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HIGH SHOCK VISCOSITY MANGANESE STEEL AND THE OPPORTUNITY FOR LOW-TEMPERATURE NUCLEAR FUSION UNDER DYNAMIC LOADS

While working with alloy Fe86Mn13C samples were found unusual behavior g - resonance in the spectrum after the plastic deformation. This abnormal shape of the spectrum can be explained by the peculiarities of the magnetic structure of the alloy samples. These features may be associated with the redistribution of magnetic and antiferromagnetic phases in Fe86Mn13C alloy samples.

Keywords: low-temperature nuclear fusion, manganese steel, shock viscosity.

ДИНАМИКАЛЫҚ ЖҮКТЕМЕЛЕР КЕЗІНДЕГІ ТӨМЕН ТЕМПЕРАТУРАЛЫ ЯДРОЛЫҚ СИНТЕЗ МҮМКІНДІГІ ЖӘНЕ МАРГАНЕЦТІ БОЛАТТЫҢ ЖОҒАРЫ ЕКПІНДІ ТҰТҚЫРЛЫҒЫ

Fe86Mn13C қорытпасының үлгілерімен жұмыс істеу барысында спектрде пластикалық деформациядан кейін g - резонанстық ерекше көрініс пайда болды. Спектрдің бұл жалпы заңдылықтан ауытқуын қорытпа үлгісіндегі магниттік құрылымның ерекшелігімен түсіндіруге болады. Бұл ерекшеліктер Fe86Mn13C қорытпасында антиферромагниттік және магниттік фазалардың таралуымен байланысты.

Түйін сөздер: төмен температуралы ядролық синтез, марганец болаты, екпінді тұтқырлық

ВЫСОКАЯ УДАРНАЯ ВЯЗКОСТЬ МАРГАНЦОВИСТОЙ СТАЛИ И ВОЗМОЖНОСТЬ НИЗКОТЕМПЕРАТУРНОГО ЯДЕРНОГО СИНТЕЗА ПРИ ДИНАМИЧЕСКИХ НАГРУЗКАХ

Во время работы с образцами Fe86Mn13C сплава был обнаружен необычный характер спектра g - резонанса после пластической деформации. Эту аномальную форму спектра можно объяснить особенностями магнитной структуры образцов сплава. Эти особенности могут быть связаны с перераспределением магнитных и антиферромагнитных фаз в образцах Fe86Mn13C сплава.

Ключевые слова: низкотемпературный ядерный синтез, марганцевая сталь, ударная вязкость.

Prosperity civilization will contribute to the scientific revolution, on the threshold of which we now stand [1]. It is a low-energy nuclear reactions. Their effects were detected in several independent series of experiments. These experiments have not yet recognized as a great academic science, because they are, at first glance, contrary

to generally accepted ideas. But they are the forerunners of the scientific revolution. All the scientific revolution began with awkward experiments rejected by reputable scientists, because they do not fit into the accepted, at the moment, the world picture.

The use of cold fusion in the energy sector is one of the reasons that most of the scientific community refers to the phenomenon of cool CNF is overly optimistic assessment of the possibility of providing mankind with free energy, which is present in the works of numerous inventors cold fusion reactors. Unfortunately, the promise of quick, easy and, most importantly, cheap success look tempting only in projects or business plans. Towards the transfer of global power with heavy hydrocarbons to the water is a lot of obstacles [1].

In addition to power low-energy nuclear reactions make it possible to solve the problem of decontamination of nuclear waste and pollution. Russian scientists have convincingly shown that the electric explosion, laser effects, even in biological systems occur decontamination of radioactive elements - they turn into non-radioactive state [2-3].

The official science still finds it impossible transformation of chemical elements in a variety of electric experiments with wires and foils made of stable isotopes of titanium, tungsten and other metals. The scientific community is also negatively related to the interpretation of the results of experiments with deuterated palladium, to the interpretation of experiments on the melting of zirconium by an electron beam, etc. [4-6]. Editorial rating scientific publications usually announce the results of research, «low-energy transmutation of chemical elements» and «cold fusion» (CNF) pseudoscientific, or find an error experiment. For 80 years virtually ignored the results of custom research, which suggests a clear conclusion - and low-energy transmutation of chemical elements, and cold fusion exists. And numerous groups of enthusiasts in different parts of the globe continue to conduct research on these phenomena. According to the most popular in the scientific and pseudo-scientific literature definition, low-energy nuclear reactions (LENR common abbreviation, i.e. low energy nuclear reactions) - these are the nuclear reaction in which the transmutation of chemical elements occurs at very low energies, and is accompanied by hard ionizing radiation [1, 7].

