ABOUT OPERATION OF NICKEL-HYDROGEN CONTAINER AND PHYSICAL MODEL - HYPOTHESIS APPEARANCE OF “STRANGE” RADIATION

V.A. Chizhov

LLC Moscow plant "FIZPRIBOR"
ChizhovV@fizpribor.ru

To date, there is no convincing idea that such something there is a "strange" radiation that has a unique ability penetrate through crystalline materials, and leave li- linear, helical and other tracks, well observed at a magnification of more 30 times.

Research of a nickel container with a nickel-hydrogen system ($Ni + NaBH_4$) and ($Ni + LiAlH_4$) showed that the container (“reactor”), which ry was at room temperature, works a year after conducted thermal process (1100 - 1150 ^{0} C). The container is periodically emits high-energy radiation - "strange" radiation that is fixed on CD disks and in a Wilson diffusion chamber.

This work presents the experimental results and pre- a physical model is proposed - the hypothesis of the formation of a cluster “strange th "radiation in the nickel-hydrogen system. Based on the proposed model-hypothesis of the formation of clusters of "strange" radiation is given clarification of the performance of the container after its one year stay at room temperature. An estimate of the working time of nickel hydrogen "reactor" at room temperature. Shown that work "Reactor" (according to the proposed model) for the periodic emission of "countries the amount of "radiation" can be determined for decades.

1. Introduction

L. I. Urutskoev in his work [1] in 2000 called him the radiation - “strange” radiation. "Strange" because his behavior, and this penetrates ability through various crystalline materials and leaving traces in the form of tracks on amorphous materials cannot be explained due to known radiation models. IN AND. Vysotsky [2], studying similar tracks, but on layered structures, believes that these are magnetic monopoles.

Experiments carried out in 2019-2020 do not confirm these assumptions. zheniya. In the previous work [3] and reports at seminars "Ball lightning" - Physics Department of Moscow State University [4] and RUDN University [5], it was about the detection of "strange" radiation niya. “Strange” radiation was recorded in the form of tracks left by this radiation on CD disks during a thermal process from a nickel container pa ("reactor") with crystals of the nickel-hydrogen system ($Ni + NaBH_4$) and ($Ni + LiAlH_4$). Also in this work were recorded tracks of "strange" radiation in the Wilson chamber and an estimate of the energy of the "strange" radiation which has a value of about 5 - 50 TeV (teraelectronvolt).

Based on the concept of "dark" hydrogen ($\hat{}H_2$) [6], model-hypothesis about the creation of a cluster from such hydrogen [3, 4, 5], - "dark hydrogen "system (hydrogen" T "- $\hat{}H_2$). This model made it possible to satisfy to explain the high energy of radiation and its cluster structure round. The cluster structure was confirmed by the fact that the track, when com "deceleration" in amorphous media is separated, creating other tracks, those. during the transition of the kinetic energy of the cluster to thermal with the creation in amorphous media of various tracks and different geometries, melting plexiglass (see [3, 4, 5]).

However, the question is how and why the formation of such an unusual cluster with an energy of tens of TeV in the nickel-hydrogen system remains open.

Fig. 1: "Reactor" (container) made of nickel foil with nickel-hydrogen system ($Ni + NaBH_4$) or ($Ni + LiAlH_4$) in a Wilson chamber. Size of con-tapeer 80 × 23 × 12 mm. Loading weight of reagents in a container 6.47 g from calculation for hydrogen 0.1 mol $^{-1}$.

Further research revealed a number of factors for understanding such an unusual effect - "strange" radiation - which will be reported in this work.

Experiment 1. Container ("reactor") (Fig. 1), which lay after thermal process 6 months at room temperature underwent following in the Wilson chamber.

