INTRODUCTION TO A NEW METHOD TO INITIATE COLD FUSION / CONDENSED MATTER NUCLEAR REACTIONS

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ABSTRACT

This is an introduction to the hydraulic-electrostatic cold fusion method that was first demonstrated to a small public group on June 6, 2005, in Edmonton, Canada. Observation of devices that appear to be 100 percent repeatable and of practical, commercial magnitude was seen.

1.1. *Introduction*

This work was demonstrated by a group managed by Hyunik Yang, professor of mechanical engineering at Hanyang University, Korea. Other members of this research team are Alexandr Koldamasov (ret.) of the Russian National Research Institute of Atomic Engineering, Andrei Desyatov, deputy director of the Russian Aviation and Space Agency at the Keldysh Research Center in Moscow, Alla Kornilova, physics professor and director at Moscow State University, Vladimir Vysotskii, physics professor at Kiev Shevchencko University, and Nahm Cho, professor of mechanical engineering at Hanyang University, Korea.

A second group of Russians is associated with this research. They are Evgeny Pavlovich Velikhov, president of Kurchatov Research Institute, Gerasimovich Gnedenko, director of Kurchatov Research Institute, and Vital'evich Goryachev, associate director of Kurchatov Research Institute. Gnedenko and Goryachev are the assignees of a related Russian patent, No. RU2232210.

1.2. *Brief Review of Current Progress in Cold Fusion*

At the 16-year mark in cold fusion's evolution, progress toward a new source of energy has been consistent but slow. The current limitations are clearly evident. Weak reactions have been relatively easy to reproduce; however, few strong reactions have been reported.

Many researchers can demonstrate excess energy in the realm of 10 percent with very high repeatability, though only in the milliwatt range. [1]

Strong reactions, achievement of higher power levels, have been difficult to obtain. The largest energy gain reported so far has been 2,500 percent by the Energetics Technology group from Israel.[2] Reports from other researchers show power in the tens of watts; however, these experiments are rare and difficult to repeat.

1.3. *Brief Review of Previous Fusion Cavitation Research*

The idea of using cavitation, the creation of rapidly expanding and collapsing cavities in fluids (bubbles), has been studied for many years by fusion researchers.

Roger Stringham of First Gate Energies started using acoustic drivers to induce cavitation in 1989. As is typical with cold fusion experiments, his research uses palladium and deuterium as the main components as well as the acoustic driver. As expected from cold fusion, his experiments do not produce significant levels of neutrons, the signature of a hot fusion reaction. Stringham has reported excess energy, in the form of heat, of 40 watts.[3]

Rusi Taleyarkhan, a nuclear engineering and science professor with Purdue University, and colleagues published papers in *Science* [4] and *Physical Review E* [5] describing another variation of acoustic cavitation, technically known as acoustic inertial confinement fusion. As is typical with hot fusion, Taleyarkhan's method does not use any host metal. His experiment runs in a room-temperature environment, and the bulk of the test liquid in the cells is at temperatures ranging from 0C to 15C. The fusion reactions take place in deuterium-bearing bubbles during the time span when sonoluminescence light flashes come - implosion conditions associated with high temperatures, plasmas and high pressures.

The main components of the system are a resonant acoustic test reactor filled with deuterium-bearing fluid (acetone is one such fluid), the acoustic driver system and a nuclear particle-based bubble nucleation source.

Significant levels of neutron emissions, commensurate with the expected branching ratios of hot fusion, are reported with this method. No excess energy is reported so far with this method.

1.4. *Mechanical Cavitation Using Hydraulic and Electrostatic Effects*

The new cavitation method uses high hydraulic pressures, high velocities and electrostatic effects. Two configurations are known. The first pumps machine oil in a fully enclosed recirculating system. 2,000 percent excess energy, in the form of heat, is reported by Koldamasov.[6] The second configuration uses a partially enclosed recirculating system, and products of heat, steam, hydrogen and helium were reported to New Energy Times by Yang, though no data has been presented.

