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SOV/126-8-3-18/33

## Internal Friction of Metastable Solid Solutions

dependence of internal friction of a deformed  $\text{Ni}_3\text{Mn}$  alloy (75% deformation), the peaks A and B remain and an additional peak, D, having a maximum at  $226^\circ\text{C}$ , appears; the general level of internal friction rises sharply (Fig 2). An additional peak, C, having a maximum at  $316^\circ\text{C}$ , is evident in a carburized  $\text{Ni}_3\text{Mn}$  alloy containing 0.35% C (Fig 3). The appearance of this peak is due to the diffusion of carbon atoms in the elastic stress range. During the investigation of the influence of alloying the  $\text{Ni}_3\text{Mn}$  solid solution with molybdenum, it was found that supplementary maxima - peaks M and C at  $52$  and  $316^\circ\text{C}$  - appeared in temperature dependence of internal friction curves (Fig 4). In Fig 5, the influence of heat treatment on the temperature dependence of a  $\text{Ni}_3\text{Mn}$  alloy containing 1.34% Mo is shown. A similar result is obtained with an alloy containing 2.77% Mo. On measuring the internal friction of  $\text{Ni}_3\text{Fe}$  alloys alloyed with Mo (Fig 6) two peaks were obtained in the low temperature range, one in the region of  $85^\circ\text{C}$  (peak A) and the other at  $170^\circ\text{C}$  (peak B). Fig 7 shows the influence of heat treatment on the temperature dependence of internal

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AUTHORS: Livshits, B.G., Avraamov, Yu.S., Osvenskiy, V.B.,  
Mezhennaya, S.O. and Belyakov, L.N.

TITLE: Internal Friction of Metastable Solid Solutions

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 8, Nr 3,  
pp 440-448 (USSR)

ABSTRACT: The alloy of stoichiometric composition  $Ni_3Mn$  and alloys of the same composition alloyed with 1.34 and 2.77% Mo, respectively, were studied by measuring the temperature dependence of internal friction. Using this method,  $Ni_3Fe$  type alloys without molybdenum and those alloyed with molybdenum, and also EI437A type alloys (nimonic) were studied. The chemical composition of the investigated alloys is shown in the table on p 441. The internal friction was measured in wire specimens, 300 mm long and 0.7 mm diameter, in vacuum. The alloy  $Ni_3Mn$  is an ordered alloy with a Curie point of approximately  $350^{\circ}C$  (Ref 10 and 11). In the curve showing the temperature dependence of internal friction of a quenched  $Ni_3Mn$  alloy (quenched from a temperature above that at which ordering occurs) two peaks, A and B, with maxima at 120 and  $290^{\circ}C$  are observed (Fig 1). In the curve of the temperature

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Investigation of the Alloy Ni<sub>3</sub>Mn by the Method of  
Internal Friction

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likewise as meta-stability of the solid solution. A further maximum (C) occurs on the temperature curve of the internal friction of carbonaceous alloys at 360° (Fig 3). The occurrence of the maximum C is explained by the diffusion of the carbon atoms in the stress field. The amount of the maximum C in carbonaceous samples is reduced after six hours of melting at 360° and subsequent hardening in water, in consequence of the carbide formation in the solid solution. Only one maximum occurs at 360° on the temperature curve of the internal friction after the separation of the carbide phase. The method of internal friction makes the investigation of the orientation state in the alloy possible. There are 3 figures and 5 references, 3 of which are Soviet.

ASSOCIATION: Moskovskiy institut stali (Moscow Steel Institute)

SUBMITTED: July 10, 1958

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18 (1)

AUTHORS:

Avraamov, Yu. S., Mezhenaya, S. Q. 30V/163-59-2-34/48

TITLE:

Investigation of the Alloy  $Ni_3Mn$  by the Method of Internal Friction (Issledovaniye splava  $Ni_3Mn$  metodom vnutrennego treniya)

PERIODICAL:

Nauchnyye doklady vysshey shkoly. Metallurgiya, 1959, Nr 2, pp 189-193 (USSR)

ABSTRACT:

The phase composition of the alloy  $Ni_3Mn$  was investigated by the method of internal friction after various thermal treatment. The influence of the thermal treatment on the  $Ni_3Mn$  alloy in dependence of the temperature on the internal friction was investigated and the results are given in figure 1. Two maxima, A and B, occur at 120 and 290° on the temperature curve of the hardened alloy. The maxima can be interpreted as meta-stability in the orientation of the solid solutions. The dependence of the internal friction of the deformed steel on temperature was investigated and is given in figure 2. Beside the maxima A and B also the maximum D occurs at 226° on the temperature curve of the internal friction of the deformed  $Ni_3Mn$  alloy (deformation degree 75 %). The maximum D is interpreted

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MEZHENNAYA, S. O., OSVENSKIY, V. B., and BELYAKOV, L. N., AVRAAMOV, Yu. S., (Moscow Inst. of Steel.)