Glass diffusion chamber Wilson with a volume of a flask of 1.5 l (Fig. 2) b)

Fig. 2: a), b). a) - Diagram of the Wilson diffusion chamber on alcohol vapor:
1 glass flask; 2- dry ice CO_2 ($T = -78\ ^0C$); 3- porous material,
soaked in alcohol; 4- alcohol vapors; 5- tracks; 6- permanent magnets; 7-
magnetic field lines; 8- metal screw cap for
camera loads;
b) - photo of the Wilson diffusion chamber without magnets.

cooled with dry ice (CO_2; $T = -78\ ^0C$) to obtain supercooled alcohol vapor (C_2H_5OH) of the chemically pure grade (medical).

Elementary particle, charged or uncharged, background, cosmic or from the tested "reactor", falling into a chamber with a supercooled

Fig. 3: The track from the "reactor" in the Wilson chamber, recorded after 6 months
nights after keeping the reactor at room temperature.

steam of alcohol, condenses its vapors, creating and leaving for some time
there is a visible condensate in the form of a track - Wilson, 1912. Then this condensate
under the influence of cooling, gravity and convection descends to the cold
the bottom of the chamber, where it condenses into liquid or is broken by convection, is not
reaching the bottom of the chamber. The average track observability is on the order of one second.

In the experiments being carried out, recording tracks in a camera (diffusion)
Wilson, as in the previous work [3], was carried out by the same camera
HUAWEI. When shooting for 46 minutes in a camera with a magnetic field of 4.5
mT were recorded weak background tracks and a powerful straight track,
which came from the "reactor" (Fig. 3).

In fig. 3 shows the temporal development and decay of the track. The process is
track observation was 0.6 - 0.8 s. After measurements in the Wilson chamber
the container was placed in an open Petri dish and placed over it
blank CD disc. After 100 hours of exposure of the disk over the reactor, on the CD dis-
ne, point and helical tracks (Fig. 4) in the amount of ~ 20
PC. screw and ~ 60 pcs. point tracks. These tracks, in comparison with the track-

Fig. 4: Spot tracks recorded as craters on the CD disc after
6 months of keeping the reactor at room temperature.

mi obtained during the thermal process (1100 - 1150 ^{0}C), for 2-3 hours of operation
"Reactors" were smaller and thinner in geometrical dimensions,
which indicates a weaker radiation energy.

Consequently, the “reactor” (container) continues to operate, but with less
intensity, at room temperature after 6 months, which cannot
to cause surprise - this radiation is indeed "strange" radiation.

According to the identified chiseled tracks - their geometry (Fig. 4), as molten
polycarbonate, an energy assessment of the radiation was made, i.e. defined
the energy of the cluster that created such a crater-shaped track.

Average geometry of a point track (Fig. 4): L_b = 14 µm; L_m = 7 microns;

$H = 12$ microns $= 1.2 \cdot 10^{-5}$ m; $R_{cf} = 5$ microns $= 5 \cdot 10^{-6}$ m, where L_{tr}, L_{m}, H and R_{cf} - length, track width, depth and average radius. Knowing the geometry of the track, we define its average mass and energy, which went to melt polycarbonate.

Density of polycarbonate CD disc [7]: $\rho = 1.2 \cdot 10^{3}$ kg / m^{3};

Specific heat of fusion [8]: $q = 1.5 \cdot 10^{5}$ J / kg.

Then:

The volume of the track - crater Fig. 4 (half of the ball): $\upsilon = 2 / 3\pi (r)^{3} = 2.6 \cdot 10^{-16}$ m^{3};

Track mass: $M = \upsilon \rho \sim = 3 \cdot 10^{-13}$ kg.

Figure: 5: [6]. Dark hydrogen model - ($\hat{}H_2$)

Fig. 6: [3, 4, 5]. The model of a distorted billiard from clusters of "dark" water kind ($\hat{}H_2$) of different energies, which create either point-like craters, or elongated helical, or circular, or other tracks.

