

NEW FIRE TRIGGERING

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PLEASE IDENTIFY YOURSELF ABOVE BEFORE EDITING

INTRODUCTION:

Below is a few quick ideas/headings to get people moving. Please add to these ideas with links to relevant research, add drawings and suggest experimental apparatus designs.

Please keep this document as clean as possible, phrase you idea carefully and try to keep it as simple as possible for non-scientific people to be able to understand.

If you have a specific design/protocol for consideration, please give a short note on it and a reference to the relevant appendix. The appendix naming convention is noted in **RED** in the top levels in square brackets.

Potential triggering methods - let's get the party started! ;-)

1. Light and high-energy electromagnetic radiation **[Appendix Axx for specific designs]**

Studies have indicated that certain frequencies of light may have a stimulative effect

1.1 Flash tubes

These produce high momentary intensity with a wide light frequency output. These could be easy to experiment with because the flash can be timed and post firing the result monitored. Depending on the type of gas used in a flash tube, there is a varying frequency response. If one worked better than another, that might guide us to the frequencies of light that are better suited to stimulating a particular New Fire configuration.

High output flash - See **A01**

1.2 Black light tubes (UV-light tubes)

1.3 Ultraviolet light emitting diodes

1.4 LASER

Laser light is known to stimulate LENR events, it is what Mitsubishi and Toyota used in their elemental transmutation research.

Coherent light may be particularly good for triggering events and there may be a matched frequency for a particular New Fire configuration.

Picosecond LASER stimulation. In this case energy is immense and power is very low because it depends on the integrated time. Matter behave differently because of the absence of heat or phonons.

Letts and Hagelstein saw anomalous heat in deuterated palladium by tuning dual lasers to 8, 15 and 20 THz^[3]. Piantelli indicates that laser light (along with many other mechanisms) can be used to trigger a critical activation threshold in his device, which makes use of a substrate of nickel or another transition metal^[5].

1.5 White LED, like in the setup of Brian P. Roarty^[1] (edit, Dieter Seeliger, 23.1.2013)
Different spectra could be tested.

1.6 X-rays

The outlines of a theory from a notable user of physics.stackexchange.com suggests that bombarding deuterated palladium with x-rays will accelerate any reaction already underway^[6], possibly leading to runaway. If x-rays can be found to accelerate a reaction, they may initiate one as well.

2. Radio frequency (RF) **[Appendix Bxx for specific designs]**

It has been suggested that RF of certain frequencies may be a good trigger source,

2.1 Standard broad band transmitter

Take a domestic radio transmitter on full power and do a slow frequency sweep with a set input signal and search for influence.

(edit, Dieter Seeliger, 23.1.2013)

To introduce a trigger event using RF, the simplest approach would be a magnetic loop antenna with the cell in the center.

In the near field of this type of antenna the magnetic part of the electromagnetic field is dominant. This antenna has a very small footprint, compared to the used wavelength and has a very very small bandwidth which could be tuned very simple to match to the experiment and the transmitter.

A simple Amateur radio transmitter can be used for this experiment.

There are no changes required to the cell geometry or mechanics.
The only possible problem could be that Rf is coupled to the measurement probes which should be deactivated or filtered and screened if the RF signal is induced.

An antenna with a diameter of 300mm attached to an appropriate high voltage capacitor can handle up to 100W RF energy between 10 and 100 MHz.

www.aa5tb.com/loop.html

http://en.wikipedia.org/wiki/Magnetic_loop

2.2 Magnetron Microwave emitter to tera-hertz electromagnetic waves

We know that a microwave oven can warm food by shaking an H-O bond - may be modified Magnetrons at other frequencies would be effective at shaking the condensed matter in a favourable way.

2.3 Resonant electrodes

Capacitor plates spaced with a resonant frequency distance.

2.4 Tesla coil

Tesla coil producing plasma arc nearby or through the cell.

3. Magnetic **[Appendix Cxx for specific designs]**

It has been suggested that good stock material for Celani wire is initially Magnetic before treatment. Yet others have indicated that magnetism may play an important role in LENR.

