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CFP (Cold Fusion Phenomenon) stands for
"Nuclear reactions and accompanying events occurring in open (with external particle and energy supply), non-equilibrium system composed of solids with high densities of hydrogen isotopes (H and/or D) in ambient radiation" belonging to Solid State-Nuclear Physics (SSNP) or Condensed Matter Nuclear Science (CMNS).

This is the *CFRL News* (in English) No.105 for Cold Fusion researchers published by Dr. H. Kozima, now at the Cold Fusion Research Laboratory, Shizuoka, Japan.

This issue contains the following items:

1. **ICAMRWT-2018 on May 17, 2018 in Busan, Korea**
2. **Abstract of H. Kozima "Nuclear Transmutations and Stabilization of Unstable Nuclei in the Cold Fusion Phenomenon" presented at ICAMRWT-2018**
3. **Dr. Bazhutov passed away.**
4. **"Introduction to CFRL and the Neutron Drop Model" distributed at ICAMRWT-2018**

1. ICAMRWT-2018 on May 18, 2018 in Busan, Korea

The *International Conference on the Application of Microorganisms for the Radioactive Waste Treatment,* was held on May 18, 2018 at Pukyung National University in Busan, Korea.

The Information of the Conference is reproduced below:

International Conference on the Application of Microorganisms for the Radioactive Waste Treatment

1. Venue; Pukyung National University,
   Jangbogo Hall 3rd floor. (Leaders club)
2. Date; May 18, 2018 (Friday)
3. Sponsors ; Green Life Intellectual Network,
   Korea Research Institute of Standards and Science,
   Pukyung National University,
   The State University of New York, Korea.
4. Program :

Time	Speaker	Title
9:30 Opening	(Organizer)	
Congratulatory 9:35 - 9:45	To be determined	
Opening Address 9:45 - 10:15	**Sanghi Rhee** (Chairman of Policy Research Committee, The Parliamentarian's Society of the Republic of Korea)	The meaning and impact of biological transmutation for the treatment of radioactive waste
Presentation 1 10:15 - 10:50	**Oleksander Tashyrev (**Zabolotny Institute of Microbiology and virology of the National Academy of Sciences of Ukraine)	Biotechnologies for bioremediation of ecosystems contaminated with radionuclides and toxic metals on the base of thermodynamic prognosis
Presentation 2 10:50 - 11:25	**Vira Govorukha (**Zabolotny Institute of Microbiology and virology of the National Academy of Sciences of Ukraine)	Novel biotechnologies for purification of radioactive wastewater
Presentation 3 11:25 - 12:00	**Kyu Jin Yum** (Coenbio R&D Center)	Bioremediation of radioactive and heavy metal contaminated soil and water
12:00 - 1:30	Lunch	
Presentation 4 1:30 - 2:05	**Jean Paul Biberian** (AMU university)	Biological transmutations, history and present results
Presentation 5 2:05 - 2:40	**Kojima Hideo** (Honorary professor, Shizuoka University)	Nuclear Transmutations and stabilization of unstable nuclei in the cold fusion phenomenon
2:40 - 3:00	**Break**	
Presentation 6 3:00 - 3:35	**Vladimir Vysotsky** (Ukraine Shevchenko University)	Nuclear transmutation of radioactive isotopes in biological systems
Presentation 7 3:35 - 4:10	**GunWoong Bahng** (SUNY Korea)	An experiment on the application of multi-complex microorganisms to reduce the radioactivity of Cs137
4:10 - 4:30	Discussions	

2. Abstract of the paper "Nuclear Transmutations and Stabilization of Unstable Nuclei in the Cold Fusion Phenomenon" by H. Kozima presented at ICAMRWT-2018

The Abstract of the paper presented from CFRL is cited below. Proceedings of this Conference will be published later in which the full paper of this presentation will be included.

"***Nuclear Transmutations and Stabilization of Unstable Nuclei in the Cold Fusion Phenomenon***"

Hideo Kozima

Cold Fusion Research Laboratory

Abstract

We summarize the nuclear transmutations observed in the cold fusion phenomenon (CFP) putting a weight on the biotransmutation, i.e. nuclear transmutations in biological systems. The CF materials, i.e. materials where occur the CFP are classified into three groups; (1) metallic materials include transition-metal hydrides (e.g. NiH_x, AuHx) and deuterides (e.g. PdD_x, TiD_x), (2) carbonic materials including hydrogen graphite (CH_x) and XLPE (cross-linked polyethylene) and (3) biological materials including bacteria, microbial cultures and biological tissues or organs. Each CF materials in each group have specific characteristics in the nuclear transmutations occurring there. We explain these characteristics briefly in this paper. The stabilization of unstable nuclei, including the decay-time shortening of radioactive nuclei, in the nuclear transmutation is especially interesting from the applicatory point of view in relation to the treatment of the hazardous nuclear waste accompanied to the nuclear power plant. A characteristic of biological systems where occurs selective adsorption of specific ions is especially useful for the application. If we have a bacterium or microbial culture absorbing an ion of a radioactive element selectively, we can remediate the radioactivity by the biotransmutation.

