

FRONTIERS SCIENCE SERIES NO. 4

Proceedings of the Third International Conference on Cold Fusion

Frontiers of Cold Fusion

October 21 - 25, 1992 Nagoya, Japan

Edited by
H. Ikegami
National Institute for Fusion Science, Japan

Universal Academy Press, Inc. *Tokyo, Japan*



International Publishers in Science & Technology *Publishing Tomorrow's Technologies Today*



The Third International Conference on Cold Fusion
October 21-25, 1992, Nagoya, Japan

Frontiers of Cold Fusion

Proceedings of the Third International Conference on Cold Fusion
October 21 – 25, 1992, Nagoya, Japan

Edited by H. Ikegami

Frontiers Science Series No. 4 (FSS-4)
ISSN 0915-8502

©Universal Academy Press, Inc., 1993

Published by
Universal Academy Press, Inc.

Postal Address: C.P.O. Box 235, Tokyo 100-91, JAPAN
Address for Visitors: BR-Hongo-5 Bldg., 6-16-2, Hongo, Bunkyo-ku, Tokyo 113, JAPAN
Telephone: + 81 3 3813 7232
Facsimile: + 81 3 3813 5932

All rights reserved. No part of this publication may be reproduced or transmitted by any means, i.e., electronic or mechanical; including photocopy, recording, and any information storage and retrieval system, without written permission from the copyright holders.

ISBN 4-946443-12-6

Printed in Japan

Preface

These proceedings of the Third International Conference on Cold Fusion (ICCF3), *Frontiers of Cold Fusion*, document the beginning of a new field of science, now in its fourth year. The five-day conference, held in Nagoya, Japan at the Nagoya Congress Center, from October 21 through 25, 1992, was the third such affair. In 1990, the first cold fusion conference took place in Salt Lake City, Utah, in the United States and the second, in 1991 was held in Como, Italy. A comparison of the proceedings from these conferences, shows that not only is evidence for the existence associated to cold fusion, unassailable, but that there are now substantial interdisciplinary research efforts in many countries, probing cold fusion phenomena in depth.

In planning ICCF3, the Organizing Committee sought to cover the broadest topics relevant to this new research field, including nuclear physics, electrochemistry, solid state physics, and materials science, so that this conference was cosponsored by the Physical Society of Japan, the Japan Society of Applied Physics, the Atomic Energy Society of Japan, the Institute of Electrical Engineers of Japan, the Chemical Society of Japan, the Electrochemical Society of Japan, and the Japan Society of Plasma Science and Nuclear Fusion Research.

Aside from press and other visitors, there were 346 registered participants at the Conference from 18 countries. Of course, the largest number, 229, was resident in Japan. One hundred and forty-eight abstracts were originally submitted, of which 137 were presented at poster sessions.

At the Conference, there were 27 invited lectures and three panel discussions, incorporating comments from the International Advisory Committee. The first panel, on the Takahashi Method, included several scientists who successfully replicated Takahashi's experiment, and one who could not. The second panel was on the Theoretical Models, and included a broad diversity of opinion, including differences on whether the production of excess heat is nuclear or not, and whether "cold fusion" is actually a fusion event, or reflects some other process. The concluding session, addressed the question of the Next Step for the direction of researches in this new field.

The Conference was organized to allow maximum time at poster sessions for small group's discussions on every poster paper, which included additional discussion time even for those already presented orally in the plenary sessions, while some would have still preferred more discussions at the oral sessions. It was clear to me, as the Chairman of the Organizing committee, that the heated discussion which occurred during the conference could have continued for longer than one week.

The proceedings consist of two parts: one for the invited papers and the other for the contributed papers. For purposes of publication, the format has been changed to reflect the subject under discussion, rather than the order of the presentations at the Conference. The number of papers contained in the proceedings, is in total, 102 out of the 148 abstract titles as listed in the program.

