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New Hydrogen Fusion Energy is Practical Technology

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1. Overview

Key point of cold fusion physics is that it should happen under the ordering (equivalently constraint) conditions of condensed matter with finite trapping time (effective lifetime) by deepened dynamic trapping potential wells, for which reaction rate formula is drastically different (very enhanced mode due to longer lifetime) from those by random two body collision process for plasma fusion and beam-target fusion.
Takahashi pointed out it in the following papers, typically:

(PDF) Fundamental of Rate Theory for CMNS

(PDF) Background for Condensed Cluster Fusion

(PDF) Physics of Cold Fusion by TSC Theory full paper

(PDF) Chaotic End-State Oscillation of 4H/TSC and WS Fusion

Detail of the TSC theory system was lectured with 10 pdf files at Kobe University in:

(PDF) Summary report of lectures on TSC theory

Using this kind of theoretical approach, We in NHFE Inc. are confident that we have solved the mechanisms of AHE (anomalous heat effect) and new production route of He-3 ash for the protium gas (H_2 gas) interaction with nano-metal-composite catalysts like CNZ (Cu1Ni7/zirconia) and PNZ (Pd1Ni10/zirconia) as shown in the following papers.

Since the solid state/chemistry mechanisms are governed by outer most electrons of consisting atoms as the EM (electro-magnetic) force interactions, AHE by D_2 gas cold fusion should have same EM field mechanisms as those of H_2 gas cold fusion, except for nuclear forces (strong and weak) interactions.
We think our solutions as the 4D/TSC fusion (He-4 ash) and the 4H/TSC WS fusion (He-3 ash) are consistent in the above basic physics view of ordering/constraint mechanisms in lattice dynamics of condensed matter.

Key experimental evidence data we have got are published as peer-reviewed papers typically in the following links (uploaded in ResearchGate):

(PDF) Detections of He-3 in Ni-based binary metal nanocomposites with Cu in zirconia exposed to hydrogen gas at elevated temperatures

(PDF) Understanding of MHE Power Generation Patterns by TSC Theory

(PDF) Characteristics of Excess Power Generation in MHE Experiments by D-System

(PDF) Rising Characteristics of MHE Power with CNZ Material

(PDF) Enhancement of Excess Thermal Power in Interaction of Nano-Metal and H(D)-Gas

And we believe that we have got to the groundbreaking discovery of clean fusion energy by light hydrogen fuel. This is a new kind of multi-body hydrogen fusion of hydrogen cluster under metal lattice transient/dynamic ordering/constraint conditions.

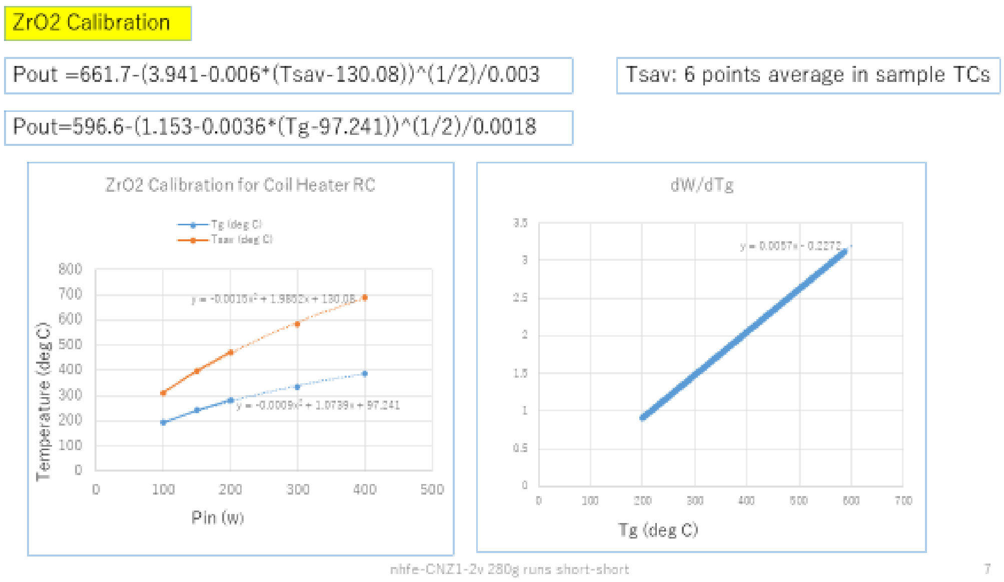
R&D in our new VB NHFE Inc., nhf-energy.com
, is going on in success of enhanced performance of excess power over 300W, COP over 2.0 and power-persistent days over 30 days. For the last 1.7 years since April 2024 when we established VB,
(PDF) New Hydrogen Fusion Energy Inc. Establishment Statement
, we have met significant progress to accumulate technical data on increasing excess power and stable output power for long time.

2. Some Technical Data to Disclose

We hope further progress in our R&D for social implementation of this technology.

