**Keith Dixon-Roche © 01/01/18**



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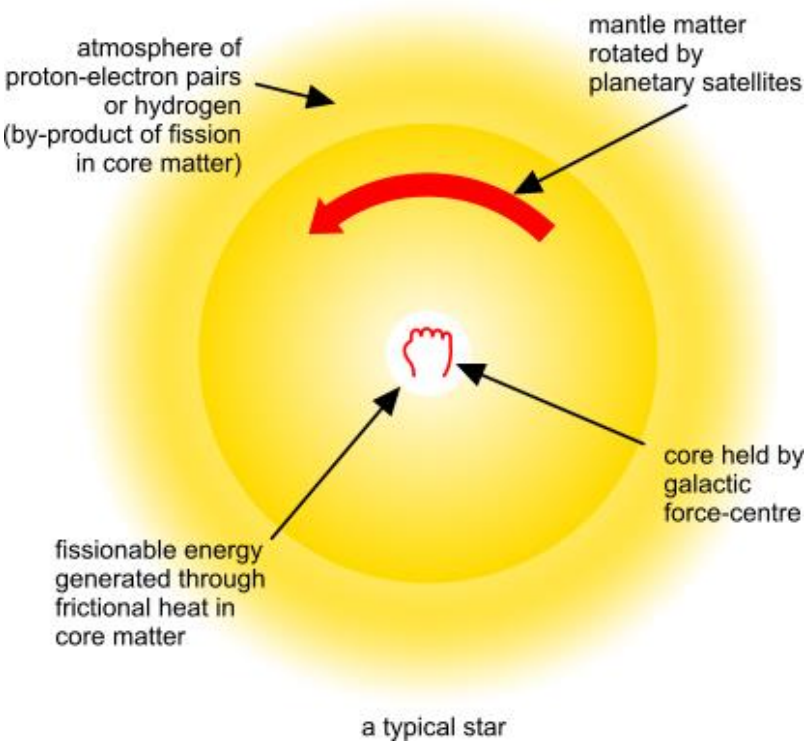
**Important Note:**
*Fusion is not the source of energy in stars (it is fission), and it is not the answer to our energy crisis. Fusion only occurs naturally in the cores of large cold bodies, such as galactic force-centres. It requires the input of energy; it does not generate energy.*



a typical star

**Neutron Energy**

All neutrons are proton-electron pairs that were united in stars (see image), under high-temperature, during previous universal periods. They do not, and cannot, exist outside atoms. Neutrons contain and are responsible for the release of all heat (electro-magnetic) energy. There is no other source of stored energy in the universe.

The reason why we still use dangerous radioactive matter to release neutron energy (nuclear power stations) is because we still don't understand where this energy originates. That should no longer be the case. Not only do we know where it is stored (in all matter) and where and how it was created, but also how to release it; exactly as it is released in bright stars ...

... by adding sufficient heat to atoms to cause their innermost proton-electron pairs to unite, creating additional neutrons in their nuclei. If this heat is applied until their neutronic ratio exceeds 1.6, their neutrons will be split into their component parts (a proton and an electron), releasing their stored energy. Those protons that fail to escape their nuclei will release their energy in the form of heat (electro-magnetic) energy, and those that manage to escape will be ejected at such a velocity that they will impact and split neighbouring neutrons releasing more energy; a chain reaction. But there is a difference between releasing neutron energy in non-radioactive matter and the way we do it today:

*a chain-reaction can be switched off when generated in non-radioactive matter, just like it could be in a star if it lost its planets, simply by removing its heat source.*

The amount of energy released from a neutronic chain reaction is such that, once initiated, it can feed itself until removed. A simple method of releasing this energy is also provided on this website.

Another huge benefit of this knowledge is that we could clean up all pollution - including the radioactive mess we have created since the 1950s - by converting it all to hydrogen gas, extracting its energy as we do so.

**This is the only genuine method for cleaning up our planet.**

**Title of the Invention:**

The safe and controlled release of neutron energy.

**Abstract:**

Neutrons are the source of all universal energy, and the fission generated in a star's core is the most efficient method for releasing it. It is how stars augment their planetary spin energy to create their intense heat and light.