3. Dr. Yuri Nicholaevich Bazhutov passed away at his age 70

Dr. Yuri Nicholaevich Bazhutov passed away on March 10, 2018 in Moscow at his age 70. He had born April 1, 1947 in Okha, Sakhalin.

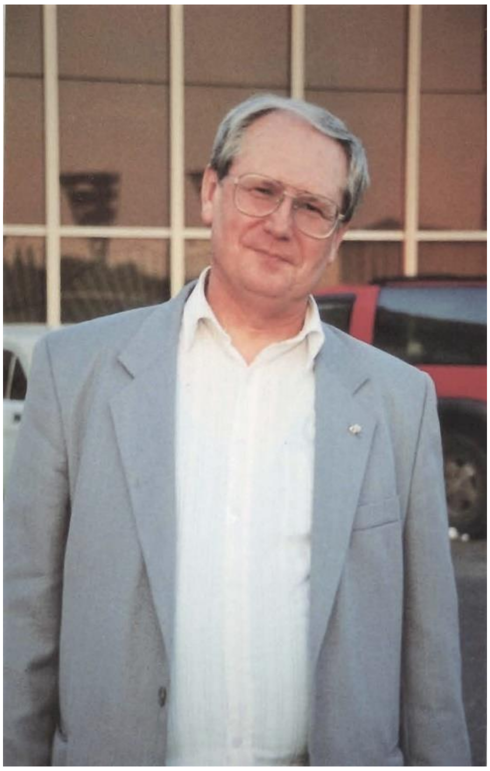
Yuri Nicholaevich Bazhutov　1947－2018

Bazhutov began organizing an annual *Russian Conference on Cold Fusion and Nuclear Transmutation* in 1993. He organized or chaired this conference every year for 24 years, with the last held in September 2017. He and Russian colleagues also organized the *13th International Conference on Cold Fusion* (ICCF13) in 2007.

Yuri in my personal memory (Hideo Kozima)

Personally, I have had a warm memory of Yuri communicating with him for more than 20 years since 1995. The first encounter with him was at the *3rd Russian Conference on Cold Fusion and Nuclear Transmutation* (RCCFNT-3) held on October 2 – 5, 1995 in Sochi, Russia. I have reported about papers presented at this Conference in *Cold Fusion* **15**, pp. 18 – 22 (1996).

At the RCCFNT-3, we travelled the round trip from Moscow to Sochi using night trains. In Moscow before the travel to Sochi, we had visited several laboratories and met Russian researchers to confirm their experimental results of tritium detection and excess heat generation.



ユーリ・バジュートフ Yuri Bazhutov

モスクワ大学物理学教授で、1992 年以来、ソ連崩壊後のロシアで、常温核融合に関する会議を毎年開き、ロシア圏の研究レベルの向上に努めてきた。彼は、エ

ルジオンＥｒｚｉｏｎという仮想的な重粒子によって、常温核融合を説明しようとしている。ドンコサックの末裔であるというが、ロシア的壮大さとでも形容したい人物と理論である。（小島英夫、「常温核融合の発見」、大竹出版、1997 年、ISBN 4-87186-038-8. 口絵写真説明）。
(Yuri's photograph in the frontispiece of my book "*Discovery of the Cold Fusion Phenomenon*" (in Japanese) published in 1997.

Caption (translated into English):
"*Yuri Bazhutov*
Professor at Physics Department of Moscow University. He has been organizing Annual Meeting on the Cold Fusion Phenomenon in Russia after the breakdown of the USSR to keep the level of researches in this field. He is trying to explain the cold fusion phenomenon using a hypothetic heavy particle "Erzion." He is proud of his genealogy that he is a descendant of the Cossack. Perhaps, his generous personality and grandeur model may have close relation with his blood."

The travel on the night train was interesting and useful to communicate each other discussing various problems not only physics but also cultural and social matters.