The first mention of the low-energy nuclear reactions relate to the 20-th years of the 20th century. American scientists Gerald Wendt and Clarence Ayrion experimentally found that at electric tungsten wire in a sealed flask formed helium [8]. After 90 years, a team of Russian physicists under the direction of the doctor of physical and mathematical sciences L.I. Urutskoyev repeated the experiment Ayriona Wendt and modern equipment and fully confirmed the results. In addition to the appearance of helium, Russian scientists discovered the distortion of natural isotopic composition of tungsten, which is directly pointed to the flow of low-energy nuclear reactions at electric [9]. Recently, there were reports that similar results have been obtained in one

of the American universities.

In the mid 50-ies Soviet engineer I.S. Filimonenko invented a heat generating device, in which the electrolysis of heavy water leaked on the palladium electrodes. It can generate several times more energy than it consumes which proves a nuclear fusion reaction. This is not a neutron radiation and radioactive waste [2-3]. In the 1980s, Americans Stanley Pons and Martin Fleischmann provided the public a similar device, explaining its action the so-called «cold fusion» [10]. This erroneous explanation discredited not only the Fleischmann and Pons, but also all directions. Only a few enthusiasts, for example, well-known Japanese scientists: Yoshiaki Arata and Yuechan Zhang from Shanghai University, at their own risk and continued to develop it and achieved some success [11-13].

In their experience in each particle of powder to 1 atom of palladium accounted for approximately 3 deuterium atoms. After the deuterium in the experimental cell temperature inside rose from 20 to 70 degrees Celsius. After the gas flow has stopped, the temperature of the matter contained in the cell remained above ambient for 50 hours [12]. Furthermore, Arata and Zhang found that in the course of the experiment appeared in the cell number of a helium-4, which essentially can not be formed from palladium and deuterium as a result of a chemical reaction. On the basis of these facts, it was concluded: nuclear fusion reaction takes place inside an experimental cell [11-13].

At the same time, some singles have managed to get a patent on a fundamentally new types of low-temperature nuclear reactors. Among those who are deprived of attention, offensive allocated academician B.V. Bolotov. He is the author of 600 inventions, a hundred and fifty of which are decorated inventors' certificates. He still managed to in the eighties of the last century to make the existing low-temperature nuclear reactor. It is unknown whether the reactor is preserved today, but in the late eighties, he warms prisoners. Radioactive fuel, like uranium, nuclear reactors B.V. Bolotov is required. Its reactors can be used as fuel iron, cobalt, nickel, and other conventional materials. However, they produce energy is due to nuclear reactions providing the conversion of chemical elements in a simple [14].

Recently, the most known are the results of experiments, a group of scientists set Rensselaer Polytechnic Institute (Rensselaer Polytechnic Institute), Purdue University (Purdue University) and the Russian Academy of Sciences. In these studies, we are talking about «sonosinteze» (sonofusion) - occurrence of nuclear fusion reactions in solution inside the collapsing bubbles of gas, which according to the experiments for a short time achieved great temperature. This phenomenon is called «sonoluminescence» [15].

Sonoluminescence rightly can be considered a form of CNF, because the reaction proceeds in a simple tabletop laboratory setting rather than in a tokamak, or to

install laser fusion. In recent years, in experiments in sonoluminescence took Academician Robert Nigmatulin and Americans Richard Leahy active participation Richard Lahey, Robert Block and RuziTaleyarhan [16].

In addition to the above-mentioned Russian scientists, the CIS and the United States the problem LENR and CNF engaged N.G. Ivoylov, S.V. Adamenko, V.A. Krivitsky, V.I. Vysotsky, A.A. Kornilov, V.Y. Velikodniy, Y.N. Bazhutov, V.A. Kirkinskii and many others. Agreat contribution to the theory and LENRCNF contributed F.A. Gareev [17-18].

