

The feasibility of Cold Fusion according to the BSM - Supergravitation Unified theory

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After Fleischmann and Pons claimed successful cold fusion in 1989, the effect has been officially denied but interest in this option for solving the energy crisis has never dismissed. Many researchers around the world have reported successful experiments in a number of international conferences. The results however have not been taken seriously by government agencies that fund research. One of the main reasons is the lack of a theoretical explanation based on current understanding of nuclear physics. Recently, interest in cold fusion was raised again by Italian researchers Sergio Focardi and Andrea Rossi at University of Bologna, who claimed that they had obtained a nuclear process with a significant heat output [1]. One of the main arguments against cold fusion by the nuclear theorists is the lack of gamma rays or a reliable proof of fusion by-products. In the race to Cold Fusion, one of the first researchers who obtained Helium using palladium as a catalyst in a deuterium atmosphere was Dr. Les Case [2]. Other researchers repeated the experiment with different degrees of success, but a number of them claimed to have obtained helium. This means that a nuclear reaction $D+D \rightarrow He$ took place with other nuclear transmutations. The feasibility of cold fusion was theoretically predicted by S. Sarg after he developed the BSM-Supergravitation unified theory [3,4]. One of the main results of this theory is a new vision about the 3D structures of protons and neutrons and their spatial configuration in atomic nuclei. This was presented in the Atlas of Atomic Nuclear Structures (ANS) that was archived in the National Library of Canada [5] and published elsewhere. Based on the 3D nuclear configuration, Stoyan Sarg showed theoretically in 2002 that alpha decay in the heavier elements is preceded by a process of fusion of protons and neutrons into a helium nucleus [6]. Consequently, cold fusion at room temperature is possible under special conditions. The Russian professor Dr. Kanarev also provided experimental and theoretical research on cold fusion and, quite surprisingly, his theory unveiled configurations of nuclear structures [7] that were very similar to those shown in the ANS [5]. There has not been any cooperation between Dr. Sarg and Dr. Kanarev and their theoretical approaches are quite different. Yet they arrived at very similar nuclear configurations. In fact the article of Dr. Kanarev was published just eight months after the articles of Dr. Sarg and his patent USD439,198S.

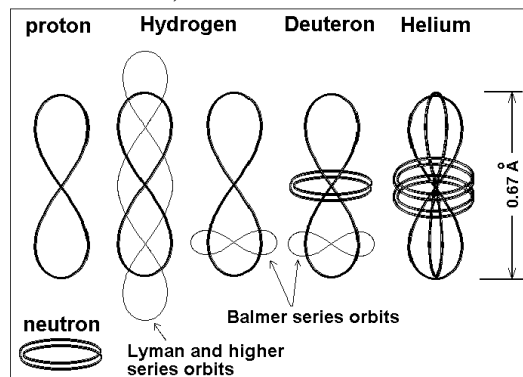
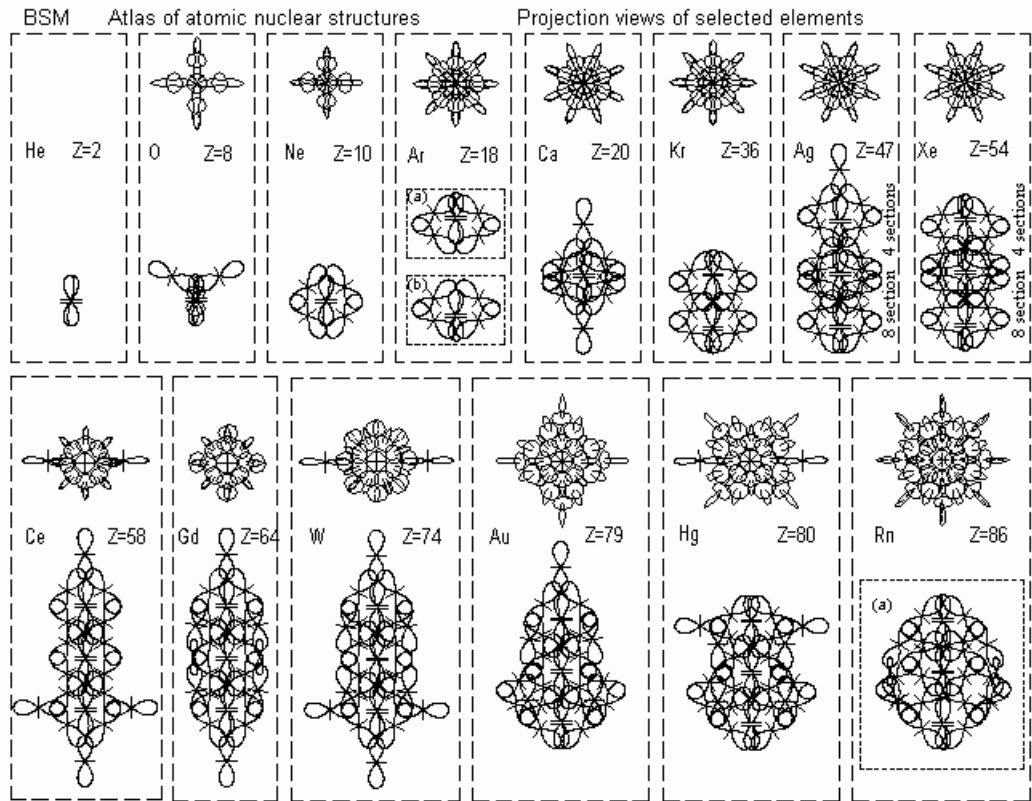


