. 12, Apr. 1957, p. 309-315.

An increase in W from 0.42% to 1.50% extends the average interlamellar distance by about 43%.

MAZANEC, Karel, inz.; CADEK, Josef, kandidat technickych ved

Effect of tungsten on the kinetic parameters of the formation of hypoeutectoid ferrite. Hut listy 12 no.6:492-500 Je '57.

1. Vyzkum, Vitkovicke zelezarny Klementa Gottwalda, Ostrava (for Mazanec). 2. Ocelarsky vyzkumny ustav, Praha (for Cadek).

CZECH/34-58-3-7/23

AUTHORS: Likeš, Jiří (Ing.), Mazanec, Karel (Cand.Tech.Sci.,Ing.),
Čadek, Josef (Cand.Tech.Sci.,Ing.)

TITLE: Application of Statistical Methods for Studying the Isothermal
Decomposition of the Austenite. Part II. Methods of Measuring
the Speed of Formation of Germinations and the Speed of Growth
(Použití statistických metod při studiu isotermického rozpadu
austenitu. Cast II. Metody mereni rychlosti tvorby zarodku a
rychlosti rustu)

ABSTRACT: The first part of this work was published in Hutnické Listy,
1957, Nr 3, p 216. It was shown in Part I that the basic para-
meters which determine the kinetics of isothermal decomposition
of austenite are the speed of formation of germinations and the
linear speed of their growth. The morphology of the decompos-
ition products which has a decisive influence on the mechani-
cal and other properties is determined primarily by the ratio
of these parameters. Therefore, for understanding the mechan-
ism of the influence of alloying elements on the decomposit-
ion of austenite, it is necessary to know the influence of
alloying elements on these parameters. Earlier work by the
authors (Ref 2) on the influence of tungsten on the speed of
formation of germinations and on the speed of growth of hypo-

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CZECH/34-58-3-7/23

Application of Statistical Methods for Studying the Isothermal Decomposition of the Austenite. Part II. Methods of Measuring the Speed of Formation of Germinations and the Speed of Growth

eutectoidal ferrite during isothermal decomposition of austenite has enabled arriving at important conclusions on the mechanism of the influence of tungsten on the ferritic reaction and has also contributed to elucidating certain general characteristics of the kinetics and the mechanism of this reaction. Correct interpretation of the results of measurement of the kinetic parameters presupposes basic knowledge of the present theory of formation of germinations and of their further growth. Therefore, the first, earlier published, part of this work was devoted to theoretical fundamentals. This second part of the paper is devoted to statistical methods of measuring the kinetic parameters. Although in the first instance the authors aimed at studying the decomposition of austenite, the work went considerably beyond the scope of this problem. Measurement of the speed of formation of germinations and the speed of their growth is based on several basic operations of quantitative stereometric metallography, namely, determination of

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CZECH/34-58-3-7/23

Application of Statistical Methods for Studying the Isothermal Decom-
position of the Austenite. Part II. Methods of Measuring the Speed
of Formation of Germinations and the Speed of Growth

the phase composition, determination of the number of part-
icles per unit of volume, determination of the specific
surface, etc. For the purpose of determining the speed of
formation of germinations it is necessary to determine the
fraction of non-transformed austenite as a function of the
reaction time, the number of particles of a given decompos-
ition product per unit of volume, also as a function of
time, and the area of the boundaries of γ-grains per unit of
volume (in cases in which it is necessary to ordinate the
speed of formation of germinations to a unit of the area of
γ-grain boundaries). In the first part of the paper the
authors deal briefly with the methods of quantitative deter-
mination of these three magnitudes and also with other meth-
ods of calculating the speed of formation of germinations.
In the second part of the paper the most important methods of
determining the speed of growth are dealt with and a method
of measuring the distance between lamellae, which is one of
the most important parameters affecting the speed of growth,
is described. In view of the large number of available
Card 3/4   methods the authors could not deal with any of them in detail.

CZECH/34-58-3-7/23

Application of Statistical Methods for Studying the Isothermal Decomposition of the Austenite. Part II. Methods of Measuring the Speed of Formation of Germinations and the Speed of Growth

They propose to do that in later work which will be devoted to a narrower field of investigation. There are 5 figures and 24 references, of which 5 are Czech, 2 German, 1 French, 4 Soviet and 12 English.

ASSOCIATION: Výzkumný ústav hutnictví železa, Praha (Ferrous Metallurgy Research Institute, Prague)

SUBMITTED: September 13, 1958.

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69269

Z/034/60/000/04/005/028
E073/E535

18,7100

AUTHORS: Mazanec, Karel, Engineer, Candidate of Technical Sciences (Výzkumný ústav VŽKD, Ostrava), Cadek, Josef, Engineer, Candidate of Technical Sciences, Likeš, Jiří, Engineer (Výzkumný ústav hutnictví železa, Praha)

TITLE: Influence of Nickel on the Speed of Formation of Germinations and on the Speed of Growth of Hypoeutectoidal Ferrite

PERIODICAL: Hutnické listy, 1960, Nr 4, pp 282-287

ABSTRACT: Earlier work by the authors of this paper (Refs 1,2) relating to the influence of W on the kinetic parameters showed that in the case of high degrees of super-cooling the speed of growth of the ferrite is controlled by the diffusion of carbon in the austenite. Therefore the authors considered it of interest to obtain information on the influence of nickel, an element which does not form carbides in steel. For the investigations two steels were used of the following compositions:
Steel A: 0.27% C, 0.26% Mn, 0.25% Si, 0.033% P, 0.026% S. 0.14% Cu, 0.04% Ni, 1.0% Cr;
" B: 0.31% C, 0.33% Mn, 0.25% Si, 0.033% P, 0.024% S, 0.16% Cu, 1.17% Ni, 1.03% Cr.

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E073/E535

Influence of Nickel on the Speed of Formation of Germinations and on the Speed of Growth of Hypereutectoidal Ferrite

These steels were produced in a 40 kg capacity high frequency furnace and cast into ingots which were then forged into rods of 20 mm dia. Prior to manufacture the samples were subjected to sphereodisation annealing for 4 hours at 700°C. Specimens of 10 x 10 x 2 mm were homogenization annealed in special ampoules without access of air for the duration of one week at 1050°C. Following that the specimens were electrolytically coated with a chromium layer about 0.03 mm thick, to prevent decarburization. Austenization was effected at 1100°C for 10 minutes in a vertical tubular furnace inside a protective argon atmosphere. On the basis of the obtained results it is concluded that:
1) Nickel reduces considerably the speed of ferrite growth, particularly at high degrees of supercooling (700° to 650°C). The influence of nickel on the speed of formation of germinations could not be determined.
2) The speed of ferrite growth in the range of high degrees of supercooling is obviously controlled by the speed of carbon diffusion in the austenite since the

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Influence of Nickel on the Speed of Formation of Germinations and
on the Speed of Growth of Hypereutectoidal Ferrite

obtained activation energy of the growth (31 000 cal/mol
for the steel A and 26 700 cal/mol for the steel B)
approaches the activation energy of the diffusion of
carbon in the austenite.
3) An analysis was made of the isothermal ferritic reaction
and the activation energy of this reaction was deter mined.
The obtained values of the activation energy (37 500 cal/mol
for steel A and 35 000 cal/mol for steel B) lead to the
conclusion that the speed of diffusion of C in the
austenite probably controls not only the speed of growth
at high degrees of supercooling but also the entire
kinetics of the ferritic reaction.
There are 13 figures, 2 tables and 11 references, 3 of
which are Czech, 4 Soviet and 4 English.