3.1 Electromagnet

Either in a static magnet or oscillating electromagnetic configuration with a range of frequencies, intensities and waveforms.

look at 2.1, RF loop antenna

3.1 Fixed high flux magnet

In motion?

3.2 Orientation

Will a cell showing a significant P_XS show different output based on orientation to earth's magnetic field

4. Acoustics **[Appendix Dxx for specific designs]**

4.1 Piezo transducer

High energy sound, ultrasonic, etc ; could create advantageous environment for triggering LENR.

4.2 Audio Speaker wide bandwidth

5. Electrical **[Appendix Exx for specific designs]**

5.1 DC Current pulse

Many researchers [sources required] have said that current pulse can trigger LENR events and particularly the leading edge.

Pulse amplitude, +ve or -ve, duration and inter-pulse interval are all things to explore.

5.2 DC Voltage spike

5.4 AC and Waveform generator

6. Thermal **[Appendix Fxx for specific designs]**

6.1 Liquid nitrogen quenching

Take a loaded Celani wire (with deuterium or hydrogen) and dunk it in liquid nitrogen, look for particle emissions In the US a young researcher reporting at ICCF-17 saw 2 million neutrons when he dunked deuterium loaded palladium wire in a similar fashion [check fact and source]. Worth seeing if something interesting happens with loaded Celani wire and do before and after SEM and

elemental analysis.

7. Pressure **[Appendix Gxx for specific designs]**

7.1 Piston

Mechanical piston to compress and depress gas in the cell

7.2 Pressure changes from a pre loaded gas tank, see **G01**

8. Ionising radiation **[Appendix Hxx for specific designs]**

It is suggested that PAPP used a low level radiation source to help get the claimed noble gas mixture into a state that would create the expansion phase given a trigger discharge [check fact and source].

Could some low level radiation source enhance or trigger the effect? see **H01**

9. Plasma/MHD **[Appendix Jxx for specific designs]**

9.1 Magneto-hydro-dynamics

This is a cross-science that involve, electrical, magnetic and plasma simulation into a fluid-type environment (fluid mechanics). Basically, one of the main features kills the critical perturbation that occurs on the surface when a newtonian fluid move on a solid surface, it induces a laminar-type flow instead of a turbulent one. Very technical and mathematical science.

10. Physical shock **[Appendix Kxx for specific designs]**

10.1 The hammer test

Take a hammer, hit a loaded wire, if nothing interesting happens, get a bigger hammer and hit it again, repeat (until either it breaks or you brake the hammer *joke - better suggestions please or can this just be a sound thing?*).

11. Nuclear Stimulation **[Appendix Lxx for specific designs]**

11.1 Neutrino stimulation

There are 65 billion of these particles per cm² per second incident on earth from the sun and because they are small and have no charge they pass through the earth as if it was not there, although there is some suggestion that they “diffract” a little like light moving through glass. Some Neutrinos have high energy - up to 15.5 MeV - given that Hydrogen molecule dissociation energy is 4.52 eV - you can see the scales here. Maybe some LENR configurations are effectively traps for Neutrinos and allow them to trigger events or release some or all of their energy.

A number of researchers working in related fields suggest that Neutrinos can play a role. One Japanese researcher said that a 100 TW could immobilise fissile material through the earth [source]. America is building a 3TW Neutrino beam at the moment [check value and source]

Statistically cross check the variation of neutrinos in the lab - mainly depends on solar eruptions - and see if this stimulation has an effect on the system studied.

11.2 Proximity to nuclear power station

Fission reactors produce neutrinos - will being near to one stimulate the New Fire?

Corollary - the police pooping the party tests :-)

If it is suggested there are things that can stimulate the New Fire, maybe there are things that can stop it. By rapidly killing the effect and returning an experiment to a baseline akin to the pre-active calibrations, we would QED that there was an effect before the killer was introduced.

12. Gasses **[Appendix Mxx for specific designs]**

12.1 He

If helium is injected into a cell - does it displace Hydrogen in nanostructures and slow the reaction down.

12.2 Ar

Piantelli's patent claims that Argon kills LENR ^[2]

This may explain why the first US test was inconclusive, but much better results were obtained during EU cell tests.