It was not an easy task to peer review each of the submitted papers to this Conference. The editorial board of the Organizing Committee accepted a lenient standard for publication. Most papers presented at the Conference were accepted so long as they satisfied a minimum standard. Sixteen papers, though submitted, were either not presented at the Conference, or withdrawn thereafter, and these were not published. Their titles, however, have been left in the attached program, with an asterisk to denote this. Likewise, other 30 titles, for which the Secretariat did not receive papers before the publication deadline, are marked with a dagger (†).

At the Conference, the video produced by Drs. Fleischmann and Pons allowed us to see that a controllable excess heat generator was already in hand. These remarkable results were confirmed thanks to the efforts of Dr. McKubre, Dr. Takahashi, Dr. Kunimatsu and Dr. Storms, who along with Drs. Fleischmann and Pons, reported on their work at the Conference and offered extensive documentation of their experiments.

Positive heat results were also presented on several light water experiments, which may be closely related to the mechanisms of excess heat generation that we see in heavy water experiments.

There is still no evidence to prove that the heat produced is nuclear in origin. The participation of main-line scientists who are not themselves working in this field, is indispensable in stimulating discussions and exchanging ideas. For this reason we found the critical contributions by Dr. Fukai at the Conference to be of great value.

A number of still indefinite but important new results were reported at the Conference, to do with the detection of nuclear products from "cold fusion" cells. The most important among these, was the report by Drs. Yamaguchi and Nishioka, that they detected helium and energetic alpha particles, which may be a possible energy carrier for excess heat. Their results, along with other interesting nuclear experiments reported by Dr. Kasagi, and Drs. Iida and Takahashi, were extremely provocative in this regard. Whatever the relation of excess heat to the occurrence of nuclear reactions, nuclear events have been demonstrated and this raises the question for theorists, of what can explain them.

These findings are extremely important even though we do not yet understand what physics exists behind these phenomena. The one thing we can say positively, is that what we have here is no ordinary nuclear reaction. Many theorists are now trying to find mechanisms that will allow them to avoid any direct handling of the coulomb barrier. What is being created is an entirely new field of research from that of traditional nuclear sciences. Probably we should no longer call this field "cold fusion," but "fusion in solid state."

It is my belief that cold fusion will become one of the most important subjects in science, one for which we have been working so patiently, with dedication and with courage, for future generations, for those who will live in the twenty-first century. In order to achieve our goal, our ultimate goal, we must continue and extend our interdisciplinary and international collaboration.

We regret deeply the untimely death of Dr. Andrew Riley of SRI International. Recently one of the most generous sponsors of our work, Mr. Minoru Toyoda passed away. At the banquet held during the Nagoya Conference, Mr. Toyoda expressed the philosophy that led him to promote cold fusion as a science. I would like to cite the last part of his message. There he said, "Cold fusion is not a matter to be studied by one single enterprise or nation. I have confidence that it will become the greatest asset as an eventual energy for mankind, to be shared among the world." This is our dream, our common understanding and the reason why we are so intensely and patiently working on cold fusion.

I would like to take this opportunity to express my sincere gratitude to the members of the International Advisory Committee and the Organizing Committee, and to all of those who participated in the Conference. It was their cooperation that made the Conference so fruitful. On behalf of the Organizing Committee, I would like to thank the Japan Society for the Promotion of Science and all the contributors for their generous financial support. I would particularly like to express my deep appreciation to Mr. Koichi Takashima, President of Kyoei Steel Ltd. for his extremely generous contribution to this Conference.

It is also my privilege to thank the Tokyo Club for the full support which they gave to the publication of these proceedings, *Frontiers of Cold Fusion*.

Finally I thank Miss S. Saito and Mrs. M. Tsubaki for their dedicated work for the Conference on behalf of the Secretariat . They not only helped to make the Conference itself successful, but they were active in forwarding the arrangements for this publication.

