# Plasma Electrolysis as Foundation for Russian E-Cat Heat Generator

Yu.N. Bazhutov[1], A.I. Gerasimova[2], V.P. Koretskiy[3]

[1] Pushkov Terrestrial Magnetism, Ionosphere and Radiowave Propagation Institute (IZMIRAN), RAS, Troitsk, Moscow, Russia, erzion@mail.ru;
[2] Russian State Agrarian Correspondence University (RGAZU), Balashikha, Moscow region, Russia, geras-albina2009@yandex.ru;
[3]Retired, Moscow, Russia, tarhanval@gmail.com

After Andrea Rossi's Heat Generator (E-cat) presentation with demonstrations of excess heat up to 600 % [1, 2] we have repeated such experiments with similar cell in Russia. As a result ~~by us~~ it has been received the considerable exit of neutrons (~500000) in serial and x-ray radiation [3, 4, 5, 6]. We presented them at the Russian annual Conferences on Cold Nuclear Transmutation [3, 4] and at the International Conference in Korea [6]. However we didn't find excess heat on these installations. Therefore we decided to return to a previous study of plasma electrolysis on the Fakel-1 installations [7] and the Fakel-2 [8,9], where we already had indications on existence of nuclear radiation and excess heat in this cell mode. On the modernized installation Fakel-3 with plasma electrolysis the convincing evidence of nuclear processes was obtained. It was provided by Erzion catalysis [10] with the large excess heat. The received results have provided the positive decision on our International patent [11]. Here we present the investigation results of plasma electrolysis with anode gas discharge in usual water. In our experiments there have been used different nuclear & calorimeter diagnostic methods. Numerous demonstrations of their nuclear nature have been obtained in full accordance with Cold Nuclear Transmutation Erzion Catalysis model predictions [12-17]. In much series there were regularly demonstrated large excess heat generations (< 700%). This can provide creating of ourself Russian E-Cat (Erzion Catalyzer) Heat Generator & new perspective nuclear energetics.

## Introduction

The present work is 15 years continuation of our previous works [7] on research of Anode Plasma Electrolysis by Fakel-1 installation with Erzion model interpretation [12-17]. Experiment statement is defined by our accent on evaporation & remote calorimetric and nuclear diagnostics of process. An installation prototype of Fakel-3 installation [10] is similar to our previous variant Fakel-2 installation [8,9] with some diagnostic innovations.

Its new elements are evaporation & digital thermocouple calorimeter and using of nuclear diagnostic presented by 2 dosimeters (control and special with Erzion converter), 2 Radiometers, plastic & NaI Scintillators, Photo emulsion & PSSD tracks diagnostic. All remote diagnostics is conducted outside of the glass aquarium playing a role of an external contour of electrolytic cell cooling, the design and which materials remained without changes (fig. 1 see).

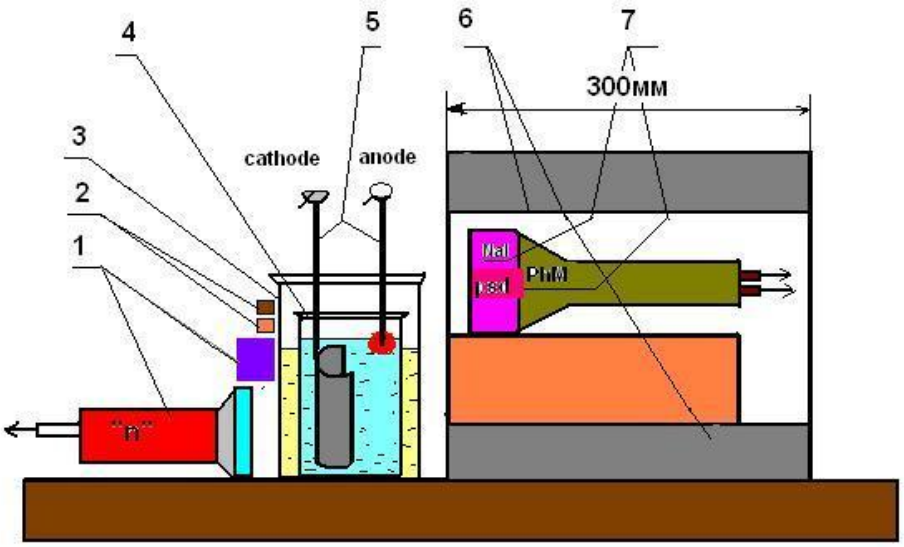


Fig.1. The scheme of experimental installation. Fакel-1 (IPRIM-2005-2007).