Energy expended to create a track:

$$Q = qM = 1.5 \cdot 10^{5} \text{ J / kg} \cdot 3 \cdot 10^{-13} \text{ kg} = 4.5 \cdot 10^{-8} \text{ J}$$

$$Q = 4.5 \cdot 10^{-8} \text{ J} = 3 \cdot 10^{11} \text{ eV} = \sim 0.3 \text{ TeV}$$

To explain the formation of point and helical tracks, how the effect of an energy cluster on an amorphous medium (glass or plexiglass), the model of "dark" hydrogen ("T" hydrogen - $\hat{}H_2$) was used with its parameters trami (Fig. 5 [6]) and the model of a distorted billiards (Fig. 6 [3, 4, 5]).

From the presented models ("T" hydrogen $\hat{}H_2$ - Fig. 5 and Fig. 6) and calculated from the calculation of the energy expended to create a point track $E = \sim 0.3$ TeV, an estimate was made of the geometry (size) of the "strange" cluster radiation.

Assuming that the speed of the cluster is commensurate with the speed of movement of the electric throne in the atom V = 110 6 - 110 7 (510 6) m / s, then the mass of the cluster will be:

$$E = W_k = \sum \frac{m_{H_2} V^2}{2};$$

$$\sum m_{\hat{H}_2} = \frac{2E}{V^2} = \frac{2 \cdot 4.5 \cdot 10^{-8}\ J}{(5\ 10^6)^2\ (m/s)^2} \approx 4\ 10^{-21}\ kg$$

Because the mass "T" of hydrogen ($\hat{H}_2$), consists of two protons (Fig. 5), then the number $\hat{H}_2$ ($N_{\hat{H}}$) in a cluster linked by a magnetic field ($\hat{H}_2$ possesses strong magnetic field [6]), will be:

$$N_{\hat{H}_2} = \sum \frac{m_{\hat{H}_2}}{2m_p} \sim = \frac{4 \cdot 10^{-21}\ kg}{2 \cdot 1.6 \cdot 10^{-27}\ kg} \approx 1 \cdot 10^6 \text{ units. } \hat{H}_2$$

Thus, the number of units "T" connected by a magnetic field in prenatal ($\hat{H}_2$) in the cluster $N_{\hat{H}_2} \sim = 1 \cdot 10^6$ pcs. $\hat{H}_2$, which at room temperature tour take off (about) in 1 hour from the container.

The diameter of "dark" hydrogen ($\hat{H}_2$) (Fig. 5 [6]) D ~ 100Fm (10^{-13} m) meme as a side of a cube and define the volume of this cell:

$$\upsilon = D^3 = (10^{-13})^3 = 10^{-39}\ m^3 .$$

Then, the total volume of the cluster:

$$\sum \upsilon = N_{\hat{H}_2} \cdot \upsilon \simeq 10^6 \cdot 10^{-39} \approx 10^{-33}\ m^3 .$$

Therefore, the side of the cube is the "diameter" of a cluster consisting of ($\hat{H}_2$) is:

$$D = \sqrt[3]{\sum \upsilon} = \sqrt[3]{10^{-33}} = 10^{-11}\ m = 0.1\ \mathring{A}$$

It should be noted that the assessment was carried out for the symmetric shape of the erased, although the magnetic field with a pronounced directivity along the "T" axis hydrogen ($\hat{H}_2$ [3]) should elongate the cluster, as shown in Fig. 6, that will result in the transverse cluster size to be less than 0.1 Å.

An important conclusion from the obtained estimate of the cluster size "Strange" radiation. The lattice parameter is a~3-5 Å, while the cluster of "strange" radiation, from the obtained estimate ki of its geometry, has a size (diameter) less than 0.1 Å. If early races judgments about penetrating ability were based on intuition, then after the estimated calculations made, it becomes clear why this is "strange" radiation has such a penetrating ability in any crystalline

substances and cannot (almost cannot) overcome amorphous media, where there is no order - frozen liquid.

Experiment 2. After 5 and 7 months after the measurements, the experiment ritual No. 1, i.e. after 1 year, the measurements were repeated, and again on the CD disk and on glass sample after 100 hours of exposure, the same tracks.

How to explain the obtained results that the nickel-hydrogen container
ner, being at room temperature, after a year gives periodically
radiation of high, very high energy of the order of 0.2 - 0.5 and up to 1 TeV?