Hideo Ikegami, Editor
National Institute for Fusion Science
March 1993

Contents

Preface	
<i>H. Ikegami</i>	iii
I. Invited Papers	
Excess Heat	
Excess Power Observations in Electrochemical Studies of the D/Pd System; the Influence of Loading	
<i>M. C. H. McKubre, S. Crouch-Baker, A. M. Riley, S. I. Smedley and F. L. Tanzella</i>	5
Measurement of Excess Heat from a Pons-Fleischmann Type Electrolytic Cell	
<i>E. Storms</i>	21
Deuterium Loading Ratio and Excess Heat Generation during Electrolysis of Heavy Water by a Palladium Cathode in a Closed Cell Using a Partially Immersed Fuel Cell Anode	
<i>K. Kunimatsu, N. Hasegawa, A. Kubota, N. Imai, M. Ishikawa, H. Akita and Y. Tsuchida</i>	31
Calorimetry of the PD-D ₂ O System: from Simplicity via Complications to Simplicity	
<i>M. Fleischmann and S. Pons</i>	47
Electrochemical Calorimetry of D ₂ O Electrolysis Using a Palladium Cathode in a Closed Cell System	
<i>N. Oyama, T. Terashima, S. Kasahara, O. Hatozaki, T. Ohsaka and T. Tatsuma</i>	67
Heat Production at the Heavy Water Electrolysis Using Mechanically Treated Pd Cathode	
<i>K. Ota, M. Kuratsuka, K. Ando, Y. Iida, H. Yoshitake and N. Kamiya</i>	71
Repeated Heat Bursts in the Electrolysis of D ₂ O	
<i>C. M. Wan, C. J. Lihn, Z. H. Chin, C. Y. Liang, S. K. Chen, C. C. Wan and T. P. Perng</i>	75
Anomalous Excess Heat by D ₂ O/Pd Cell under L-H Mode Electrolysis	
<i>A. Takahashi, A. Mega, T. Takeuchi, H. Miyamaru and T. Iida</i>	79
Measurements of Excess Heat and Tritium during Self-Biased Pulsed Electrolysis of Pd-D ₂ O	
<i>F. Celani, A. Spallone, P. Tripodi and A. Nuvoli</i>	93
“Quasi-Plasma” Transport Model in Deuterium Overloaded Palladium Cathodes	
<i>A. de Ninno and V. Violante</i>	107
Calorimetric Principles and Problems in Pd-D ₂ O Electrolysis	
<i>M. H. Miles and B. F. Bush</i>	113
Tritium and Excess Heat Generation during Electrolysis of Aqueous Solutions of Alkali	
<i>M. Srinivasan, A. Shyam, T. K. Sankaranarayanan, M. B. Bajpai, H. Ramamurthy, U. K. Mukherjee, M. S. Krishnan, M. G. Nayyar and Y. P. Naik</i>	123
The January 2, 1992, Explosion in a Deuterium/Palladium Electrolytic System at SRI International	
<i>S. I. Smedley, S. Crouch-Baker, M. C. H. McKubre and F. L. Tanzella</i>	139

Nuclear Products

Experiments with Global Detection of Cold Fusion Byproducts <i>D. Gozzi, P. L. Cignini, R. Caputo, M. Tomellini, G. Balducci, G. Gigli, E. Cisbani, S. Frullani, F. Garibaldi, M. Jodice and G. M. Urciuoli</i>	155
Possible Nuclear Reactions Mechanisms at Glow Discharge in Deuterium <i>A. B. Karabut, Y. R. Kucherov, I. B. Savvatimova</i>	165
Experimental Studies on the Anomalous Phenomenon in Pd Metal Loaded with Deuterium <i>D. L. Wang, S. H. Chen, D. X. Fan, W. J. Chen, Y. J. Li, Y. B. Fu and X. W. Zhang</i>	169
Energy of the Neutrons Emitted in Heavy Water Electrolysis <i>M. Nakada, T. Kusunoki and M. Okamoto</i>	173
Direct Evidence for Nuclear Fusion Reactions in Deuterated Palladium <i>E. Yamaguchi and T. Nishioka</i>	179
Search for Anomalous Effects Involving Excess Power and Helium during D ₂ O Electrolysis Using Palladium Cathodes <i>M. H. Miles and B. F. Bush</i>	189
Deuteron Fusion Experiment with Ti and Pd Foils Implanted with Deuteron Beams <i>T. Iida, M. Fukuhara, H. Miyazaki, Y. Sueyoshi, Sunarno, J. Datemichi and A. Takahashi</i>	201
Observation of High Energy Protons Emitted in the TiD _x + D Reaction at E _d = 150 keV and Anomalous Concentration of ³ He <i>J. Kasagi, K. Ishii, M. Hiraga and K. Yoshihara</i>	209
Evolution of Tritium from Deuterated Palladium Subject to High Electrical Currents <i>T. N. Claytor, D. G. Tuggle and S. F. Taylor</i>	217
Tritium and Helium Production in Palladium Electrodes and the Fugacity of Deuterium Therein <i>J. O'M. Bockris, C. Chien, D. Hodko and Z. Minevski</i>	231
Reproducible Nuclear Reactions during Interaction of Deuterium with Oxide Tungsten Bronze <i>K. Kaliev, A. Baraboshkin, A. Samgin, E. Golikov, A. Shalyapin, V. Andreev and P. Goluburchiy</i>	241
Is Reported "Excess Heat" Due to Nuclear Reactions ? <i>D. B. Buehler, L. D. Hansen, S. E. Jones and L. B. Rees</i>	245