ASSOCIATIONS: Výzkumný ústav VŽKG, Ostrava (Research Institute
     VŽKG, Ostrava) and Výzkumný ústav hutnictví Železa, Praha
     (Ferrous Metallurgy Research Institute, Prague)

SUBMITTED: June 27, 1959

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8070

Z/034/60/000/08/006/030

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E073/E335

AUTHORS: Likeš, Jiří, Čadek, Josef, Mazanec, Karel and
             Kudělková, Jarmila

TITLE: Contribution to the Methods of Stereometric Metallography.
             Part III. Method of Determining the Number of and the Size
             of Disc Particles to Disperse Phase

PERIODICAL: Hutnické listy, 1960, Nr 8, pp 615 - 619

ABSTRACT: Methods of quantitative evaluation of the microstructure
             of metals and alloys are gaining in importance in the
             study of phase transformations. The kinetics of the
             majority of such transformations can be described by two
             kinetic parameters, the speed of formation of the nuclei
             and the speed of growth of a new phase. Measurement of
             these parameters is based on using statistical methods
             of microstructural analysis. One of the most important
             tasks is determining the number of particles in the new
             phase per unit of volume of the specimen and the real
             (three-dimensional) size of these particles on the basis
             of the number and size of intersections of particles per
             unit of area of a polished specimen or on the basis of the
             length and the number of segments created by the

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EO73/E335

Contribution to the Methods of Stereometric Metallography.
Part III. Method of Determining the Number of and the Size of
Disc Particles to Disperse Phase

intersection of particles of a polished specimen with
lines drawn at random in the plane of the polished
specimen. Such particles can have a variety of shapes,
i.e. they can be spherical, cylindrical, acicular. disc-
shaped, etc. In earlier papers (Refs 1,2), one of the
authors dealt with spherical particles. For studying
martensitic and bainitic reactions it is important to
develop a method of determining the number of disc-
shaped particles. In this paper, the authors solved
this problem for the case of particles of equal size
with a random distribution and random orientation in
the body of the specimen. Expressions are derived for
the average number of particles per unit of volume and
for the size of the particles k, D whereby all the
expressions depend on the average number of intersections
n per unit of area of the polished plane of the specimen,
the average number of intersections n' per unit of
length of longitudinally-drawn straight lines and on

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E073/E335

Contribution to the Methods of Stereometric Metallography.
Part III. Method of Determining the Number of and the Size of
Disc Particles to Disperse Phase

estimating the value of p , the volume part of the
phase α . The value of k is then determined by
interpolation from tabulated $\varphi(k)$ values. In the
experimental part of the paper, comparison is made
between the average $\bar{F}$ of the areas of the polished
sections measured and the theoretically determined value
E(f) . Finally, the theoretically derived relations
are used for determining the number and size of bainite
particles. The here described method enables direct
measurement of the kinetic parameters of proceeding
isothermal, martensitic and, particularly, bainitic
reactions. Acknowledgments are expressed to V. Kejha,
VÚHŽ, for his assistance in carrying out measurements
on the polished specimens and to J. Kazdova, VÚHŽ, for
her assistance in carrying out calculations. There are
5 figures, 4 tables and 13 references, of which 5 are
Czech, 7 are English and 1 is Soviet.

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Z/034/60/000/08/006/030
Contribution to the Methods of Stereometric Metallography.
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Part III. Method of Determining the Number of and the Size of
Disc Particles to Disperse Phase

ASSOCIATIONS: Výzkumný ústav hutnictví železa, Praha
        (Ferrous Metallurgy Research Institute, Prague)
        Výzkumny ústav, VŽKG, Ostrava (Research Institute
        VŽKG, Ostrava)

SUBMITTED: August 25, 1959

Card 4/4

MALY,J., inz.; JANOSIKOVA,V.,inz.;MAZANEC,K.,inz.,Kandidat technickych ved

Oxy-acetylene cutting of low-alloyed self-hardening
steel. Zvar sbor 9 no.3:325-344 '60

1. Vyskumny ustav zvaracsky, Bratislava (for Maly)
2. Vyzkumny ustav, Vitkovicke zelezarny Klementa Gottwalda
   (for Janosikova and Mazanec)

Z/034/61/000/001/007/021
E073/E535

AUTHORS: Mazanec, Karel, Engineer, Candidate of Technical Sciences
             and Kamenska, Emilie, Engineer

TITLE: Contribution to the Study of Surface Tension on the
             Austenite Grain Boundaries

PERIODICAL: Hutnické listy, 1961, No.1, pp.41-49

TEXT: The surface energies of melts have been measured by
numerous authors and adequate data are available. However, few
measurements have been made of the surface tension of solid
substances or at the grain boundaries. For steel, only the data
published by Van Vlack (Ref.2) on the absolute values of the surface
tension at the austenite grain boundaries are available. The views
of Read and Schockley (Ref.3) on the properties of grain boundaries
have been experimentally verified as a function of the grain
orientation by a number of authors, for instance Dunn, Daniels and
Bolton (Ref.4) and Aust and Chalmers (Ref.5). So far, no work has
been published in Czechoslovakia on measuring the relative and
absolute surface tension at the grain boundaries of steel. In this
paper the results are published of measurements of the relative
energy at the grain boundaries of two different phases (ferrite and
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Z/034/61/000/001/007/021
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Contribution to the Study of Surface Tension on the Austenite Grain
Boundaries

austenite) and on the austenite grain boundaries. In the final part
of the paper an attempt is made to determine the absolute surface
tension of austenite by means of a modification of the Sears method
(Ref.7). The relative values of the surface tension at the
austenite-ferrite grain boundary for the isothermal decomposition
temperature of 750°C, determined by means of statistical evaluation
of the angles between individual grains measured in the plane of the
polished section, were found to be: $\sigma_{\alpha\gamma} \approx 0.7 \; \sigma_{\gamma\gamma}$ and

$\sigma_{\alpha\alpha} \approx 0.9 \; \sigma_{\gamma\gamma}$.   For the interphase 6-ferrite-austenite, the
following relations were found to apply for the temperature range
1000 to 1200°C: $\sigma_{\delta\gamma} \approx 0.83 \; \sigma_{\gamma\gamma}$ and $\sigma_{\gamma\gamma} \approx 1.2$ to $1.4 \; \sigma_{\delta\delta}$.