- 1 – radiometer of the neutrons counter
- 2 – gold or tungsten anode (S < 1 $cm^2$)
- (cathode – nickel or titan (S~30 $cm^2$))
- 3 – glass aquarium with cooled water (7 l)
- 4 – glass case of an electrolytic bath (500 ml)
- 5 – external lead small house from standard modules
- 6 – internal (additional) lead protection of the gamma rays detector
- 7 – the detector of gamma-radiations (standard block "lemon" with crystal NaI (Tl) 63x63 $mm^2$)

Apparently from fig. 3,4, an aquarium with an electrolytic cell are placed in a flue block for an extract of steams of alkali NaOH and additional cooling of powerful installation (~ kw). All diagnostics was spent in a case in immediate proximity to external glass of an aquarium. Viewing glass of a case has been executed from thick plexiglas in the thickness in 1 cm.

The main our nuclear & calorimetric results are presented here.

Fig.2. The common view of experimental installation. Fakel-1 (IPRIM, 2005-2007).

## New experimental installation Fakel-2,3 (KIAE, 2010-2013)

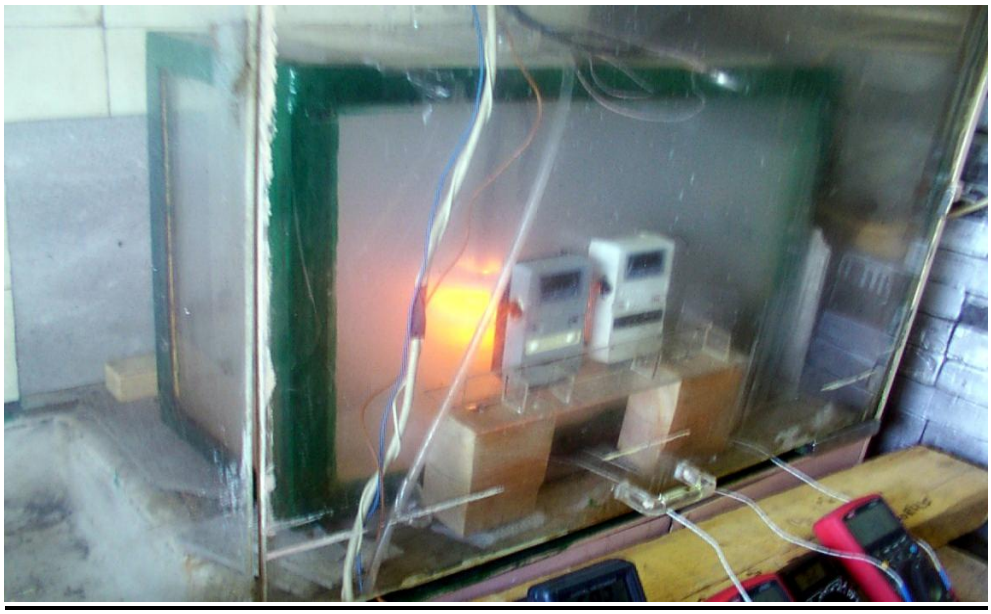

Fig.3. The common view-1 of new experimental installation. Fakel-2 (KIAE, 2010-2012).

Fig.4. The common view-2 of new experimental installation Fakel-3 (KIAE, 2013).