Perhaps deliberate injection into a cell that is thought to be working could show a fall off in the effect to zero over a time period which would help to suggest that, if all other things are equivalent, the effect seen previously was in fact real.

12.3 Hydrogen Sulphide

Celani claims that sulphur in steel can stop his wires from working. So maybe injecting Hydrogen Sulphide will kill the effect. It has both Hydrogen which is already part of the experiment and the claimed killer - sulphur.

CAUTION: Hydrogen Sulphide is a very toxic gas but with proper precaution, use of correct gas mask and having Amyl Nitrate as an antidote in case of exposure, experimental use should be practical.

<http://www.inchem.org/documents/icsc/icsc/eics0165.htm>

[supplier links and advice on handling/legalities needed]

12.4 Nitrogen

Nitrogen was reported here to kill the effect.

13. Electrical **[Appendix Nxx for specific designs]**

13.1 Deliberate application of high current

It is claimed that too much current in an active wire can alter the special nano structures so that they no longer produce an effect. If, after a successful experiment showing apparent excess heat well beyond chemical, the wire was exposed in this way, we may be able to show a difference in long term performance without having to introduce anything else into the cells.

Additionally, an experiment protocol that stepped current exposure gradually upwards - then ran for PXs before stepping up again, would allow discovery of the current exposure that destroys a particular wires potential for the effect.

14. Contaminants and impurities **[Appendix Pxx for specific designs]**

14.1 Sulphur

On the basis of x-ray spectroscopy, Hioki et al. conclude that surface segregation of sulphur from palladium bulk to be a factor in reducing the permeation rate of deuterium in palladium foil ^[4], a rate believed to be related to

LENR effects in deuterated palladium.

Products and part list:

Please add links to suppliers, specific products and part numbers, etc. OR explanatory, tutorial references on temperature measurement

References:

- [1] Brian P. Roarty and Carol J. Walker, Protocol for a Silicate-based LENR Using Electrodes of Various Metals, JCMNS-Vol10, page 30ff, 2013
<http://www.iscmns.org/CMNS/JCMNS-Vol10.pdf>
- [2] Piantelli, S. and F. Piantelli, *Method for producing energy and apparatus therefor* WO 2010/058288. 2010: World Intellectual Property Organization.
<http://lenr-canr.org/acrobat/PiantelliSmethodforp.pdf>
- [3] Letts, D. and P.L. Hagelstein. *Stimulation of Optical Phonons in Deuterated Palladium*. In ICCF-14 International Conference on Condensed Matter Nuclear Science. 2008. Washington, DC. <http://lenr-canr.org/acrobat/LettsDstimulatio.pdf>
- [4] Hioki, T., N. Takahashi, J. Gao, A. Murase, S. Hibi and T. Motohiro. *Effects of Self-poisoning of Pd on the Deuterium Permeation Rate and Surface Elemental Analysis for Nuclear Transmutation*. J. Condensed Matter Nucl. Sci. 6 (2012) 64–76.
<http://www.iscmns.org/CMNS/JCMNS-Vol6.pdf>
- [5] Piantelli, S., L. Bergomi and T. Ghidini. *Method for producing energy and apparatus therefor*. EP2368252B1. 2013: European Patent Office.
<http://www.22passi.it/downloads/EP2368252B1%5B1%5D.pdf>
- [6] Maimon, R. Response to the question “Why is cold fusion considered bogus?,” on physics.stackexchange.com. <http://physics.stackexchange.com/a/13734/6713>

Appendix A

A01 High output flash

A very good description of the hardware and circuits can be found at:

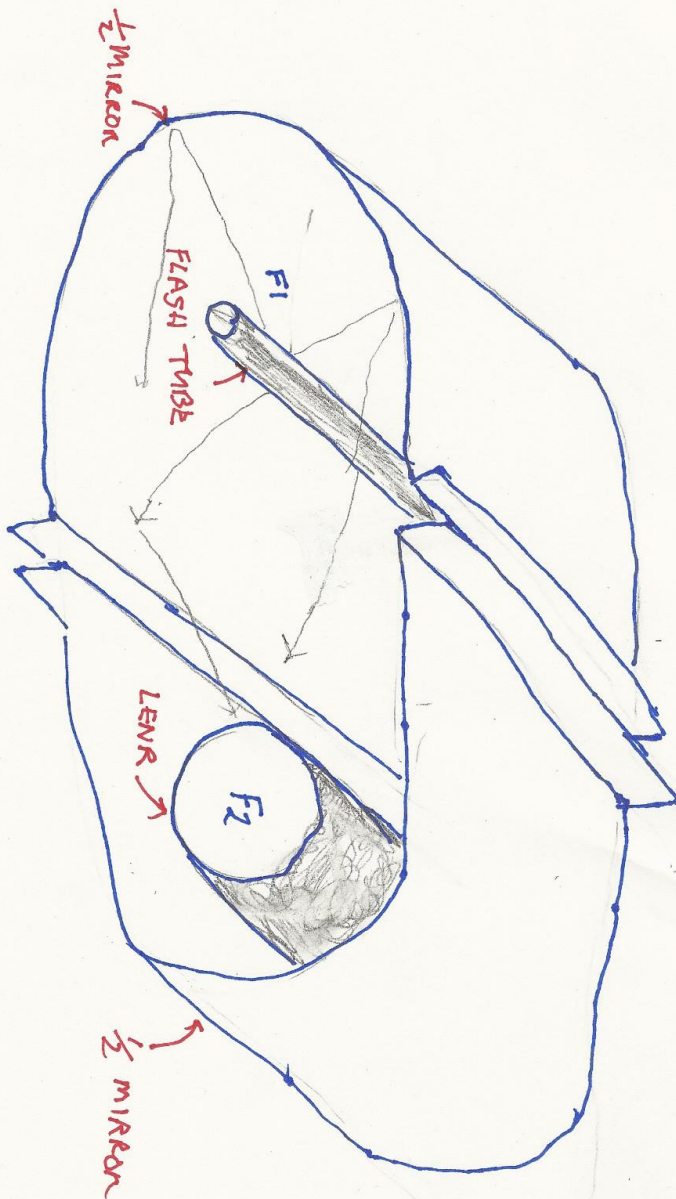
http://www.perkinelmer.de/PDFS/downloads/dts_applicationnotehighperformance_flash_final071004.pdf

The flashes are from 1 to 100 microseconds long, depending on circuitry. The flash energy is stored in a capacitor. The very short flash time makes for very high peak powers from just a handful of joules stored in the capacitor. Large tubes have been used to peel paint from commercial airliners. The painted surface layer gets briefly hot, but the underlying bulk of the metal skin stays cool.

The output light flash consists of two components: line structure from the fill gas and broadband blackbody from the nearly transparent hot gas. The tube envelope material (quartz or pyrex glass) controls the optical output. The fill gas turns into a plasma at the very high temperatures in a flash (8000 C). At low duty cycles, the tubes get warm. High energy and high duty cycles cause the envelope to get very hot and even explode. The tube radiates light in all directions.

From an optical design point of view a tube appears to be linear light source about 2 mm in diameter and stretched over the interior of the tube- a distance of at least several centimeters. Additional mirrors and lenses can help deliver the light to the region of the target. The light can not efficiently be focused to a tiny spot like a laser, but rather illuminates a relatively wide area. Metallic targets mostly will be somewhat reflective or opaque. The light will only strike the surface layer. Chemically conjugated bonds will be attacked by the UV within wavelengths of 200-300 nm transmitted by the quartz envelope. A borosilicate envelope absorbs these bands and is easier on organic compounds in the tube housing. In a hydrogen environment, no photochemistry will take place in the gas cloud. Surface absorption effects will generate brief but shallow thermal pulses in the metallic surface. It is not likely to deliver enough energy to melt any illuminated structures.

The flash energy could be coupled into a transparent device using cylindrical mirror shaped into an ellipse. The flash tube would be located at one focal zone. The target would be at the other focal zone. I do not know of any mechanism by which a bright flash of light from a flash tube could excite other than thermal responses.



