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Research Article

Preloaded NANOR®-Tech Trumps the "TDK Energy Solution"

Mitchell R. Swartz, Gayle M. Verner

JET Energy, Inc., Wellesley, MA USA ©

Abstract

Cold fusion (Lattice Assisted Nuclear Reactions: LANR) driven systems can deliver clean, large levels of energy production (through heat) which enable competing and superior handling properties and portability.

Keywords: Fusion, Nanor, Phusor, Power density, Energy density, Zirconium oxide

1. Introduction

TDK, a large Japanese electronics company, purports their new lithium oxide-based solid electrolyte energy production component replaces coin-shaped cell batteries. Further technical details were sought after their recent announcement which received good media reviews on-line, such as by Hackaday:

> *"While the energy density is high, keep in mind that the batteries of this type are usually tiny, so the total actual power available is probably not very high. Tiny batteries are definitely a thing. We are always hearing about breakthroughs, but we always wonder if and when we'll see actual products."*

The TDK battery competes with cold fusion and CF/LANR-derived systems, which deliver clean, large levels of energy production and density. High energy density is important which is why cold fusion (Lattice Assisted Nuclear Reactions: LANR) will be an oncoming contender.

As we show below, by contrast to simple batteries, the recent generations of CF/LANR energy production devices [which have preloaded ZrO_2-PdNiD nanomaterial at their core] demonstrate significant energy and power densities.

2.1. Background: Cold Fusion/LANR is Absolutely Real

Thirty-seven years of solid sterling evidence shows conclusive experimental LANR data proving excess heat of a nuclear origin, as reported by multiple groups. Loaded deuterons in PdD (often under difficult-to-achieve conditions) couple together in these active systems to generate *de novo* ^{4}He, loss of D, unique antiStokes and RF Deuterium-line emission signatures and considerable excess heat.

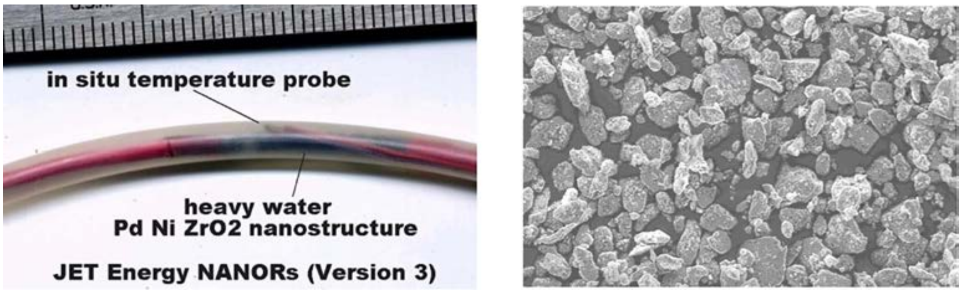

Figure 1. (left) –NANOR®-type Component; Series 3 NANOR®-type LANR component, (right) dry and preloaded ZrO_2-PdNiD nanostructured core material.

2.2. LANR has Progressed in Many Ways

Working CF/LANR systems led to open demonstrations (2 at MIT), academic courses, and new discoveries with advancements from BOTH aqueous solution systems and dry pre-loaded nanomaterial CF/LANR components.

Also, working CF/LANR systems now have increased incremental power gains (reflecting efficiency). Development of CF/LANR-specific diagnostics (antiStokes and RF emissions) and properties (quantum computers) now exist also.

2.3. Background-NANOE®-Type LANR Components

NANOR®-type LANR Components are a new generation of CF/LANR quantum electronic devices exhibiting large and reproducible energy gains. Most importantly, the activation of LANR is, for the first time, separated from loading. The core is ZrO_2PdNiD [Zr (∼66%), Ni (0-30%), and Pd (5-25%) by weight] with additional D. The PdNiD nanostructured core islands are electrically isolated by the zirconia (ZrO_2) dielectric.

These NANOR®-type preloaded components are dry, sealed into an electrically conductive (high impedance) configuration, enabling superior handling properties and useful portability. The self-contained two electrical terminals NANOR®-type LANR components are fully preloaded with deuterons. They are ∼2 cm in length, with 30 to 400 milligrams of an active LANR nanocomposite ZrO_2-PdD core. The power density ∼19.50 watts/gram of nanostructured material, that improves their already superior handling and portability properties.