Further statistical data were obtained and a critical analysis was
made of the applied method of measuring the relative surface tension
between two phases. The theoretical frequency curve for angles of
85° between grains was determined and this curve is compared with
experimentally determined curves of frequencies with a modal value

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Contribution to the Study of Surface Tension on the Austenite Grain Boundaries

of $\Theta = 85°$. The two curves were found to be in good agreement; the modal value of the angle determined experimentally is in agreement with the real angle between the two grains investigated. By means of vacuum etching of the surface of specimens, a method was developed of measuring the relative surface energy σ_{hr} between the austenite grains. The specimens were etched in the temperature range 1050 to 1100°C for durations of 48 hours, maintaining the vacuum at 3 to 5 x 10^{-4} mm Hg col. Furthermore, a method was developed for measuring the angles of "wrinkles" by the type MIS-11 profile meter and an evaluation was made of some of the data on a method of measurement and the shape of the wrinkles which form during vacuum etching. For soft carbon steel and two alloy steels (with 1% Cr and with 1% Cr + 1% Ni), the relative value $\sigma_{hr} = 0.6$ to 0.75 σ_v, which corresponds to an average value of the wrinkle angles of $\Theta = 136$ to 145°. By means of the modified drop method, the absolute surface tension on the free austenite surface was determined, using spectrally pure lead as a standard material. The

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Contribution to the Study of Surface Tension on the Austenite
Grain Boundaries

experiments were carried out in a carefully purified atmosphere of
argon and unsaturated lead vapours at 900°C for a duration of
4 hours. On the basis of the equilibrium of the surface tension
vectors in the horizontal and vertical directions, the surface
tension was determined under the above given conditions for two
types of steel; for the soft carbon steel σ_y = 1240 dyn/cm and for
the 30ChN2MA steel σ_v = 1300 dyn/cm. Furthermore, an analysis was
made of the shape of the lead drops as determined in the transverse
cross-section on the surface of the specimen during measurement of
the σ_y values. Finally, the absolute surface tension at the grain
boundaries on eliminating the influence of unsaturated lead vapours
was tentatively calculated. The surface tension at the austenite
grain boundaries at 1100°C was found to be about 800 dyn/cm for
soft carbon steels. In evaluating the influence of lead vapours
on the wrinkle angles, it was found that this influence is small
and in the given case brings about a change of the wrinkle
angles from 144.5 to 139°. So far, this quantity

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Z/034/61/000/001/007/021
EO73/E535

Contribution to the Study of Surface Tension on the Austenite Grain Boundaries

has not been measured on other alloys investigated but work on this point is continuing. Some of the measurements were carried out by Engineer Kašík, VÚHŽ, Prague. There are 19 figures and 28 references: 5 Czech, 1 Soviet, 1 French, 1 German and 20 English.

ASSOCIATION: Výzkumný ústav VŽKG, Ostrava (Research Institute VŽKG, Ostrava)

SUBMITTED: June 17, 1960

Card 5/5

OSKORY, Adam; MAZANEK, Karol

Application of carburation with natural gas in the petroleum industry.
Wiad naft 7 no.9:211-213   S '61.

OSKORY, Adam; MAZANEK, Karol

General informaticns on modern annealing. To be contd. Wiad naft
7 no.10:233-234 '61.

OSKORY, Adam; MAZANEK, Karol

General informations on modern heat treatment of steel.(To be contd.)
Wiad naft 7 no.11:254-255 '61.

(Steel)

OSKORY, Adam; MAZANEK, Karol

General informations on modern annealing. Conclusion. Wied naft
7 no.12:279-28 '61.

18.8200

Z/034/61/000/008/002/005
E073/E435

AUTHORS: Mazanec, Karel, Engineer and
             Kamenska, Emilie, Candidate of Technical Sciences,
             Engineer

TITLE: Study of the influence of oxygen on surface tension

PERIODICAL: Hutnické listy, 1961, No.8, pp.561-565

TEXT: A number of authors have expressed the view that an
increased content of oxygen produced intergranular brittleness
in steel.   J.Plateau, G.Henry and C.Crussard (Ref.2:
Precipitation Processes in Steels;   Iron and Steel Inst. Spec.
Rep. No.64, 1959, pp.157-176) have pointed out that a relation
may exist between intergranular brittleness and segregation of
oxygen at the grain boundaries.   In this paper, the authors
investigate other causes of this brittleness.   An attempt is
made to determine more accurately the crystallographic
relations pertaining to stripes on free surfaces, revealed after
high-temperature etching at low pressures.   Furthermore, certain
views are expressed on the properties of fractures, since
similar stripes were observed on fracture surfaces, particularly
in cases of braked fractures in martensite when the fracture was

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Study of the influence of ...

mostly along the grain boundaries.   Under such conditions, the
formation of stripes has not hitherto been observed.
J.Bénard, J.Moreau and J.Plateau (Ref.6: Zeitsch. Electrochemie,
61, 1957, pp.59-65) explain the stripe formation by the fact that
adsorption of oxygen reduces the surface energy, particularly on
some crystallographic planes.   This facilitates changes on the
surface of the specimen caused by surface diffusion, enabling
formation of non-uniformities corresponding to those planes where
the surface energy is lowest.   A certain analogy can be
anticipated between the character of these striped surfaces and
certain fracture surfaces which occur during intercrystalline
fractures.   In the case of grain boundaries, the probable cause
of formation of stripes are oxygen atoms which are dissolved in
the metal and can be adsorbed at the grain boundaries.   The
experiments were made on the steel 30ChN2MA produced in a 40 kg
high-frequency laboratory furnace in such a way as to obtain an
increased oxygen content (0.016%).   After forging, the material
was homogenized at 1000°C for one week.   From this material,
specimens were produced for studying the mutual orientations of
the stripes and the crystallographic planes.   After careful
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proparation of the surface of the polished specimens, these were vacuum-etched at 1C50°C at a residual pressure of 3×10^{-3} to 1×10^{-3} mm Hg for durations of 2 - 48 hours. Under such conditions, no continuous oxygen layers formed on the specimens and oxygen was only adsorbed at the surface of the material. For comparison, the stripe-formation was also investigated after studying braked fractures. These test specimens were austenized at 1100°C for 1 hour and then water-quenched. After quenching, the specimens were loaded for 1 hour with a static stress of 60 kg/mm², corresponding approximately to 0.35 σ_p of the given steel after quenching. The braked fractures occurred after the load has been applied for 30 to 50 minutes. It was found that the stripes on the free surface were parallel to the planes {111} or {100}. The preferential etching of the plane {100} indicates that the adsorbed oxygen reduces the surface tension in this plane much more intensively than in the planes {111} which should have the lowest surface energy, since they have the densest atom population. The striping is attributed to a decrease in the surface energy. The gained energy forms the motive force of surface diffusion on the

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grain boundaries and brings about stripe formation at spots which
are suitably oriented.   It was found that a close relation exists
between stripe-formation on the free surface and on fractures.
An explanation is given why stripe formation is difficult to observe
on fractures;   it was observed for the first time on quenched steel
during tests involving braked fractures and on soft carbon steels.
J.Plateau et al (Ref.2) were not successful in detecting stripe
formation in the Fe-O system by means of optical fractography.
A direct relation exists between the adsorbed oxygen, the stripe-
formation and the strength properties of the steel.   In
accordance with the theory of Griffith, a drop in the surface energy
in the presence of adsorbed oxygen on the grain boundaries leads to
a decrease in the critical size of cracks in intercrystalline
fractures, i.e. to easier fracture.   There are 11 figures, 1 table
and 14 references: 6 Soviet-bloc and 8 non-Soviet-bloc.   The
references to English language publications read as follows:
J.Plateau, G.Henry, C.Crussard: Iron and Steel Inst.Spec.Rep. No.64,
1959, pp.157-176;   B.Chalmers, R.King, R.Shuttleworth, Proc. Roy.
Soc. A 193 (1948) pp.465-480;   C.Andreade, R.F.Y.Randall, Proc.
Phys. Soc. B 63, 1950, pp.198-210.
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Study of the influence of ...