Such explanations do not exist at the moment, they do not exist.

Model-hypothesis of the appearance of "strange" radiation in nickel-hydrogen reactor and its prolonged emission from the “re- actor ”in time. In 2016, I reviewed the LENR process in nickel-hydrogen system in the area of ideal crystal defect - twin boundary (DW) (Fig. 7) (the results of this work were reported at seminars FIZFAKA MSU [9] and at RUDN University in December 2016 [10]).

Fig. 7: [9], [10]. Twin boundary (DW) scheme during reactor operation nickel-hydrogen system.

It was shown in [11, 12] that the DW has anomalous properties, there, a high tension of electric tric field ($E = 10^{12} - 10^{14}$ V / m). In the earlier work of our classes Sikov Physics - I.M. Livshits, I.V. Oparin [13], anomalous energy domain of the DW. However, opinions about the sharpness of the boundaries of the DW go [13, 14, 15].

Based on my proposed LENR process model for nickel hydrogen system on the DW (Fig. 7 [9], [10]) follows:

1. Twin boundary (DW) is an energy hole.
2. It is known [16, 17] that the diffusion of the dopant into the crystal is mainly for defects. The presence of twin boundaries (DW), dis- locations, low-angle boundaries and boundaries of polycrystalline blocks, in difference from point defects, according to Frenkel, leads to an increase diffusion rates by 3 - 5 orders of magnitude [18]. Note that point de- defects, dislocations and low-angle boundaries introduce, in comparison with DW and boundaries of polycrystalline blocks (GPB), a much smaller contribution and modeling will not be considered at this stage.

1. For the convenience of modeling, let us assume that the energies of the DW and GPB are equal; these defects create equal energy wells - $\Delta E_{DG} = \Delta E_{GPB}$.
2. We assume that the doping impurity, and this is for the given considered process catalysts - lithium aluminum hydride ($Ni + LiAlH_4$) or boron - sodium sodium ($Ni + NaBH_4$) - 10 to 30% focused on defects DG and GPB.
3. The indicated catalysts were calculated by the mass of hydrogen (H) per 0.1 g / mol.

4. It is known [19] that hydrogen in nickel is in the proton state, as and shown in Fig. 7.
5. Quasi-free and excess electrons, which “left” hydrogen, and hydrogen protons are clamped by the energy well of the DW defect (Fig. 7).

Thus, the problem is reduced to a quantum mechanical problem, when the electrons with hydrogen protons are trapped in a potential well and it is necessary to consider them behavior in it. However, even at a given and constant temperature, the oscillatory process in the crystal is present (phonon component) on the boundary of the energy well, i.e. boundary conditions functionally change- are. Therefore, in this case it is impossible to use the simplified stationary Schrödinger equation:

$$\frac{-\,^2}{2m}\Delta\psi + U\psi = E\psi,$$

and if we take into account the whole process with a rise in temperature up to 1200 ^{0} C, then the boundary the conditions of the energy well (DW) will change to a greater extent and according to other laws that are also unknown. In this case, you need use the temporary Schrödinger equation:

$$\frac{-\,^2}{2m}\Delta\Psi + U\Psi = i\frac{\partial\Psi}{\partial t},$$

and the function Ψ, like the boundary conditions, will depend on the space coordinates, temperature and time - $\Psi_{(x, y, z, T, t)}$

It is clear that the solution of such a problem with respect to electrons and protons with a constant a steady gain of energy from interaction with an energy barrier (the boundaries of the energy hole of the DG) does not seem to be possible. Is it a hopeless situation?

But, apparently, there is a way out. Let's proceed as follows.

Understanding what it means to solve the equation of quantum mechanics is, to find the probability of the process and its energy characteristic.

From the experiment and the energy estimate (see above) it is known that that in about 1 hour one cluster of this “strange” radiation flies out, which consists of ~ 10^6 units. Hydrogen "T" bound by magnetic field (property of “dark” hydrogen ($\hat{H}_2$) is to have a magnetic field [6]) Fig. 6 - this is the probability of this process.

