The Nature of Chemical Non-Homogeneity of the Fusion Zone in Some Pearlite Steels

rinsed in alcohol. A high frequency "DG-2" generator was used (Ref. 10) for exciting the spectrum, fitted with a variable shunting liquid capacitor. For simultaneous determination of carbon and other elements (chrome, niobium, etc.) plate types "III" and "I" of different sensitivity were inserted. The relative carbon determination error was 3.7%. The weld specimens of steel with 0.12% C, were welded with electrodes producing different contents of elements, and heated for 100 hours in 700°C. The microstructure of a specimen is shown in Figure 1. It was proved that it is possible to change the nature of the carbonized zone in welded joints prone to carbon migration in increased temperature, by adding elements producing carbides of different stability, and by changing the fusion depth. The following was concluded: 1) Carbon migrates between the parent and the weld metal toward the side with a higher content of carbide forming elements (or with elements forming more stable carbides), and the nature of the carbonized zone depends on details of the welding process and the type of the carbides forming. 2) Increasing the depth of the fusion in the parent metal must lead to a smoother change of carbon

The Nature of Chemical Non-Homogeneity of the Fusion Zone in Some Pearlite Steels

concentration in the parent metal at the weld. The maximum carbon concentration in the fusion zone is the higher the more carbon is formed in the carbides by the alloying element in the metal. The speed of the carbon penetration increase depends directly on the stability of the carbides forming. 3) The "PMT-3" apparatus with pointed electrode instead of a diamond is well suited for analysis. There are 2 photographs, 2 diagrams, and 11 references 10 of which are Soviet and 1 English.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut po stroitel'stvu magistral'nykh truboprovodov (All-Union Scientific Research Institute for Construction of Pipe Mains)

SUBMITTED: November 9, 1959

Card 3/3

84697

1.2300 2208, 2708 only

S/135/60/000/005/004/009
A115/A029

AUTHORS: Livshits, L.S., Candidate of Technical Sciences; Panich, S.I., Technician

TITLE: Some Regularities of Migration of Carbon in Perlite Steel Welding Joints

PERIODICAL: Svarochnoye proizvodstvo, 1960, No. 5, pp. 23 - 24

TEXT: After reheating a welded joint up to 500 - 700°C the carbon migrates through the solid solution to the joint, where a concentration of carbides took place during the welding process. Unequal concentration of carbon in the ferrite causes its migration into the sphere of more stable carbides. Replenishment of carbon content in the ferrite (conditional equilibrium) takes place at the expense of less stable carbides. A diagram of impaired homogeneity in a seam after reheating is shown in Figure 1. Although general laws of carbon migration in weldments are known, there are still some questions unsolved. One of them is the influence of the various alloying elements and their quantities upon the behavior in the zone of fusion. In this connection, a series of tests has been made

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Some Regularities of Migration of Carbon in Perlite Steel Welding Joints

by means of fusion upon steel St.3 (0.17% C). The patterns were exposed to 700°C for 1.10 and 100 hours, after which they were tested metallographically, the extent of carbon migration being judged by the depth of the decarbonized zone of the basic metal. According to the location of the alloying elements (Table 2) it cannot be said that the influence of the alloying elements upon carbon migration is in direct dependence on the affinity of the given elements with carbon. Actually, with equal content (in weight %), tungsten yielding more stable carbides gives a twice smaller zone of decarbonization than chromium yielding less stable carbides. Instead of the sequence Mn, Cr, Mo, Nb, W, V, based on increasing influence upon carbon migration, the sequence W, Mn, Mo, Nb, Cr, V was found showing at first glance no congruity. Allowing for previously expressed observations that dissolved atoms of carbide-forming elements influence carbon migration, the results of the tests have been represented in atomic percents (Fig. 2b). Results obtained of the dependence of the decarbonized depth on the duration and temperature of processing (Fig. 4) show that decarbonizing proceeds slowly at 550°C. At 624°C the rate of decarbonizing makes itself felt

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84697

S/135/60/000/005/004/009
A115/A029

Some Regularities of Migration of Carbon in Perlite Steel Welding Joints

and the speed at 700°C rises in importance; here, eventually, a premature destruction of a seam is possible. There are 4 figures, 2 tables and 5 Soviet references.

ASSOCIATION: VNIIST (All Union Scientific Research Institute of Welding)

Card 3/3

S/135/60/000/007/004/014
A006/A002

AUTHORS: Livshits, L.S., Candidate of Technical Sciences, Panich, S.I., Technician

TITLE: On the Effect of Heterogeneity in the Fusion Zone of Perlite Steels on Their Properties

PERIODICAL: Svarochnoye proizvodstvo, 1960, No. 7, pp. 13-15

TEXT: In a number of cases structural heterogeneity arises in the fusion zone of weld joints in perlite steels, appearing in the formation of a decarburized and a carburized zone. To reveal the effect of this heterogeneity in the fusion zone on the strength of weld joints, their ductility, endurance and behavior at high temperatures and under brief and long-lasting loading, the following tests were performed on "30 XM" (30KhM) steel joints welded with "Ц-17" (TsL-17) electrodes; tensile tests on Gagarin specimens with one-side notches; impact tests on specimens with notches in the fusion zone, the seam and the base metal, endurance tests, performed at TsNIITMash on "У-12" (U-12) machines; and rupture strength tests on specimens with notches across the weld joint, performed on "ВП-8" (VP-8) machines at the Moskovskiy institut stali (Moscow Steel Institute)

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S/135/60/000/007/004/014
A006/A002

On the Effect of Heterogeneity in the Fusion Zone of Perlite Steels on Their Properties

under the supervision of Engineer V.N. Manygin. The following results were obtained: The heterogeneity in the fusion zone reduces the strength of welds subjected to brief static tensile tests, if the stress concentrator is located in the fusion zone. This necessitates particular requirements to weld joints which are prone to the formation of a heterogeneous structure in the fusion zone. Fatigue strength is reduced in weld joints with or without stress concentrators. Endurance strength decreases considerably at high temperatures in weld joints of heat-resistant perlite steels with a heterogeneity in the fusion zone. The greatest negative effect is produced by the decarburized section of the fusion zone. Therefore the degree of heterogeneity formed in the fusion zone, must be evaluated according to the magnitude of decarburization. There are 6 tables, 4 figures and 1 Soviet reference.

ASSOCIATION: VNIIST

Card 2/2

21243
S/193/61/000/006/003/007
A004/A104

1.2300

AUTHORS: Bakhrakh, L. P., and Livshits, L. S.

TITLE: ВСН-5 (VSN-5) electrodes for welding non-revolvable joints of Х18Н12М2Т (Kh18N12M2T) steel pipes

PERIODICAL: Byulleten' tekhniko-ekonomicheskoy informatsii, no. 6, 1961, 23-24

TEXT: The VSN-5 electrodes were developed in 1960 by the Vsesoyuznyy nauchno-issledovatel'skiy institut stroitel'stva truboprovodov (All-Union Scientific Research Institute for the Construction of Pipelines) (see also Byulleten' tekhniko-ekonomicheskoy informatsii, 1961, no. 2, 23). The electrode has a Cv. 04Х18Н11М3 (Sv. 04Kh18N11M3) steel core and a coating consisting of 40 parts marble, 40 parts feldspar, 3 parts ferromanganese, 3 parts titanium dioxide, 3 parts ferrosilicon, 8 parts ferrocolumbium, 2 parts ferromolybdenum, 1 part aluminum, and 30-32 parts water glass. The VSN-5 electrode makes it possible to obtain a built-up metal of the following composition:

C	to 0.13	Ni	10 - 12
Si	0.5 - 0.8	Nb	0.9 - 1.2
Mn	0.5 - 1.5	Mo	2.3 - 2.6
Cr	17 - 19	S and P	not more than 0.035

Card 1/2

S/137/61/000/012/094/149
A006/A101

AUTHORS: Livshits, L.S., Polyakova, R.B.

TITLE: Investigating weld joints of grade 1 X 18H12T (1Kh18N12T) austenite steel steam-conducting pipes

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 12, 1961, 13-14, abstract 12E73 ("Elektr. stantsii", 1961, no. 7, 21 - 25)

TEXT: To evaluate the properties of 1Kh18N12T weld joints produced with ЦТ-15 (TsT-15), КТИ-5 (KTI-5) and ЭА-400/10 (EA-400/10) electrodes, the authors investigated the technological properties of the electrodes, hot-crack sensitivity during welding, mechanical properties and microstructure of the weld metal and the weld-adjacent metal. The investigations were performed on welded specimens immediately after welding without heat treatment; after austenization; aging; and austenization and aging. The experiments yielded the following results: 1) The best combination of properties is offered by weld joints produced with KTI-5 electrodes. When using these electrodes for welding, there is the least danger of hot crack formation, the brittleness of the weld is lower than in joints welded with TsT-15 electrodes, and heat resistance of the weld joint

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after extended heating has a maximum value. 2) Austenization promotes homogenization of the weld joint structure and improves the plastic properties. However, extended heating after austenization impairs the properties; moreover, on austenized butts the condition of the fusion zone is strongly impaired so that during long-lasting thermal tests, failures prevail in this zone without plastic deformation. 3) It was found that weak areas exist in both not heat-treated and austenized weld joints. Therefore studies must be continued in the following directions in order to discover the means of further improving the quality of weld joints on 1Kh18N12T steel to raise the reliability of steam conductors: a) investigating the causes of impaired base metal properties (extended heat resistance) in the weld-adjacent zone; b) investigating the causes of impaired properties of welds and fusion zones during prolonged heating of austenized weld joints.