Materials and Hydrogen Behavior

Hydrogen/Deuterium Concentration in Pd under Cathodic Polarization <i>M. Enyo</i>	255
The ABC's of the Hydrogen-Metal System <i>Y. Fukai</i>	265
Some Observations Related to the Presence of Hydrogen and Deuterium in Palladium <i>D. R. Coupland, M. L. Doyle, J. W. Jenkins, J. H. F. Notton, R. J. Potter and D. T. Thompson</i>	275
Deuterium Concentration Profiles and Crystallization Anomalies in Electrolytically Deuterated Titanium Plates <i>B. Escarpizo, J. F. Fernandez, F. Cuevas, J. Tornero and C. Sanchez</i>	285

Theory and Modeling

Coherent and Semi-Coherent Neutron Transfer Reactions <i>P. L. Hagelstein</i>	297
Nuclear Fusion in Condensed Matter <i>V. Romodanov, V. Savin, Ya. Skuratnik and Yu. Timofeev</i>	307
Condensed Matter Effects for Cold and Hot Fusion <i>Y. E. Kim, M. Rabinowitz, R. A. Rice and J. -H. Yoon</i>	321
New Hydrogen Energies in Specially Structured Dense Media: Capillary Chemistry and Capillary Fusion <i>J. -P. Vigier</i>	325

Activity Review

Cold Fusion Researches in China - From Confirmation to Analyzing the Mechanism <i>X. Li</i>	337
Cold Fusion Researches in Russia <i>V. Tsarev</i>	341
Cold Fusion Research in Italy <i>F. Scaramuzzi</i>	353

II Contributed Papers

Chapter I : Excess Heat

Study of Deuterium Charging in Palladium by the Electrolysis of Heavy Water: Search for Heat Excess and Nuclear Ashes <i>L. Bertalot, F. de Marco, A. de Ninno, A. La Barbera, F. Scaramuzzi, V. Violante and P. Zeppa</i>	365
Cold Fusion Reaction Products and Behaviour of Deuterium Absorption in Pd Electrode <i>T. Mizuno, T. Akimoto, K. Azumi and M. Enyo</i>	373
Observation of Excess Heat during Electrolysis of 1M LiOD in a Fuel Cell Type Closed Cell <i>N. Hasegawa, K. Kunimatsu, T. Ohi and T. Terasawa</i>	377
On the Explosion in a Deuterium/Palladium Electrolytic System <i>X. Zhang, W. Zhang, D. Wang, S. Chen Y. Fu, D. Fan and W. Chen</i>	381
Measurements of D/Pd and Excess Heat during Electrolysis of LiOD in a Fuel-Cell Type Closed Cell Using a Palladium Sheet Cathode <i>M. Kobayashi, N. Imai, N. Hasegawa A. Kubota and K. Kunimatsu</i>	385
Anomalous Heat Generation/Absorption in Pd/Pd/LiOD/D ₂ O/Pd Electrolysis System <i>C. M. Wan, S. K. Chen, C. Y. Liang, C. J. Linn, C. J. Linn, S. B. Chu and C. C. Wan</i>	389
Periodically Current-Controlled Electrolysis of D ₂ O/Pd System for Excess Heat Production <i>H. Miyamaru and A. Takahashi</i>	393
Some Lessons from 3 Years of Electrochemical Calorimetry <i>M. E. Melich and W. N. Hansen</i>	397
A Potential Shuttle Mechanism for Charging Hydrogen Species into Metals in Hydride-Containing Molten Salt Systems <i>B. Y. Liaw and B. E. Liebert</i>	401