Then, from all the data and reasoning given, it is possible to imagine the dynamics of the ongoing process in the energy hole and do some assessments of the ongoing processes in this system, and this process is considered third.

Process dynamics. Under the influence of the oscillatory process in the cry- In steel, the boundaries of an energy well of the DG or GPB type are not stable. Post- strong "rocking" of electrons and protons leads to their accumulation energy before the formation of a small atom, such as a meso-atom or drin-like (Fig. 7). In this case, the probability of nickel entering the nucleus (Ni^{58}) increases. When the first hydrino-like atom [20] enters core (Ni_{58}) there is a change in the nucleus - (transmutation) and from the nickel nucleus leaves (should fly out, but they are not) neutron (n), the lifetime of which in normal conditions is 14 minutes, which then breaks down into proton (p_+), electron (e_-) and neutrino - ($\bar{\nu}_e$) [21]:

$$n = p_+ + e_- + \bar{\nu}_e$$

However, the time (~ 14 min) of the existence of a neutron refers to earlier studies.

given conditions, as a free state of a neutron, and under the conditions of a given
a process when a lot of energetically active electrons and protons,
prepared to create small-sized atoms - energetically active medium (Fig. 7) - it is possible that the neutron decays immediately.

Having made this assumption, we have that it is precisely the decay of the neutron and triggers "the formation of" T "hydrogen (ˆH_2) with an abnormally high mag- field (Fig. 5).

Having made such an assumption intuitively, much becomes explicable. As soon as the formation of the 1st “T” hydrogen (ˆH_2) has occurred, its magnetic the field acts on all energetically prepared electrons and proto- that are transformed into the same “T” states of hydrogen (ˆH_2). Formed magnetic and neutrally charged cluster with a higher estimated energy

Fig. 8: Scheme of the formation of a cluster of "strange" radiation from "T" hydrogen (ˆH_2) due to the fast decay of the neutron and energetically prepared for such formation of (e^-) and (p^+) protons by an electron .

(~ 0.3 TeV) and with special properties - this is high energy, magnetic bunch (ˆH_2) and small cluster size (<10^{-11} m). In addition, this the assumption explains the just question of venerable nuclear physicists:

- Why is there no neutron flux if it is “cold nuclear fusion” (LENR)?

And if we return to the energy of this "strange" radiation, which has tens of TeV, then this process in a nickel-hydrogen system is unlikely COLD NUCLEAR SYNTHESIS.

Continuing the discussion about the ongoing process, we have that the energy quantum of "strange" radiation is determined primarily by the occurrence was the process of transmutation in the nickel core and the emission of a neutron going on, and the energy the cluster of this radiation is determined by the energy readiness the electrons and protons in the domain of the DW (energy well) and their number. If their number is small, then the cluster consists of a small number weak hydrogen “T” (ˆH_2) and has a relatively weak energy of ~ 0.1 TeV, which and is observed when the "reactor" is operating at room temperature, creating point tracks only. In the case of a large number of energetically prepared (p^+) and (e^-) energies of the cluster are high, on the order of tens of TeV, and then such clusters create both long helical and other tracks. This the process of cluster formation is shown in Fig. 8.

In fig. 8, the proton in the decay of a neutron was isolated not without reason. On anomalous behavior of a neutron when interacting with substances in which rykh contained hydrogen, drew attention back at the beginning of the last twentieth century I. Curie [22].

Thus, from the proposed model it follows that, knowing the amount acts (released clusters) of "strange" radiation, one can say about the number of nickel transmutation transitions during the operation of the reactor.

Assuming that all reasoning about the ongoing process in the container nickel-hydrogen systems are correct, but they are logical, you can make an estimate the operability of the reactor at room temperature and answer the question question - why the reactor works for a whole year and how long can it work at room temperature?