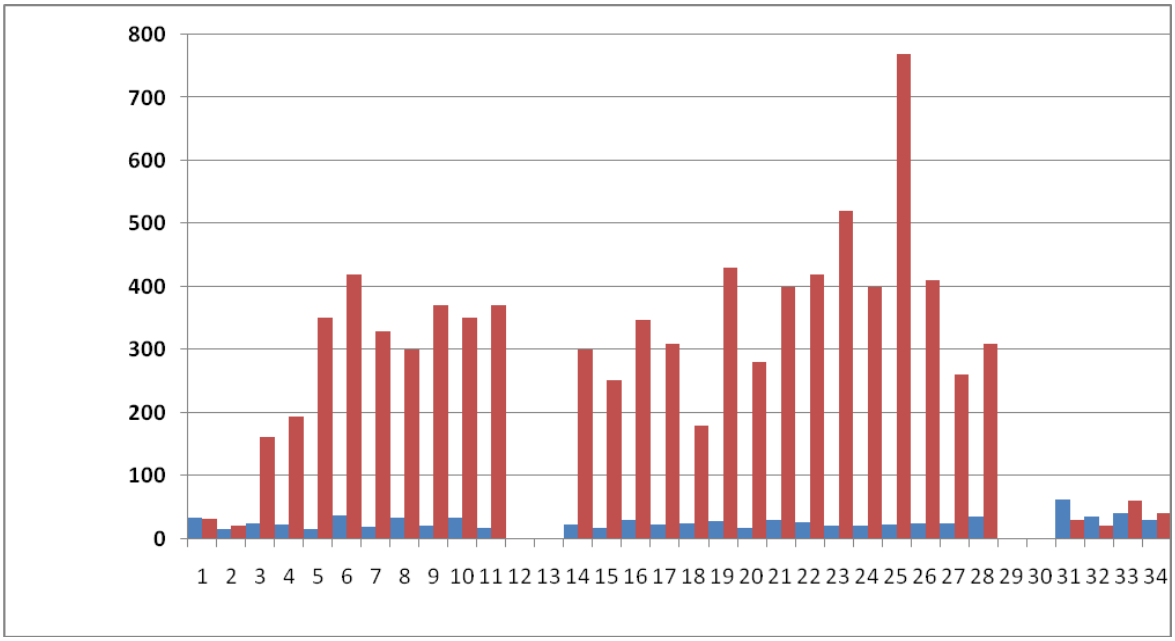


Fig.5. The dosimeters account per minute (dark blue for the worker with the converter, blue for a control dosimeter).

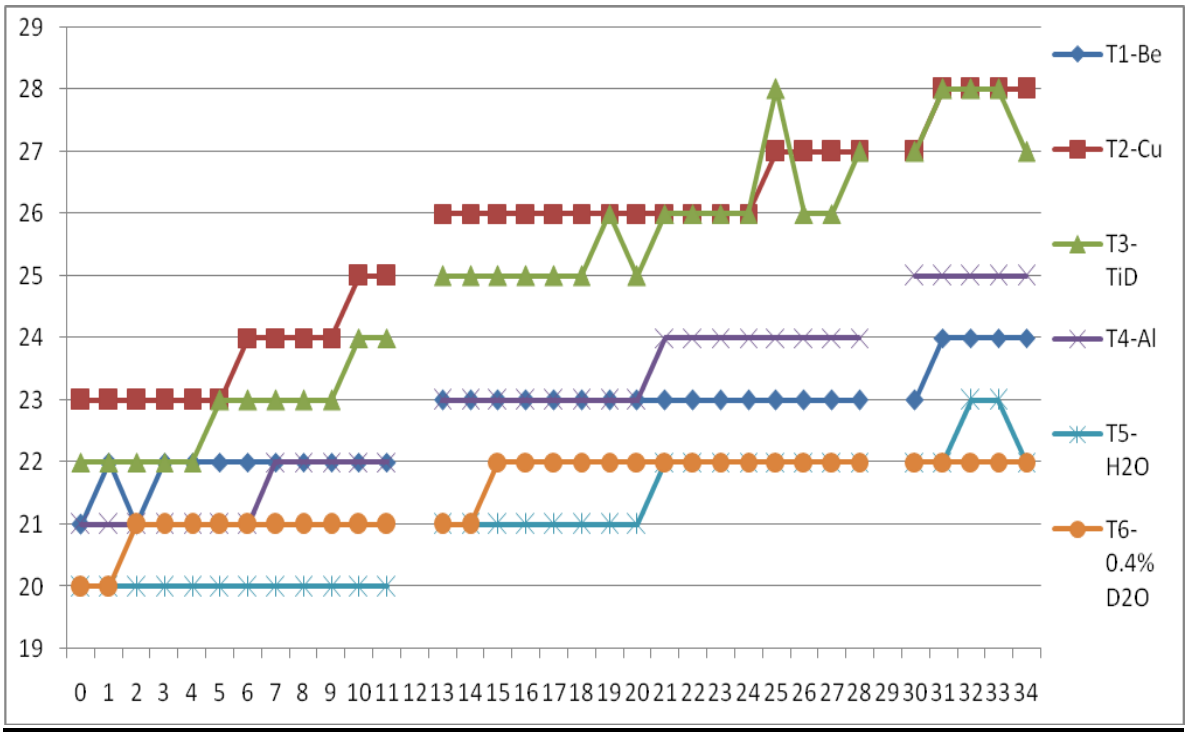


Fig.6. Temperature dependence from working time (minutes) of plasma electrolysis ( I~2A, U~600V) for different samples in 5-serial.