Since that time, numerous scientists have published more than 3000 articles and invited about 50 theoretical models for the interpretation of the results. Numerous articles describe experiments in which the observed changes in the elemental composition of matter at such weak external influences on deuterated materials from the standpoint of modern theoretical physics can be no question of explaining the observed phenomena by nuclear reactions in condensed matter [19]. However, in experiments with deuterated materials heat is recorded neutron emission, tritium and helium. The elemental composition of matter thus varies. But a slight modification of the construction of the experimental setup and extremely small variations in the experimental conditions entail drastic changes in the results [19]. In the experiments, no recurrence, so it is believed that the Achilles heel of CNF and LENR is poor reproducibility of the results.

The physics community, as in any human community, periodically dominated by various fashion hobbies. Thus, the main forces of the modern experts on elementary particles now keen study of elementary particles at energies giant that existed in our world in the first moments after the Big Bang supposedly gave birth to the modern universe.

1) The views of the scientific community on the issue LENR and CNF formed on the basis of a consensus on the three standard theoretical restrictions on the phenomenon of low energy transmutation of chemical elements (see [20]).

2) the inability to pass the Coulomb barrier;

3) extremely small cross section of weak processes;

4) small probability of many-particle collisions.

Even in the earliest estimates of the probability of cold fusion reactions, which have not yet taken into account the physical effects, discovered much later, it is not denied the possibility of nuclear reactions in cold hydrogen. Moreover, the well-known m-catalysis is quite enough to overcome unthinkable factor in 2730 banning orders. This fact should be absolutely irrefutable conclusion: the Coulomb barrier, which prevents nuclear fusion reactions in cold hydrogen, is extremely vulnerable. Therefore, the speed of the cold fusion reaction can be controlled by changing the external conditions in which there is a macroscopic quantity of hydrogen isotopes. At the same time, a fundamental point of view, is not only well known m- catalysis, but also other

external influences may lead to the implementation of nuclear fusion at a temperature of 300 <T <1500 K, close enough to the room [1, 8, 20].

In accordance with the assessments and conclusions of scientists, there are the following «legal» the feasibility of nuclear fusion reactions:

a) inform the deuterons interacting speed sufficient to overcome the Coulomb barrier. Bring deuterons can be achieved by plasma heating, as well as with the help of particle accelerators. TCB problem has not been solved to this day. Energy consumption for acceleration of deuterons in accelerators are so great that their use to produce energy by nuclear fusion reactions is impractical. The efficiency of such systems are negative.

b) reduce the size of the atoms so that the wave functions of nucleons in nuclei of deuterium atoms in neighboring molecules overlapped even at T ~ 300°K, and the synthesis reaction went with sufficient for practical use probability. This opportunity gives muon catalysis and ultra-high pressure (10^8-10^9 atm).

In the first case the energy yield of the reaction does not cover the cost of energy to create muon in accelerators (meson factories) [19]. In the second case, a great external pressure required to compress the electron shells of atoms to the desired size, there are usually stars in the interior under the action of gravity.

The phenomenon of cold fusion in condensed matter extensively studied experimentally and described in the scientific literature.

The permeability of the Coulomb barrier deuteron very effectively regulated with the help of external influences (e.g., m- catalysis or external pressure).

The existence of metastable nuclear-active electrically neutral atoms dineutron confirmed by numerous experiments, as well as the results of nuclear-geophysical studies in which abnormally high prevalence of tritium was found in Nature [19].

Because cold fusion on the basis of neutrino catalysis is feasible, manageable, and is suitable for use in engineering practice, to the extent necessary to the systematic study of the properties of a new nuclear-active chemical element dineutron, and analysis of the possibilities of its use in technical devices and processes [19].

It should be clearly understood that the CNF is not a rival TCB. Controlled thermonuclear fusion - is, first and foremost, cyclopean, industrial power plants, each of which is able to provide energy to a medium-sized country, such as England, France or Germany. Installations CNF - a small-scale energy production and costly stable and radioactive isotopes [1].

Without exception, the researchers CNF problems outside the Commission on pseudoscience, in one voice say - cold fusion is the objective reality given to us in the form of premonitions bright energy future of all mankind.

However, you need to add in a barrel of honey spoon of tar, and rather big. A common problem of these and similar studies at this stage is the absence of a satis-

factory theory to explain the full range of phenomena described. And without such a theory can not deliver targeted experiments and make substantial progress in understanding, and most importantly, use, low-energy nuclear reactions. Need to consolidate the efforts of various scientists and specialists - physicists, chemists, biologists, energy. Only then can we bring the future. Only then a different picture of the world will turn fantasy into reality!