The volume of the reagent in the reactor: $\vartheta \sim= 1$ cm^3;

Nickel (Ni) concentration: $N_{Ni} \sim= 5 \cdot 10^{22}$ at;

Hydrogen concentration (H_2): $N_H \sim= 5 \cdot 10^{21}$ at.

Then, knowing the number of defects, it is possible to assess the work of the reaction torus in time.

The structure of polycrystalline reagent blocks of nickel-hydrogen s-system after the thermal process is shown in Fig. 9.

The concentration of defects (density units per 1 cm^2 of $\sim 10^4$), and for volume

Fig. 9: Polycrystalline nickel-hydrogen after thermal process 1100-1150 ^{0}C.

will be $\sim 10^5 - 10^6$ cm^{-3}. Taking into account the DG in each block, we take the total the concentration of defects is $\sim 10^7$ cm^{-3}, and the concentration of the dopant according to hydrogen, which is in these defects (the diffusion process is orders of magnitude more effective in terms of defects) we take as ~ 1/10 part of the total concentration for hydrogen.

Then, the concentration of defects: $N_{def} \sim = 10^7\ cm^{-3}$.

Impurity concentration (H_2) on defects: $N_{H_2 def} \sim = 5 \cdot 10^{20}$ at.cm^{-3}.

It is known [23] that in the crystal lattice of nickel hydrogen is in the proton state.

Therefore, one defect accounts for:

$$N_{1H_2 def} \sim = \frac{5\ 10^{20}\ at.cm^{-3}}{10^7\ cm^{-3}} \sim = 5\ 10^{13} \frac{at.H_2}{def} \ldots$$

It is known from the experiment that the probability of a cluster ejection from the reactor is "Strange" radiation at room temperature occurs ~ 1 time in 1 hour, and it follows from the estimated calculations that the cluster contains ~ 10^6 units. ($\hat{H}_2$) "T" hydrogen.

Let us estimate how many hours the reactor can operate until the full consumption of water kind in defect.

The number of $\hat{H}_2$ in one cluster: $C_{Cl(\hat{H}_2)} \sim = 10^6 \frac{units}{hour} \ldots$

Note that hydrogen "T" ($\hat{H}_2$) consists of two protons and two electronew (Fig. 4).

Under these conditions, the time (τ) of the reactor will be:

$$\tau = \frac{N_{1H_2 def}}{C_{Cl(\hat{H}_2)}} = \frac{5\ 10^{13}\ at}{2 \cdot 10^6\ at\ /\ hour} = 2.5 \cdot 10^7\ hours$$

In a year $\sim 10^4$ hours, and then until the complete depletion of the dopant the reactor should work:

$$T \approx \frac{\tau}{10^4} \approx \frac{2.5 \cdot 10^7\ hours}{10^4\ hours\ /\ year}\ year \approx 2.5 \cdot 10^3\ years.$$

The purely evaluative result obtained is an idealistic evaluation this process. Of course, the real process is much more diverse, and in it must have an exponential with decreasing concentration of the alloying impurity of hydrogen in the DW, and slowing down the probability of ditch of such energy, but a definite integral is the area under the curvilinear surface should remain in infinity of time with decreasing weight the probability of ejection of clusters of "strange" radiation.

Let us evaluate the operation of the reactor in a different way - from the theory of radioactive decay:

$$N = N_0 e^{-\omega\tau};$$

Page 14

or rather, half-life:

$$T = \frac{\ln 2}{\omega} = \frac{0.69}{\omega};$$

where ω is the decay probability per unit time.