On the platform of a station from Sochi to Moscow (September, 1995).
(From left to right; Lev Sapogin, Bob Smith, Talbot Chubb, (skipping two people), K. Fukushima, Yuri, Bereshkov, and Hideo)

Before leaving Moscow, Yuri invited us to his home to show their Russian hospitality which we enjoyed very much. I express deep regret for his passing away to another world while we need more his power to establish the science of the cold fusion phenomenon.

Yuri in a compartment on the train to Moscow (September 1995)

We reported the *4^{th} Fourth Russian Conference on Cold Fusion and Nuclear Transmutations* (RCCFNT-4) held on May 20 – 25 (1996) in Sochi in *Cold Fusion* #**18**, pp. 4 – 11 (1996). At this Conference, we used the night trains for the round trip from Moscow to Sochi again enjoying the communication among participants.

The journal *Infinite Energy* reported his obituary posting at their webpage:
http://www.infinite-energy.com/resources/yuri-bazhutov.html

４．“*Introduction to CFRL and the Neutron Drop Model*” distributed at ICAMRWT-2018

A brochure with above title “Introduction to CFRL and the Neutron Drop Model” was distributed at ICAMRWT for audience’s convenience who are not necessarily intimate with the cold fusion phenomenon.

The brochure is reproduced below.

Introduction to the CFRL and the Neutron Drop Model

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II. *Scheduled Presentations from CFRL*

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IV. *Books and papers on the Nuclear Transmutation and Stabilization of Unstable Nuclei in the Cold Fusion Phenomenon by Hideo Kozima et al. with* (*Brief Explanations*).

I. Cold Fusion Research Laboratory (CFRL)

Dr. Hideo Kozima, Director,

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Websites; http://www.geocities.jp/hjrfq930/, http://web.pdx.edu/~pdx00210/

II. Scheduled Presentations from CFRL

1. **ICAMRWT-2018** (*International Conference on the Application of Microorganisms for the Radioactive Waste Treatment,*), May 18, 2018, Busan, Korea.

We will present an invited paper at this Conference;

H. Kozima, “*Nuclear Transmutations and Stabilization of Unstable Nuclei in the Cold Fusion Phenomenon*.”

2. ICANP-2018 (International Conference on Atomic & Nuclear Physics – *Cutting edge Advancements in Atomic & Nuclear Physics –*), July 23 – 25, Osaka, Japan**.**

The Scientific Federation website;

http://scientificfederation.com/atomic-nuclear-physics-2018/

We will present an invited paper at this Conference;

H. Kozima, “*Development of the Solid State-Nuclear Physics.*”

3. JCF19 (19th Annual Meeting of the Japan CF-Research Society), November 9 – 10, 2018, Morioka, Japan**. (cf.** The JCF website: http://jcfrs.org/NEW.HTML)

We will present a paper at this Conference;

H. Kozima, "*Inductive Logic and Meta-analysis in the Cold Fusion Phenomenon.*"

III. Abstract, Table and Figure of the paper to be presented at ICAMRWT-2018

International Conference on the Nuclear Waste Treatment by Biological Transmutation, May 18, 2018, Busan, Korea.

"Nuclear Transmutations and Stabilization of Unstable Nuclei in the Cold Fusion Phenomenon"

Hideo Kozima
Cold Fusion Research Laboratory

Abstract

We summarize the nuclear transmutations observed in the cold fusion phenomenon (CFP) putting a weight on the biotransmutation, i.e. nuclear transmutations in biological systems. The CF materials, i.e. materials where occur the CFP, are classified into three groups; (1) metallic materials include transition-metal hydrides (e.g. NiH_x, AuH_x) and deuterides (e.g. PdD_x, TiD_x), (2) carbonic materials including hydrogen graphite (HC_x) and XLPE (cross-linked polyethylene) and (3) biological materials including bacteria, microbial cultures and biological tissues or organs. Each CF materials in each group are composed of super-lattice with a sublattice of host elements and another of hydrogen isotopes and have specific characteristics in the nuclear transmutations occurring there. We explain these characteristics briefly in this paper. The stabilization of unstable nuclei, including the decay-time shortening of radioactive nuclei, in the nuclear transmutation is especially interesting from the applicatory point of view in relation to the treatment of the hazardous nuclear waste accompanied to the nuclear power plant. A characteristic of biological systems where occurs selective adsorption of specific ions seems especially useful for the application. If we have a bacterium or microbial culture absorbing an ion of a radioactive element selectively, we can remediate the radioactivity by the biotransmutation.