High-manganese steel, which was invented in the nineteenth century Hadfield plays still an important role as a kind of construction material used in engineering and other industries. Due to its high wear resistance was used for the manufacture of the parts that wear out during operation with a significant specific pressure - rail crossings, cheeks crushers, ball mills, balls, etc. Track Shoe The most amazing thing was that, under the influence of stress, this steel becomes harder and harder.

After casting manganese steel grain boundary carbides excessive fall, reducing its strength. Therefore, the steel must be subjected to heat treatment, which resulted in the boundary carbides dissolve in the metal [21]. After hardening steel have a hardness of 230 HB, it is nonmagnetic and has unusual mechanical properties. Proportional limit is 40 kg/mm^2, a tensile strength of about 100 kg/mm^2, elongation and necking 60 and 45%, respectively. Unlike most metals, high-manganese steel in a tensile test produced a very small neck and necking area is retained substantially the same effective length throughout the sample. This is a great tendency to hardening steel in cold deformation [22].

During service parts due to hardening (under load), carbon is released into the surface layer - it is this and explain the hardening of steel. The thermal conductivity of steel is the thermal conductivity of the lead, which is 4-6 times lower than the other steels, the thermal expansion coefficient is 1.9 times greater than that of low carbon steels. These are very important characteristics of the metal, since they affect the possibility of occurrence of cold cracking in the temperature effects [23-24]. There is a significant probability of hot cracks and, due to the shrinkage of the casting alloy, which is 1.6 times more low-carbon metal. High quenching temperature austenitic structure transforms to martensite, which increases the risk of fractures in the area of exposure to high temperatures [23-24].

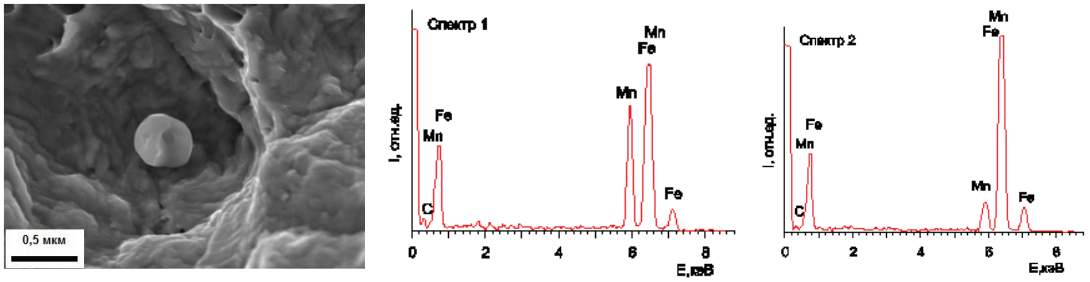
Steel 110G13L studied quite extensively, but remain outstanding following questions: 1 - the nature of self-strengthening of steel structure under impact loading; 2 - structure, formed in the shear deformation zone; 3 - causes a local change of the magnetization in a shock.

It is generally believed that the hardening of the steel during cold work is determined by the transformation of metastable austenite into martensite at the local strain areas such as lines or sliding around on the surface of the samples when they are subjected to wear under shock loads. However, these worksNikonov and Goss strongly

shaken the submission. Nikonov found that the maximum hardness of samples deformed on impact tester was not on the surface, a few millimeters deep hardening, and that does not depend on the number of slip lines. He also found that the hardening occurs even if deformation occurs at high temperature such as 550°, and that the material is cold-worked by tempering softens at 450° [25].

Despite numerous studies the causes of self-strengthening steel 110G13L this problem is not completely solved. In this paper we consider the possibility of self-strengthening steel 110G13L due to an abnormally large heat release in localized regions under shock loading. With dynamic loading, there are acoustic waves that can propagate in the metal at a rate of more than 6 km per second and create a greater concentration of power in localized areas Oscillating acoustic wave displacement can be activated not only dislocation glide, but actually athermal slip-barrier [26]. Acoustic waves can stimulate the flow of nuclear reactions. Thus Nigmatulin in experiments using sound pressure of 1 bar [27]. Such pressure can be obtained from the acoustic emission in the martensitic transition [8].