Experiments Supporting the Transmission Resonance Model for Cold Fusion in Light Water: I. Correlation of Isotopic and Elemental Evidence with Excess Heat <i>R. T. Bush and R. D. Eagleton</i>	405
Experimental Studies Supporting the Transmission Resonance Model for Cold Fusion in Light Water: II Correlation of X-Ray Emission with Excess Power <i>R. T. Bush and R. D. Eagleton</i>	409
Implications of Isoperibolic Electrode Calorimetry for Cold Fusion : The Silica Effect <i>E. E. Criddle</i>	417
Excess Heat Production in Electrolysis of Potassium Carbonate Solution with Nickel Electrodes <i>R. Notoya and M. Enyo</i>	421
Excess Heat Produced during Electrolysis of H ₂ O on Ni, Au, Ag and Sn Electrodes in Alkaline Media <i>T. Ohmori and M. Enyo</i>	427

Chapter II : Nuclear Products

Measurement of 2.5 MeV Neutron Emission from Ti/D and Pd/D Systems <i>M. Agnello, E. Botta, T. Bressani, D. Calvo, A. Feliciello, P. Gianotti, F. Iazzi, C. Lamberti, B. Minetti and A. Zecchina</i>	433
Evidence for Stimulated Emission of Neutrons in Deuterated Palladium <i>B. Stella, M. Corradi, F. Ferrarotto, V. Milone, F. Celani and A. Spallone</i>	437
“Cold” Fusion in a Complex Cathode <i>Y. Arata and Y. -C. Zhang</i>	441
Neutron Measurements in a AC-Discharged Tube <i>W. X. Liang, D. M. Xu, G. Y. Zhang, Z. L. Yao and E. Y. Wang</i>	445
Anomalous Effects in Deuterium/Metal Systems <i>H. Q. Long, S. H. Sun, H. Q. Liu, R. S. Xie, X. W. Zhang and W. S. Zhang</i>	447
The Anomalous Nuclear Effects Inducing by the Dynamic Low Pressure Gas Discharge in a Deuterium/Palladium System <i>H. Q. Long, R. S. Xie, S. H. Sun, H. Q. Liu, J. B. Gan, B. R. Chen, X. W. Zhang and W. S. Zhang</i>	455
Neutron Monitoring on Cold Fusion Experiments <i>L. J. Yuan, C. M. Wan, C. Y. Liang and S. K. Chen</i>	461
Neutron Emission from Palladium Electrodes in Deuterium Gas under Highly Non-uniform Electric Field <i>H. Yamada, N. Sugaya, T. Kamioka, M. Matsukawa, T. Fujiwara and K. Noto</i>	465
Neutron Emission from Crushing Process of High Piezoelectric Matter in Deuterium Gas <i>T. Shirakawa, M. Chiba, M. Fujii, K. Sueki, S. Miyamoto, Y. Nakamitsu, H. Toriumi, T. Uehara, H. Miura, T. Watanabe, K. Fukushima, T. Hirose, T. Seimiya and H. Nakahara</i>	469
A Search for Fracture-Induced Nuclear Fusion in Some Deuterium-Loaded Materials <i>K. Watanabe, Y. Fukai, N. Niimura and O. Konno</i>	473
Search for Excess Heat, Neutron Emission and Tritium Yield from Electrochemically Charged Palladium in D ₂ O <i>S. Isagawa, Y. Kanda and T. Suzuki</i>	477