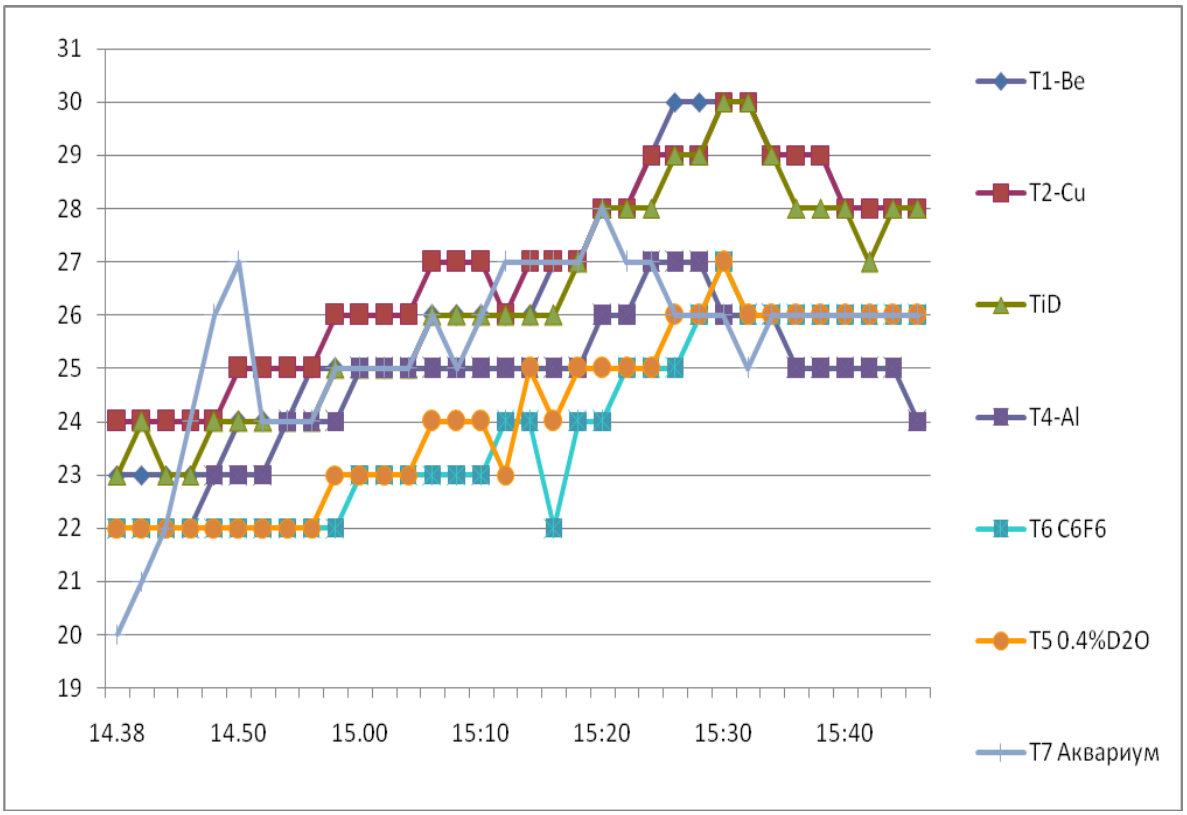


Fig.7. Temperature dependence from working time (minutes) of plasma electrolysis ( I~2A, U~600V) for different samples in 12-serial (7.12.10).

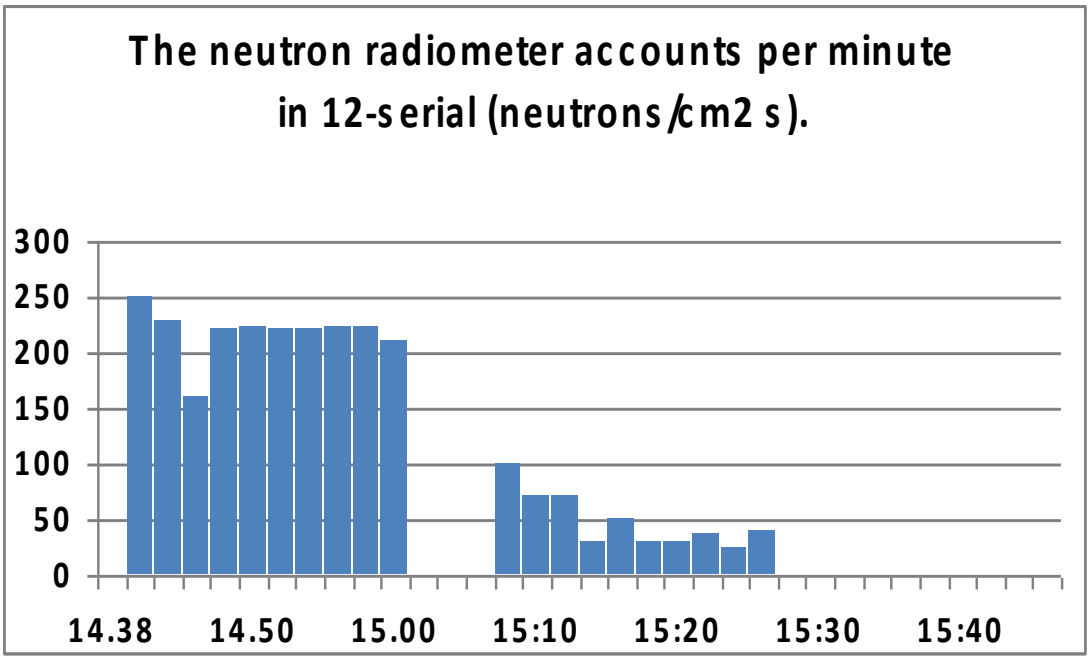


Fig.8. The neutron radiometer account per minute in 12-serial (neutrons/cm2 s).

