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Is cold fusion a natural phenomenon?

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For more than quarter of a century, cold fusion was considered impossible, as there was no theoretical base for it. The solution to this puzzle is surprisingly simple. The supercomputers are available only in recent years. A powerful computer and the low energy quantum scattering theory solved the problem. A six-open channel Faddeev equation calculation was carried out a few years ago. The calculation revealed the universal phenomenon, the Stark-effect induced resonances within a colliding system and they are named as Gailitis resonances. Conditions exist when they produce interesting physical phenomena and cold fusion is one example. At resonant energies, a p-state proton approaching a Li isotope with atomic number $A=7$, form Gailitis resonances with the Li atom. This aspect is quite similar to that of muon catalyzed fusion while a negative muon confines the two hydrogen isotopes, $A=2$ and 3 to form a muonic molecule. However, it is the polarizability of the Li atom that enables the formation of Gailitis resonances. In addition, the nucleus of the Gailitis resonance, a p-state proton and the nucleus of the Li atom, has total energy, nuclear angular momentum, and parity to match that of a well-known broad compound nuclear state of Be isotope with $A=8$. That greatly enhances the probability for the proton to enter the nucleus of Li atom and becomes a compound nuclear state of the Be nucleus. This state is known to decay only into two energetic alpha particles. More details can be found in a special issue below.

Biography

Chi Yu Hu has done her PhD from MIT, Cambridge, in the year 1962. She was an Assistant Professor at the California State University, Long Beach, CA (1963-2006) and became a Professor in the year 2006. Some of her publications can be found in ResearchGate. She has been a Guest Editor for a Special Issue "Positron scattering and annihilation with atoms and molecules including emerging new resonances and their applications in other systems".

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