Measurement of Neutrons in Electrolysis at Low Temperature Range <i>M. Fujii, M. Chiba, K. Fukushima, M. Katada, T. Hirose, K. Kubo, H. Miura, S. Miyamoto, H. Nakahara, Y. Nakamitsu, T. Seimiya, T. Shirakawa, K. Sueki, H. Toriumi, T. Uehara and T. Watanabe</i>	481
Limit on Fast Neutrons from DD Fusion in Deuterized Pd by Means of Ge Detector <i>E. Choi, H. Ejiri and H. Ohsumi</i>	485
Statistically Significant Increase in Neutron Counts for Palladium Plate Filled with Deuterons by Electrolysis <i>M. Fujiwara and K. Sakuta</i>	491
Detection of Neutron and Tritium during Electrolysis of D ₂ SO ₄ - D ₂ O Solution <i>O. Matsumoto, K. Kimura, Y. Saito, H. Uyama, T. Yaita, A. Yamaguchi and O. Suenaga</i>	495
Production of Neutron and Tritium from D ₂ O Electrolysis with Palladium Cathode <i>G. Y. Fan, X. F. Wang, G. S. Huang, H. Y. Zhou, Z. E. Han, Z. D. Wu</i>	499
The FERMI Apparatus and a Measurement of Tritium Production in an Electrolytic Experiment <i>B. Stella, M. Alessio, M. Corradi, F. Croce, F. Ferrarotto, S. Improta, N. Jucci, V. Milone, G. Villoresi, F. Celani, A. Spallone</i>	503
Time-Evolution of Tritium Concentration in the Electrolyte of Prolonged Cold Fusion Experiments and its Relation to the Ti Cathode Surface Treatment <i>J. Sevilla, B. Escarpizo, F. Fernandez, F. Cuevas and C. Sanchez</i>	507
The Change of Tritium Concentration during the Electrolysis of D ₂ O in Various Electrolytic Cells <i>K. -H. Lee and Y. -M. Kim</i>	511
Comments on Methodology of Excess Tritium Determination <i>S. Szpak, P. A. Mosier-Boss and J. J. Smith</i>	515
Fine Structure of the Charged Particle Bursts Induced by D ₂ O Electrolysis <i>R. Taniguchi and T. Yamamoto</i>	519
Measurement of Protons and Observation of the Change of Electrolysis Parameters in the Galvanostatic Electrolysis of the 0.1M-LiOD/D ₂ O Solution <i>S. Miyamoto, K. Sueki, H. Iwai, M. Fujii, T. Shirakawa, H. Miura, T. Watanabe, H. Toriumi, T. Uehara, Y. Nakamitsu, M. Chiba, T. Hirose and H. Nakahara</i>	523
Helium Isotopes from Deuterium Absorbed in LaNi ₅ <i>H. Sakaguchi, G. Adachi and K. Nagao</i>	527
The Detection of ⁴ He in Ti-Cathode on Cold Fusion <i>Q. F. Zhang, Q. Q. Gou, Z. H. Zhu, B. L. Xio, J. M. Lou, F. S. Liu, J. X. S. , Y. G. Ning, H. Xie and Z. G. Wang</i>	531
Real Time Measurements of the Energetic Charged Particles and the Loading Ratio (D/Pd)* <i>D. W. Mo, L. Zhang, B. X. Chen, Y. S. Liu, S. Y. Doing, M. Y. Yao, L. Y. Zhou, H. G. Huang, X. Z. Li, X. D. Shen, S. C. Wang, T. S. Kang and N. Z. Huang</i>	535
Detection of Radioactive Emissions in the Electrolytic Deuteriding-Dedeuteriding Reactions of Pd and Ti <i>H. Uchida, Y. Hamada, Y. Matsumura and T. Hayashi</i>	539
The Sensitizing Phenomenon of X-Ray Film in the Experiment of Metals Loaded with Deuterium <i>S. H. Chen, D. L. Wang, W. J. Chen, Y. J. Li, Y. B. Fu and X. W. Zhang</i>	543