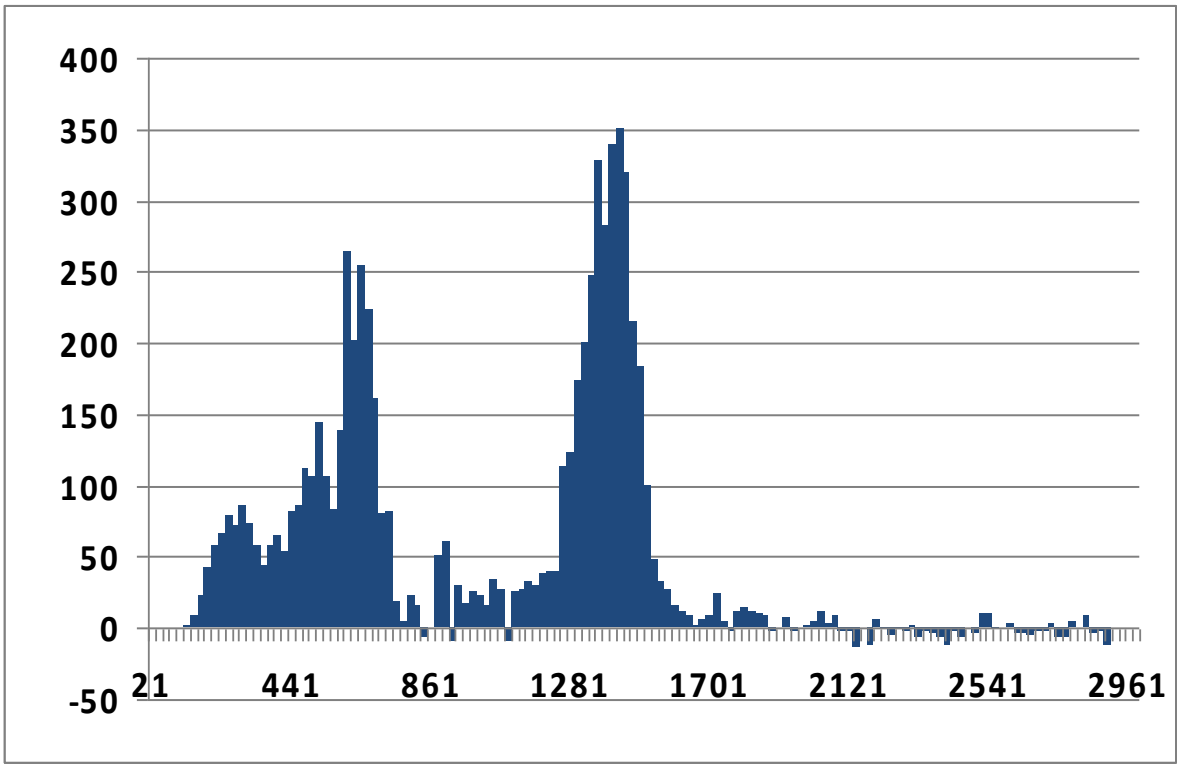


Fig.9. Energy spectrum in PSD (keV) with wood in front of scintillator in 20 cm from Anode Plasma center. Spectrum peak equal 4 MeV Protons inside PSD.