ELLIPTICAL [CYLINDRICAL] FLAT MIRROR - FLASH TUBE-LENR
CONCEPT SKETCH

27 JAN 2013 PPK

Appendix G

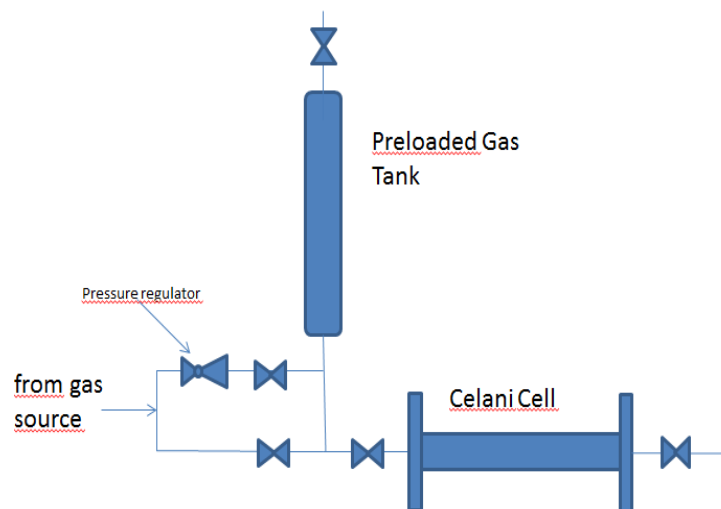
G01 Pressure changes from a pre loaded gas tank. (edit, Dieter Seeliger, 23.1.2013)

Easy to install in the existing system, adding a small tank with the same size of the cell connected by an magnetic valve. Tank could be pressurized from the gas cylinder by the use of a simple pressure regulator.

When the valve is fully opened by an electric pulse, the pressure will step up to a defined pressure niveau in a short time.

With the addition of another pressure release valve, the pressure can be lowered.

This cycle could be repeated several times.



Picture 1, Dieter Seeliger, 24.1.2013



Appendix H

H01 Use of potassium compounds

The purpose of the "catalyst" could be to make atomic, even ionised Hydrogen. If we look at this wikipedia article

http://en.wikipedia.org/wiki/Nascent_hydrogen

We can see there are two recommended ways of making atomic Hydrogen, an electron arc or UV light. Since It requires a minimum of 13.6eV to ionise a *Hydrogen atom* in its ground state. Using this calculator

http://www.calctool.org/CALC/other/converters/e_of_photon

We need a UV wavelength of 91nm or shorter which is in the Extreme UV (EUV) range - and these are tough to generate. There are suppliers of suitable generators used in the semiconductor industry, but they are very expensive.

So do we need to in-situ dissociate H₂ and ionise it?

Maybe K (potassium) could be a key part of the story... Why?

Potassium-40 decays to argon-40 and calcium-40 with a half-life of 1.25 billion years. Here are some decay modes

http://wiki.answers.com/Q/What_is_the_nuclear_decay_equation_for_potassium-40

"As 40K is a alpha and beta- emitter it produces the alpha particle which is an ionised He atom and so as soon as it interact with H this will capture the electron of H to liberate the proton and then continues onto interacting with another H and ionise it also. Meanwhile the beta-emission being electrons are liberated from any atom will participate to ionisation"

10.7% of K decay events lead to Gamma Rays with 1461 keV - quite a bit more than the 13.6eV required to ionise Hydrogen in its ground state.

So what would be the highest temperature K containing compound for powder experiments?

Potassium Titanate is a good candidate for nickel powder experiments with a melting point of 1150 degrees centigrade and may help prevent sintering. Often this

compound is used in the friction or welding industries - a non-fibrous form (better from a health perspective) can be found here:

<http://tamceramics.com/products/titanates/fiber-free-potassium-titanate>

Also, of possible interest is this Potassium Titanate supported palladium catalyst

<http://www.sciencedirect.com/science/article/pii/S1566736708000721>

Could the decay of K be enough to catalyse the Nickel Hydride at temperature which would, following transmutation then see enough particles for further sustained but nuclear interaction?

so natural 40K is 31 Bq/g if it works at all - this may be enough.

Also, could immersing Celani wire in KOH and then drying it, end up with enough 40K in very close proximity to the Nano structures?