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ASSOCIATION: Výzkumný ústav VŽKG (Research Institute VŽKG)

SUBMITTED: February 16, 1961

Card 5/5

LIKES, Jiri, inz.; MAZANEC, Karel, inz., kandidat technickych ved

Contribution to the methods of determining the interlamellar distance
of perlite. Hut listy 16 no.6:417-420 Je '61.

1. Vyzkumny ustav hutnictvi zeleza, Praha (for Likes). 2. Vyzkumny
ustav, Vitkovicke zelezarny Klementa Gottwalda, Ostrava (for Mazanec).

MAZANEC, Karel, inz., kandidat technickych ved; KAMENSKA, Emilie, inz.

Examination of the effect of oxygen on surface stress. Hut listy
16 no.8:561-565 Ag '61.

1. Vyzkumny ustav, vitkovicke zelezarny Klementa Gottwalda.

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Z/054/62/000/003/002/004
E073/E535

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AUTHORS: Mazanec, Karel, Engineer, Candidate of Technical
            Sciences and Kamenská, Emilie, Engineer

TITLE: On the causes of formation of braked fractures in the
            martensite of high-strength steels

PERIODICAL: Hutnické listy, no.3, 1962, 202-209

TEXT: The authors studied the formation of braked fractures
in freshly quenched martensite of the steel 50 $CH\backslash 2M\backslash$, which after
water quenching had a strength of 170 to 185 kg/cm^2. Torsion as
well as tensile tests were made on notched and non-notched
specimens. In some of the tensile tests the kinetics of propa-
gation of the cracks were determined by the changes in conductivity,
whilst the specimens were maintained at $+20^\circ C$ ($\pm 2^\circ C$) in gasoline,
or, in the case of below-freezing temperatures, in a mixture of
gasoline and CO_2. The changes in the dynamic modulus and internal
friction were determined at various temperatures on quenched rods
and on rods after ageing. Some of the specimens were additionally
subjected to cathodic saturation with hydrogen. It was found that
braked fractures occur in martensite at stresses considerably lower
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On the causes of formation of ...   Z/034/62/000/003/002/004
                                       E073/E535

than the ultimate strength of martensite.   These cracks appeared
primarily (70 to 80) at the grain boundaries of the initial
austenite, whereby this process was most marked immediately after
quenching and became gradually less with increasing duration of
ageing at normal or at low temperatures.   In contrast to the view
of Troiano, the formation of braked fractures is not attributed to
the presence of hydrogen, since braked fractures also appeared
on specimens that were subjected to vacuum extraction.   The only
effect of additional saturation with hydrogen was to shorten the
incubation period.   Thermomechanical treatment (deformation by
about 15% in bending) directly after austenization, followed by
rapid quenching, increased appreciably the incubation period and
this is attributed to "strengthening" of the boundaries of the
initial austenite, which also manifested itself in an increase of
the bond strength.   The following probable mechanism is
suggested: during martensitic transformations easily mobile new
dislocations are generated which behave essentially as individual
ones and during their movement they only need to overcome the
Peirls-Nabaro barrier.   The reduced ability to form such

Card 2/4

On the causes of formation of ...   //034/62/000/003/002/004
E073/E535

braked fractures at lower temperatures is due to the temperature
dependence of the width of the dislocations. Due to the relatively
low external stresses, these dislocations will move and accumulate
at obstacles (grain boundaries); as a result of this a stress
state will develop which, combined with the microcracks during the
martensitic reaction, causes extension of the microcracks and the
formation of braked fractures.   If prior to applying an external
load the material is aged at normal or slightly higher tempera-
tures, the mobility of the dislocations decreases, due to the fact
that they become partially "blocked" by point disturbances
leading to a decrease in their effective length. The easy
mobility of dislocations formed during the martensitic reaction
was also confirmed by the high relaxation ability, which at $-20°C$
reaches 10% of the acting stress.   The authors believe that it
is necessary to study more closely the metallurgical relations
that influence the formation of braked fractures, including the
properties of the boundaries of the initial austenite, which
greatly affect the formation of such fractures.   There are
18 figures and 3 tables.

Card 3/4

On the causes of formation of ...   Z/034/62/000/003/002/004
                                         E073/E535

ASSOCIATION: Výzkumný ústav VŽKG
                (Research Institute VŽKG)

SUBMITTED: September 15, 1961

Card 4/4   X

OSKORY, Adam; MAZANEK, Karol

Application of nitriding in the petroleum industry. Wiad naft
8 no.6:136-138 Je '62.

OSKORY, Adam; MAZANEK, Karol
    Proper selection and application of construction steel alloys in
    repairs of petroleum installations. Wiad naft 8 no.11:260-262 N '62.

MAZANEC, Karel, inz., kandidat technickych ved; KAMENSKA, Emilie, inz.

Contribution to the study of braked fracture formation in the martensite of high strength steel. Hut listy 17 no.3:202-209 Mr '62.

1. Vyzkumny ustav, Vitkovicke zelezarny Klementa Gottwalda.

HYSPECKA, Ludmila, inz.; BALUSEK, Jaromir; MAZANEC, Karel, inz., Dr.Sc.

Thermomechanical treatment of structural steel. Hut listy 18 no.1:44-48 Ja '63.

1. Vyzkumny ustav, Vitkovicke zelezarny Klementa Gottwalda, n.p., Ostrava.

L 17520-63   EWP(q)/BDS   AFFTC/ASD   JD

2/0065/63/000/002/0251/0262

ACCESSION NR: AP3002912

AUTHOR: Hyspecka, Ludmila; Balusek, Jaromir; Mazanec, Karel

TITLE: Increasing the strength limit of structural steel CrNiMo by thermomechanial treatment.

SOURCE: Kovove materialy, no. 2, 1963, 251-262

TOPIC TAGS: austenitic area, steel deformation, quenching, elongation, ductility, martensitic structural change

ABSTRACT: A study was made of thermomechanical treatment of two kinds of steel: one steel, containing 0.27% C, was Czech steel 30ChN2MA; the other contained 0.4% C and its composition was: 1-1.68%Mn, 2.29-2.4% Cr, 1.86-2.2% Ni, 0.42-0.39% Mo, 1.08-1.1% Si, 0.018% P, 0.014-0.023% S. The samples were rolled at 900°C, at a speed of 0.75 m/sec and 120 tons pressure. Time used for rolling was 20 seconds, quenching in oil or water was accomplished in 1-2.5 secs. Steel with 0.27% C showed an increase in tensile strength of 14 kg/mm² even when rolled at 550° C, although deformation then changed from 85% to 70%. Steel with 0.4%C showed an

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L 17520-63

ACCESSION NR; AP3002912

increase of 18.3 kg/mm^2 at 900° and 39 kg/mm^2 at 550° C., Increase of ductility also obtained. The thermomechanical treatment not only refines the micro-structure, but also causes changes in the geometry of the martensite plates. The difference in strength in metastable or stable austenite after forming may be explained by a larger number of failures when forming metastable austenite, and by their retention even after the transformation from austenite to martensite. The favorable effect of thermomechanical treatment is due to substantial avoidance of the softening of the original austenitic grain boundaries during transition to martensite; thus maximum strength due to chemical composition is maintained. Orig. art. has 6 figures and 5 tables.