V. Tarisova

[Abstracter's note: Complete translation]

Card 2/2

LIVSHITS, L.S.; RAKHMANOV, A.S.

Character of fracture as a criterion in the evaluation of brittleness. Zav.lab. 27 no.7:899-903 '61. (MIRA 14:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut po stroitel'stvu magistral'nykh truboprovodov.
(Steel--Brittleness)

18.8200

21397
S/032/61/027/012/010/015
B104/B102

AUTHORS: Rakhmanov, A. S., and Livshits, L. S.

TITLE: Simplification of the determination of the resilience components

PERIODICAL: Zavodskaya laboratoriya, v. 27, no. 12, 1961, 1510 - 1513

TEXT: The number of samples required for determining the resilience of a material could be reduced substantially by repeated impact tests of one and the same sample with equal or increasing impact energy. The bending angle of the sample as a function of the impact energy of the pendulum was determined for 1 - 2 samples in tests in which the samples were not completely destroyed. Two or three samples are required for determining the resilience and the bending angle of breaking samples. The following steels were tested: 19Г (19G) (with low viscosity after deformation and aging); 10Г2 (10G2) (hot-rolled, medium viscosity); 12МХ (12 MKh) (heat-treated, high viscosity); 1Х18Н9Т (1Kh18N9T) and the Al alloy АМг (AMg) medium viscosity and high plasticity). For samples tested without

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destruction it is possible to find stresses at which the bending angles are equal at equal loads, no matter whether the sample is loaded once or several times. This equality was found for a pendulum energy of 1 kgm for low-alloy pearlitic steels, (19G, 10G2, 12MKh) or even if the energy is increased successively. This value is 2 kgm in austenitic CrNi steels, and ≥ 3 kgm in the above-mentioned Al alloy. The resilience of samples subjected to several impact tests diverges from the value obtained by one test. Destruction and deformation energies can be determined from a plot of bending angle versus consumed impact energy. There are 3 figures, 1 table, and 5 references: 4 Soviet and 1 non-Soviet. The reference to the English-language publication reads as follows W. I. Harris, Ir., I. A. Rinebolt and R. Raring. The Welding. J., No. 9 (1951).

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut po stroitel'stvu magistral'nykh truboprovodov (All-Union Scientific Research Institute for the Construction of Main Pipelines)

LIVSHITS, L.S., kand.tekhn.nauk; POLYAKOVA, R.B., inzh.; MAKSIMOVA, K.I., inzh.

Investigation of the welded joints of steampipes from 1Kh18N12T austentic steel. Elek. sta. 32 no.7:21-25 Jl '61. (MIRA 14:10)
(Steampipes)

AKULOV, I.A., kand. tekhn.nauk,dots.; ALEKSEYEV, Ye.K., inzh.; GURARI, M.D., inzh.[deceased]; DMITRIYEV, I.S., kand.tekhn.nauk,dots.; YEVSEYEV, R.Ye., inzh.; ZIL'BERBERG, A.L., inzh.; LIVSHITS, L.S., kand.tekhn.nauk; MEL'NIK, V.I., inzh.; RAZUMOVA, E.D., inzh.; TARAN, V.D., prof., doktor tekhn.nauk; FAL'KEVICH, A.S., kand.tekhn. nauk; TSEGEL'SKIY, V.L., inzh.; CHERNYAK, V.S., inzh.; SHILOVTSEV, D.P., inzh.; ZVEGINTSEVA, K.V., inzh., nauchnyy red.; TYURIN, V.F., inzh.,nauchnyy red.; VOLNYANSKIY,A.K.,glav.red.; SOKOLOV,D.V.,zam. glav.red.; SEREBRENNIKOV,S.S., red.; MIKHAYLOV,K.A.,red.; STAROVEROV, I.G., red.; VOLODIN, V.Ye., red.; NIKOLAYEVSKIY, Ye.Ya.,red.; LYTKINA,L.S.,red.izd-va; PEREVALYUK,M.V.,red. izd-va; RUDAKOVA, N.I., tekhn. red.

[Welding operations in building]Svarochnye raboty v stroitel'stve. Moskva,Gosstroiizdat,1962. 783 p. (MIRA 15:6)
(Welding—Handbooks, manuals, etc.) (Building)

LIVSHITS, Lev Semenovich, kand. tekhn. nauk. Prinimali uchastiye: BAKHRAKH, L.P., starshiy nauchnyy sotr.; PANICH, S.I., inzh.; GRINBERG, N.A., asp.; KURKUMELLI, E.G., inzh.; KAVKOVA, V., red.

[Role of alloyed steel composition on the conservation of structural homogeneity, and the properties of welded joints during heat time]Rol' sostava legirovannykh stalei v sokhranenii strukturnoi odnorodnosti i svoistv svarnykh soedinenii pri dlitel'nykh rabochikh nagrevakh. Moskva, VNIIST Glavgaza SSSR. Redaktsionno-izd. otdel, 1962. 56 p. (MIRA 15:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut po stroitel'stvu magistral'nykh truboprovodov (for Bakhrakh, Panich, Grinberg, Kurkumelli).
(Steel—Welding) (Metals, Effect of temperature on)

ALFEROVA, N.S., doktor tekhn. nauk; BERNSHTEYN, M.L., kand. tekhn. nauk; BLANTER, M.Ye., doktor tekhn. nauk; BOKSHTEYN, S.Z., doktor tekhn.nauk; VINOGRAD, M.I., kand. tekhn.nauk; GAMOV, M.I., inzh.; GELLER, Yu.A., doktor tekhn. nauk; GOTLIB, L.I., kand. tekhn. nauk; GRDINA, Yu.V., doktor tekhn.nauk; GRIGOROVICH, V.K., kand. tekhn. nauk; GULYAYEV, B.B., doktor tekhn. nauk; DOVGALEVSKIY, Ya.M., kand. tekhn. nauk; DUDOVTSEV, P.A., kand. tekhn. nauk [deceased]; KIDIN, I.N., doktor tekhn. nauk; LEYKIN, I.M., kand. tekhn. nauk; LIVSHITS, B.G., doktor tekhn. nauk; LIVSHITS, L.S., kand.tekhn. nauk; L'VOV, M.A., kand. tekhn. nauk; MEYERSON, G.A., doktor tekhn. nauk; MINKEVICH, A.N., kand. tekhn. nauk; NATANSON, A.K., kand. tekhn. nauk; NAKHIMOV, A.M., inzh.; NAKHIMOV, D.M., kand. tekhn. nauk; OSTRIN, G.Ya., inzh.; PANASENKO, F.L., inzh.; SOLODIKHIN, A.G., kand. tekhn.nauk; KHIMUSHIN, F.F., kand. tekhn. nauk; CHERNASHKIN, V.G., kand. tekhn. nauk; YUDIN, A.A., kand. fiz.-mat. nauk; YANKOVSKIY, V.M., kand. tekhn. nauk; RAKHSHTADT, A.G., red.; GORDON, L.M., red. izd-va; VAYNSHTEYN, Ye.B., tekhn.

[Metallography and the heat treatment of steel]Metallovedenie i termicheskaia obrabotka stali; spravochnik. Izd.2., perer. i dop. Pod red. M.L.Bernshteina i A.G. Rakhshtadta. Moskva, Metallurgizdat. Vol.2. 1962. 1656 p. (MIRA 15:10)

(Steel--Metallography)
(Steel--Heat treatment)

LIVSHITS, Lev Semenovich. Prinimal uchastiye BAKHRAKH, L.P., inzh.; ALEKSEYEV, Ye.K., inzh., nauchnyy red.; PEREVALYUK, M.V., red. izd-va; SHEVCHENKO, T.N., tekhn. red.