The present invention relates to a theoretical method for the safe and controlled release of neutron energy for use in domestic, industrial and commercial applications, using fuel that is free to everyone, infinitely available throughout time and the universe, and the by-product of which is clean and safe.

**Cited Patents**

none

**References:**

The Life & Times of the Neutron; Keith Dixon-Roche; ISBN 978-1-08251-683-2

The Mathematical Laws of Natural Science; Keith Dixon-Roche; ISBN 979-8-61029-449-0

**Definitions:**

By definition: **electro-magnetic energy** shall mean the massless radiated electrical and magnetic wave-energy radiated by a proton-electron pair commensurate with the electron's orbital velocity. Electro-magnetic energy is what we generally refer to as gamma, X, light, radio, micro, heat, etc. It travels at a constant velocity of light-speed irrespective of its intensity.

By definition: **EME** shall mean electro-magnetic energy.

By definition: **light-speed** shall mean the velocity of EME through a medium,
where: for example, the velocity of EME through a vacuum is approximately 299792459 metres per second.

By definition: **fission** shall mean the splitting of neutrons into their component parts; a proton and an electron.

By definition: **alpha-particle** shall mean a proton ejected from an element when a neutron is separated into its component parts (an electron and a proton).

By definition: **beta-particle** shall mean an electron ejected from an element when a neutron is separated into its component parts (an electron and a proton).

By definition: **proton-electron pair** shall mean a proton partnered with an orbiting electron.

By definition: **hydrogen** (atom) shall mean a proton-electron pair.

By definition: **deuterium** (atom) shall mean a hydrogen atom with a single neutron attached.

By definition: **tritium** (atom) shall mean a hydrogen atom with two neutrons attached.

By definition: **helium** (element) shall mean an element comprising two deuterium atoms.

By definition: **particles** shall mean the electron and the proton that together constitute a proton-electron-pair.

By definition: **neutron** shall mean an atomic particle comprising a proton-electron pair that united when the orbiting electron had achieved light-speed. Note: neutrons are only created inside an element and cannot exist alone.

By definition: **atomic nucleus** shall mean the collection of protons and neutrons in the core of an element.

By definition: **neutron-creation** shall mean the uniting of an element's proton-electron pair(s) whose electrons orbiting in shell-1 achieve light-speed.

By definition: **shell** shall mean the orbit of an element's orbiting electron. Each shell contains two electrons and is equally spaced from its neighbouring shells. Shells are referred to as follows; the innermost shell as number one, the next shell as number two, and so forth. There are no valences. All electrons lost to an atom through electrical current are stripped from the outermost shell progressively inwards. A valency created by an electron knocked from an inner shell will immediately be filled by an electron orbiting in the next outer shell. All other outer electrons will subsequently relocate inwards until all valences are filled and all electrical forces balance. Shell radii are inversely proportional to the electron's orbital velocity. In any and all elements, the orbital velocity of the electron(s) in shell-1 is greatest, the orbital velocity of the electron(s) in shell-2 is less, the orbital velocity of the electron(s) in shell-3 is proportionally lesser still, and so forth.

By definition: **atom** is a deuterium or tritium atom.

By definition: Isaac Newton's **atomic constant of proportionality**: **K** = 0.15587874533403 $s^2/m^3$

By definition: **element** is a collection of deuterium and tritium atoms.

By definition: **neutronic ratio** shall mean the relative elemental population of tritium atoms to deuterium atoms, which may vary as follows,
Maximum theoretical range; $1 \leq \psi \leq 2$
Limiting practical range; $1 \leq \psi \leq 1.66666$
Natural range; $1 \leq \psi \leq 1.6$

By definition: **critical ratio** shall mean a neutronic ratio that exceeds the maximum in nature; $\psi \geq 1.6$.

By definition: **neutronic radius** shall mean an electron's orbital radius when it achieves light-speed and immediately before it unites with its proton partner to create a neutron;
$\mathbf{R_n}$ = 2.81793795383896E-15 metres

By definition: **neutronic temperature** shall mean the electro-magnetic energy radiated when an orbiting electron achieves light-speed,
where: $\mathbf{T_n}$ = 623316124.717178 Kelvin.