ASSOCIATION: Vyzkumny ustav VZKG, Ostrava (Research Institute of the Klement Gottwald Iron Works at Vitkovice)

SUBMITTED: 00   DATE ACQ: 15 Jul 63   ENCL: 00

SUB CODE: ML   NO REF SOV: 004   OTHER: 008

Card 2/2

RYS, Premysl; MAZANEC, Karel

Prospect and trends of the research in the field of metallic
materials. Vestnik CSAV 73 no.2:212-221 '64.

1. Corresponding member of the Czechoslovak Academy of Sciences
(for Rys).

ACCESSION NR: AP4041522   Z/0065/64/000/003/0309/0321

AUTHOR: Bruska, Otakar (Brzhuska, Otakar); Matyas, Miroslav
(Matiash, Miroslav); Mazanec, Karel (Mazanets, Karel)

TITLE: Contribution to the study of steel properties at high
deformation rates

SOURCE: Kovove materialy, no. 3, 1964, 309-321

TOPIC TAGS: dynamic hardness, high deformation rate, Armco iron
dynamic hardness, 30KhN2MA steel dynamic hardness, room temperature
dynamic hardness, subzero temperature dynamic hardness, explosive
forming, high energy rate forming

ABSTRACT: Armco iron and 30KhN2MA steel were subjected to dynamic
hardness tests with the purpose of studying their behavior at high
deformation rates. The method is based on shooting a projectile
into a specimen. The dynamic hardness H_K is determined as the ratio
$E:w$, where E is the energy consumed in the formation of the impression
having a volume w. The dynamic hardness tester consists of four
parts: 1) a device for projectile acceleration, 2) a device for

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ACCESSION NR: AP4041522

measuring projectile velocity, 3) a device for determination of ballistic pendulum deflection, and 4) a device for measuring the volume of the impression. A projectile 4—5 g in weight shot with a velocity of approximately 130 msec^{-1} and a kinetic energy of approximately 5 kg m hits a specimen placed in a ballistic pendulum. The deflection of the latter determines the consumed energy. The velocity of the projectile is determined by computer and two photo cells. The dynamic hardness (H_K) of Armco iron at +20, -30, -78, and -196C amounts to 180, -200, -235, and -210 H_K, i.e., H_K has its maximum at -78C. The dynamic hardness of 30KhN2MA steel depends on heat treatment and has its maximum at -30C. The fact that H_K at first increases and then decreases is explained by the ad abatic character of the deformation process and the change of the value of specific heat. The cause of the different behavior of both tested materials has not yet been reliably explained. The dynamic hardness measurements, however, provided valuable findings on the mechanical properties of the materials at high deformation rates. These findings will make possible a more detailed determination of the conditions for shaping by unconventional methods, e. g., by explosive forming. Orig. art. has: 8 figures, 6 formulas, and 1 table.

Card 2/3

ACCESSION NR: AP4041522

ASSOCIATION: VAAZ, Ostrava; VUVZKG, Ostrava

SUBMITTED: 27Aug63

SUB CODE: MM   NO REF SOV: 006

ENCL: 00

OTHER: 004

Card 3/3

L 18819-65   EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EWP(k)/EWP(b)   Pf-4   ASD(m)-3/
ASD(f)-2   JD/RW
ACCESSION NR: AP5000101   Z/0065/64/000/006/0549/0557

AUTHOR: Hyspecka, L. (Gyspetska, L.); Mazanec, K. (Mazanets, K.);
Lukas, P. (Lukash, P.)

TITLE: Martensite strength in thermomechanically treated Cr-Ni-Mo
steels

SOURCE: Kovove materialy, no. 6, 1964, 549-557

TOPIC TAGS: martensite strength, Cr Ni Mo steel, microstructural
analysis

ABSTRACT: A microstructural analysis of the martensite for three
methods of heat treating Cr-Ni-Mo steels was conducted by trans-
mission electron microscopy of thin foils. It was found that the
character of the inner twin crystals in the martensite plates was
not altered by thermomechanical treatment. Measurements of the re-
lative width and the relative distance of inner twin crystals in the
plates showed that the maximum rate of measurement in both cases
was 80—110Å. It is concluded that the increase in the strength of
the martensite after thermomechanical treatment is probably caused

Card 1/2

L 18819-65
ACCESSION NR: AP5000101

by the refining of the martensite plates and by the decrease in the dynamic effects of these plates on the grain boundaries of the initial austenite. Orig. art. has: 6 figures, 3 tables, and 1 formula.

ASSOCIATION: Vyzkumny ustav metalurgicky VZKG, Ostrava (Metallurgical Research Institute, VZKG); Ustav vlastnosti kovu CSAV, Brno (Institute of the Properties of Metals, CSAV)

SUBMITTED: 04Jun64   ENCL: 00   SUB CODE: MM

NO REF SOV: 001   OTHER: 017

Card   2/2

L 63307-65   EWA(d)/EWP(t)/EWP(a)/EWP(b)   JD

ACCESSION NR: AP5020844   CZ/0034/64/000/009/0641/0644

AUTHOR: Hyspecka, Ludmila (Engineer); Mazanec, Karel (Engineer, Doctor of sciences); Chamrad, Antonin (Engineer)

TITLE: Investigation of the CSN 15223 steel structure stability after long-term annealing

SOURCE: Hutnicke listy, no. 9, 1964, 641-644

TOPIC TAGS: steel, metal heat treatment, metal test, annealing, cyclic strength, plasticity/CSN 15223 steel

Abstract /Authors' English summary 7: The steel investigated came from bores from material after process heat treatment, or was heated in the laboratory. As a result of the heat treatment car-

has 2 figures, 3 graphs, and 7 tables.
Card 1/2

L 63307-65

ACCESSION NR: AP5020844

ASSOCIATION: Vitkovicke zelezarny Klementa Gottwalda (Vitkovice Klement Gottwald Iron Works)

SUBMITTED: 00 ENCL: 00 SUB CODE: MM, AS

NO REF SOV: 000 OTHER: 003 JPRS

L 50734-65   EWP(k)/EWA(c)/EWP(b)/T/EWA(d)/EWP(t)   Pf-4   JD/HW

ACCESSION NR: AP5013221   CZ/0065/65/000/002/0187/0197

AUTHOR: Otypka, K. (Otipka, K.); Hyspecka, L. (Gyspetska, L.); Mazanec, K. (Mazanets, K.)

TITLE: A study of the effect of thermomechanical treatment on martensite softening

SOURCE: Kovove materialy, no. 2, 1965, 187-197

TOPIC TAGS: thermomechanical treatment, martensite, martensite softening, carbide precipitation

ABSTRACT: The authors studied the effect of thermomechanical treatment (TMT) in comparison with conventional treatment, on changes in the free path in ferrite. The free path in ferrite were determined for soft-annealing at 200, 400, and 600°C using Fullman's method. On the basis of the measured changes in coercive force during the annealing of specimens treated by TMT and conventionally it was found that the character of the coercive-force changes in both cases did not change. But, for the lowest annealing temperature, only, there was a difference observed in the absolute value of the coercive force. After TMT (in annealing at 100°C)

Card 1/2

L 50764-65
ACCESSION NR: AP5013221

the coercive force was 6 Oe higher. This was associated with the higher level of internal stresses after TMT. Inasmuch as there was no change in the values of the free path in ferrite for either of the compared cases of treatment,
it was assumed that the increased strength properties after TMT were not influenced by the change in carbide precipitation. Moreover, the strengthening caused by these processes of precipitation apparently does not lead to the preservation or improvement of plastic properties of steel after TMT in comparison with conventional treatment.