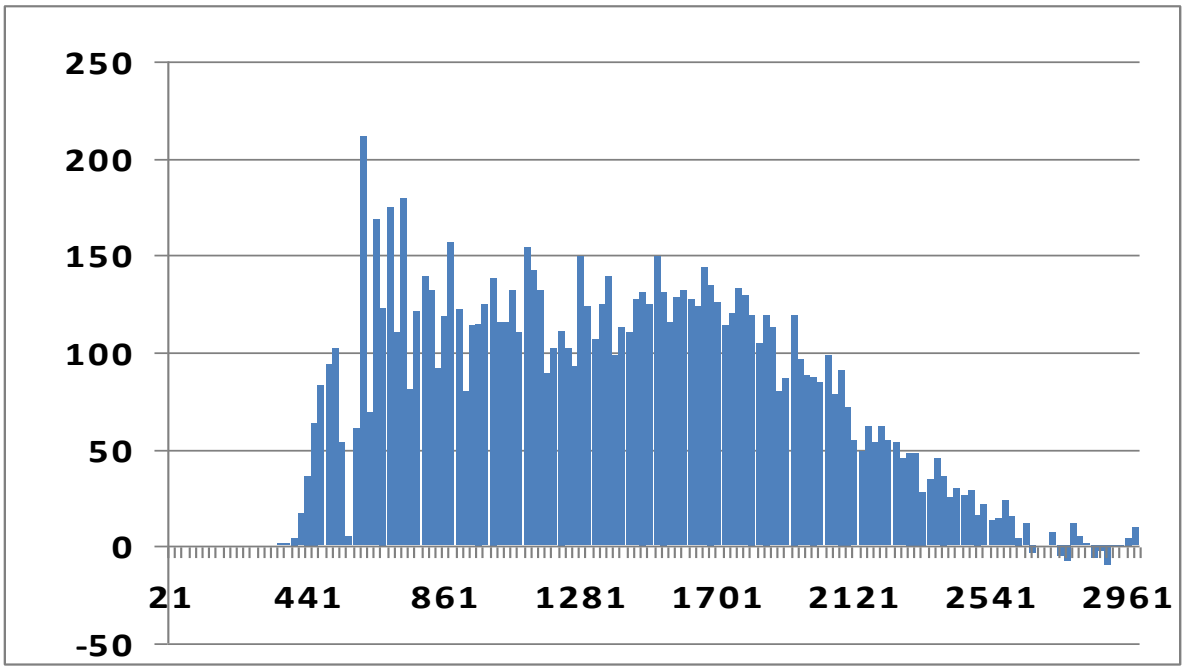


Fig.10. Energy spectrum in PSD (keV) with Teflon (CF2)n in front of scintillator in 20 cm from Anode Plasma center. Spectrum equal to β spectrum from F20 decay produced inside of Teflon from stable F19 isotope due to F19(ЭN, Э0)F20 reaction.

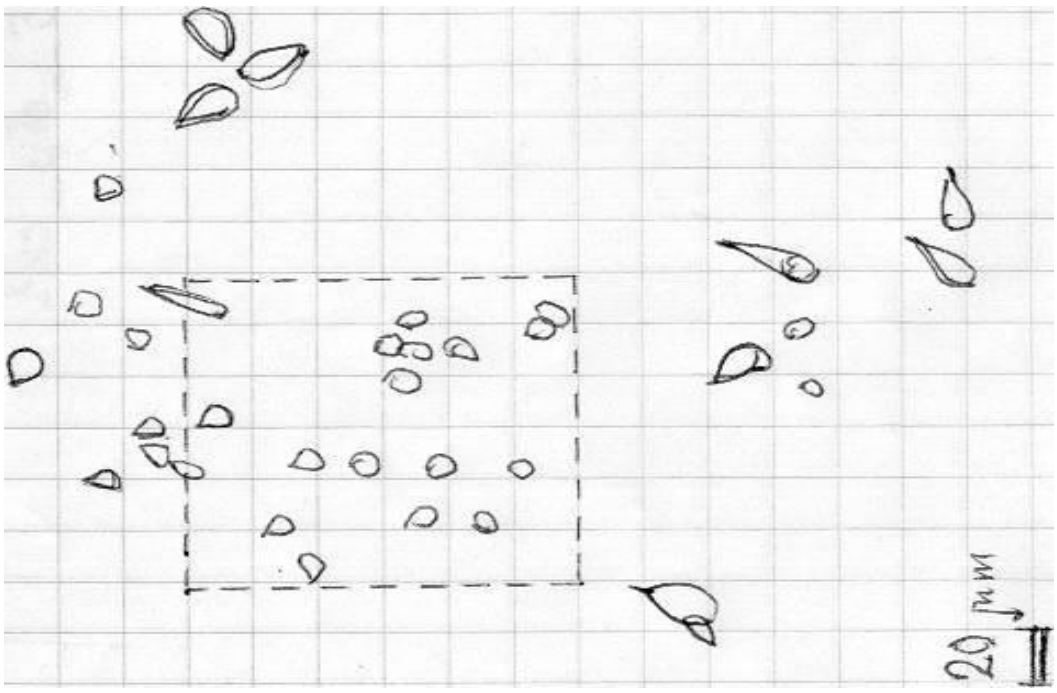


Fig.11. Picture of pits swarm in PSSD (CR39) after it exposition in 6-serial of Plasma electrolysis in 20cm from it center. One from 20 such swarms in PSSD (1.5x0.6 cm2)