Then, the probability of this process will be determined by the ratio of flying particles per unit time to the total number of particles in the defect:

$$\omega = \frac{C_{Cl(H_2)}}{N_{1H_2 def}} = \frac{2 \cdot 1 \cdot 10^6\ at\ /\ hour}{5\ 10^{13}\ at} = 4\ 10^{-6}\ hour^{-1};$$

Therefore, the half-life will be:

$$T = \frac{\ln 2}{\omega} = \frac{0.69}{4 \cdot 10^{-6}\ hour^{-1}} \sim = 2\ 10^5\ hours$$

In a year, $\sim 10^4$ hours, then until half-life, when the concentration of hydrogen in defect of the DG will decrease by half, the reactor will operate:

$$T \sim = \frac{2 \cdot 10^5 \text{ hours}}{10^4 \text{ hours / year}} \sim = 20 \text{ years.}$$

Of course, this result is also relative. It is clear that for this process, the probability ω = const cannot be used, as for radioactive decay, which should change with decreasing concentration protons and electrons in the DW - $\omega = f(N_{H_2DW})$. Apparently, ω is also should decrease exponentially with decreasing hydrogen concentration (N_{H_2DW}) in the twin boundary (DW):

$$\omega = \omega_0 e^{-k_{DG}};$$

where ω_0 is the probability of the formation of a cluster of “strange” radiation at a fixed set temperature at the beginning of the reactor operation; k_{DG} - coefficient of active the formation of a cluster with a change in the concentration of protons and thrones in a defect (DG) during the operation of the "reactor", which can be determined experimentally in further studies of the operation of the reactor:

$$k_{DG} = f(N_{H_2DG}) = \frac{d(N_{H_2DG})}{dt},$$

where N_{H_2DW} is the current concentration of the hydrogen “plasma” (protons and thrones) in the DW defect, i.e. in an energy pit.

Conclusion. Using the physical model-hypothesis of the emergence of “countries "radiation" and experimental data, and from the energy estimates, and an intuitive understanding of the process, apparently to get to the bottom of the “strange” radiation. Now it is a "strange" radiation the idea no longer seems so “strange”. From the obtained estimate, It follows that the paradox of the operation of a nickel-hydrogen reactor after 1 year

allowed at room temperature and, apparently, the next 10 years it will work the same as the first 6 months, since decrease in concentration protons and electrons, even twofold, will not affect the orders of concentration tion dopant (H_2) in the defect (DH) and the likelihood of clusters from ($\hat{H}_2$) “strange” radiation in a defect (DW) will change.

It should be noted that the CD disk does not capture all clusters and does not is 100% protected against this “strange” radiation.

As for the high operating temperatures of the "reactor", this process requires further research is in progress.

Literature

[1] L.I. Urutskoev, V.I. Liksonov, V.G. Tsinoev. Experimental detection of "strange" radiation and transformation of chemical elements. // Journal of Radioelectronics, No. 3, 2000. http://jre.cplire.ru/jre/mar00/4/text.html

[2] S.V. Adamenko, V.I. Vysotsky. Experimental detection and mode simulation of the orientational movement of hypothetical magnetically charged particles on a multilayer surface. // Surface, X-ray, synchrotron and neutron research, 2006, no. 3, p. 84-92.

[3] V.A. Chizhov. Experimental verification of ongoing processes in nickel-hydrogen system using two catalysts: (Ni + $NaBH_4$) and Ni + $LiAlH_4$). // XV International Conference “Finsler generalizations of the theory of relativity ”(FERT-2019), p. 223.

[4] V.A. Chizhov. CNF experiment, nickel-hydrogen plant, countries

radiation, Wilson chamber. // Report at the seminar “Sharo-
lightning "Physics Department of Moscow State University. M.I. Lomonosov. Internet resource
- https://www.youtube.com/watch?v=AHVrEDOreEw - appeal 14.08.
2020

[5] V.A. Chizhov estimated the energy of the “strange radiation” and registered
streamed his tracks in Wilson's cell. // Report to the workshop
re "Ball Lightning" 02/27/2020 RUDN Moscow. Internet resource-
https://www.youtube.com/watch?v=cpDN4uWduI8 - appeal 10/01/2020

[6] Baranov DC, Zatelepin VN The synthesis of dark Hydrogen (Neutronlike
Particles) in a hydrogen Reactor. International conference “Scientific Research
of the SCO countries: Synergy and Integration ”, Beijing, China, 2019, pp. 165-
173, ISBN 978-5-905695-48-3