3. Experimental – Electric Power Drive

To accurately measure excess heat (XSH) in LANR, careful sequencing of input power to both the component and the ohmic control is required. We use precision-controlled power sources like a Keithley current source, Tekpower TP3005P, with DAQ monitoring. Analysis of the delivered and applied precise step functions yield calorimetry. For each step pulse, the electrical dissipation (V*I) is maintained over a long period of time. The results are confirmed by long-term time integration, which rules out false positives.

4.1. Result -Active Dry Preloaded ZrO_2-PdNiD LANR Component

The next figure shows the applied input voltage and resulting incremental power gain for NANOR®-type Component N5-02A, calibrated by an ohmic control resistor in Run EJan01A. Note how many orders of magnitude the incremental power gain realized from the active NANOR®-type component, compared to the ohmic control. Achieving these high

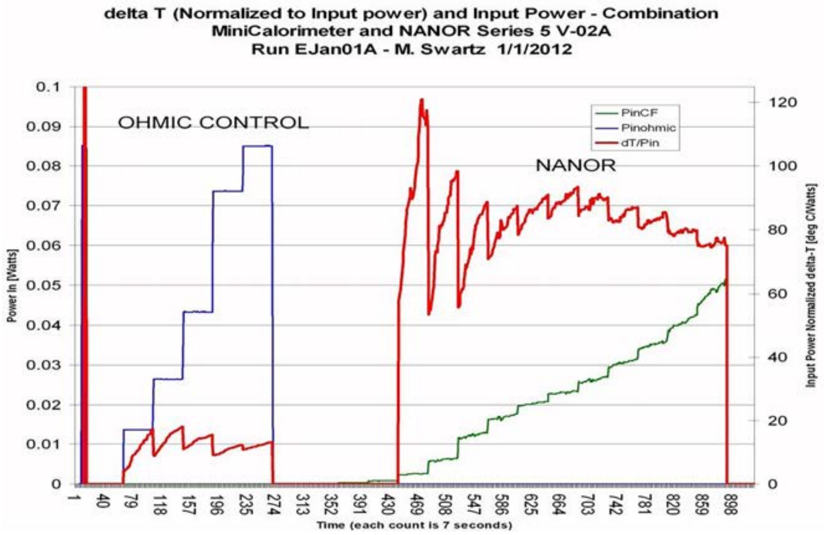

Figure 2. Preloaded NANOR® V-02A – Shown are the applied input voltage and resultant incremental power gain for NANOR®-type Component N5-02A, calibrated by an ohmic control resistor in a previous run (EJan01A).

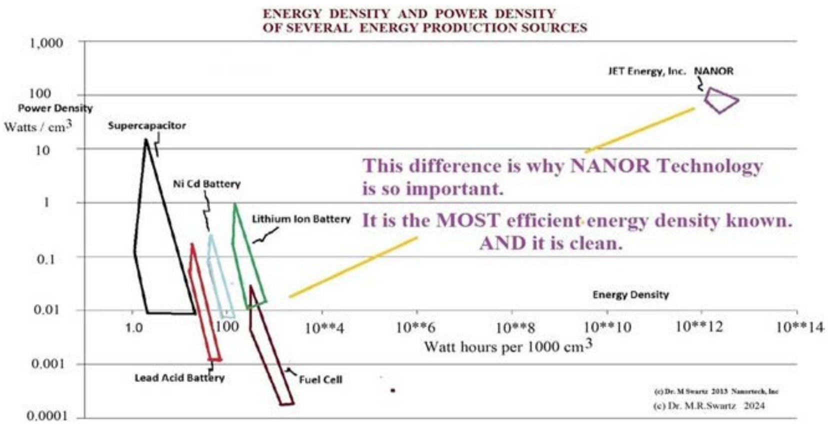

Figure 3. Power Density and Energy Density for several Energy Production and Energy Storage Systems including CF/LANR NANOR®-type Components.

incremental power gains has required improved alloys and their loading by deuterons, followed by careful avoidance of possible electric avalanches, thereby extending the duration of the heat production cycles.

4.2. Results - Range of Energies and Power Densities Available

The next cumulative graph [Figure 3] shows the range of energy densities and power densities available by several energy production and energy storage systems. CF/LANR energy production devices [which include NANOR®-type components with their preloaded ZrO_2-PdNiD nanomaterial at the core] demonstrate significant energy and power densities.

5. Conclusion: LANR is Important

LANR's fuel is abundant, larger and more available than all the Earth's oil reserves. Its energy production is clean, quiet, and so efficient that in the future, LANR will energize engines, motors, and electrical generators enabling transportation, improved health with new and improved opportunities.

Acknowledgements

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