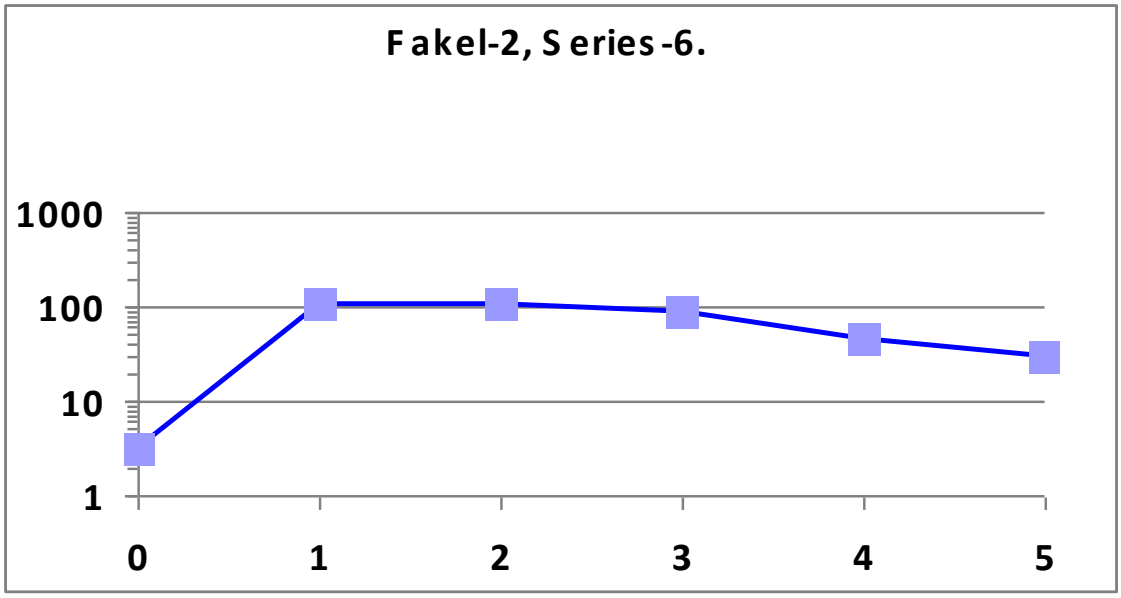


Fig.12. Pits density dependence in PSSD (1/mm2) versus depth (mm) for CR39 films pile after exposition in Plasma electrolysis (λ((3-5)mm) ~ 2mm).

Table 1. The main our calorimetric results, received in Fakel-2, 3 series

| № Series | Electrolyte composition | Discharge time (min) | Added water (litre) | W (kW) | Δ W (%) | Maximum temperature alteration (ΔT ° C) in samples: Cu - Be - Al - TiD - $H_2O$ |
|---|---|---|---|---|---|---|
| Fakel-2-8 | 10 M NaOH | 21 | 5,5 | 1,58 | 620 | (1) - (1) - (0) - (1) - (1) |
| Fakel -2-12 | 10 M NaOH | 36 | 2,0 | 1,84 | 160 | 6 - 7 - 5 - 6 - 5 |
| Fakel -3-1 | 10 M NaOH | 14 | 1,5 | 1,50 | 200 | 2.5 - 3 - 2 - 3 - 7 |
| Fakel -3-5' | 10 M NaOH | 25 | 2,0 | 0,90 | 300 | 2 - 2 - 2 - 1 - -- |
| Fakel -3-6' | 10 M NaOH | 30 | 7,5 | 1,50 | 670 | 9 - 11 - 10 - 10.5 - 6 |
| Fakel -3-3 | 5 M NaOH | 80 | 6,0 | 1,20 | 170 | 2 - 3 - 3 - 3 - -- |
| Fakel -3-4 | 2.5 M NaOH | 45 | 1,5 | 0,70 | 110 | 3 - 2 - 2 - 2 - -- |
| Fakel -3-2 | 2 M $Na_2CO_3$ | 74 | 4,0 | 1,54 | 130 | 6.5 - 7 - 9 - 8.5 - 18 |

In Fakel-D&DTs series we had received very similar nuclear & calorimetric results confirmating previous our results in Fakel-2, 3 series.
The Fakel-D&DTs installation are presented in our another report here.

## Conclusion

Here it is presented the results from 24 series of Calorimetric & Nuclear Diagnostic in Anode Plasma Electrolysis (06.2010-05.2013) fulfilled in NRC "Kurchatov institute". From the first steps we already have demonstrated transmutation F19->F20, production of 4 MeV protons and pits density dependence in organic PSSD films. Neutron radiometer and β-dosimeter with Teflon converter had shown systematic excess account at Anode Plasma Electrolysis. Temperature dependence for special (Be, TiD, Cu, Al, $H_2O$, $D_2O$, $C_6F_6$, …) samples the same as all previous results were according with Erzion model predictions. Results of measurements of the consumed and excess power had shown regular reproducibility of large excess heat (160 – 670)%. In series Fakel-(3-5*& 3-6*) series the titration of the electrolyte had shown decrease of its concentration for only 1,5 +/-0,5% and had proved that the evaporation mechanism of excess energy was carried out. These considerable results convincingly confirm nuclear nature of process and its full compliance to representations of Erzion model [12-17].