By definition: **neutron-energy** shall mean the energy stored in a neutron (all neutrons store the same energy), which is the sum of all energies (kinetic plus potential plus spin) generated by the particles at the time of their union as a neutron,
where: $E_n$ = |KE| + |PE| + |SE| = 1.6374222445251E-13 Joules

By definition: **neutron-energy release** shall mean the splitting of neutrons into their component parts in the form of alpha and beta particles, or their reversion to proton-electron pairs. This will begin to occur when the targeted element exceeds the critical ratio. This energy will be released as a combination of heat (EME) and alpha and beta particles.

By definition: **controlled release** shall mean the ability to automatically or manually inhibit further release of neutron-energy.

By definition: **neutron depletion** shall mean the release of neutron-energy from a fuel's elements.

By definition: **fuel** shall mean any matter or substance of any mass comprising any combination of elements irrespective of radioactive level.

By definition: **by-product** (or residual) shall mean the matter remaining after an element has been reduced to atoms through neutron-energy release. This residual will comprise mostly (>99%) hydrogen and helium, and to a lesser extent (<1%) deuterium & traces of tritium.

By definition: **ejection velocity** is the velocity at which a proton is ejected at the time of neutron-energy release, which is calculated as follows:
$F = k.e^2/Ø_n^2$ {kg.m/s$^2$}
$a = F/m_p$ {m/s$^2$}
$v = \sqrt{[\ a.Ø_n\ ]}$ {(m/s)$^2$}
$v^2 = k.e^2.Ø_n / m_p.Ø_n^2 = k.e^2 / m_p.Ø_n$ { (m/s)$^2$}
v = 6,230,746.60879046 m/s

By definition: a **chain reaction** shall mean the compound release of neutron-energy due to the kinetic energy in the alpha particles. A single proton ejected from a neutron will split (through impact) numerous neighbouring neutrons, each of which will release the energy from more neighbouring neutrons, and so forth. Protons will travel at ejection velocity over an inter-atomic distance of <1E-09 metres (the spacing between adjacent neutrons) resulting in a period between neutron-energy releases of <1.605E-16 seconds. Protons will not impact neighbouring protons due to their identical electrical charges.

By definition: **activation energy** shall mean a source of EME applied to an atom for the purpose of generating new neutrons.

**Description:**

An orbiting electron - not an electron in free-flight - retrieves EME from its surroundings, which it converts to kinetic energy. It simultaneously transfers this energy to its proton-partner, which uses it to augment its positive electrical charge. As a result, the pair radiate EME of the same magnitude and characteristics as that which the electron absorbed. The EME generated by the proton-electron pair varies proportionally with the surrounding EME.

A neutron is created (only within an element) as a result of constantly applied EME sufficient to raise the velocity of its shell-1 electron(s) to light-speed.

When, as a result of continual neutron generation, the element achieves a neutronic ratio greater than the critical ratio, it will eject two of its neutrons, thereby initiating a chain-reaction.

If a released proton is unable to escape from its atomic nucleus, the resulting proton-electron pair will release its neutron-energy as EME (heat), and the element's atomic number (Z) will increase by one.

If a proton escapes its atomic nucleus, the proton-electron pair will be ejected from the element as alpha and beta particles with kinetic energy commensurate with neutron-energy. Each kinetic proton will release - through impact - neutron energy from numerous neighbouring neutrons liberating considerably greater energy than the activation energy required to initiate the chain-reaction, which can be reduced (or stopped) in non-radioactive matter simply by reducing (or deactivating) the heat energy source.