ASSOCIATION: Vyzkumny ustav metalurgicky VZKG, Ostrava (Metallurgical Research Institute, VZKG)

SUBMITTED: 25Sep64   ENCL: 00   SUB CODE: MM

NO REF SOV: 002   OTHER: 012

Card 2/2

L 21103-66   EWP(w)/T/EWP(t)/EWP(k)   IJP(c)   JD/HW/JG
ACC NR: AP6008679   SOURCE CODE: CZ/0065/65/000/005/0448/0461

AUTHORS: Hyspecka, Ludmila--Gyspetska, Ludmila; Balusek, Jaromir--Valushek, Yaromir; Mazanec, Karel--Mazanets, Karel

ORG: VU VZKG, Ostrava

TITLE: The effect of metallurgical factors on strength properties of structural Cr-Ni-Mo steels after thermo-mechanical treatment
SOURCE: Kovove materialy, no. 5, 1965, 448-461
TOPIC TAGS: alloy steel, structural steel, mechanical heat treatment, plasticity, strength property, martensite, austenite

ABSTRACT: In this study the effect of production technology on the properties of an alloyed Cr-Ni-Mo steel after thermo-mechanical treatment was determined. In all cases investigated there was an increase in strength properties after thermo-mechanical treatment and in some cases (mainly in melts with higher carbon contents), there was also an increase in plasticity. The relative maximum rise in the ultimate strength for given carbon content was measured in melts smelted in the air, while the relative minimum value was measured on melts smelted in vacuum from highly pure raw material. This finding was explained by the so-called dynamic effects of martensite plates on the boundaries of austenite grains. It is most likely
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L 21103-66
ACC NR: AP6008679
                                                                          0

that in melts smelted from highly pure material (low P and S), a reinforce-
ment of the austenite grain boundaries takes place to a certain extent and,
evidently, the possibility of defect formation on the boundaries of
austenite grains under the impact effect of martensite plates decreases. In
these melts, the probability of relaxation of stresses caused by the dynamic
effects of martensite plates on the austenite grain boundaries was increased.
Further, it was shown that it is very difficult to clarify the observed
phenomena by the action of carbide precipitation or by nucleation of carbides
in the course of thermo-mechanical treatment. Orig. art. has: 7 figures and
4 tables.
(Based on author's abstract.)   (KS)

SUB CODE: 11/   SUBM DATE: 16Feb 65/   ORIG REF: 007/   OTH REF: 013/

SOV REF: 002/

Card 2/2

L 34155-66   EWP(w)/T/EWP(t)/ETI   IJP(c)   JD

| ACC NR: AP6026039 | SOURCE CODE: CZ/0034/66/000/003/0182/0187 |

AUTHOR: Chamrad, Antonin (Engineer); Mazanec, Karel (Professor; Engineer; Doctor of sciences)

ORG: Klement Gottwald Vitkovice Iron Works, Ostrava (VZKG)

TITLE: Effect of the open hearth furnace manufacturing process of high strength steels on their inclination to undergo delayed fracture

SOURCE: Hutnicke listy, no. 3, 1966, 182-187

TOPIC TAGS: material fracture, industrial furnace, steel industry, martensite steel/ 30ChN2MA martensite steel

ABSTRACT: Formation of delayed fracture in martensitic steel was investigated on a model. The cracking was found to occur mainly on grain boundaries. Strengthening of the grain boundaries, by means of alloying elements, substantially decreases the tendency of the steels to undergo delayed fracture. Czechoslovak steel 30ChN2MA was strengthened by addition of Fe-Ti, and the tendency of fracturing was eliminated. Oxygen increases the tendency to fracturing. The importance of investigating primary production technology of metals when attempting to improve properties of steels is discussed. Orig. art. has: 11 figures and 2 tables. [Based on authors' Eng. abst.] [JPRS: 36, 646]

SUB CODE: 11, 13, 05 / SUBM DATE: none / ORIG REF: 006 / OTH REF: 013

Card 1/1   UDC: 669.15-194.55

L 00860-67   EWP(-)/T/EWP(t)/ETI   JD

ACC NR: AP6029488   SOURCE CODE: CZ/0065/66/000/003/0221/0228

AUTHOR: Sejnoha, Roman--Sheynoga, Roman; Jakob, Miloslav--Yakob, Miloslav; Mazanec, K.

ORG: University of Mining Engineering, Ostrava (Uysoka skola banska)   41

TITLE: Slight deformation of martensite

SOURCE: Kovove materialy, no. 3, 1966, 221-228

TOPIC TAGS: creep mechanism, martensite steel, metal deformation, creep test

ABSTRACT: Creep tests were carried out at 20C on as-quenched and as-quench-ed-and-aged (aging at room temperature) specimens of low-carbon steel with a high M_s temperature. Creep deformation up to $3 . 10^{-5}$ was measured during the first three hr of the test at a stress level of 20 kp/mm^2 (30000 psi) only. The deformation was reduced to zero at 20 kp/mm^2 after brief aging. The results were evaluated by the Winchell-Cohen equation. The values of the elastic limit are in agreement only under conditions that the free length of dislocations is

Card 1/2

L 00860-67

ACC NR: AP6029488

equal to 2000 Å in the freshly hardened martensite steel and to 3000 Å after 10^4 min of aging. The low value of the elastic limit after hardening of martensite steel and the effect of aging on it cannot be explained satisfactorially by the first stages of carbide reactions (Cohen's model). The extent of self-tempering in steel hardening with high M_s temperatures is so great that these first stages of carbide reactions are completed, to a great degree even before complete cooling from the quenching temperature. For the steel used, the extent of self-tempering corresponds to an aging of some 10^4 sec at room temperature (for the reaction controlled by a carbon diffusion). The study was reviewed by Karel Mazanec, Research Institute of Metallurgy, VZKG, Ostrava. Orig. art. has: 5 figures, 3 formulas, and 2 tables. [Based on authors' abstract]   [NT]

SUB CODE: 11/ SUBM DATE: 19Jul65/ ORIG REF: 004/ OTH REF: 009/

hs

Card 2/2

MAZANEC, K.

Young human embryo Pha II. with developing head process. Biol.
listy 31 Suppl:148-154 2 Jan 1951.   (CIML 20:9)

1. Of the Institute of Embryology of Charles University, Prague
(Head--Prof. Z. Frankenberger, M.D.). Author is M.D.

Mazanec, K.

ZEMANKOVA-KUNZOVA, H.; MAZANEC, K.

Effect of quercetin and sodium salicylate on serum myocarditis in
rabbit. Biol. listy, Praha 32 no. 4:337-343 1952. (CLML 23:1)

1. Of the Institute of Pharmacology and of the Institute of Histology
of Palacky University in Olomouc.

MH...IKT .. K.

HEINC, A.; MAZANEC, K.; VEJDOVSKY, V.

Experiences from 102 partial perforating keratoplasties. Cesk.
ofth. 10 no.5:303-315 Oct 54.