Receiving large excess heat (to 700%), allowing to use this process for creation already soon effective Plasma Electrolysis Heat Generator (PEHG) of the new type working at the mechanism of Cold Nuclear Transmutation by Erzion Catalysis.

## References


[1] S. Focardi and A. Rossi, "A new energy source from nuclear fusion", Journal of Nuclear Physics, March 22, 2010.

[2] Yu. Bazhutov, "Heat Generator of Rossi & Focardi and its Theoretician Interpretation", Inventing, Moscow, vol. XII, № 1, pp. 49-59, 2012.

[3] Yu. Bazhutov, V. Koretskiy, V. Martemianov, A. Parkhomov et al, "Research of Thermodynamic and Radiation Effects at Loading of Doping Intermetallid $LaNi_{4,75}Al_{0,25}$ by Hydrogen", Proc. Conference RCCNT&BL-18, Moscow, pp.107-116, 2012.

[4] Yu. Bazhutov, E. Belousova, V. Koretskiy, A. Parkhomov et al, "Investigation of Radiation Effects at Loading Ni, Be and $LaNi_5$ by Hydrogen", Proc. Conference RCCNT&BL-19, Moscow, pp.129-142, 2012.

[5] Yu. Bazhutov, "Experimental Test of Rossi Effect with Metallic Hydrides", Inventing, Moscow, vol. XIII, № 5, pp.51-59, 2013.

[6] Yu. N. Bazhutov, E.O. Belousova, A.G. Parkhomov et al., "Investigation of Radiation Effects in Loading Ni, Be and LaNi5 by Hydrogen". J. Condensed Matter Nucl. Sci., 13 (2014), P. 19–28.

[7] Yu. Bazhutov et al, "Neutrons, γ-Rays & Tritium Diagnostic at Electrolysis with Anode Gas Discharge in Water Solutions", Proc. Conference ICCMNS -13, Moscow, pp.156-169, 2008.

[8] Yu. Bazhutov, L. Kashkarov, G. Lyapin et al. "Calorimetric & Nuclear Phenomena in Anode Plasma Electrolysis", Proc. Conference RCCNT&BL-17, Moscow, pp. 39-46, 2011.

[9] Yu. Bazhutov, O. Egorov, L. Kashkarov "New Results of Nuclear Phenomena Researches of Anode Plasma Electrolysis", Proc. Conference RCCNT&BL-18, Moscow, pp.37-47, 2012.

[10] Yu. Bazhutov, A. Gerasimova, L. Kashkarov, A. Parkhomov, "Plasma Electrolysis as Alternative Heat Generator", Proc. Conference RCCNT&BL-19, Moscow, pp. 43- 54, 2013.

[11] Yu. Bazhutov, A. Gerasimova, V. Koretskiy, A. Parkhomov, "Method and apparatus for heat energy generation by plasma electrolysis". Application for international patent number PCT/RU2014/000019 from 16.01.2014.

[12] Bazhutov Yu.N., Vereshkov G.M., Kuzmin R.N., Frolov A.M. / / Collection PPh&CPhSQ, TsNIIMash, 1990, 67-70.

[13] Bazhutov Yu.N., Vereshkov G.M. "The new stable hadrons in cosmic rays, their theoretical interpretation and possible role in catalysis of cold nuclear fusion," Preprint No. 1, TsNIIMash, 1990, p.1-56.

[14] Bazhutov Yu.N., Vereshkov G.M. "A Model of Cold Nuclear Transmutation by the Erzion Catalysis", Proceedings of ICCF-4, Hawaii, 1993, v.4, 8-1.
[15] Bazhutov Yu.N., Vereshkov G.M., Kuksa V.I. "On the possible existence of new stable hadrons - hypothetical catalysts of cold nuclear transmutation", Proc. RCCNT-3, Moscow, 1996, p.157-201.
[16] Bazhutov Yu.N., Kuznetsov A.B., Pletnikov E.V. "Spectroscopy of Erzion-catalytic nuclear transmutation." Preprint № 1, SRC PhTP "Erzion" TsNIIMash, 1-172 (1993).
[17] Bazhutov Yu.N. "Local and global nuclear transmutation in Erzion model", Proceedings of the 5th Russian Conference on Cold Nuclear Transmutation of Chemical Elements, Moscow, 1998, p.142-149.