[Welding steel alloys in assembly work in construction]Svarka legirovannykh stalei na montazhnykh rabotakh v stroitel'stve. Moskva, Gosstroiizdat, 1962. 191 p. (MIRA 15:12)
(Steel alloys—Welding) (Building, Iron and steel)

43275

1.2300

S/842/62/000/000/006/006
E191/E435

AUTHORS: Livshits, L.S., Candidate of Technical Sciences, Bakhrakh, L.P., Engineer

TITLE: The welding of alloy steel production plant pipework

SOURCE: Primeneniye svarki v stroitel'nykh konstruktsiyakh. Vses. konfer. po prim. svarki v stroi. konstr., 1961. Moscow, Gosstroyizdat, 1962. 344-350

TEXT: The main tasks in the welding of alloy steel pipes are enumerated. In manual arc welding, the development of new electrode material is reported with which certain alloy steels can be welded without subsequent heat treatment. The welding of pearlitic steels with austenitic electrodes is discussed generally. The presence of elements more similar to carbon than chromium is needed. This condition is fulfilled in steels with a high molybdenum content. Automatic and semi-automatic welding is discussed and recommendations for the necessary fluxes are given. There are 2 figures and 2 tables.

ASSOCIATION: VNIIST

Card 1/1

LIVSHITS, L.S., kand.tekhn.nauk

Structural heterogeneity of areas of fusion and calculation of the metal composition of welded joints. Svar. proizv. no.9:1-5 S '62. (MIRA 15:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut po stroitel'stvu magistral'nykh truboprovodov.
(Steel—Welding)
(Metals, Effect of temperature on)

LIVSHITS, L.S., kand.tekhn.nauk

Connection between the solubility of carbon in ferrite and the type of carbides formed during tempering. Metalloved. i term. obr. met. no.9:20-22 S '62. (MIRA 16:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov.
(Laminated metals—Metallography) (Tempering)

41882
S/135/62/000/011/001/006
A006/A101

/ 2380

AUTHORS: Livshits, L. S., Candidate of Technical Sciences, Bakhrakh, L. P., Engineer

TITLE: Problems in the welding of steels of different structural classes

PERIODICAL: Svarochnoye proizvodstvo, no. 11, 1962, 8 - 10

TEXT: The authors investigated structural heterogeneity in the fusion zone of austenitic steel with steels of other structural classes. Table 2 shows the results of measuring the size of the decarbonization zone in non-alloyed steel, adjacent in the fusion zone to high-alloyed welds. These data make it possible to estimate the intensity of carbon transfer at 700°C. The structural heterogeneity in the fusion zone of the investigated steels may be caused by the mixing of dissimilar metals, the formation of intermediate martensite alloys in the weld, and carbon transfer from the ferrite-perlite steel into the austenite steel. If the content of carbon in the base and weld metals is low and if the carbon is not transferred during heating, the formation of martensite interlayers in the weld near the fusion line is not dangerous. The carbon transfer during

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Problems in the welding of...

heating of such welds entails carbonization of the martensite zone, sharp increase in hardness and brittleness so that the weld joints are not suitable for operation. Carbon transfer from perlite into austenite steel during heating is predetermined by the appearance of the gradient of its concentration in the ferrite and austenite solution near the fusion line. The C concentration of non-alloyed steel, subjected to welding, is 0.02% at 700°C. Knowing this value and using the data given in table 2, the carbon concentration in high-alloy welds at the same temperature can be calculated by a method developed by L. S. Livshits, which is based on the regularities resulting from the second law of diffusion. The calculation shows that at 700°C about 0.01455% C is dissolved in the austenite of Cr-Ni steels Kh18N8 and Kh25N20 and in the ferrite of Kh13 Cr-steel and that about 0.0172% C is contained in the solid solution of alloy Kh15N60. Calculation of the alloying of steels to be welded, by a method in which extended heating would not cause carbon transfer into the austenite metal, is recommended. There are 2 tables and 4 figures.

ASSOCIATION: VNIIST

Card 2/2

S/126/62/013/004/012/022
E111/E435

AUTHORS: Livshits, L.S., Panich, S.I., Assonova, Ye.A.

TITLE: Influence of alloying on the concentration of dissolved carbon in ferrite

PERIODICAL: Fizika metallov i metallovedeniye, v.13, no.4, 1962, 572-576

TEXT: The relation between carbon solubility in ferrite and the concentration of different alloying elements (which affects welding processes, ageing, etc) was investigated for manganese (0.12% C, 0.41 to 2.68% Mn), chromium (0.10% C, 0.10 to 2.00% Cr), molybdenum (0.10% C, 0.25 to 3.00% Mo), tungsten (0.11% C, 0.59 to 3.22% W), vanadium (0.12% C, 0.25 to 1.68% V) and niobium (0.10% C, 0.41 to 1.69% Nb) steels, using the internal-friction method. Specimens were heat treated to obtain a close approximation to equilibrium for the carbide/solid-solution phases. For each alloying element increasing concentration was accompanied by decreasing internal-friction peak maximum. Increase in alloying-element concentration beyond a critical value had little effect on the decrement-versus-temperature plot. A steel alloyed

with 0.25 and 0.46% aluminium was also studied to provide an indication of the effect of dissolved nitrogen: there was no difference between the two curves. The experimental conditions did not permit a direct quantitative study of the effect of the alloying elements on dissolved-carbon concentration in ferrite. This information was obtained indirectly by making certain assumptions and showed that the elements can be arranged in the following order in decreasing effect for a given element/carbon atomic ratio on the dissolved-carbon concentration: niobium, vanadium, tungsten, molybdenum, chromium, manganese. The given values of the effect for different values of the ratio has practical importance for deciding the effect of alloying on ageing, for instance. There are 2 figures and 1 table.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut po stroitel'stvu magistral'nykh truboprovodov (All-Union Scientific Research Institute for the Construction of Main Pipelines)

SUBMITTED: August 1, 1961

GRINBERG, N.A.; LIVSHITS, L.S.

Hard facing of parts working in conditions of abrasive wear and shock loading. Avtom. svar. 15 no.7:18-24 Jl '62. (MIRA 15:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov.
(Hard facing) (Machinery—Testing)

S/129/63/000/003/003/009
E111/E351

AUTHORS: Livshits, L.S., Grinberg, N.A. and Kurkumelli, E.G.

TITLE: Influence of carbon and alloying elements on carbide-formation in the tempering of steel

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, no. 3, 1963, 12 - 15

TEXT: Steels containing about 0.8 - 5.5% Cr or 0.6 - 2.6% V and about 0.1, 0.4 or 0.8% C were melted, cast, heat-treated, cooled to -75 °C after quenching and tempered at 550 or 700 °C for 10 h. The carbide composition was determined by X-ray diffraction, the carbide separation being effected by electrolytic dissolution. The nature and stability of the carbides formed on tempering were found to depend on the ratio of alloying elements to carbon. Characteristic ratios were found for each element, which governed the stability range of cementite-type and special carbides for any given temperature and heating time. The ratio, nature and stability of the carbides are affected by the general level of the alloying-element content; for a given value of the ratio an increase in the level broadens the stability range of the special

Card 1/2

S/129/63/000/003/003/009
E111/E351

Influence of .....

carbide at the expense of the cementite-type carbide.
There are 3 tables.

ASSOCIATION: VNIIST
Tverdykh splavov

Card 2/2

S/125/63/000/003/011/012
A006/A101

AUTHORS: Livshits, L. S., Bakhrakh, L. P.

TITLE: Radiographical investigation of carbon migration in the fusion zone

PERIODICAL: Avtomaticheskaya svarka, no. 3, 1963, 90 - 93

TEXT: The process of carbon transfer beyond the fusion zone of the weld and base metal, depends considerably upon the peculiarities in the carbonized zone and higher alloyed steel. Experiments were carried out to study more precise the regularities in the formation of a carbonized zone and its nature. Metal, containing radioactive carbon, was welded upon various steel grades. Two cases are investigated: 1) the weld and base metal are differently alloyed pearlite class steels; 2) the weld and the base metal are of different structural classes, i.e. pearlite and austenite. The radioactive isotope was introduced into electrode rods which were used to produce three layers of 12X5M (12Kh5M) steel (0.15% C); 1X18H9 (1Kh18N9) steel (0.12% C) and X15H60 (Kh15N60) alloy (0.12% C) on Armco-iron (0.04% C). The distribution of C in the fusion zone and the adjacent areas was studied by radiographical analysis of the

Card 1/3

Radiographical investigation of...

specimens in initial state and after heating at 700°C during 13 hours. Specimens with built-up 1Kh18N9 steel and Kh15N60 alloy were investigated after heating at 900 and 1,050°C for 2 hours. It was found that the introduction of alloying, carbide-forming components, to the built-up material caused the migration of C from one to another section of the joint, due to the different C concentration in the solid solution. The addition of carbide-forming components to a section where the carbon diffuses, increases sharply its C-concentration. The carbon, migrating beyond the fusion zone, is bound into carbides until all the components, able of carbide formation, have been bound into carbides. Then the C content in the solution increases slightly. The total C concentration is higher in alloyed than in non-alloyed steel. The degree of carbonization will be the higher the closer the alloying component is to carbon and the higher the C content in the carbides. In the second series of tests it was found that the intensity of C migration is determined by the gradient of its concentration in a solid solution. C concentration in KhN9 steel, heated to 700°C, is below 0.02% and lower than in a nickel-base alloy. In heating to 900°C the solid solution of austenite steel contains up to 0.05% C, and in heating to 1,050°C it contains 0.12% C. The fact that all the carbon (about

Radiographical investigation of...