1. Z Ocni kliniky PU v Olomouci, predn. prof. Dr. V.Vejdovsky a z
histologicko-embryologickeho ustavu v Brne, predn. doc. Dr.K.Mazanec.
        (CORNEAL TRANSPLANTATION
            subtotal, perforating)

MAZANEC, K.

EXCERPTA MEDICA Sec.12 Vol.11/4 Ophthalmology Apr57

556. **MAZANEC K.** and HAVELKA B. Hist.-Embr. Inst., Brno. *Příspévek
k histochemii rohovky. A contribution to the histochemistry of
the cornea ČSL. MORFOL. 1955, 3/2 (157-167) Tables 2 Illus. 1
The epithelium and endothelium of the cornea contain numerous minute droplets
of lipoids. Bowman's membrane gives a positive reaction for acid mucopoly-
saccharides; this decreases with age and is replaced by a lipoid reaction. Lamel-
lae of the substantia propria consist of collagen fibres, enveloped by acid muco-
polysaccharides; the interfibrillar substance contains also mucoproteins. With
increasing age, polysaccharides are replaced by lipoids. Descemet's membrane
manifests a lipoprotein character. The inner parts thus consist chiefly of muco-
polysaccharides and the outer layers are rich in lipoids as a protection against
the aqueous milieu.   Frankenberger - Prague (I, 12)

VEJDOVSKY, V.; MAZANEC, K.

Histological examination of clear corneal graft after keratoplasty.
Cesk.ofth. 11 no.4-5:208-213 1955.

1. Z ocni kliniky PU v Olomouci a histologickoembryologickeho
ustavu MU v Brne
          (CORNEAL TRANSPLANTATION
              histol. exam. of healing process)

MAZANEC, Karel; PLICZKA, Zdanek

Microscopis histochemistry of the sensory elements of the retina.
Cesk.ofth. 11 no.4-5:227-234 1955.

1. Z histologicko-embryologickeho ustavu lekarske fakulty
Masarykovy univerbity v Brne. Prednosta: Dr Karel Mazanec
        (RETINA, anatomy and histology
            histochemistry of rods & cones)

MAZANEK, Karel

Commemorating the 70th birthday of professor Zdenek Frankenberger.
Os morfologie 10 no.1:3-6 '62.

MAZANEC, Karel, MUDr.

An abnormal previllous human ovum (HEB-49) approximately
12-13 days old. Os morfologie 10 no.1:83-93 '62.

1. Director, Institute for Histology and Embryology,J.E.
Purkyne University, Brno.

MAZANEC, K.; DUSEK, J.

    Accidental detection of a young, approximately 12-day-old, abnormal
    human ovum. Cesk. gynek. 27 no.10:723-729 D '62.

    1. Katedra histol. a embryol. lek. fak. UJEvP v Brne — Katedra patol.
    anat. lek. fak. UP v Olomouci.
            (OVUM)   (UTERINE HEMORRHAGE)   (ENDOMETRIUM)

VACEK,Z.; MAZANEC,K. Za technicke spoluprace: CIBULKY,M.

Submicroscopical and cytochemical observations on the develop-
ment of the decidua during first three months of gravity.
Cesk. morf. 12 no.1:63-73 '64.

1. Embryologicky ustav lekarske fakulty Karlovy university
Praha, a histologicko-embryologicky ustav lekarske fakulty
Brno.

*

MAZANEC, M.

POLAK, H.; HAHN, P.; MAZANEC, M.; TEPLY, V.

Effect of histamine on metabolism. Sbor. lek. 56 no.5-6:105-116 June 54.

1. Z III. interni kliniky KU v Praze, prednosta prof. MUDr J.Charvat, klinicko-fysiologicka laborator, a z Biologickeho ustavu Cs akademie ved, fysiologicke oddeleni v Praze.
(HISTAMINE, effects,
on glycogen metab.)
(GLYCOGEN, metabolism,
eff. of histamine)

MAZANEC, M.

POLAK, H.; TEPLY, V.; MAZANEC, M.

Effect of the central nervous system on glycolytic action of
histamine. Sbor. lek. 56 no.5-6:117-125 June 54.

1. Z klinicko-fysiologicke laboratore III. interni kliniky KU
v Praze, prednosta prof. MUDr J.Charvat.
        (HISTAMINE, effects,
            on glycogen metab. in denervated organs)
        (GLYCOGEN, metabolism,
            eff. of histamine in denervated organs)
        (CENTRAL NERVOUS SYSTEM, physiology,
            regulation of glycogen metab. after admin. of histamine)

KOWALSKA, Eugenia; MAZANEK, Czeslaw

Ultrasonic surface purification. Przem chem 41 no.8:421-422
Ag '62.

1. Politechnika Slaska, Gliwice.

KOWALSKA, Eugenia; KOWALSKI, Witold; MAZANEK, Czeslaw

Propagation velocity of ultrasonic waves in aqueous solutions
of sulfuric acid. Chemia stosow 7 no.4:585-592 '63.

1. Katedra Chemii Ogolnej A, Politechnika Slaska, Gliwice.

KOWALSKA, Eugenia, doc. mgr inz.; MAZANEK, Czeslaw, mgr inz.

Cavitation in the ultrasonic impact grinding process.
Hutnik P 30 no.12:392-394   D '63.

1. Politechnika Slaska, Gliwice.

KOWALSKA, Eugenia, doc. mgr inz.; KOWALSKI, Witold, doc. dr inz.MAZANEK,
Czeslaw, mgr. st. asystent

Ultrasonic cavitation. Wiad chem 18 no.3:147-157   Mr'64

1. Kierownik Katedry Chemii Ogolnej A, Politechnika Slaska,
Gliwice (for Kowalska). 2. Kierownik Zakladu Technologii
Zwiazkow Siarki i Fosforu, Politechnika Slaska, Gliwice (for
Kowalski). 3. Katedra Chemii Ogolnej A, Politechnika Slaska,
Gliwice (for Mazanek).

L 41770-66   EWT(1)/T/EWP(k)

ACC NR: AP6031700   (N)   SOURCE CODE: PO/0099/66/040/003/0469/0473

AUTHOR: Kowalska, Eugenia; Kowalski, Witold; Bodzek, Michal; Mazanek, Czeslaw

ORG: Department of General Chemistry, Slask Polytechnic Institute, Gliwice (Katedra Chemii Ogolnej A Politechniki Slaskiej); Technical Institute for Sulfur and Phosphorus Compounds, Slask Polytechnic Institute, Gliwice (Zaklad Technologii Zwiazkow Siarki i Fosforu Politechniki Slaskiej)

TITLE: Velocity of ultrasonic waves in disperse systems

SOURCE: Roczniki chemii-annales societatis chimicae polonorum, v. 40, no. 3, 1966, 469-473

TOPIC TAGS: ultrasonic wave, interferometer, emulsion

ABSTRACT: Measurements of velocity of ultrasonic waves in naphtha-in-water-emulsion, oleic acid-in-water-emulsion were made. The velocity was measured by means of a resonance-phase interferometer at frequency 1 Mc. The possibility of ultrasonic speed calculation in emulsion from known velocity of ultrasonic waves in the components of emulsion has been analysed. Orig. art. has: 4 figures, 2 formulas and 5 tables. [Based on authors' Eng. abst.] [JPRS: 36,002]

SUB CODE: 20 / SUBM DATE: 10Jun65 / ORIG REF: 001 / SOV REF: 002
OTH REF: 002

Card 1/1

KOWALSKA, Eugenia, doc., mgr. inz.; MAZANEK, Czeslaw, mgr. inz.