Fig. 1. Shape of the proton and neutron and nuclear configuration of H, D and He atoms according to the BSM-SG theory

Fig. 2. shows an extract from the Atlas of the Nuclear Structures showing the graphical view of some selected atomic nuclei. Fig. 3. shows some atomic nuclei according to Dr. Kanarev [7] The

similarity between the atomic nuclei derived by his theory and those by BSM-SG and the ANS is quite obvious.



Note: (a) and (b) are polar sections of the nucleus with two selected planes. The angle between them is 22.5°

Fig. 2. Extract from the Atlas of the Nuclear Structures showing the graphical view of some selected atomic nuclei [5]

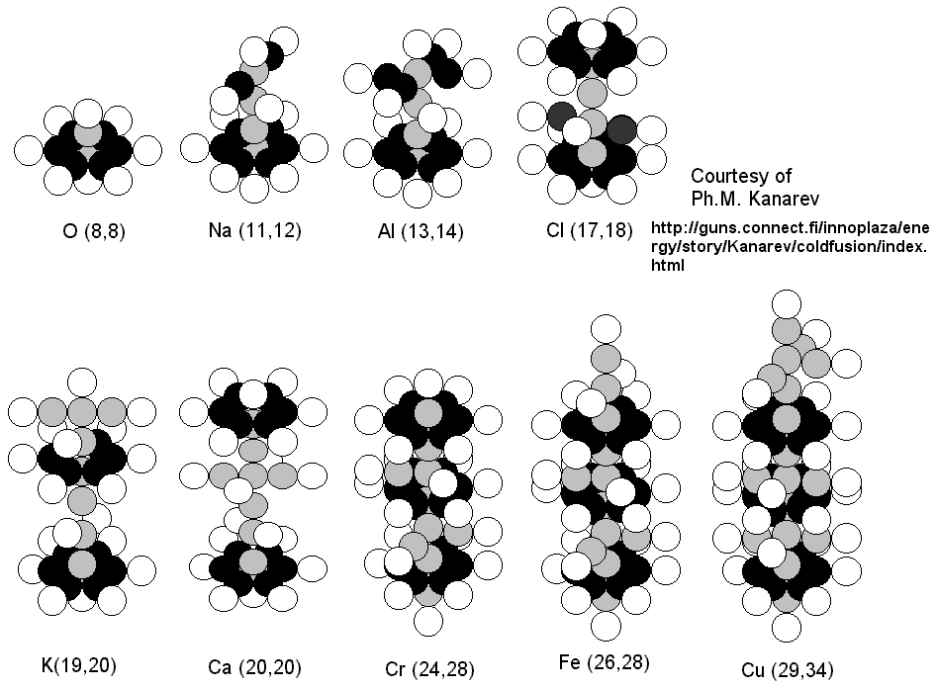


Fig. 3. Some atomic nuclei according to Dr. Kanarev. Courtesy of Kanarev [7]. The similarity to the atomic structure derived by S. Sarg in BSM-SG and shown in ANS [5] and Fig. 2 is obvious

Fig. 4 shows the position of the two deuterons in the atomic nucleus of Gadolinium (Gd). They fuse into a helium nucleus in the alpha radioactive decay that occurs at room temperature.