"The Internal Friction of 'Metastable' Solid Solutions."

report presented at an Inter-vuz Conference on Relaxation Phenomena in Pure Metals and Alloys, 2-4 Apr 1958, at Moscow Inst. of Steel.

Vest. Vys. Shkoly, 9, 72-3, 1958.

Mezhenko, Yu. A

Russkaya tekhnicheskaya periodika, 1800-1916 gg;  
bibliograficheskiy ukazatel'. Moskva, Akademkniga,  
1955.

298 p. facsims, 27 cm.

At head of title: Akademiya Nauk SSSr. Institut  
Istorii Yestestvoznaniya I Tekhniki.

USSR / Farm Animals. General Problems. Q

Abs Jour : Ref Zhur - Biologiya, No 5, 1959, No. 21199

become dehydrated, osmic pressure of cellular juice increases, as well as transparency of protoplasm, the original structure of the protein complex becomes disrupted, proteins are subjected to denaturization, the stability of the pigment-protein-lipoid complex of plastids becomes impaired, and as a result losses of nutritious substances increase. -- F. M. Kazantsev

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USSR / Farm Animals. General Problems.

Abs Jour : Ref Zhur - Biologiya, No 5, 1959, No. 21199

Author : Zhuravlev, Ye. M.; Zeyliger, D. O.; Mazhenko, I. V.;  
Ivanovskiy, V. M.

Inst : Penza Institute of Agriculture  
Title : Changes of the Chemical Composition of Red Clover  
Leaves When Dried

Orig Pub : Sb. Tr. Penzenskogo s.-x. in-ta, 1958, Vyp. 2,  
425-437

Abstract : The entire clover plant of the Penezenskiy 1 variety  
and lucerne plant of the improved Bol'shev'yasskaya  
variety were dried in a laboratory with dissipated  
light. The leaves of the 4th and 5th layers were  
analyzed. The leaves were analyzed 24, 48 and 96  
hours after drying. To the extent to which the plants

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MEZHEUKO, I.V.

USSR / Cultivated Plants. Fodder Grasses and Stalks. M

Abstr Jour : Raf Zhur - Biokhimiya, No 6, 1959, No. 2423  
Author : Zhuravlov, Ye. M.; Volkova, M. G.; Mezheuko, I. V.; Ivanovskiy, V. M.  
Title : Protein and Carbohydrate Content of Leaves and Stalks of Fodder Grasses, Carotene and Chlorophyll in Various Phases of Plant Development  
Orig Pub : Sb. Tr. Penzensk. 9.-kh. In-tsa, 1959, Vp 2, 403-424

Abstract : Spontaneous changes in the content of carotene, chlorophyll, and starch in the leaves and stalks of various phases of plant development were studied. The reciprocal relation between the weight of leaves and stalks changes in favor of leaves as the plants develop. The percent content of starch in the leaves and stalks is lower in the leaves than in the stalks, the difference being larger as the plants develop. A correlation between the quantities of chlorophyll and carotene in the leaves and stalks was observed. The total quantity of soluble carbohydrates in the stalks were considerably higher than in the leaves. The maximum content of starch was observed more often in leaves than in stalks and protein content was higher in stalks than in leaves. The content of carotene and chlorophyll in the stalks was 47% and 150% higher than in the leaves. A reciprocal relation between the quantities of chlorophyll and carotene in the stalks was observed. The total quantity of soluble carbohydrates in the stalks were considerably higher than in the leaves. The maximum content of starch was observed more often in leaves than in stalks and protein content was higher in stalks than in leaves. The content of carotene and chlorophyll in the stalks was 47% and 150% higher than in the leaves. A reciprocal relation between the quantities of chlorophyll and carotene in the stalks was observed.

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MEZHENINOV, Mikhail Yur'yevich, inzh.; KRASUKHIN, Moisey Naumovich,  
kand. tekhn. nauk; YEGOROV, Boris Aleksandrovich, inzh.;  
NIKITIN, D.V., nauchnyy red.; MINAYTVA, T.M., red.; KNAKNIN,  
M.T., tekhn. red.

[Manufacture of vegetable tanning extracts] Proizvodstvo rastitel'-  
nykh dubil'nykh ekstraktov. [By] M.IU. Mezheninov, M.N. Krasukhin,  
B.A. Egorov. Moskva, Rostekhzdat, 1962. 291 p. (MIRA 16:3)  
(Tanning materials)

MEZHERINOV, M.Yu.