Phenomenon of Low Energy Emissions from Hydrogen/Deuterium Loaded Palladium <i>R. K. Rout, A. Shyam, M. Srinivasan and A. B. Garg</i>	547
Electron Impact H-H and D-D Fusions in Molecules Embedded in Al <i>K. Kamada</i>	551
Observations on the Biological Cold Fusion or the Biological Transmutation of Elements <i>H. Komaki</i>	555

Chapter III : Materials and Hydrogen Behavior

TEM Investigation of Hydrogen Ordering in Pd <i>C. L. Hsu, C. M. Wan and F. -R. Chen</i>	561
Hydrogen and Deuterium Absorption by Pd Cathode in a Fuel-Cell Type Closed Cell <i>A. Kubota, H. Akita, Y. Tsuchida, T. Saito, A. Kubota, N. Hasegawa, N. Imai, N. Hayakawa and K. Kunimatsu</i>	565
Preparation of Pd Electrodes and Their Hydrogen Loading Ratios <i>T. Sano, T. Terasawa T. Ohi and S. Nezu</i>	569
Absorption of Hydrogen into Palladium Foil Electrode: Effect of Thiourea <i>T. Nakata, Y. Tsuchida and K. Kunimatsu</i>	573
In-Situ Electrochemical Quartz Crystal Microbalance Studies of Water Electrolysis at a Palladium Cathode <i>N. Oyama, N. Yamamoto and T. Tatsuma</i>	577
A Role of Lithium for the Neutron Emission in Heavy Water Electrolysis <i>M. Nakada, T. Kusunoki, M. Okamoto and O. Odawara</i>	581

Chapter IV : Theory and Modeling

Tunnel Disintegration and Neutron Emission Probability <i>T. Tani and Y. Kobayashi</i>	589
Field Formation of the Condensed Matter Fusion by Electro-Transport of Deuterium in Palladium <i>M. Tamaki and K. Tasaka</i>	593
The Combined Resonance Tunneling and Semi-Resonance Level in Low Energy D-D Reaction <i>X. Z. Li, D. Z. Jin and L. Chang</i>	597
Lawson Criterion Made Obsolete by Cold Fusion through the Double Screening Process <i>M. Rambaut</i>	601
Fractofusion Mechanism <i>K. Yasui</i>	605
Is Sono-Fusion to be a Possible Mechanism for Cold Fusion ? <i>K. Fukushima</i>	609
Review for “Nattoh” Model and Experimental Findings during Cold Fusion <i>T. Matsumoto</i>	613
Thermodynamic Theory of Cold Nuclear Fusion (C. N. F) <i>Z. L. Zhang and S. I. Liu</i>	617
Ion Band State Fusion <i>S. R. Chubb and T. A. Chubb</i>	623
Solid State Boson Condensation Model of Cold Fusion <i>J. T. Waber</i>	627
Mechanism of Cold Nuclear Fusion in Palladium <i>K. Tsuchiya, K. Ohashi and M. Fukuchi</i>	633

A Mechanism for Cold Nuclear Fusion: Barrier Reduction by Screening under Transient Coherent Flow of Deuterium <i>N. Matsunami</i>	637
Quantum Mechanics on Cold Fusion <i>N. Yabuuchi</i>	641
A Physical Description of Cold Fusion <i>E. L. Ragland</i>	649
Multilayer Thin Film Electrodes for Cold Fusion <i>G. H. Miley, J. U. Patel, J. Javedani, H. Hora, J. C. Kelly</i> <i>and J. Tompkins</i>	659
Electrodeless, Multi-Megawatt Reactor for Room-Temperature, Lithium-6/Deuterium Nuclear Reactions <i>J. Drexler</i>	663
Conference Program	669
International Advisory Committee	679
Organizing Committee	680
List of Sponsors	681
Exhibits and Demonstrations	681
List of Participants	683
Author Index	695