The authors [29-30] discovered that after severe plastic deformation of steel specimens 110G13L structure of the grain boundary phase may correspond to β-Fe-Mn, which contains two types of the Frank-Kasper polyhedra - FK12 and FK14 [26, 21-23]. In alloys mechanism plastic flow in the bands of strain localization associated with a mechanism of dynamical phase transition, that is with the type of symmetry in the crystal phase instability resulting in high local stress fields. In [24] it is shown that at break 110G13L steel with high toughness (more than 300 mJ/mm^2) in the rupture zone is not formed cracks, the metal is torn by craters, which are at the bottom of the particle size of 1-2 microns, enriched with manganese (Figure 1).



a) b) c)

Fig. 1. Crater viscous sample fracture 110G13L steel, the bottom of which the particle enriched manganese: a) the microstructure of the crater; b) microprobe analysis of particles at the bottom of the crater, and c) on the sample surface.

The first patent for a strategically important isotope 57 iron-manganese A.A.

Kornilov and V.I. Vysotsky received in 1995 [23-24]. The authors have shown that in certain biological systems can be held sufficiently effective conversion isotopes. No chemical reactions, and nuclear. And it is not about the chemical elements as such, but it is about their isotopes. What's the fundamental difference? «Chemical elements difficult to identify, they can appear as an impurity, they can bring in a sample by chance. When changing the ratio of isotopes - is a more reliable marker» - Vysotsky explains [24].

Mossbauer effect - is now the most reliable methods for solving existing problems in the detection experiment emergence of a new kernel. It would be best for the purity of proving the existence of cold fusion to get some exotic isotope, rarely found in nature, such as the core of iron-57 isotope. The situation in the periodic table is as follows: in just five iron isotopes, but in front of the iron in the series is monoisotope manganese-55, another isotope of manganese have not. That is, if the manganese-55 plus one proton - obtain iron-56, and if instead of the usual water take heavy, deuterated, ie add to the nucleus of manganese one proton and one neutron, we find the very rare isotope iron-57 [20, 22].

The exceptional reliability of the detection of occurrence of this Mossbauer iron-57 isotope, which has one neutron more than the conventional iron-56, just possible to understand how this unique tool you can use. In experiments V.I. Vysotsky took manganese Mn55 and added thereto proton. As a result of nuclear fusion reactions received conventional iron Fe56 [25]. In order to prove the accuracy of such a process with greater reliability, crops grown on heavy water, where instead of protons, deuterons! The result is Fe57, Mossbauer effect is clearly confirmed.

In the absence of iron in the initial solution, after the biological activity of the culture is in it appeared, and this isotope, which in terrestrial rocks is very small. And in this process exhibited 50% Fe57. That is, in a biological culture there was a nuclear reaction 25Mn55 + 1d2 → 26Fe57 [25].

Thus, studies of areas of localization of deformation provide a more complete picture of the processes taking place in the structure of steel products 110G13L at their operation.

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«БАҒДАРЛАМАЛАУ» ПӘНІ БОЙЫНША ЭЛЕКТРОНДЫ ОҚЫТУ ӘДІСТЕМЕЛІК КЕШЕНІН ҚОЛДАНУ ТЕХНОЛОГИЯСЫ

Мақалада электронды оқыту әдістемелік кешенінің анықтамасы мен құрылымы қарастырылған. Электронды оқыту кешені құрылымының әрбір элементіне талдау жасалған және электронды оқыту кешенінің мүмкіндіктері келтірілген.

Түйінді сөздер: электронды оқыту кешені, электронды оқыту кешенінің құрылымы.

ТЕХНОЛОГИЯ ИСПОЛЬЗОВАНИЯ ЭЛЕКТРОНОГО УЧЕБНОГО КОМПЛЕКСА ПО ДИСЦИПЛИНЕ «ПРОГРАММИРОВАНИЕ»

В статье рассмотрен метод структуры и определения электронного учебного комплекса. На каждый элемент электронного учебного комплекса был сделан анализ и были предоставлены возможности электронного учебного комплекса.

Ключевые слова: электронный учебный комплекс, структура электронного учебного комплекса.

TECHNOLOGY USE ELECTRONIC EDUCATIONAL COMPLEX ON DISCIPLINE «PROGRAMMING»

The article describes the structure and the method of determining e-learning industry. The analysis was made to each element of the electronic educational complex and the possibilities