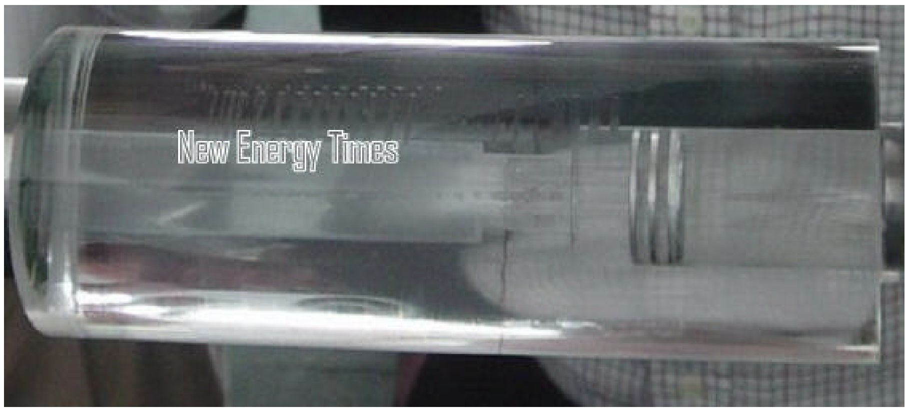

Figure 1. Photograph of Hydraulic-Electrostatic Cold Fusion Cell Using Machine Oil

1.5. *Unique Characteristics of the Hydraulic-Electrostatic Cold Fusion Method*

This method differs markedly from both previous cold and hot fusion cavitation experiments. It differs from cold fusion work in that no host metal, such as palladium, is required. No deuterium gas or heavy water is required, and no electrochemistry is involved. The lack of electrochemistry requirements is a significant advance toward a commercial application, because electrochemistry is generally a very complicated, difficult-to-control environment.

The basic components of this method besides the cell, pictured above, are a pump motor used to recirculate the fluid and a heat exchanger to capture the heat energy.

Data has not been presented on the energy gain of the recent work; however, three cold fusion experts, electrochemist Martin Fleischmann (co-discoverer of cold fusion, and retired from the University of Southhampton), electrochemist Michael McKubre (SRI International), and physicist Peter Hagelstein have reported to New Energy Times that they have a high, though not absolute, level of confidence that the method is, in fact, exhibiting a positive energy balance.

In multiple demonstrations starting on June 6, 2005, Fleischmann, McKubre, Hagelstein and Krivit observed operators turn the device on and off at will, on demand. Observers noted that operators could increase or decrease the input to the machine, and in turn, the observers watched the machine respond directly with a correlated heat energy production, as displayed on the control console.

Tadahiko Mizuno, a nuclear engineer with Hokkaido University, visited another laboratory in Korea on Sept. 27, 2005, and witnessed a similar device, though the available instrumentation was insufficient for him to verify the claims of neutron emissions.

The qualitative characteristics of this method appear to be 100 percent repeatable, sustainable over a period of minutes to hours, and controllable.

1.6. *Why Is This Cold Fusion?*

Three dominant characteristics support the recognition of this method as a form of cold fusion. First, it apparently generates excess energy from hydrogen-based materials such as water or oil. Second, the reactions occur in a room-temperature laboratory environment. And third, based on reports from the Yang group, the branching ratios appear to follow those known of cold fusion experiments. Helium production is reported as the dominant byproduct, with relatively low levels of neutron and gamma emission.

1.7. *Conclusion*

Confidently confirming the validity of the claimed excess heat and nuclear products in this work is difficult because sparse data has been presented by the researchers. People privileged with more in-depth knowledge have been constrained by nondisclosure agreements. Reports of independent audits have been mentioned to New Energy Times, yet such audits have not been made available to New Energy Times; the reason given is that the audits are the private property of the commercial and investment parties who have paid for them.

The claims are, needless to say, startling, profound and possibly auspicious. However, further attention to this research will require more detailed data. New Energy Times will seek the cooperation of Yang's research team to perform an audit and encourage additional disclosures by the researchers at the next ICCF conference.

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