Table 1 System and Obtained Evidence of the CFP: Host solids, agents, experimental methods, direct and indirect evidence, cumulative and dissipative observables are tabulated. Q and NT express excess energy and the nuclear transmutation, respectively. Direct evidence of nuclear reactions in the CFP are dependences of reaction products on their energy (ε) and position (***r***), decrease of decay constants of radioactive nuclides, decrease of fission threshold energy of compound nuclei.

Host solids	C, Pd, Ti, Ni, Au, Pt, KCl + LiCl, $ReBa_2Cu_3O_7$, Na_xWO_3, KD_2PO_4,

	TGS (triglycine sulfate), $SrCe_aY_bNB_cO_d$, XLPE (cross linked polyethylene), Biological Systems (microbial cultures)
Agents	*n, d, p*, ${}^{6}_{3}Li$, ${}^{10}_{3}B$, ${}^{12}_{6}C$, ${}^{39}_{19}K$, ${}^{85}_{37}Rb$, ${}^{87}_{37}Rb$
Experiments	Electrolysis, Liquid contact, Gas discharge, Gas contact
Direct evidences of nuclear reaction	Gamma ray spectrum $\gamma(\varepsilon)$, Neutron energy spectrum $n(\varepsilon)$, Space distribution of NT products $NT(\boldsymbol{r})$, Stabilization of unstable nuclei (Decrease of decay constants), lowering of fission threshold energy
Indirect evidences of nuclear reaction	Excess energy Q, Number of neutrons N_n, Amounts of tritium atom N_t, helium-4 atom* N_{He4}, NT products (NT_D, NT_F, NT_A), X-ray spectrum $X(\varepsilon)$
Cumulative observables	$NT(\boldsymbol{r})$, amount of tritium atom N_t, helium-4* N_{He4},
Dissipative observables	Excess energy Q, neutron energy spectrum $n(\varepsilon)$, number of neutrons N_n, Gamma ray spectrum $\gamma(\varepsilon)$, X-ray spectrum $X(\varepsilon)$,

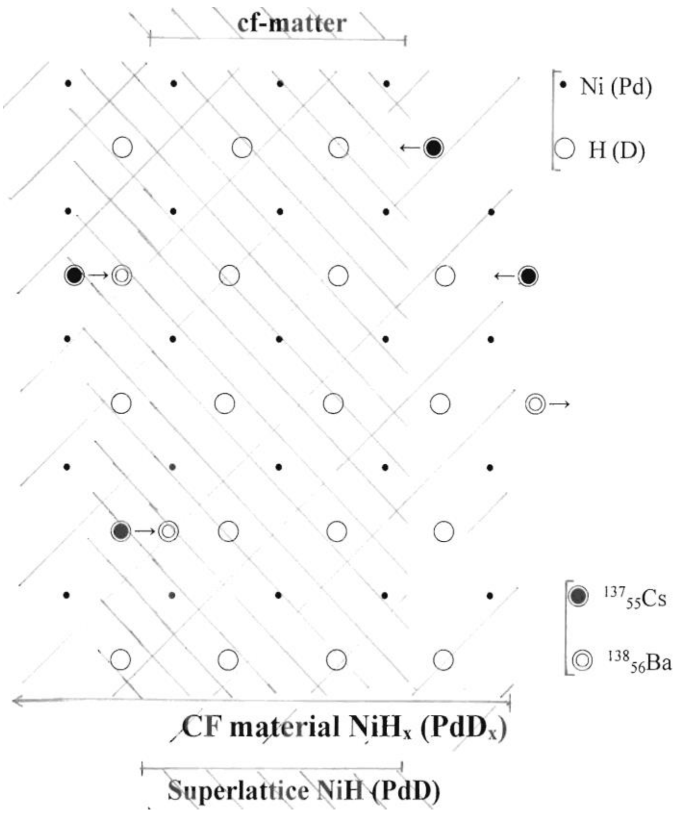

Fig. 1 Schematic explanation of nuclear transmutations at the surface region of a CF material (e.g. NiH_x (PdD_x) in this figure). ${}^{137}_{55}Cs$ is adsorbed on and absorbed in the surface region of a CF material NiH_x (PdD_x) and reacts with a neutron in the cf-matter to

be transmuted into ${}^{138}{}_{56}\text{Ba}$.