Possibilities of using in power engineering and mining
industries the dispersive and coagulating action of supersonics.
Przegl gorn 18 no.5:290-292 My '62.

KOWALSKA, Eugenia, doc.mgr inz.; MAZANEK, Czeslaw, mgr inz.

Influence of acoustic vibration on the intensification of the fuel combustion process. Wiad hut 15 [i.e. 20] no.1:9-10 Ja '64.

9

𝓒 A

Blast-furnace profile   Eugeniusz Mazanek (Centr.-
Zwiazek Przemyslu Hutniczego, Katowice, Poland)
Hutnik 15, 158-64(1948)(in Polish).— A review of the
existing blast-furnace designs and a discussion of their
characteristic differences.   E. A. Ackermann

BLAST FURNACES IN THE U.S.S.R.   E. Mazanek. (Hutnik, 1948, vol. 15, Oct.-Nov., pp. 461-467). (In Polish). The development of blast-furnaces in the U.S.S.R. is considered. Some examples of standard types of blast-furnace are given with dimensions and production data on charges and output. Data on the linings are also presented. W.J.W.

METALLURGICAL LITERATURE CLASSIFICATION

S   7

Zinc in the Blast-Furnace. K. Masanek. (Stal, 1947, No. 1,
19; Stahl und Eisen, 1949, Vol. 27, pp. 772-773).
An ore containing 1·67% of zinc has been smelted in a Russian
blast furnace from 1935 to 1945 and the distribution of zinc
in the brickwork and the gas at different levels in the shaft
has been investigated. The results showed that some zinc
circulated in the shaft and that this proportion increased
with low gas temperature at the throat of the furnace. Thus
high throat temperatures (250-300° C.) and hot driving
prevented the precipitation of zinc and zinc oxide on the
shaft lining. —E. A. N.

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Maranek E. Blast-Furnace Operation.
"Obsluga wielkiego pieca" Katowice, 1950. PWT. 8° pp 339, 178
figs

Blast-furnace profiles and progress in their design. Blast-furnace
products. Iron ores. Preparation of ores. Fluxes. Fuels. Size of indivi-
dual parts of a blast-furnace. Plan of a blast-furnace installation.
Construction of blast-furnaces and auxiliary equipment. Blast fur-
nace gas. Air heaters. Blast furnace blowers Blast-furnace processes
Blast-furnace operation. Electric furnaces for smelting pig-iron Po-
wer consumption figures

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"Influence of the charge on the work of a cupola." (p.4) WIADOMOSCI HUTNICZE
(Centralny Zarzad Przemyslu Hutniczego) Stalinogrod. Vol 9, no. 9, Sept. 1953

SO: EAST European Accessions List Vol 4, No 8, Aug. 1954

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Mazanek, E. Carburization of Iron with Carbon Monoxide.
Nawęglanie żelaza za pomocą tlenku węgla". Archiwum Hut-
nictwa (PAN), No. 4, Warszawa, 1956, PWN, pp. 341-367, 9 figs., 11 tabs.

Tests were made in which CO was used for carburizing iron,
spongy iron and iron ore under various conditions of temperature
and for various periods of time. The following results were obtained
during reduction: 1) carburization was a prolonged process, the increas
ia of carbon content being proportional to the quadratic root of the
time required for carburizing; 2) it was somewhat easier to carburize
spongy iron obtained by reducing ore, in view of the greater porosity
of spongy iron as compared with compact pure iron; 3) carburization
of ore in the course of reduction was very slow and the rate of the
process did not increase till about 70% of the ore was reduced;
4) porosity was an important factor in the carburization since it facili-
tated contact with carbon monoxide, and consequently it would pro-
bably be easier to carburize iron derived from hematite than iron
from the compact magnetite ore; 5) these tests indicated that car-
burization with carbon monoxide in blast furnaces was of no com-
mercial value. Other tests not here discussed were made, and it was
found that carburization was easily obtained by passing melted metal-
lic iron over hot red coke. This method is of great significance for
blast furnace processes.

reduce the As content by the audn. of 8 to the mix.

F. J. Hendel

MAZANEK, F.; BENESCH, P.

Ferrocoke. p. 89. (Hutnik, Vol. 24, No. 3, Mar 1957, Katowice, Poland)

SO: Monthly List of East European Accessions (EEAL) LC, Vol. 6, No. 8, Aug 1957. Uncl.

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The self-melting sinter. p. 181
(HUTNIK, Vol. 24, No. 5, May 1957, Katowice, Poland)

SOURCE: Monthly List of East European Accessions (EEAL) LC, Vol. 6, No. 9, Sept. 1957 Uncl.

POL/39-25-11-4/26

18(5)

AUTHOR: Mazanek, E., Dotsent, Mechanical Engineer and Janowski, J., Mechanical Engineer

TITLE: Heat Conductivity, Thermal Expansion and Reactivity of Refractory Carbon as Building Material for Blast Furnaces (Przewodnictwo cieplne, rozszerzalność cieplna i reakcyjność wielkopiecowych konstrukcyjnych materiałów węglowych)

PERIODICAL: Hutnik, 1958, Vol 25, Nr 11-12, pp 447-456 (Poland)

ABSTRACT: Blast furnaces are lined with carbon bricks well fitted together or with raw carbon blocks bound by carbon filler. The materials used must have a good heat conductivity and be stable not only toward hot iron and slag, but also toward CO_2. Besides, the latter method requires the use of materials having the same thermal expansion. The heat conductivity of a number of specimens of different sizes was measured at different temperatures. The results show that the heat conductivity of burned refractory carbon diminishes with the increase

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Heat Conductivity, Thermal Expansion and Reactivity of Refractory
Carbon as Building Material for Blast Furnaces

of porosity, specific gravity and resistivity and with
the increase of temperature. The heat conductivity of
raw carbon blocks and carbon filler increases with the
increase of temperature. High thermal expansion and
shrinkage factors have been responsible for much damage
in refractory carbon. These factors are especially
high with raw carbon lining, and it is advisable to
heat it up to temperatures above $250^{\circ}C$ before blowing
in the furnace. The reactivity of refractory carbon
with CO_2 was studied under different conditions, with
materials of different porosity and compressive strength
and with varying gas composition and temperatures. The
results show that the stability of refractory carbon
toward CO_2 declines with greater porosity and at tem-
peratures above $1000^{\circ}C$, is higher toward a mixture of
CO_2 with N_2 than toward pure CO_2 and in the presence of
coke. A good heat conductivity of carbon lining ensures
better heat transfer. The thermal expansion factors of
carbon blocks, carbon filler and fireclay being differ-

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Heat Conductivity, Thermal Expansion and Reactivity of Refractory
Carbon as Building Material for Blast Furnaces

ent, it is expedient to use carbon bricks fitted togeth-
er instead of a combination of materials. The influence
of CO_2 on refractory carbon in the shaft is in evidence
even if its concentration is not high and if coke is
present, although both these factors contribute to its
durability. There are 9 photographs, 20 graphs, 11
tables and 13 references, 5 of which are Polish, 6
English, 1 Soviet and 1 German.

ASSOCIATION: AGH - Kraków (Cracow Academy of Mining and Metallurgy)

Card 3/3

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