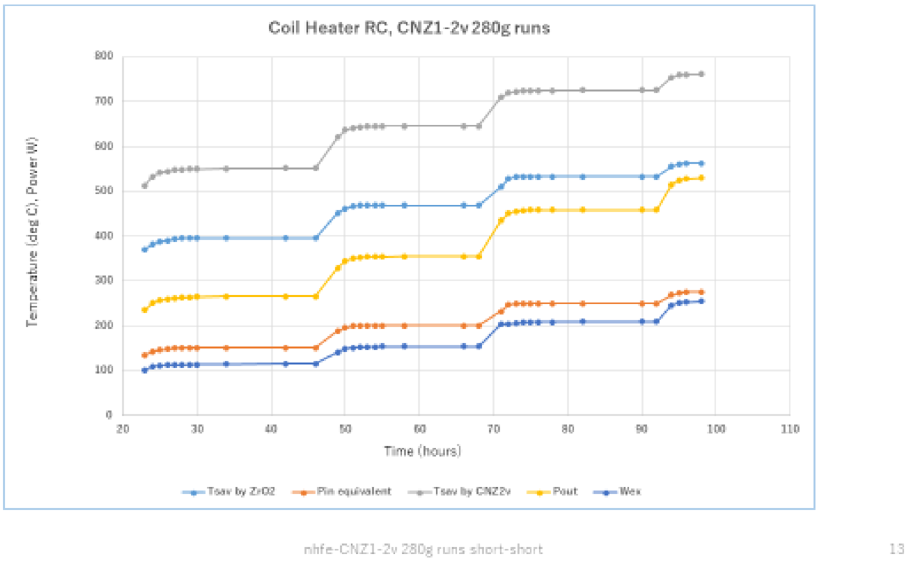
In the following, we disclose some technical data and laboratory feature for your understanding.

Slide-1: NHFE Reactor No.1; setting reactor chamber into outer thermal isolation chamber with water cooling coil on surface. Currently several reactors are running for accumulating R&D data.

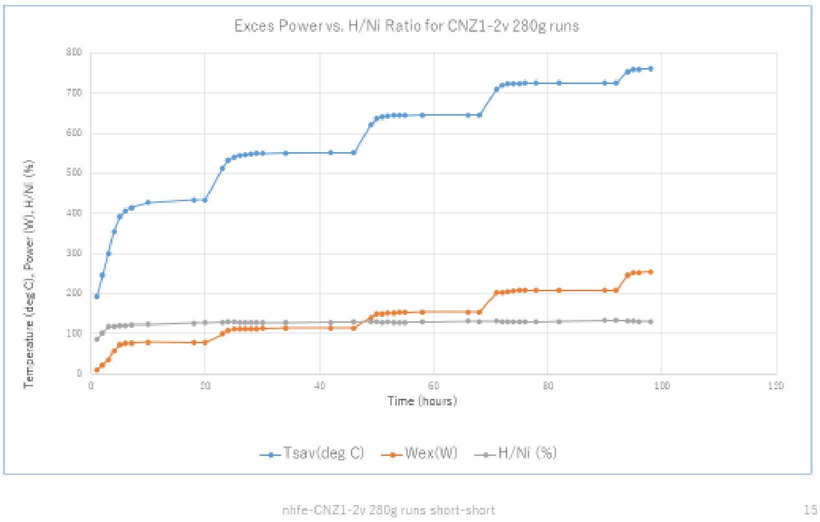


Slide-2: Calibration data of thermal power by dummy zirconia (1kg) sample powder, for

NHFE No.1 reactor.



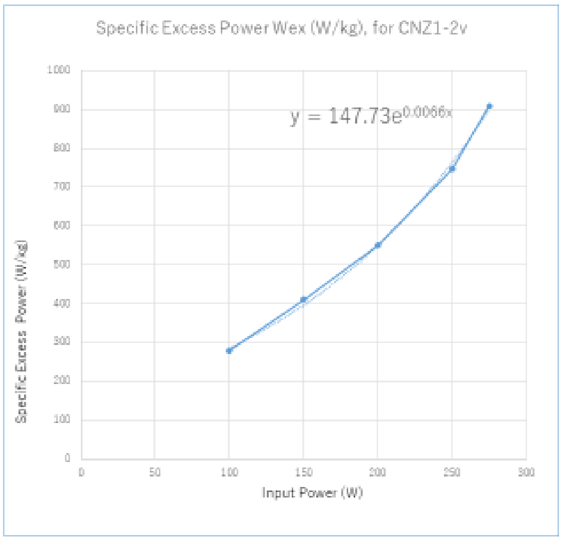
Slide-3: Typical generation pattern of excess thermal power by CNZ type meso-catalyst powder, for several input heater powers (Pin-equivalent; brown), out-put powers (yellow), excess powers (dark blue), reference RC temperatures by zirconia (light blue; 6 points average in RC) and RC temperatures by CNZ sample powder (gray; 6 points average in RC). This is an interim data for one month run in April 2025.



Slide-4: Evolution data of RC temperature, excess power and hydrogen loading ratio H/Ni (%). Keeping H/Ni ratio almost constant (ca. 1.15), we can increase excess power.