0.3%) of non-alloyed steel is in the solid solution, brings about the active migration of C from the carbon to the Cr-Ni steel. The C content in a Kh15N60 solid solution will be lower than in Kh19N9 steel. The reduced C concentration in solid solutions of Kh18N9 and Kh15N60 steel, is maintained during the process, due to a high chromium content. There are 4 figures.

Card 3/3

BAKHRAKH, L.P., inzh.; LIVSHITS, L.S., kand.tekhn.nauk

Welding OKh13 (E1496) steel structures. Svar. proizv. no.10:18-20 O '63. (MIRA 16:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov.

ACCESSION NR: AT4043505 S/3107/64/000/003/0010/0017

AUTHOR: Livshits, L. S. (Candidate of technical sciences)

TITLE: Effect of alloying elements on the carbon content in ferrite

SOURCE: Nauchno-tekhnicheskoye obshchestvo mashinostroitel'noy promy*shlennosti. Sektsiya metallovedeniya i termicheskoy obrabotki. Metallovedeniya i termicheskaya obrabotka, no. 3, 1964, 10-17

TOPIC TAGS: carbon steel, alloy steel, ferrite carbon content, alloy steel decarburization, carbide forming process, alloying element carbon affinity, decarburization, Me/C ratio, quantitative decarburization characteristics, ferrite, decarburization temperature, carbon diffusion

ABSTRACT: Samples of plain carbon steel (0.16% C) were welded to samples of steel alloys with various contents of Mn, Cr, Mo, W, V, Nb, Si and Ni, then heated (5, 50 or 100 hrs; 550, 625, 700, 760 and 900C) and studied metallographically to determine the separation boundaries and evaluate the depth of the decarburization zones as criteria of the intensity of carbon diffusion from unalloyed to alloy steel. The results show that alloying with elements whose affinity to C is greater than that of Fe decreases the concen-

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ACCESSION NR: AT4043505

tration of C in ferrite. Decarburization of ferrite in alloy steel on heating is related to carbide formation and occurs only when the Me/C ratio (C=carbon content in %; Me=alloying element content in %; see Table 1 in the Enclosure) attains a value characteristic for a given element and given heating conditions. Mn, Cr, Mo, W, V and Nb affect the ferrite C content at 550-700C. Quantitative characteristics of the process were calculated and it was established that the effects of individual alloying elements are cumulative. Orig. art. has: 4 graphs, 1 table, 1 formula and 1 photomicrograph.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 01

SUB CODE: MM NO REF SOV: 001 OTHER: 001

Card 2/3

ACCESSION NR: AT4043505

Enclosure 01

Table 1. Critical values (K) of the Me/C ratio for various temperatures

Temp. in °C	K	alloying element Mn	Cr	Mo	W	V	Nb
700	K_a in at%	1,3	1,1	0,95	0,95	0,95	0,91
	K_w in % by weight ..	5,9	4,8	7,9	14,6	4,0	7,0
625	K_a in at%	2,2	1,15	1,7	1,75	1,4	0,91
	K_w in % by weight ..	10,0	5,0	14,3	27,0	6,0	7,0
550	K_a in at%	2,6	1,4	2,0	1,95	1,65	1,04
	K_w in % by weight ..	12,0	6,0	16,6	30,0	7,0	8,0

Card 3/3

Ilyshits, L. S.

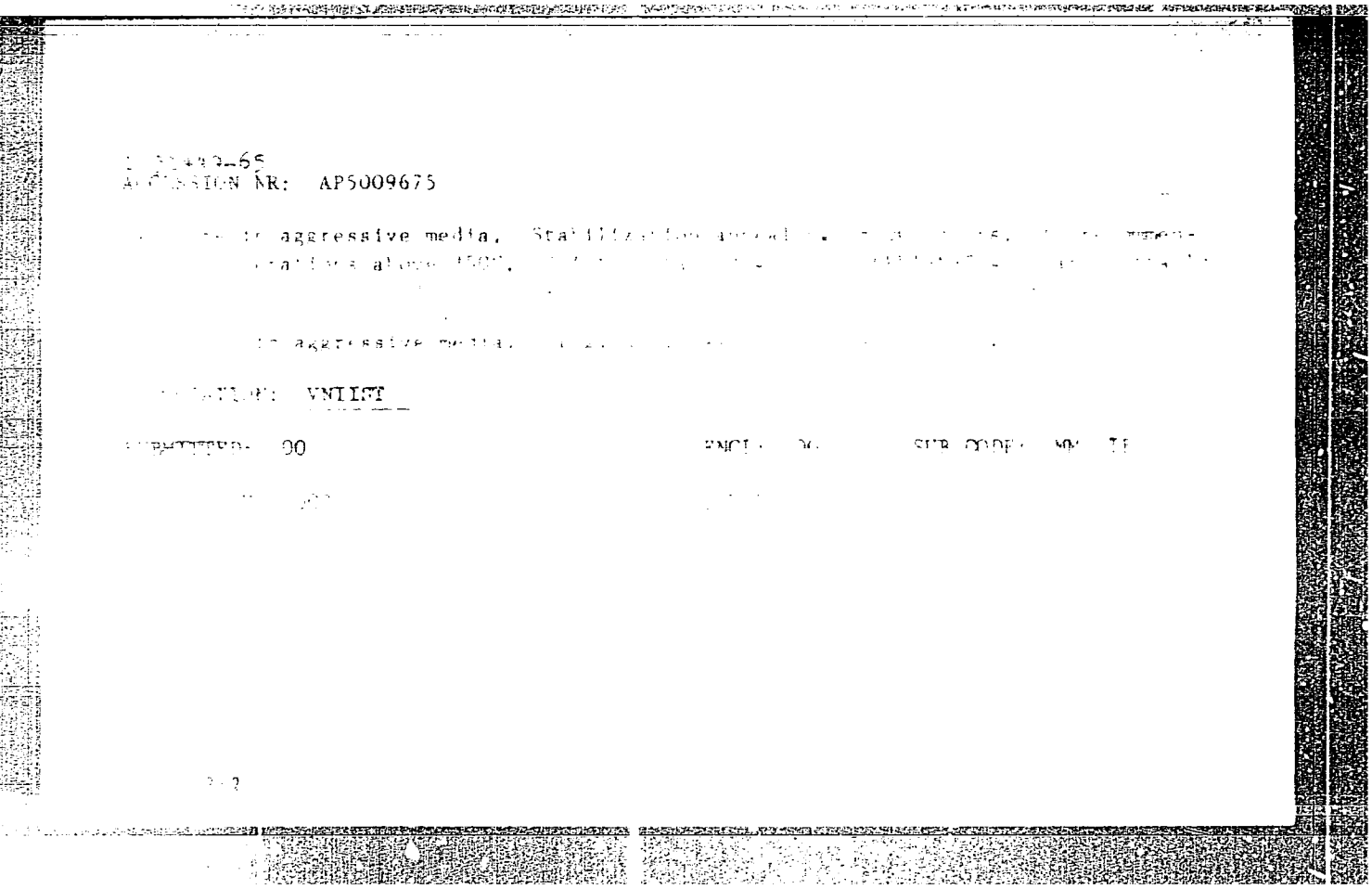
Svarochnoye proizvodstvo, no. 4, 1965, 28-31

TOPIC TAGS: steel piping, gas shielded welding, weld joint corrosion, corrosion resistance, stabilization annealed joint, 08Kh18N10B welding wire

The authors welded steel pipes

and found that Sv-08Kh19N10B wire, 1 mm in diameter, is best for carbon dioxide shielded welding and provides joints suitable for normal and high-temperature

Card 1/2



ACCESSION NR: AP5009675

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LIVSHITS, L.S., doktor tekhn. nauk; BAKHRAKH, L.P., inzh.