The reaction occurs in free space and in CF materials as follow;

[In free space] ${}^{137}{}_{55}\text{Cs} \rightarrow {}^{137}{}_{56}\text{Ba} + e^{-} + \underline{\nu}_e$, $(\tau = 30.07\ \text{y})$ (1)

[In CF material] ${}^{137}{}_{55}\text{Cs} + n \rightarrow {}^{138}{}_{55}\text{Cs}^*$, $(\sigma = 0.113\ \text{b})$ (2a)

${}^{138}{}_{55}\text{Cs}^* \rightarrow {}^{138}{}_{56}\text{Ba} + e^{-} + \underline{\nu}_e$. $(\tau = 33.41\ \text{m})$ (2b)

IV. Books and papers on the Cold Fusion Phenomenon from CFRL with (*Brief Explanations*).

[Kozima 1996] H. Kozima, K. Hiroe, M. Nomura and M. Ohta, "Elemental Transmutation in Biological and Chemical Systems," *Cold Fusion*, **16**, pp. 30 – 32 (1996), ISSN 1074-5610.
(*This is the first paper which took up the biotransmutation as an event in the CFP.*)
This paper is reproduced in the following page of the CFRL website;
http://www.geocities.jp/hjrfq930/Papers/paperc/paperc.html

[Kozima 1998] H. Kozima, *Discovery of the Cold Fusion Phenomenon,* Ohtake Shuppan Inc., Tokyo, Japan, 1998. ISBN: 4-87186-044-2.
(Chapter 9 Nuclear Transmutation Occurs in Solids, Also, (pp. 109 – 128) *gives many data on the nuclear transmutation.* Section 10.1 Biotransmutation (pp. 130 – 133) *gives a brief introduction to the biotransmutation data from M. Kushi and V.I. Vysotskii.*)

[Kozima 2000] H. Kozima, "Electroanalytical Chemistry in Cold Fusion Phenomenon," in *Recent Research Developments in Electroanalytical Chemistry*, pp. 35 – 46, Ed. S.G. Pandalai, Transworld Research Network, 2000, ISBN 81-86846-94-8.
(*Nuclear transmutations in the CFP are explained by the TNCF model. Existence of the preference for combination of a cathode metal (Pd, Ni, Ti), an electrolyte (Li, K) and a solvent (D_2O, H_2O) to induce the CFP is pointed out as* [Pd, Ti; D_2O; Li] *and* [Ni; H_2O; K, Na, Rb])

[Kozima 2006] H. Kozima, *The Science of the Cold Fusion Phenomenon*, Elsevier Science, 2006, ISBN-10: 0-08-045110-1.
(Section 2.5 Nuclear Transmutation (pp. 35 – 46) *gives extensive data sets of the nuclear transmutation w*hich have been explained by the TNCF model introduced in Sections 3.7.6 and 3.7.7. Section 2.5.1.1 Decay Time Shortening (p. 40) *gives examples of stabilization of unstable nuclei observed in the CFP*. Section 3.7 cf-matter and Neutron Drop Model (pp. 102 – 110) *gives a quantum mechanical explanation of the formation of the cf-matter as a source of the trapped neutrons assumed in the TNCF model*.)

[Kozima 2008] H. Kozima, "An Explanation of Nuclear Transmutation in XLPE

(Crosslinked Polyethylene) Films with and without Water Trees," *Proc. JCF8* (Kyoto, Japan, Nov. 29 – 30, 2007), pp. 44 – 50 (2008), ISSN 2187-2260, http://jcfrs.org/proc_jcf.html.
(*The nuclear transmutations observed in XLPE are explained by the TNCF model as events in the CFP.*)

[Kozima 2010] H. Kozima and H. Date, "Nuclear Transmutations in Polyethylene (XLPE) Films and Water Tree Generation in Them," *Proc. ICCF14* (August 10 – 15, 2008, Washington D.C., U.S.A.), pp. 618 – 622 (2010), ISBN 978-0-578-06694-3. http://jcfrs.org/proc_jcf.html.
(*The nuclear transmutations observed in XLPE are explained by the TNCF model as events in the CFP*.)

