

Preface

This book is Proceedings of the 5th Meeting of Japan CF-Research Society, JCF5 which was held at Fukae Campus of Kobe University, Kobe, Japan, on December 15-16, 2003.

Japan CF-Research Society (JCF) was established in March 1999. The main aim of the society is to investigate the nuclear reactions that occur in the solid-state or condensed matter, especially in low energy regions. CF stands for Condensed-matter Fusion, Coherently-induced Fusion, Cleaner Fission, Clean Fusion, Cold Fusion and other nuclear reactions in condensed matter. And the main goal is expected to develop science and technologies to extract useable energy from CF phenomena. CF researches cross traditional academic domains and require an interdisciplinary approach in collaboration efforts of nuclear physics, fusion science, radiation physics, condensed-matter physics, surface and catalysis science, metallurgy, hydrogen science, electrochemistry, calorimetry, accelerator and beam science, laser science, nuclear and quantum science and engineering, molecular dynamics, acoustics, thermodynamics, physical chemistry, and so on. Another significant goal of the society is to enhance Japan's role as a focal point of research in this area and to act as a clearing house for international cooperation and information exchange. This commonly reasons why we employ English as conference language and publish books of ABSTRACTS and PROCEEDINGS in English. For the past three meetings, JCF1, JCF2, and JCF3, we published books of ABSTRACTS only on our web-site (<http://wwwcf.elc.iwate-u.ac.jp/jcf/>). The society has decided to issue books of PROCEEDINGS for further meetings from the JCF4 meeting, as both of printed versions and electronic versions in our web-site(same address as above one).

Submitted papers to JCF5 were peer-reviewed by the editorial board (Chairman: Prof. Hiroshi Yamada, Iwate University). One or two reviewers were selected by the board to review papers, comment problems and errors, and return to authors for correction. Most papers were accepted to publish via one-through reviewing processes with minor corrections.

In JCF5 Meeting, there came about 50 participants and 22 papers were presented (see JCF5 ABSTRACTS). This book of JCF5 PROCEEDINGS contains 19 full papers through submission and reviewing processes. For non-JCF members, inquiry to obtain a copy of book should be sent to Prof. Hiroshi Yamada (Faculty of Engineering, Iwate University, Morioka Japan; yamada@dragon.elc.iwate-u.ac.jp).

We thank all participants of JCF5 for their efforts to make this PROCEEDINGS and hope the information of this proceedings useful to further progress of CF studies.

Akito Takahashi (Prof., Osaka University), Director-in-Chief of JCF

Hiroshi Yamada (Prof., Iwate University), Chairman of JCF Editorial Board

CONTENTS

Preface

A. Takahashi and H. Yamada	i
----------------------------	---

BEAM

Experiments to Confirm ${}^7\text{Li}(d,n\alpha){}^4\text{He}$ Reaction Rate Enhancement in Liquid Lithium T. Minari, S. Awano, R. Nishio, T. Hirao, Y. Awa, A. Taniike, Y. Furuyama, and A. Kitamura	1
---	---

D(d,p)t Reaction Rate Enhancement and its Dependence on Target Material under Irradiation of D Ions Y. Awa, T. Minari, S. Awano, R. Nishio, T. Hirao, A. Taniike, Y. Furuyama and A. Kitamura	6
--	---

Detection of d + alpha channel by 3D fusion A. Takahashi, H. Miyamaru and T. Dairaku	11
---	----

DISCHARGE, LASER, MAGNETIC FIELD, etc.

Observation of Nuclear Reaction in Glow Discharge Experiment Using Deuterated Palladium Electrode S. Narita, H. Yamada, A. Arapi, D. Kato, M. Yamamura and M. Itagaki	14
---	----

Measurements of New Elements in Pd-H ₂ Thin Films A. Lorusso, V. Nassisi, E. Filippo, M. Di Giulio, D. Manno, G. Buccolieri and F. Celani	19
--	----

Heating of Heavy Water by Acoustic Wave Propagation in Magnetic Field and Phonon Maser Action of Deuteron K. Kamada and I. Yoshizawa	23
--	----

Neutron Emission from D ₂ Gas under Magnetic Field at Low Temperature T. Mizuno, K. Himoro, T. Akimoto, T. Ohmori and Y. Aoki	29
---	----

ELECTROLYSIS

Anomalous Isotopic Distribution of Palladium Generated during the Light Water Critical Electrolysis on Palladium Electrodes T. Ohmori, T. Mizuno, H. Yamada and S. Narita	36
---	----

Further Tests on Composition and Isotopic Anomalies when Pd Thin Cathodes are Electrolyzed in Acidic C ₂ H ₅ OD/D ₂ O Mixtures Added with Th-Hg Salts at Micromolar Concentration F. Celani, A. Spallone, P. Marini, V. di Stefano, M. Nakamura, A. Mancini,	
--	--

P. G. Sona, E. Righi, G. Trenta, C. Catena, G. D'Agostaro, P. Quercia, V. Andreassi, F. Fontana, L. Gamberale, D. Garbelli, E. Celia, F. Falcioni M. Marchesini, E. Novaro and U. Mastromatteo	41
--	----

Search for Neutrons from Palladium Cathodes during Alternate Electrolysis of Heavy and Light Water T. Aoki and N. Yoshizawa	46
---	----

Heat Measurement during Light Water Electrolysis Using Multilayer Cathodes M. Fujii, H. Inoue, S. Mitsushima, N. Kamiya and K. Ota	51
---	----

GAS PERMEATION

Confirmation of Transmuted Elements on Pd Complexes using D ₂ Gas Permeation Method M. Sakano, S. Sakai, T. Itoh, Y. Iwamura and S. Kuribayashi	55
--	----

Correlation between Deuterium Flux through Pd Complexes and Quantity of Nuclear Products using D ₂ gas Permeation Method Y. Iwamura, T. Itoh, M. Sakano, S. Sakai and S. Kuribayashi	60
---	----

The Phenomena of Nuclear Transmutation by D ₂ Gas Permeation Through Pd Complex T. Higashiyama, H. Miyamaru, A. Takahashi and M. Sakano	65
---	----

Elemental Analysis on Pd-foil after Hydrogen Permeation at Room Temperature by TOF-SIMS H. Yamada, S. Narita, H. Onodera, H. Suzuki, N. Tanaka, T. Nyui and T. Ushirozawa	69
--	----

THEORY

Clean Fusion by Tetrahedral and Octahedral Symmetric Condensations A. Takahashi	74
--	----

Analysis of Nuclear Transmutation as Secondary Reactions of Multibody-fusion M. Ohta and A. Takahashi	79
--	----

Quantum States of Charged Bose Particles in Solids K. Tsuchiya	84
---	----

Revisiting Anomalous Explosion of Hydrogen and Oxygen Mixture from a View Point of Cold Fusion H. Yamamoto	89
--	----

Nuclear-fusion chemistry through nucleonic liquid crystals N. Yabuuchi	93
---	----