Technological characteristics of electric arc welding of dissimilar steels. Vest. mashinostr. 45 no.7:58-62 Jl '65.
(MIRA 18:10)

ACCESSION NR: AP5014893 UR/0135/65/000/006/0001/0003 621.791.92

AUTHOR: Kurkumelli, E. G. (Engineer); Grinberg, N. A. (Cand. of technical sciences); Livshits, L. S. (Dr. of technical sciences)

TITLE: Effect of austenite in built-up metal on wear resistance and impact strength

SOURCE: Svarochnoye proizvodstvo, no. 6, 1965, 1-3

TOPIC TAGS: wear resistance, abrasive wear, impact strength, deposited metal, weldment, carbide phase, austenite content

ABSTRACT: A major problem of the theory of wear is the effect of the structural state and chemical composition of an alloy on its wear resistance. In this connection, the authors investigated the effect of the amount of austenite on the wear resistance and impact strength of deposited metals of the Fe-C-Cr-Ni-B system with different amounts of austenite and a fixed amount and properties of the carbide phase. The metal was deposited by means of arc welding (reversed-polarity direct current of 150-170 amperes, arc voltage 25 volts) in a two-pass build-up sequence with specially developed thickly coated electrodes. Iron-

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L 53080-65
ACCESSION NR: AP5014893

base weld metal alloyed with carbon, chromium, nickel, and boron was investigated. In addition to its wear tests in an abrasive-wear machine and impact tests in an impact testing machine, the deposited metal was subjected to a complete metallographic analysis and the structure of the carbides was investigated by the phase X-ray analysis method. Microstructural examinations confirmed that the content of austenite increases with the amount of nickel. Deposited metals of this system, in the presence of a fixed 22% carbide phase, display the following optimal properties depending on their application: 1. Austenite content up to 12% -- expedient for welding machine parts that operate under conditions of active abrasive wear in the absence of impact loadings; 2. Austenite content 12-49% -- best for the weldments operating under conditions of simultaneous abrasive wear and impact loadings; 3. Austenite content > 50% -- suitable for machine parts that operate in the presence of considerable impact loadings and insignificant abrasive wear.

ASSOCIATION: VNIIST

SUBMITTED: 000 ENCL: 00 SUB CODE: MM

NO REF SOV: 005 OTHER: 000

Card 2/2

L 9686-66 EWT(m)/EWP(w)/T/EWP(t)/EWP(b) JD

ACC NR: AP5027462 SUB CODE: UR/0032/65/031/011/1368/1371

AUTHOR: Livshits, L. S.; Rakhmanov, A. S.

ORG: All-Union Scientific Research Institute for Trunk Pipeline Construction (Vsesoyuznyy nauchno-issledovatel'skiy institut po stroitel'stvu magistral'nykh truboprovodov)

TITLE: Criteria and methods for evaluating the proneness of steel to brittle fracture

SOURCE: Zavodskaya laboratoriya, v. 31, no. 11, 1368-1371

TOPIC TAGS: brittle fracture, rupture strength, steel, metal test, cyclic test, test method

ABSTRACT: The existence of a large number of methods of testing and evaluating the proneness of metals to brittle fracture, differing in the manner of application of load and the type of specimens tested, complicates the selection of the optimal type of test. A general consideration of the problem, however, indicates that fundamentally the process of the deformation and fracture of a loaded specimen consists of four basic stages: 1) elastic deformation; 2) plastic (elasto-plastic) deformation, accompanied by the genesis or development of the existing fracture nuclei to a stage at which the "main line" of the fracture is determined, i.e. transition to the transcritical stage of crack development; 3) deformation of metal at the base of the de-

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UDC: 620.178.2

ACC NR: AP5027462

veloping crack; 4) separation of the metal of the specimen into two parts. The loading rate of the specimen is a decisive factor in brittle fracture. Hence, dynamic (cyclic) loading should be employed in lieu of static loading in brittle fracture tests. Whatever the method of testing steel for proneness to brittle fracture, the following two indicators are basic: A_g (work of generation of fracture -- total work of the elasticity of plastic deformation) and A_f (work of fracture, characterizing the resistance to the development of the "main" crack). Since the proneness of steel to brittle fracture increases with decreasing temperature, it is important to determine the temperature of the transition of steel to brittle state in the presence of minimal A_g and A_f. These considerations argue in favor of the superiority of the method of determining A_g and A_f by means of a determination of the individual components of the impact strength of steel (cf. Zavodskaya laboratoriya, XXVII, 7, 1961 and XXV, 2, 1959). This method makes it possible to combine cyclic loading with various test temperatures, to determine A_g and A_f, to compare types of fracture with the magnitude of A_f and $T_{cr.f}$ (critical temperature of fracture), and to determine susceptibility to the action of stress concentrators. Such an approach has led to the solution of various practical problems: the elucidation of the causes of fracture of certain structural elements in cases where other methods and criteria for evaluating proneness to fracture were fruitless; the determination of certain common principles of the effect of heat treatment on the brittleness of steel (in the case of e.g. low-alloy steels it was established that the role of heat treatment lies in

L 9686-66

ACC NR: AP5027462

influencing, through the size of ferrite grains, the brittleness characteristics A_g and A_f). Orig. art. has: 4 figures.

SUB CODE: 11, 13/ SUBM DATE: none/ ORIG REF: 008/ OTH REF: 000

Card 3/3

LIVSHITS, L. S.; Inzh.

Building

Efficient "assembly-line" production of stone dwellings. Biul. stroi tekh., 9, No. 1, 1952. Minmashstroy NII Po Stroitel'stvu

Monthly List of Russian Accessions, Library of Congress, April 1952. UNCLASSIFIED.

LIVSHITS, L.S., inzhener.

Mechanized equipment for performing construction and assembly work in high places. Mekh.stroi. 10 no.12:23-25 D '53. (MLRA 6:11)
(Hoisting machinery) (Scaffolding)

KUREK,N.M., laureat Stalinskoy premii, kandidat tekhnicheskikh nauk;
LIVSHITS,L.S., inzhener

"Organizing and planning construction work ; industrial and public buildings" [professor]B.S. Ukhov. Reviewed by N.M. Kurek, L.S. Livshits. Stroi. prom.33 no.4:44-45 Ap '55.
(Ukhov,B.S.) (Building) (MLRA 8:6)

Livshits, L.S.

LIVSHITS, Lev Samoylovich; UDAL'TSOV, A.N., glavnyy red.; ROGOVSKIY, L.V., red.

[Over-all mechanization of earthwork related to the construction of large one-story industrial buildings] Kompleksnaia mekhanizatsiia zemlianykh rabot pri stroitel'stve krupnykh odnoetazhnykh promyshlennykh zdanii. Moskva, Filial Vses. in-ta nauchnoi i tekhn.inform., 1956. 36 p. (Informatsiia o nauchno-issledovatel'skikh rabotakh. Tema 32 no.I-56-77) (MIRA 11:3)
(Earthwork)

LIVSHITS, L.S.

Hollow prestressed reinforced concrete foundations under footings for heating systems. Stroi. prom. 34 no.9:45 S '56. (MLRA 9:10)

1. Zamestitel' nachal'nika PTO, inzhener-stroitel' Krasnoural'skogo stroitel'nogo upravleniya.
(Foundations)

LIVSHITS, Lev Samoylovich; FILATOV, A.I., inzh.,ved.red.; ZHELUDKOV, V.I., inzh.,red.; FOMICHEV, P.M., tekhn.red.

[Reusable devices for erecting reinforced concrete construction elements of multistoried buildings] Inventarnye prisposobleniia dlia montazha zhelezobetonnykh konstruktsii mnogoetazhnykh zdanii. Moskva, Filial Vses.in-ta nauchn.i tekhn.informatsii, 1957. 27 p. (Peredovoi nauchno-tekhnicheskii i proizvodstvennyi opyt. Tema 55, no.S-57-75/13) (MIRA 11:12)

(Hoisting machinery)

LIVSHITS, L.S., inzhener.

Concerning the article "New methods for constructing industrial buildings." Bet.i zhel.-bet.no.1:36 Ja '57. (MLRA 10:3)
(Reinforced concrete construction)

ABEZGAUZ, V.D., inzh.; LIVSHITS, L.S.; SHIFRIN, M.A., kand.tekhn.nauk

Operating and improving the SM-535 stand. Stroi.i dor.mashinostr. no.7:32-36 Jl '59. (MIRA 12:11)
(Prestressed concrete construction)

LIVSHITS, L.S., inzh.; MIKHAYLOV, N.V., kand.tekhn.nauk

Prefabricated roof elements of industrial buildings. Mov.tekh. mont. i spets.rab. v stroi. 21 no.4:16-19 Ap '59. (MIRA 12:5)

1. Nauchno-issledovatel'skiy institut stroitel'noy promyshlennosti Minstroya RSFSR.
(Roofing, Concrete)

LIVSHITS, L.S., inzh.; SHAUL'SKIY, V.A., inzh.

Making supports for electric power transmission lines using molds for forming multihollow panels. Mov.tekh.mont. i spets.rav.v stroi. 21 no.10:21-24 O '59. (MIRA 12:11)

1. Eksperimental'no-konstruktorskoye byuro Eksperimental'nogo zavoda zhelezobetonnykh izdeliy NIL-200.
(Electric lines--Poles) (Precast concrete)

LIVSHITS, Lev Samoylovich, inzh.; ABEZGAUZ, Viktor Davydovich, inzh.