Table 1 describes the reduction (elemental change) of an iron atom through neutron creation:

| **Property** | **Iron** | **Chromium** | **Titanium** | **Calcium** |
|---:|---:|---:|---:|---:|
| neutrons created | 0 | 2 | 4 | 6 |
| atomic number | 26 | 24 | 22 | 20 |
| energy input (J) | 0 | 5.207222E-13 | 5.081266E-13 | 4.944814E-13 |
| neutrons / element | 29.847 | 31.847 | 33.847 | 35.847 |
| **Ψ** | **1.147961538** | **1.326958333** | **1.5385** | **1.79235** |
| neutron factor | 0.534442316 | 0.570254445 | 0.606066575 | 0.641878704 |
| neutrons (/kg) | 3.1935000E+26 | 3.4074900E+26 | 3.6214800E+26 | 3.8354700E+26 |
| neutron energy (J/kg) | 5.2291049E+13 | 5.5794989E+13 | 5.9298929E+13 | 6.2802869E+13 |
| **Table 1: Neutron Creation in an Iron Element** | | | | |

An ejected proton (alpha-particle) will lose negligible kinetic energy on its way through a one-kilogram mass of iron, and could conceivably impact at least one neutron per element in its path. Therefore, two ejected protons (both proton-electron pairs in shell-1) could theoretically release the energy from 62,427,686 neutrons; making the system up to six-billion per-cent efficient.

The energy required to unite both shell-1 proton-electron pairs in an iron atom may be calculated thus:

Electron velocity in each shell: $v_n = \sqrt{[\ (2\pi)^2 / K.n.R_n\ ]}$

Electron kinetic energy in each shell: $KE_n = ½.m_e.v_n^2$

Total KE = $2\ .\ {}_{n=1}\Sigma^{n=13} KE_n$

*where subscript 'n' and variable 'n' defines the electron shell number and $R_n$ is the neutronic radius (constant)*

| Element | Shell (full) | $v_e$ | $KE_e$ | KE (total) |
|---|---|---|---|---|
| helium | 1 | 299792459 | 4.094E-14 | 8.187E-14 |
| beryllium | 2 | 211985281 | 2.047E-14 | 1.228E-13 |
| carbon | 3 | 173085257 | 1.365E-14 | 1.501E-13 |
| oxygen | 4 | 149896230 | 1.023E-14 | 1.706E-13 |
| neon | 5 | 134071264 | 8.187E-15 | 1.869E-13 |
| magnesium | 6 | 122389759 | 6.823E-15 | 2.006E-13 |
| silicon | 7 | 113310899 | 5.848E-15 | 2.123E-13 |
| sulphur | 8 | 105992640 | 5.117E-15 | 2.225E-13 |
| argon | 9 | 99930820 | 4.548E-15 | 2.316E-13 |
| calcium | 10 | 94802700 | 4.094E-15 | 2.398E-13 |
| titanium | 11 | 90390827 | 3.721E-15 | 2.472E-13 |
| chromium | 12 | 86542628 | 3.411E-15 | 2.541E-13 |
| iron | 13 | 83147468 | 3.149E-15 | 2.604E-13 |
| nickel | 14 | 80122905 | 2.924E-15 | 2.662E-13 |
| zinc | 15 | 77406080 | 2.729E-15 | 2.717E-13 |
| germanium | 16 | 74948115 | 2.558E-15 | 2.768E-13 |
| selenium | 17 | 72710351 | 2.408E-15 | 2.816E-13 |
| bromine | 18 | 70661760 | 2.274E-15 | 2.861E-13 |
| strontium | 19 | 68777107 | 2.155E-15 | 2.905E-13 |
| zirconium | 20 | 67035632 | 2.047E-15 | 2.946E-13 |
| molybdenum | 21 | 65420078 | 1.949E-15 | 2.984E-13 |
| ruthenium | 22 | 63915967 | 1.861E-15 | 3.022E-13 |
| palladium | 23 | 62511049 | 1.780E-15 | 3.057E-13 |
| cadmium | 24 | 61194879 | 1.706E-15 | 3.091E-13 |
| tin | 25 | 59958492 | 1.637E-15 | 3.124E-13 |
| tellurium | 26 | 58794138 | 1.574E-15 | 3.156E-13 |
| xenon | 27 | 57695086 | 1.516E-15 | 3.186E-13 |
| barium | 28 | 56655449 | 1.462E-15 | 3.215E-13 |

**Table2: Neutron Generation Energy**

Element: represents elements with two electrons in the outer shell

Shell (full): represents the occupied shell numbers (two electrons per shell)

$KE_e$: represents the electron kinetic energy in a single electron in the respective shell number

KE (total): represents the total energy required in the element to create two neutrons in shell-1

(note: *the velocity in shell-1 is light-speed and helium elements cannot be converted to neutrons*)

The activation energy required to eject the first two neutrons in an iron atom is therefore;

2.604E-13 + 2.541E-13 + 2.472E-13 = 7.617E-13 Joules.