Marketing of tanning extracts in granulated form. 4ozh.-obuv.  
pron. 2 no.5:23-25 My '60. (MIRA 13:9)  
(Tanning materials)

KUSAKIN, P.S.; MEZHENINOV, M. Yu.

Simple pipe-cutting machine. Obm.tekh.opyt. [MLP] no.27:  
37-39 '56. (MIRA 11:11)  
(Pipe cutting)

IVANOV, A.I.; MEZHENINOV, M.Yu.

Devices used for bending steel sheets in making hoist buckets.  
Obm.tekh.opyt. [MLP] no.27:36-37 '56. (MIRA 11:11)  
(Sheet-metal work)

BELOVODENKO, A.I.; MEZHENINOV, M.Yu.

Improved rolling-out of watertubes for boilers. Obm.tekh.opyt.  
[MLP] no.27:35-36 '56. (MIRA 11:11)  
(Rolling (Metalwork)) (Boilers, Watertube)

YASIN, M.G. \*MEZHENINOV, M.Yu.

Long-link chains used for hoists and conveyors. Obm.tekh.opyt.  
[MLP] no.27:34-35 '56. (MIRA 11:11)  
(Chains)

BELOVODENKO, A.I.; MEZHENINOV, M.Yu.

Measures for preventing wash water from getting into boiler  
furnaces. Obm.tekh.opyt. [MLP] no.27:33-34 '56. (MIRA 11:11)  
(Boilers--Safety measures)



MAKSIYEV, V.Yu.; MEZHENINOV, M.Yu.

Discharging wash water from Kestner apparatuses for producing  
solid extract. Obm.tekh.opyt. [MLP] no.27:33 '56. (MIRA 11:11)  
(Condensers (Vapors and gases))

MEZHENINOV, M.Yu.

Utilizing the steam of the secondary boiling-up. Obm.tekh.opyt.  
[MLP] . no.27:31-33 '56. (MIRA 11:11)  
(Steam engineering)

IVANOV, Ye.N.; MEZHENINOV, M.Yu.

Pneumatic brushes used for cleaning pipes of Kestner apparatuses  
ofr producing solid extract. Obm.tekh.opyt. [MLP] no.27:29-31  
'56. (MIRA 11:11)

(Brooms and brushes)

KORCHAGIN, I.G.; MEZHENINOV, M.Yu.

Devices used for pouring into sacks and weighing extract flowing  
out of Kestner apparatuses. Obm.tekh.opyt. [MLP] no.27:28-29  
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(Tanning materials) (Condensers (Vapors and gases)--Attachments)

YASIN, M.G.; MEZHENINOV, M.Yu.

Heating columns having shortened tubes and used in Kestner apparatuses  
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'56. (MIRA 11:11)

(Condensers (Vapors and gases))

YASIN, M.G.; ~~MEZHENINOV~~, M.Yu.

Barometric condensers made of stainless steel. Obm.tekh.opyt.  
[MIP] no.27:24-26 '56. (MIRA 11:11)  
(Condensers (Vapors and gases))

YASIN, M.G.; MEZHENINOV, M.Yu.

Improved fitting of bottom filters in diffusers. Obm.tekh.opyt.  
[MLP] no.27:21-23 '56. (MIRA 11:11)  
(Diffusers)

YASIN, M.G.; MEZHENINOV, M.Yu.

Devices for preventing casual openings of bottom lids of diffusers.  
Obm.tekh.opyt. [MLP] no.27:19-21 '56. (MIRA 11:11)  
(Diffusers--Safety measures)



MESHCHERYAK, G.Ye.; MEZHENINOV, M.Yu.

Pneumatic shutting of bottom lids of diffusers. Obm.tekh.opyt.  
[MLP] no.27:17-19 '56. (MIRA 11:11)  
(Diffusers)

YASIN, M.G.; MBZHENINOV, M.Yu.

Using V-belts for rotating chopping machines. Obn.tekh.opyt.  
[MLP] no.27:15-17 '56. (MIRA 11:11)  
(Crushing machinery)

SMIRNOV, S.I.; MEZHENINOV, M.Yu.

Simple stackers. Obm.tekh.opyt. [MLP] no.27:12-15 '56.  
(Materials handling) (MIRA 11:11)

MEZHENINOV, M.Yu.

Ways of modernizing the equipment of tanning plants. Leg. prom. 19  
no. 5:10-18 My '55.  
(Tanning) (MLRA 8:7)