[Anode-mechanical tools for cutting high-strength and hardened reinforcing steel] Anodno-mekhanicheskie pily dlia rezaniia vysokoprochnoi i uprochnennoi armaturnoi stali. Moskva, Gos-Stroiizdat, 1960. 18 p. (MIRA 13:4)

1. Akademiya stroitel'stva i arkhitektury SSSR. Institut organizatsii, mekhanizatsii i tekhnicheskoy pomoshchi stroitel'stvu. 2. Nachal'nik Eksperimental'no-konstruktorskogo byuro Nauchno-issledovatel'skogo instituta po stroitel'stvu (NII-200) (for Livshits). 3. Nachal'nik konstruktorskogo otdela Eksperimental'no-konstruktorskogo byuro Nauchno-issledovatel'skogo instituta po stroitel'stvu (NII-200)(for Abezgauz).
(Cutting machines) (Reinforced concrete)

ABEZGAUZ, V., inzh.; LIVSHITS, L., inzh.

Preparing wire bundles to be used in making prestressed construction elements. Stroitel' no.1:18-19 Ja '60. (MIRA 13:5)

(Prestressed concrete)

LIVSHITS, L.S., inzh.

Composite panels for roofs of industrial buildings. Bet. i zhel.-bet. no.9:418-420 S'60. (MIRA 13:10)
(Concrete slabs) (Roofing, Concrete)

LIVSHITS, L.S., inzh.

Large panels for roofing industrial buildings. Mont. i spets. rab. v stroi. 23 no. 1:17-21 Ja '61. (MIRA 14:1)

1. Nauchno-issledovatel'skiy institut po stroitel'stvu (NII-200).
(Concrete slabs) (Roofing, Concrete)

LIVSHITS, L.S., kand.tekhn.nauk (Moskva); GRINBERG, N.A., inzh. (Moskva)
MUKHIN, V.N., inzh. (Moskva); KALYALIN, V.S., inzh. (Moskva)

Increasing the durability of the teeth of rotary excavators. Stroi. truboprov. 6 no.5:5-7 My '61. (MIRA 14:7)
(Excavating machinery)

LEBEDEV, N.P., inzh.; LIVSHITS, L.S., inzh.; SPIRIDONOV, V.M., inzh.

Precast prestressed concrete smoke stacks. Mont. i spets. rab. v stroi. 24 no.5:9-12 My '62. (MIRA 15:5)

1. Eksperimental'no-konstruktorsk ye byuro Nauchno-issledovatel'skogo instituta stroitel'noy promyshlennosti.
(Chimneys) (Precast concrete construction)

LIVSHITS, L.S., doktor tekhn. nauk; GRINBERG, N.A., kand. tekhn. nauk

Structure and properties of the fusion zone of wear-resistant hard facing. Svar. proizv. no.9:7-9 S '64. (MIRA 17:12)

1. Vsesoyuzny nauchno-issledovatel'skiy institut po stroitel'stvu magistral'nykh truboprovodov.

GRINBERG, N.A.; LIVSHITS, L.S.; [illegible]

Effect of the carbide phase on the wear-resistance of hard-faced metal. Avtom. svar. 17 no.8:19-25 Ag '64. (MIRA 17:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut po stroitel'stvu magistral'nykh truboprovodov.

LIVSHITS, L.S.; RAKHMANOV, A.S.

Criteria and methodoloby of determining the tendency of steel for brittle fracture. Zav. lab. 31 no.11:1368-1371 '65.
(MIRA 19:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut po stroitel'stvu magistral'nykh truboprovodov.

LIVSHITS, L.S.

Studies on the higher nervous activity in man during hypnosis in chronic alcoholism. Zhur. vys. nerv. deiat. 9 no.6:837-844 N-D '59. (MIRA 13:9)

1. Chair of Psychiatry, Vitebsk Medical Institute.
(ALCOHOLISM) (NERVOUS SYSTEM) (HYPNOSIS)

DOZORETS, Yu.L., dotsent; LIVSHITS, L.S.

Obliterating phlebitis of the vena hepatica (Chiari's disease).
Zdrav. Belor. 6 no. 7:23-25 Je '60. (MIRA 13:8)

1. Iz gospital'noy terapevticheskoy kliniki (ispolnyayushchiy obyazannosti zaveduyushchego - dotsent Yu.L. Dozorets) Vitebskogo meditsinskogo instituta (direktor - I.I. Bogdanovich).
(PHLEBITIS)

LIVSHITS, L.Ya.

Diagnostic significance of certain neurohumoral substances in acute closed injury of the cranium and brain. Sov.med. 23 no.6:13-16 Je '59. (MIRA 12:9)

1. Iz otdeleniya neyrokhirurgii (zav. - kand.med.nauk Ye.I. Babichenko) Saratovskogo nauchno-issledovatel'skogo instituta travmatologii i ortopedii (dir. - dotsent Ya.N.Rodin).
(BRAIN wds. & inj.)
(CHOLINESTERASE blood)
(CHOLINESTERASE CSF)
(ACETYLCHOLINE CSF)

BABICHENKO, Ye.I., kand.med.nauk; LIVSHITS, L.Ya. (Saratov)

Echinococcosis of the brain. Klin.med. 37 no.9:148 S '59.
(MIRA 12:12)

1. Iz kliniki neyrokhirurgii (ispolnyayushchiy obyazannosti zaveduyushchego - kand.med.nauk Ye.I. Babichenko) Saratovskogo nauchno-issledovatel'skogo instituta travmatologii i ortopedii (dir. - dotsent Ya.N. Rodin).
(BRAIN, diseases)
(ECHINOCOCCOSIS, case reports)

LIVSHITS, L. Ya., Cand Med Sci -- (diss) "Diagnostic value of the activity of cholinesterase in blood serum and in cerebro-spinal fluid in acute closed cranial-brain trauma." Saratov, 1960. 12 pp; (Ministry of Public Health RSFSR, Saratov State Medical Inst); 200 copies; free; (KL, 50-60)2-36)

LIVSHITS, L. Ya.

USSR/Chemistry - Analysis, Nickel Aug 50

"Photocolorimetric Method for Determination of Manganese and Chromium in Nickel Electrotype," L. B. Ginzburg, L. Ya. Livshits, State Sci Res Inst of Nonferrous Metals

"Zavod Lab" Vol XVI, No 8, pp 918-923

Develops quick method for colorimetric determination of small quantities of Mn and Cr in Ni electrolyte based on ability of septavalent Mn and hexavalent Cr to form brightly colored solutions.

PA 169t6

LIVSHITS, L. Ya.

"Behavior of Arsenic and Antimony in Electrolytic Refining of Copper." Sub 19 Nov 51, Moscow Inst of Nonferrous Metals and Gold imeni M. I. Kalinin

Dissertations presented for science and engineering degrees in Moscow during 1951.

SO: Sum. No. 480, 9 May 55

LIVSHITS, L. Ya.

USSR.

1 C H Behavior of arsenic and antimony in the electrolytic refining of copper. L. Ya. Livshits and V. A. Puzukhin, J. Appl. Chem. U.S.S.R. 27, 263-9(1954)(Engl. translation). See C.A. 48, 9840a. H.L.H.

LIVSHITS, L. YA.

Behavior of arsenic and antimony in the electrolytic refining of copper. L. Ya. Livshits and V. A. Pazukhin. *Zhur. Priklad. Khim.* 27, 298–300(1954).—Several factors were investigated to det. the causes of the deleterious effect of the presence of As and Sb on electrically refined Cu. Electrolysis of solns. prepd. in the lab. and those obtained from a refinery showed that up to a c.d. of 300 amp./sq. m., the elements were not deposited on the cathode even with As 14.5 and Sb 0.5 g./l. in the soln. At 400 amp./sq. m., As 0.002 and Sb 0.001% were found with the cathodic Cu. It led to the conclusion that to obtain electrolytically pure Cu it was important to keep the soln. from becoming cloudy (As and Sb could be present in appreciable amts.). Cloudiness was due to oxidation. A series of expts. with anodes contg. 0.02 and 0.38% As showed that only As^{+3} entered the soln.; the concn. of As^{+3} and As^{+5} increased with time up to 90 hrs.; then the concn. of As^{+5} increased very much more rapidly than As^{+3}. It was shown experimentally that As^{+3} was oxidized by air only in the presence of Cu^{+}, apparently owing to the reaction $Cu^{+} + O_2 \rightarrow Cu^{++} + O_2^{-}$. Oxidation of As^{+3}, Sb^{+3}, and Cu^{+} was assumed to take place simultaneously as in conjugated reactions. Only at higher c.d., and then indirectly, did electrolysis affect the rate of oxidation—more rapid soln. at the anode. Whereas Sb^{+3} pptd. quantitatively in the presence of As^{+3} (10 g./l.) it was not the case during electrolysis. This apparent discrepancy was proven to be due to the tendency of Sb^{+3} and Sb^{+5} to form supersatd. solns.; Sb^{+5} oxidized more rapidly than its rate of pptn. Sb^{+5} did not ppt. in the presence of As^{+5}. I. Beneowitz