[Kozima 2013] H. Kozima, "Cold Fusion Phenomenon in Open, Nonequilibrium, Multi-component Systems – Self-organization of Optimum Structure," *Proc. JCF13* **13-19,** pp. 134 - 157 (2013), ISBN 978-0-578-06694-3. http://jcfrs.org/file/proc_jcf.html. This paper is the most read one in our papers by the statistics of the ResearchGate.
(*An extensive explanation of the TNCF model (and its extended Neutron Drop Model) based on the complexity and n-p or n-d interactions in the CF materials. The cf-matter (cf-material in this paper) is the source of the trapped neutrons assumed originally in the TNCF model.*)

[Kozima 2014a] H. Kozima, "Nuclear Transmutation in Actinoid Hydrides and Deuterides**,"** *Proc. JCF14,* **14-6**, pp. 77 – 94 (2014), ISSN 2187-2260, http://jcfrs.org/proc_jcf.html.
(*A unified and consistent explanation is given for the decay-time shortening (or stabilization of unstable nuclei) observed in uranium (and thorium) hydrides and deuterides prepared by the implantation in a glow discharge or by the absorption in electrolysis*.)

[Kozima 2014b] H. Kozima, "Nuclear Transmutations (NTs) in Cold Fusion Phenomenon (CFP) and Nuclear Physics," *Proc. JCF14,* **14-15,** pp. 168 - 202 (2014), ISSN 2187-2260, http://jcfrs.org/proc_jcf.html.
(*The TNCF and neutron drop models which were successful for explanation of the nuclear transmutations observed in the CFP are justified by the recent knowledge of nuclear physics*.)

[Kozima 2015] H. Kozima, "From the History of CF Research – A Review of the Typical Papers on the Cold Fusion Phenomenon –,*" Proc. JCF16,* **16-13,** pp. 116-157 (2016), ISSN 2187-2260, http://jcfrs.org/proc_jcf.html.
(Section 3.7 Nuclear Transmutations in Carbon-Hydrogen Systems–Biotransmutation,

Hydrogen Graphite, and XLPE (Cross-Linked Polyethylene) – *gives a summary of our explanation on the nuclear transmutations observed in C-H systems*.)

[Kozima 2016a] H. Kozima, "Nuclear Transmutations in Polyethylene (XLPE) Films and Water Tree Generation in Them (2)," *Proc. JCF16,* **16-17,** 210 – 215 (2016), ISSN 2187-2260, http://jcfrs.org/proc_jcf.html.

(*The new observation of the γ-ray emitted from ^{214}Pb and ^{214}Bi in XLPE is explained by the TNCF model. The NT found in XLPE may have a direct relation with the NT's found in biological systems (biotransmutations).*)

[Kozima 2016b] H. Kozima, "Biotransmutation as a Cold Fusion Phenomenon," *Proc. JCF16,* **16-18,** 216 - 239 (2016), ISSN 2187-2260, http://jcfrs.org/proc_jcf.html.

(*Extensive data sets obtained by Vysotskii and Kornilova have been explained consistently by the TNCF model*.)

[Kozima 2017] H. Kozima, T. Ohmori and M. Ohta, "Nuclear Transmutations in Critical and Supra-critical Electrolysis with Graphite, Pd, W, Re, Pt and Au Cathodes Analyzed by the TNCF Model," *Proc. JCF17,* **17-12,** pp. 89 -147 (2017), ISSN 2187-2260, http://jcfrs.org/proc_jcf.html.

(*Nuclear transmutations observed in specific CF materials other than rather ordinary transition-metal hydrides and deuterides have been successfully explained by the TNCF model*.)

[Kozima 2019a] H. Kozima, "Development of the Solid State-Nuclear Physics," *Proc. JCF19* (2019) (to be submitted).

(*The Solid State-Nuclear Physics, the interdisciplinary physics between solid state physics and nuclear physics, developed by the investigation of the cold fusion phenomenon is investigated from a new point of view based on the reconstruction of the logical induction-reduction structure in modern science where the reduction has overwhelmed over the induction. The science of complexity demands us to esteem the induction above the deduction when we have no solid principles in such fields as the cold fusion phenomenon governed by complexity. The meaning of the meta-analysis in the CF research is discussed in relation to the Astronomy in 18^{th} century and EBM at present.*)

[Kozima 2019b] H. Kozima, "Inductive Logic and Meta-analysis in the Cold Fusion Phenomenon," *Proc. JCF19* (2019) (to be submitted).

(*Our phenomenological approach with a model based on the experimental facts has been able to give a consistent explanation of experimental data sets obtained in various CF materials.* [Kozima 1998, 2006, 2015, 2016a, 2016b, 2017] *The logic used in the explanation of the CFP in these works may be explained by the historically proven logics, the inductive logic and the meta-analysis. In this paper, the methodology used in our

explanation of the CFP by our TNCF model is discussed from general point of view in logics.)