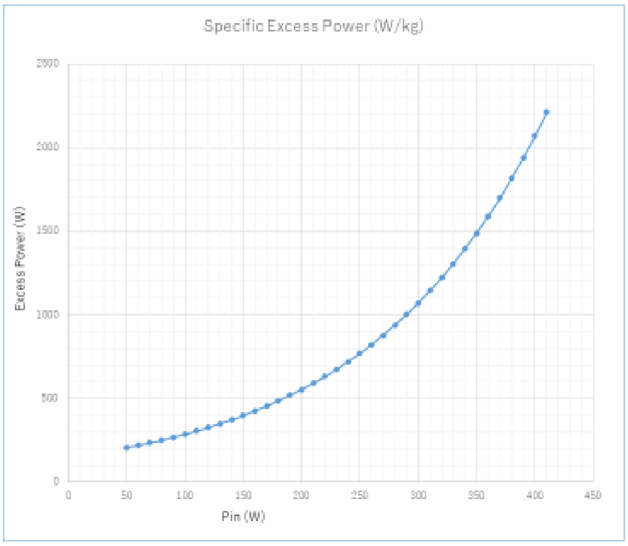
Pin(W)	Wex (W/kg)
100	279
150	410
200	550
250	746
275	910

非線形現象：
O-site phonon 励起による
TSC生成率増大は指数関数的で、
4H/TSC WS Fusion Rateは
温度上昇により、指数関数的に
増大する
（laser, IR光によるCNZ粉末の
局部的昇温が有効）



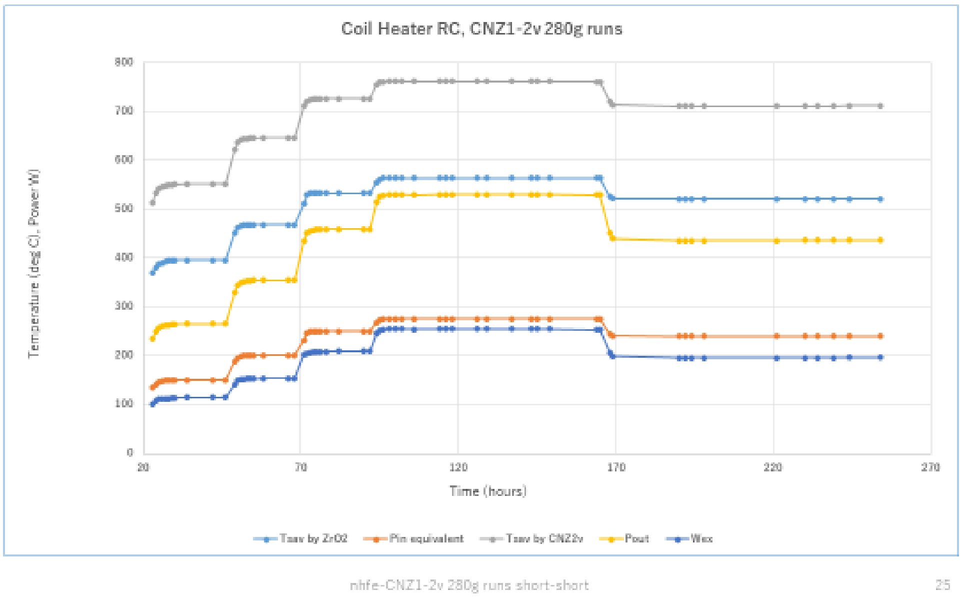
nhfe-CNZ1-2v 280g runs short-short 12

Slide-5; Enhancement trend of specific excess power (W/kg-sample) with increment of input heater power, for CNZ1-2v sample (280g). Specific excess power increases exponentially as predicted by the TSC theory, as a function of sample temperature, by exponential increase of TSC formation probability when phonon excitation of protons in O-sites of FCC sites. Data were taken in April 2025.



nhfe-CNZ1-2v 280g runs short-short 22

Slide-6; Technical data of specific excess power of CNZ1-2v sample, as a function of input heater power. 2kW/kg-sample excess power is attained with Pin =400W.



Slide-7; Technical data for ca. 10 days operation: for several input heater powers (Pin-equivalent; brown), out-put powers (yellow), excess powers (dark blue), reference RC temperatures by zirconia (light blue; 6 points average in RC) and RC temperatures by CNZ sample powder (gray; 6 points average in RC). This is an interim data for one month run. By Pin =275 watt, excess power was 255 watt, hence CoP = 1.927 and output power was 530 watt. Data were taken in April 2025.

3. Summary Comments

Presently disclosed technical data are a portion of data we have obtained. These R&D data show that New Hydrogen Fusion Energy technology is very practical to realize small laboratory-size thermal power generation module with several kW output power level, by using CNZ-type meso-catalyst powders with H_2 gas of ordinary pressure (0.1-0.3 MPa) and 600-1000 degree C in RC(reaction chamber) of one litter size.

By combining several RC module units, we can increase output power level, rather easily. RC design to sustain H-loading ratio to be slightly over 1.0 under RC temperature of 600-1000 degree C seems to be of optimum criteria.

Output power level can be controlled rather easily by changing input heater power level. After attaining high CoP value, we may switch to PID-control mode with adjusting input heater power level (On-Off mode) for practical thermal power usage conditions.