LIVSHITS, L. Ya. (Saratov)

Intramedullary teratoma. Vop. neirokhir. no.6:62 '61.
(MIRA 14:12)

1. Klinika neyrokhirurgii Saratovskogo nauchno-issledovatel'skogo instituta travmatologii i ortopedii.

(SPINAL CORD—TUMORS)

LIVSHITS, L.Ya.; MELAMUD, E.Ye. (Saratov)

Treatment of multiple aneurysms of the middle cerebral artery complicated by intracerebral hemorrhage. Vop.neirokhir. no.2: 48-49 '62. (MIRA 15:3)

1. Otdeleniye neyrokhirurgii Saratovskogo nauchno-issledovatel'skogo instituta travmatologii i ortopedii.
(INTRACRANIAL ANEURYSMS) (BRAIN--HEMORRHAGE)

LIVSHITS, L.Ya., kand.med.nauk; PARSAMOV, S.O. (Saratov)

Effectiveness of late anticoagulatn therapy in cerebral vascular thrombosis. Klin.med. no.9:137-139 '62. (MIRA 15:12)

1. Iz otdeleniya neyrokhirurgii Saratovskogo nauchno-issledovatel'skogo instituta travmatologii i ortopedii (dir. - dotsent Ya.N. Rodin).
(THROMBOSIS) (ANTICOAGULANTS (MEDICINE))

LIVSHITS, L.Ya.

Successful application of cisternal puncture in cystic arachnitis of the posterior cranial fossa. Kaz.med.zhur. no.5:58-59 S-O '62. (MIRA 16:4)

1. Otdeleniye neyrokhirurgii (zav. - kand.med.nauk Ye.I. Babichenko) Saratovskogo nauchno-issledovatel'skogo instituta travmatologii i ortopedii.

(MENINGITIS) (PUNCTURES (MEDICINE))

LIVSHITS, Leonid Yakovlevich, inzh.; KIRILYUK, Leonid Vasil'yevich, inzh.; GERCHIKOV, David Solomonovich, kand. tekhn. nauk; STETSENKO, V.I., kand. tekhn. nauk, retsenzent

[Manual on the installation of radio-isotope relay devices in industry] Posobie po ustanovke radioizotopnykh releinykh priborov v promyshlennosti. Kiev, Tekhnika, 1965. 95 p. (MIRA 18:12)

LIVSHITS, L.Ya.; RUBIN, V.I.

Determination of acetylcholine and similar substances in the spinal fluid. Lab. delo 7 no.3:15-17 Mr. '61. (MIRA 14:3)

1. Otdeleniye neyrokhirurgii (zav. Ye.I.Babichenko) i biokhimicheskaya laboratoriya (zav. V.I.Rubin) Saratovskogo nauchno-issledovatel'skogo instituta travmatologii i ortopedii.
(CHOLINE) (CEREBROSPINAL FLUID)

GERBACH, Vasiliy Vasil'yevich; KUZNETSOV, Konstantin Alekseyevich; LIVSHITS, Lev Zakharovich; PLYASUNOV, Vladimir Ivanovich; KONSTANTINOV, A.P., kand.ist.nauk, obshchiy red.; KAZAROV, Yu.S., red.; FRUMKIN, P.S., tekhn.red.

[Workers of the Baltic Factory in three revolutions] Rabochie-Baltiitsy v trekh revoliutsiiakh. Pod obshchei red. A.P.Konstantinova. Leningrad, Gos.soiuznoe izd-vo sudostroit.promyshl., 1959. 146 p. (MIRA 12:5)
(Leningrad--Shipbuilding workers)

LIVSHITS, M., inzh.; NEZHINSKAYA, G., inzh.

Enameling and glazing in corona-discharge electric fields.
Stroi. mat. 4 no.11:17-20 N '58. (MIRA 11:12)
(Glazing) (Enamel and enameling) (Spraying and dustring equipment)

LIVSHITS, M.

White Russian Society of Hygienists in 1960. Zdrav. Bel. 7 no.5: 70-71 My '61. (MIRA 14:6)
(WHITE RUSSIA—PUBLIC HEALTH)

LIVSHITS, M.

White Russian Scientific Society of Hygienists in 1961. Zdrav.Bel. 8 no.7:88-89 Jl '62. (MIRA 15:11)
(WHITE RUSSIA—PUBLIC HEALTH SOCIETIES)

ADRIANOVA, V.P.; ANDREYEV, T.V.; ARANOVICH, M.S.; BARSKIY, B.S.; GROMOV, N.P.; GUREVICH, B.Ye.; DVORIN, S.S.; YERMOLAYEV, N.F.; ZVOLINSKIY, I.S.; KABLUKOVSKIY, A.F.; KAPELOVICH, A.P.; KASHCHENKO, D.S.; KLIMOVITSKIY, M.D.; KOLOSOV, M.I.; KORCLEV, A.A.; KOCHINEV, Ye.V.; LESKOV, A.V.; LIVSHITS, M.A.; MATYUSHINA, M.V.; MOROZOV, A.N.; POLUYAROV, D.I.; RAVDEL', P.G.; ROKOTYAN, Ye.S.; SMOLYARENKO, D.A.; SOKOLOV, A.N.; USHKIN, I.N.; SHAPIRO, B.S.; EPSHTEYN, Z.D.; AVRUTSKAYA, R.F., red. izd-va; KARASEV, A.I., tekhn.red.

[Brief handbook on metallurgy, 1960] Kratkii spravochnik metallurga, 1960. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1960. 369 p. (MIRA 13:7)
(Metallurgy)

LIVSHITS, M. A.

A facula model. Astron. zhur. 40 no.1:38-47 J-F '63.
(MIRA 16:1)

1. Gosudarstvennyy astronomicheskiy institut im. P. K. Shternberga.

(Sun—Faculae)

LIVSHITS, M. A.; NIKOL'SKIY, G. M.

"Izvestiia Astrofizicheskogo Instituta AN Kaz.SSR." (On M. G. Karimov's work). Astron. zhur. 40 no.1:199-201 J-F '63. (MIRA 16:1)

1. Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR.

(Sun—Corona)

LIVSHITS, M.A.

Evaluation of electron densities of stellar chromospheres. Astron. zhur. . 40 no.6:1065-1070 N-D '63. (MIRA 16:12)

1. Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR.

LIVSHITS, M.A.; NIKOL'SKIY, G.M.

The n_e and T relation in the transition region between the chromosphere and corona. Astron.zhur. 41 no.1:75-79 Ja-F '64. (MIRA 17:4)

1. Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR.

LIVSHITS, M.A.; PIKEL'NER, S.B.

Diamagnetic ejection of gas concentrations from sunspot areas. Astron. zhur. 41 no.3:464-472 My-Je '64.
(MIRA 17:6)

1. Institut zemnogo magnetizma, ionosfery i raspredeleniya radiovoln AN SSSR i Gosudarstvennyy astronomicheskiy institut im. P.K. Shternberga.

LIVSHITS, M.A.

Energy balance in the transition area between the chromosphere and corona. Astron. zhur. 41 no.3:473-481 My-Je '64.
(MIRA 17:6)

1. Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR.

ACCESSION NR: AP4017615 S/0033/64/041/001/0075/0079

AUTHOR: Livshits, M. A.; Nikol'skiy, G. M.

TITLE: The n_e and T relation in the chromosphere - corona transition region

SOURCE: Astronomicheskiy zhurnal, v. 41, no. 1, 1964, 75-79

TOPIC TAGS: atmosphere, chromosphere, corona, spectroscopy, stellar atmospheres, transition region, stellar radiation

ABSTRACT: The authors discuss the formation of the transition region between the chromosphere and the corona, pointing out that the energy ablated by radiation from any level of the transition level is composed of the dissipation energy of the shock waves at that level and the energy carried upward as a result of heat conduction. The authors call "important" the conclusion according to which, in the transition region, both in undisturbed as well as active regions, the law $n_e^{2.5}T = \text{const.}$ has been found to be valid. It is affirmed that in a stable condition the energy balance in the transition region of stellar atmospheres is described by the equation:

$$\mathcal{E}(n_e,T) = E_{diss.}(n_e,T);$$

that is, by the equality of two independent functions: the emission and energy of

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dissipation per cm^3. In this article, the authors attempt to determine the universality of the found dependence of $\mathcal{E}$ on density and temperature, noting that, since the emission of the transition region in all stellar atmospheres (having in mind "stable" stars) is caused by the radiation of an optically thin layer in shortwave lines (with this radiation belonging to different ions formed and excited by electron collisions), then $\mathcal{E}$ in the function n_e and T can be found theoretically. Thus, the law $n_e^{2.5}T = const.$, found for the solar transition region, is generalized to apply to the atmospheres of "stable" stars. It is assumed, in this connection, that the cooling source of the transition region is line emission by highly ionized atoms; this cooling is compensated by the dissipation energy of weak shock waves. From this, according to the authors, it follows that, in the first approximation, this law holds for the transition regions of "stable" stars. Some peculiarities of the transition region are discussed, it being demonstrated that in the chromosphere and corona, density distribution corresponds to the hydrostatic (in the chromosphere the logarithmic gradient is not more than two times less than the observed, while in the corona they are identical when $T \approx 1.5 \cdot 10^6$). Orig. art. has: 3 figures and 8 formulas.