[7] Design Center. // Table of substance density. Internet resource-
https://www.center-pss.ru/st/st142.htm - appeal 05/09/2020

[8] Specific heat of fusion of polymers. // Chemist's Handbook 21, p. 274.
Internet resource - https://www.chem21.info/page/1161511961151652491171
48008072161061116194044174 / - appeal 11.05.2020

[9] Presentation by V.A. Chizhova at the seminar on CMM Physics Department of Moscow State University
12/07/2016 New theoretical estimates and proposals for little
costly verification of energy release in Rossi's “generator”. // In-
web site - http://lenr.seplm.ru/seminary/prezentatsiya-va-chizhova-na-
seminare-po-shm-na-fizfake-mgu-07122016 - request 06/15/2020

[10] V.A. Chizhov, F.S. Zaitsev A critical analysis of the processes occurring
in the Rossi cell. // “Cold Nuclear Fusion and Ball Mol-
Niya ”Seminar at RUDN University - 12/29/2016 - Global Wave. Internet resource-
https://www.youtube.com/watch?v=6fTAb7hKnuY- appeal 05/11/2020

[11] V.A. Chizhov. Again about superconductivity, or experiments are waiting for an answer.
// M., Sputnik +, 2015, p. 21-28.

[12] V.A. Chizhov. Again about superconductivity. Part II. Experiments on
superconductivity 2014 - 2015 under pressure and their explanation using
model MSP-DG (model of the onset of superconductivity on an ideal
crystal lattice defect - twin or twin boundary.
// M., Sputnik +, 2015, p. 27-34.

[13] I.M. Lifshits. On a macroscopic description of the twinning phenomenon
crystals. // Journal of Experimental and Theoretical Physics. 1948,
Vol. 18, no. 12. pp. 1134 - 1143.

[14] Chemist's Handbook 21, Dependence of Atomic Energy on Distance
to the coherent twin boundary, p. 41-46. Internet resource -
https://www.chem21.info/pics/212709/ - appeal 05/09/2020

[15] OM Ostrikov. Calculation of the energy of a wedge-shaped nanotwin in the frame
dislocation mesoscopic model. // Journal of technical philosophy
ziki, 2008, volume 78, issue. 2, p. 58 - 62.

[16] N.A. Dolgopolov. Grain-boundary diffusion of copper in aluminum and in alloy
wah aluminum-copper and aluminum-cerium. Dissertation for the competition of a scientist
degree of candidate of physical and mathematical sciences. // “National Research
Research Technological University "MISIS" ', 2014

[17] A.V. Zvyagintsev. The dependence of the processes of interaction of metals with water
predominantly from the structure of electrochemical systems. // Scientific notes Ta-
Vrichesky National University. V. I. Vernadsky Series “Bio-
logic, chemistry ”. Volume 26 (65). 2013. No. 4. S. 259-269.

[18] Chemist's Handbook 21, Diffusion in solids., P. 49, 364 -366. // In-

web resource: -https: //www.chem21.info/info/12531/
g.

[19] N.A. Galaktionova. Hydrogen in metals. // M., Metallurgizdat, 1967,

- 304 p.

[20] A.P. Trunev. Electron structure, hydrino and cold nuclear synthesis. // Chaos and Correlation, November 25, 2011. // Internet resource: - http://ivanik3.narod.ru/1-oder/TeorPredposylky/Trunev/CR11_2011.pdf - appeal May 21, 2020

[21] Neutron. // Great Soviet Encyclopedia. // Internet resource - https://gufo.me/dict/bse/ Neutron. - appeal 18.05.2020

[22] I. Curie. On the interaction of a neutron with paraffin or any other a compound rich in hydrogen, high energy protons are formed. // Internet resource -https: //wiki2.org/ru/Neutron - appeal 05/18/2020

[23] Xu Shupen, V.V. Larionov. The behavior of hydrogen in t-tane at his irradiation neutroans. // National research Tomsk polytechnic university. http://earchive.tpu.ru/bitstream/11683/52415/1/conference_tpu-2018-C84_p77.pdf