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Hydrogen Subatoms in the Transmutation of Isotopes

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Abstract

It is shown that nuclei colliding in the presence of hydrogen subatoms may achieve a significant convergence by virtue of repulsive-force shielding, thereby substantially increasing the probability of nuclear reaction. What makes the subatomic states of hydrogen so particular is their being spin-oriented with a notably compact localization. In biological structures, the formation of subatoms requires the presence of water with hydrogen ions and parietal formations with an electron-spectrum energy value slightly larger than 6eV.

Keywords: hydrogen subatoms, transmutation of isotopes, biological systems.

Hydrogen subatoms are spin-oriented atoms of hydrogen in their base state, notable for a more compact localization that allows them to approach the nuclei of other elements to significantly closer distances, which in turn increases the probability of nuclear reaction by several orders of magnitude [1]. Let us denote by r_{0i} the threshold radius between the subatom and the nucleus, past which the former ionizes in the outer electric field of the ion:

$$r_{0i} = \frac{9Za}{2(1+Z)^2} \quad (1)$$

Here, Z denotes the atomic number, as given in the periodic table of elements, and $a = \hbar^2 / m\, e^2$ denotes the Bohr radius. As an example, titanium has $r_{0i} = a / 5.34$. In this case, the polarizability of the subatoms will be two orders of magnitudes lower than the standard value for hydrogen atoms. Delivering a proton in an electron shell at such distances to nuclei of, let's say, nickel (Z = 28) is equivalent in energy to that of a projectile proton of approximately 5keV, and should increase the probability of nuclear reaction considerably [2].

In our opinion, the results from the many years of experiments aimed at the realization of controllable nuclear fusion of isotopes in growing microbiological cultures deserve close attention and a consistent explanation [3]. A number of such explanations exists. Specifically, the authors of the monograph of [3] have proposed a model based on the particular nature of barrierless nuclear reactions in non-stationary nuclear systems. This model describes the quantum movement of two uncharged particles in a parabolic cavity, formed by the external environment, with a discrete quantum spectrum. However, the particles *are* later assumed to be charged in the Born approximation for Coulomb particles that is used in computing the scattering cross section.

We wish to demonstrate that the movement of two charged nuclei in a hydrogen-subatom field may lead to a significant convergence of these nuclei, which may increase the probability of nuclear reaction under normal room-temperature conditions.

Let us formulate the equations of motion for the hydrogen subatom in a field of nuclei with atomic numbers Z_1 and Z_2, corresponding to what is shown in Fig. 1.

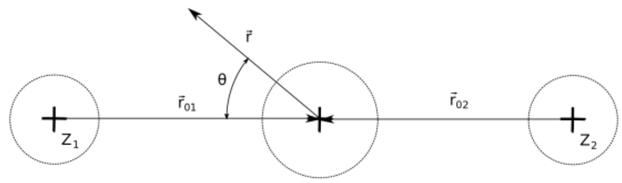

Figure 1: Hydrogen subatom in a field of two charged particles.

$$-\frac{\hbar^2}{2m}\Delta\,\Psi(\vec{r},\vec{r}_{01},\vec{r}_{02}) - \frac{e^2\Psi}{\vec{r}} - \frac{e^2 Z_1\Psi}{|\vec{r}+\vec{r}_{01}|} - \frac{e^2 Z_2\Psi}{|\vec{r}+\vec{r}_{02}|} = (E^* - \varepsilon)\Psi(\vec{r},\vec{r}_{01},\vec{r}_{02}) \quad (1)$$

$$E^* = mc^2 - \frac{e^2 Z_1}{r_{01}} - \frac{e^2 Z_2}{r_{02}} - \frac{e^2 Z_1 Z_2}{r_{01}+r_{02}}$$

Here, r_{01}, r_{02} are the problem parameters. When $r_{01}, r_{02} >> r$, we may use (1) to obtain the equation that describes the energy spectrum for the hydrogen subatom [1]

$$-\frac{\hbar^2}{2m}\Delta\,\Psi(\vec{r}) - \frac{e^2\Psi}{\vec{r}} = (mc^2 - \varepsilon)\Psi(\vec{r}) \quad (2)$$

The solution of Equation (2) yields:

$$\varepsilon = m\,c^2 + \frac{2e^2}{9a} \quad (3)$$

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An energy diagram of the hydrogen subatom is presented in Fig. 2.