ASSOCIATION: Institut zemnogo magnetizma, ionosfery* i rasprostraneniya radiovoln Akademii Nauk SSSR (Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propogation of the Academy of Sciences, SSSR)

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ACCESSION NR: AP4017615

SUBMITTED: 13Apr63 DATE ACQ: 18Mar64 ENCL: 00

SUB CODE: AS NO REF SOV: 007 OTHER: 007

Card 3/3

L 21427-65 EWT(l)/EWG(v)/EPF(t) [illegible]

ACCESSION NR: AT4049113 S/2555/64/010/000/0107/0109

AUTHOR: Livshits, M. A.

TITLE: Structure of the outer atmospheres of stars and of the Sun

SOURCE: AN SSSR. Astronomicheskiy sovet. Voprosy* kosmogonii, v. 10, [illegible]

TOPIC TAGS: acoustic wave, hydrogen zone, hot star, convection, turbulence, acoustic wave dissipation, chromosphere, stellar atmosphere, inversion layer, resonance line, recombination radiation

ABSTRACT: Acoustic waves are generated by strong convections in zones close to hydrogen. In hot stars such convection is replaced by turbulence. Dissipation of acoustic waves may take place in stellar chromospheres, where it causes ionization of the chromosphere. The loss of energy spent for radiation is only slightly dependent upon temperature since the chromospheric temperature and that of the inversion layer do not differ significantly. On the basis of this

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ACCESSION NR: AT4049113

assumption, gas cooling is considered to be equivalent to a decrease in ionization. Radiation consisting of basic resonance lines departs from the upper layers of the chromosphere. [illegible] is associated with [illegible] radiation, which is [illegible] wave energy. The [illegible] concentration in the chromosphere can be interpreted from its [illegible] and from the measured emission. Solar active regions may be created by strengthened convective motions in the chromosphere. Orig. art. has: 1 figure.

ASSOCIATION: none

SUBMITTED: 00	ENCL: 00	SUB CODE: AA	
NR REF SOV: 010	OTHER: 003	ATD PRESS: 3134	

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L 18301-65 EWT(l)/EWG(v)/EEC-4/EEC(t) Pe-5/Pq-4 AFWL/ASD(a)-5/RAEM(c)/ ESD(t) GW

ACCESSION NR: AP5001230 S/0033/64/041/006/1007/1020

AUTHOR: Pikel'ner, S. B.; Livshits, M. A.

TITLE: On the theory of heating the active and undisturbed chromosphere

SOURCE: Astronomicheskiy zhurnal, v. 41, no. 6, [illegible], 1007-1020

TOPIC TAGS: sonic wave, magnetic field, photosphere, chromosphere, corona, dissipation, refraction, Alfven velocity, sonic velocity, chromospheric active region

ABSTRACT: Convective motions beneath the photosphere generate sonic waves when no magnetic field exists in the photosphere and magnetosonic waves when a magnetic field is present. These generating waves heat the chromosphere and corona. The state of the waves is changed by dissipation and refraction. Refraction impedes the heating of layers where the Alfven velocity is much greater than the sonic velocity. This state depends upon changes in the Alfven velocity, the density, and the state of the magnetic field. The temperature and velocity distribution at various heights [illegible]

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ACCESSION NR: AP5001230

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which shows that refraction plays a role only from a height of 5000 km. The active regions of the chromosphere and the corona are brighter, with fluctuations in their brightness depending on the field intensity of the active regions in the photosphere. The Alfven velocity is small in lower chromospheric layers and increases with height, approaching sonic velocity. Then the waves interact and exchange their energies, forming a complicated wave front structure. These wave associations propagate along the magnetic lines of force, forming condensations and rarefactions. Orig. art. has: 14 formulas and 4 tables.

ASSOCIATION: Gos. astronomicheskiy institut im. P. K. Shternberga (State Astronomical Institute); Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR (Institute of Terrestrial Magnetism, Ionosphere, and Propagation of Radio Waves, AN SSSR)

SUBMITTED: 08Apr64 ENCL: 00 SUB CODE: AA
NO REF SOV: 012 OTHER: 013 ATD PRESS: 3156

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TITLE Astronomical [illegible]

SOURCE: AN SSSR. Vestnik, no. 1, 1965, [illegible]

TOPIC TAGS [illegible] conference, solar [illegible], solar chromosphere, astrophysic instrument, solar magnetic

ABSTRACT: The conference of the Commission on Solar Investigations of the Astronomical Council, Academy of Sciences SSSR, held in Lvov 29 September — 2 October 1964, dealt with the problem of the total magnetic vector of the sun and the instruments used in its measurement. Thirty reports were delivered and discussed.

V. A. Krat reported on the general state of solar investigations. [illegible] A. Ioshpa and V. N. Obridko (Institute of Terrestrial Magnetism, Ionosphere, and Propagation of Radio Waves [illegible] magneti solar vector and the magnetograph they used.

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[illegible]-65
ACCESSION NR: AP5004553

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A. B. Severnyy and T. T. Tsapa (Crimean Astrophysical Observatory, Academy of Sciences SSSR) reported on a modified method for determining transversal fields of the [illegible] Stepanov Institute of Terrestrial Magnetism [illegible]

[illegible] Nikol'skiy reported on the [illegible] of the Main Astronomical Observatory at [illegible] Institute of Terrestrial Magnetism and Ionosphere [illegible] of the objective is [illegible]

SUBMITTED: [illegible] ENCL: [illegible] SUB CODE: AA

NO REF SOV: [illegible] OTHER: [illegible]

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L 1863-66 EWT(1) GW

ACC NR: AP5016939 UR/0026/65/000/006/0048/0057

AUTHOR: Livshits, M. A. 55

TITLE: New data on solar activity 54 12,55

SOURCE: Priroda, no. 6, 1965, 48-57

TOPIC TAGS: solar activity, solar cycle, sunspot, solar photosphere, solar corona, solar chromosphere, astrophysic instrument

ABSTRACT: More sophisticated and precise instruments have made it possible to obtain new data on processes occurring in the sun. Thus, a specially designed coronograph has made it possible to observe the chromosphere and the corona in individual spectral lines at times other than during solar eclipse. Studies of the glow of the outer atmosphere have shown that with the increase of distance from the photosphere the temperature of the rarified gas increases from 6,000° in the photosphere to 1,500,000° in the corona. Since it is impossible for one body to heat another to a temperature higher than its own, the outer layers could not have been heated to such a high temperature by the radiation of the photosphere. Some mechanical processes must have played an essential role in this heating. Thus, the spectral observations and the detection of the dynamic phenomena may lead to a better understanding of the basic physical laws governing the behavior of a quiet Sun. It follows from these observations that the appearance and development of active zones on the Sun must be connected with the escape of the magnetic field to the Sun's surface. Investigations

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ACC NR: AP5016939

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of the 11.1-year cycle of solar activity showed some interesting characteristic features of the appearance of sunspots. At the beginning of each cycle, the spots appear first far from the solar equator, at the latitudes of about 30°. During the cycle period, the spots descend toward the equator to 15° at the maximum and to 15° at the following maximum. Further, the new spots start forming at high latitudes (30°). Considerable research work is being done now in the USSR on the problem of solar cycle. M. N. Gnevyshev (Pulkovo Observatory) has detected that the gradual change of the latitude of spot zone during the cycle is to be interpreted as two "waves" of the activity at the latitudes 25 and 15°. The second wave of activity lags behind the main maximum by approximately three years. Development of further research on the problem of solar activity is not only of theoretical, but also of practical importance, having in mind the complex influence of the Sun on the Earth. Orig. art. has 6 figures and 1 graph.

ASSOCIATION: Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln, Akademiya nauk SSSR (Institute of Terrestral Magnetism, the Ionosphere and Radio Wave Propagation, Academy of Sciences SSSR)

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LIVSHITS, M.A.

In the Astronomical Council plenum of the Commission for Solar Studies. Vest. AN SSSR 34 no.1:106-108 Ja '65.
(MIRA 18:2)