**Benefits:**

1) Any and all matter contains neutrons. Therefore, any and all matter may be used as a fuel.
2) Because this invention does not require fuel of critical mass, its fuel mass size is unlimited.
3) Whilst this invention is a similar process to that which occurs naturally in a nuclear reactor, it is not dangerous and does not generate nuclear waste.
4) This invention can be used to convert high-proton elements to lower-proton elements; e.g. uranium to gold. Therefore, it can be used to recycle nuclear waste (to hydrogen and helium).
5) The by-product of this energy generation method is safe and clean.
6) The protons (alpha particles) released by this method can be used for '*zero-cost*' cancer treatment precluding the need for expensive cyclotrons.
7) The fuel can be any matter without exception; it can be household or garden waste, soil or rocks. It is therefore free of cost to everybody.
8) There is no more need for mining or drilling (oil).
9) It eliminates the need for today's expensive and inefficient energy generation methods; solar, wave and wind power; nuclear power-stations; fossil fuelled power stations, hydro-dam electricity generation, etc.
10) Because the fuel size is unlimited, every building in the world, no matter how large or small can have its own dedicated electricity generator that will cost nothing to fuel. This capability eliminates the need for electricity distribution systems; cables, transformers, pylons, trenching, etc. Moreover, suitable fuel-cells may be safely installed in vehicles.
11) There is sufficient neutron energy in one metre of the earth's crust to fuel the human race for 1E+14 years, so this invention will obviate the need for future alternative fuel sources. Therefore, mankind can continually improve the range and efficiency of this energy generation method knowing that its fuel source will never run-out.

FIG ①

The neutron energy in a beach pebble - FIG ① - contains 5.9E+12 Joules of neutron energy. It will fuel an average UK household for 75 years or a family saloon (vehicle) for 100 years.

By way of illustration, if iron were selected as the fuel, the activation energy for a single atom (9.82453E-13 Joules) will release up to 2.0444E-05 Joules of neutron-energy, making this energy generation method 2,080,913,794% efficient. And this neutron-energy release will continue whilst the activation energy is supplied to the fuel.

Cessation of this chain reaction will occur either when all the excess neutrons in the fuel have been ejected or when the input energy is switched off.

After initiation, the activation energy may be supplied from the energy generated by the chain reaction, making the process self-activating until the fuel is exhausted or the heat source is switched off.

This process may continue until all of the fuel has been converted to hydrogen and helium gas.

System efficiency is dependent upon the ability to focus the activation energy. The smaller the focal area the greater the system efficiency. It is envisaged that greatest efficiency will be achieved if the activation energy can be applied over an area with a radius of approximately one nanometre. However, the application of more input energy over a larger area will result in greater output energy.

It is unnecessary to apply an activation energy equivalent to the neutronic temperature. It is only necessary to allow activation energy to accumulate until the neutronic temperature has been reached in a single atom, which is the process that occurs in a star's core.

**Claims:**

Refer to **Definitions** for a definition of the terms used in these claims.

1. The release of neutron energy from non-radioactive matter through fission.

2. The release of neutron energy in non-radioactive matter by increasing its element's neutronic ratio to greater than the critical ratio.

3. Increasing an element's neutronic ratio by converting its innermost proton-electron pairs into neutrons through the application of electro-magnetic energy.

4. Controlling the increase in an element's neutronic ratio by converting its innermost proton-electron pairs into neutrons through the application of concentrated electro-magnetic energy.

5. Termination of neutron-energy release in non-radioactive matter by reducing the activation energy.

6. Termination of neutron-energy release in non-radioactive matter by terminating the activation energy.

7. Reduction of neutron-energy release in non-radioactive matter by reducing the activation energy.

8. Reduction of neutron-energy release in non-radioactive matter by terminating the activation energy.

9. The use of alpha particles released by neutron-energy generation for the treatment of cancerous cells.

10. The by-product of neutron-energy release as hydrogen and helium atoms.