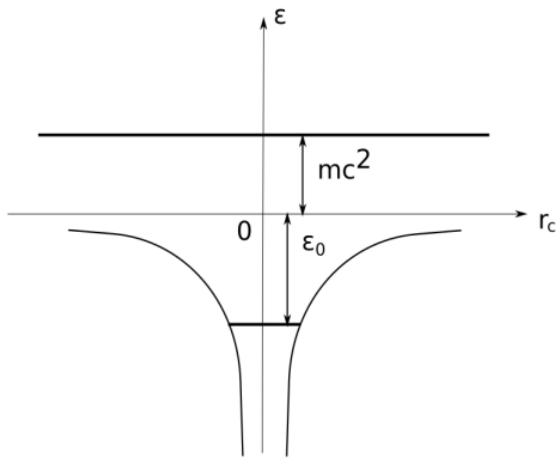

Figure 2: Energy diagram for the hydrogen subatom.

Let us consider the case when $r_{01} << r$. In this case,

$$\frac{1}{|\vec{r}+\vec{r}_{01}|}=\frac{1}{\sqrt{r^2+{r_{01}}^2-2rr_{01}\cos\Theta}}\approx\frac{1}{r} \quad (4)$$

noting that $\Theta\sim\pi/2$ for hydrogen subatoms [1]. An analogous expression may be obtained for $r_{02}<< r$.

Thus, we may reformulate Equation (1) as

$$-\frac{\hbar^2}{2m}\Delta\ \Psi\ (\vec{r}\ ,r_{01},r_{02})-\frac{e^2(1+Z_1+Z_2)\Psi}{\vec{r}} =(E^*\ -\varepsilon)\Psi\ (\vec{r}\ ,r_{01},r_{02}) \quad (5)$$

This equation is analogous to Equation (2), and so we may readily state its solution.

$$\varepsilon=mc^2+\frac{2e^2}{9a}(1+Z_1+Z_2)^2-\frac{e^2Z_1}{r_{01}}-\frac{e^2Z_2}{r_{02}}-\frac{e^2Z_1Z_2}{r_{01}+r_{02}} \quad (6)$$

The electron will be free if the following equation holds:

$$\frac{2e^2}{9a}(1+Z_1+Z_2)^2=\frac{e^2Z_1}{r_{01}}+\frac{e^2Z_2}{r_{02}}+\frac{e^2Z_1Z_2}{r_{01}+r_{02}} \quad (7)$$

From this relationship, we may then find the minimum distance for the possible convergence of the nuclei.

$$r_{01}+r_{02}=\frac{9aZ_1Z_2}{2(1+Z_1+Z_2)^2-9a(Z_1/r_{01}+Z_2/r_{02})} \quad (8)$$

When Z_1 , Z_2 >> 1, we have the approximate expression

$$r_{01}+r_{02}\geq\frac{9a(2Z_1+2Z_2+Z_1Z_2)}{2(1+Z_1+Z_2)^2} \quad (9)$$

In this case, the Coulomb repulsion energy for nuclei at this distance is equivalent to the energy of colliding nuclei:

$$\Delta E\leq\frac{2e^2Z_1Z_2(1+Z_1+Z_2)^2}{9a(2Z_1+2Z_2+Z_1Z_2)} \quad (10)$$

As an example, for the case of the nuclei of magnesium ($_{12}Mg$) and oxygen ($_8O$) colliding with a hydrogen subatom, we have $\Delta E\approx 1.9$keV, which should increase the probability of nuclear reaction significantly. Such a reaction has been observed in biological cultures [3]. In collisions of this nature, the hydrogen subatom may act as an electron shield (a "catalyzer"), stimulating nuclear reactions without taking part in them. In Equation (9), we see that the greater the charge of the nuclei, the smaller the distances to which they can approach one another, which is in agreement with the views of the authors of [3].

For the formation of hydrogen subatoms in biological structures, it is necessary that there be hydrogen ions and walls possessing a complete electron spectrum with energies slightly larger than 6eV. In this case, the hydrogen ions, located close to the wall, will be able to take electrons to the subatomic level through tunneling. Traces of the hydrogen subatoms should be visible in the ultraviolet range through radiation or absorption of quantums with the energy

$$\Delta\varepsilon=\frac{2e^2}{9a}=6.02eV \quad (11)$$

In biological systems, it is possible to have "paired" reactions, where one of the nuclei directly collides with the hydrogen subatom, $^*H^1$. For example:

$$K^{41}+\ ^*H^1=\ Ca^{42}+e+\Delta\varepsilon \quad (12)$$

Here, the energy release due to this reaction would be $\Delta\varepsilon=$ 9,96*10^3keV. Reactions of this type have been observed experimentally and are described in [3].

As such, it is not just the surrounding environment, as discussed in [3], but also its composition – for example, the presence of hydrogen subatoms – that may have a noticeable influence on the interactions between the colliding nuclei.

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