

Low Energy Nuclear Reactions: 2007 Update

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“Cold Fusion”: Major Problems !

1. Poor repeatability
2. No replicators to support independent confirmation
3. Weak corroborative nuclear evidence
4. Gamma / neutron data was in error
5. Appeared to contradict laws of physics

18 Years Later ... LENR (Low Energy Nuclear Reactions)

1. High repeatability
2. U.S. Navy SPAWAR co-deposition - narrow replications
3. Excess heat and transmutations - broad replications
4. Expansive corroborative nuclear evidence
5. Proposed Widom-Larsen theory

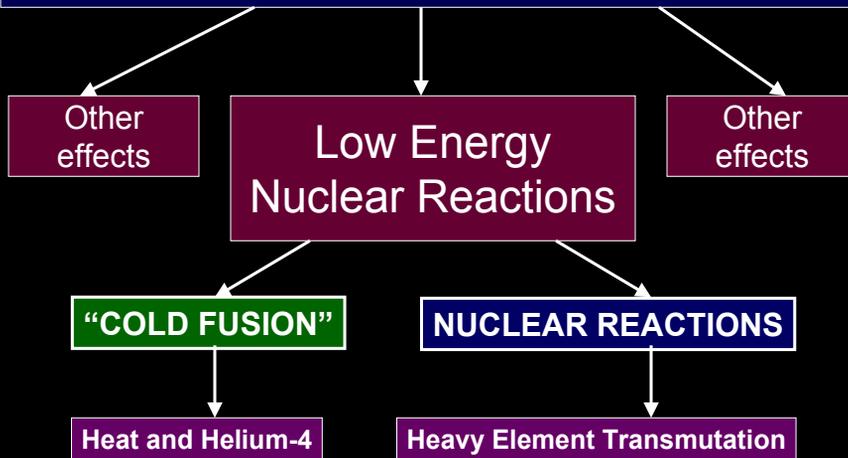
Cold Fusion? Maybe, Maybe Not

Could be fusion ...

Could be something else ...

Either way – potentially significant

Condensed Matter Nuclear Science



Many Methods Claimed

For example:

- Electrolysis (3 methods)
- Gas (2 methods)
- Cavitation (3 methods)
- Others

Threshold Parameters for the Excess Heat Reaction

(McKubre - SRI International)

1. Minimum Atomic Ratio D:Pd (> 0.90)
2. Minimum Current Density (250 mA/cm^2)
3. Dynamic Trigger

It's a Materials
Science Problem!

U.S. Navy SPAWAR Co-Deposition CR-39 Nuclear Track Detector Experiment

1. **Repeatable on Demand**
2. **Tracks on front and back of CR-39 – both sets spatially correlated to cathode**
3. **Emissions penetrate 1mm thick plastic**
4. **“Dry” as well as “wet” geometries**
5. **Energy calculations under way**

Widom-Larsen Theory

Highlights of Claims:

1. Not fusion/fission; weak interactions
2. Explains most anomalous experimental data in "cold fusion"
3. Matches Miley, possibly Iwamura data
4. Explains light and heavy hydrogen experiments
5. No "new physics"

www.newenergytimes.com/wltheory

Nuclear Ash

Products/Effects	D/Pd	H/Pd
Heat	10^{12} events/s/W	Minor
Helium-4	10^{11} events/s/W	n/a
Tritium	10^4 events/s	n/a
(Fast? Slow?) Neutrons	Uncertain	Uncertain
Charged Particles	Yes	Uncertain
Heavy Element Transmutation	Minor	Major
Gamma-Rays	Yes	Unknown
X-Rays	Yes	Unknown
Hot Spots on Cathodes	Yes	Unknown
Craters, Melting, Vaporization	Yes	Unknown

www.newenergytimes.com
www.LENR.org

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