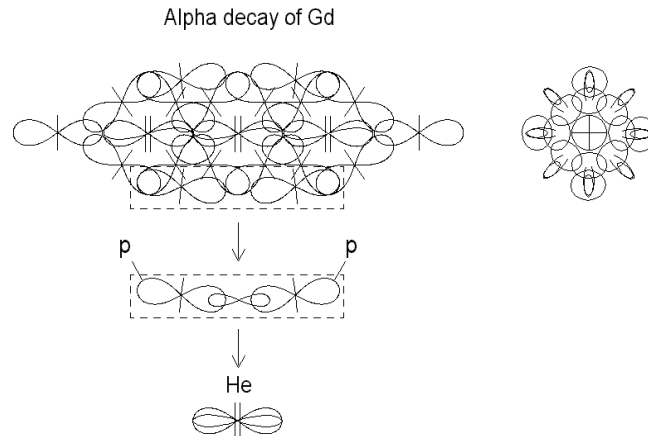


Fig. 4. Alpha decay of Gd. The position of the two protons (deuterons) are shown prior to their fusion into helium nucleus. Only the protons and deuterons at the axial section of the Gd nucleus are shown.

Fig. 5. Shows the role of Palladium as a catalyst in the Dr. Less Case experiment, from the point of view of the BSM-Supergravitation Unified theory and the Atlas of the Atomic Nuclear Structures. Note that the upper section of the Palladium atom contains 4 pairs of deuterons, while the bottom two sections contain 8 deuteron pairs. The deuterium molecule shown in the upper right part of Fig. 3 becomes trapped in the upper section of the Pd atomic nucleus where the Supergravitational forces are quite strong and the fusion of the two deuterons into a helium nucleus takes place.

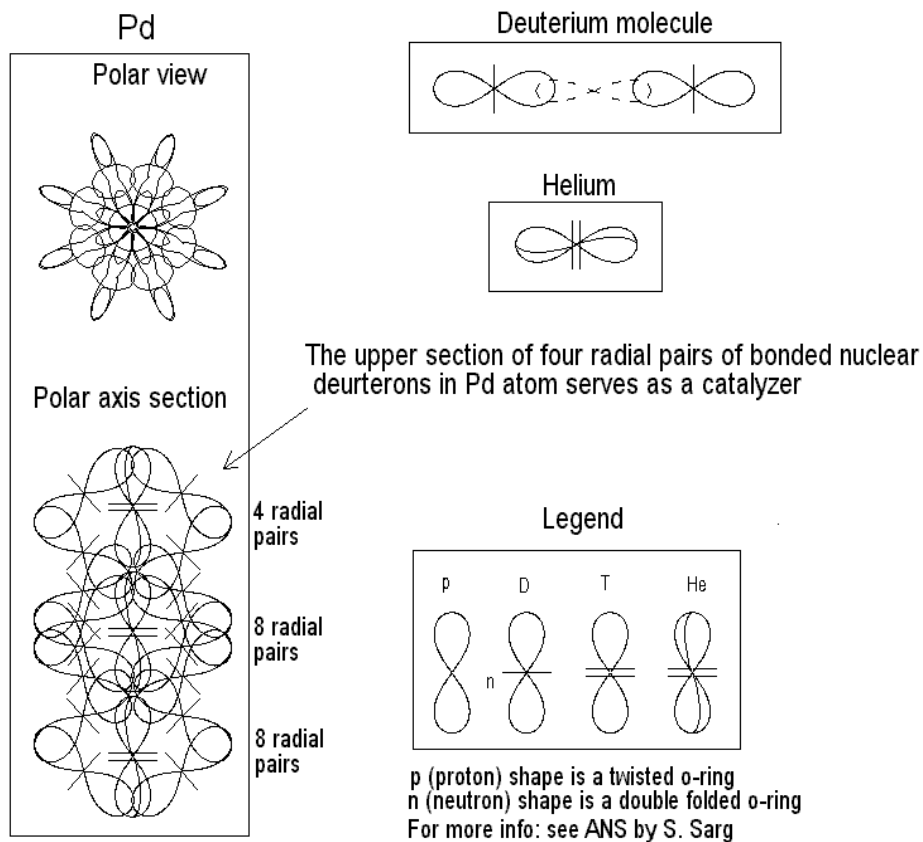


Fig. 5. The role of Palladium as a catalyst for $D+D \rightarrow He$ nuclear reaction, from the point of view of the BSM-Supergravitation Unified theory and the Atlas of the Atomic Nuclear Structures.

Conclusion: The cold fusion feasibility is analyzed using the nuclear structures suggested by the BSM – Supergravitation Unified Theory. The alpha decay is similar to cold fusion which is possible because the deuterons are very close to the other nucleons of the atomic nucleus. In such an environment, the fusion process is feasible because the strong Supergravitation (nuclear) forces are involved. Similar conditions could be created when deuterons penetrate into the metal lattice of some elements serving as catalysts. The fusion or nuclear transmutation could be invoked by an electric arc (plasma electrolysis) or ultrasound treatment if using a proper catalyst at room or some elevated but not very high temperature.

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