****

http://www.cbsnews.com/8601-100_162-4952167-3.html?assetTypeId=30&blogId=&tag=contentMain;contentBody

by **Brian_Josephson** May 6, 2009 5:01 PM EDT

Larsen talks of 'undying adherence to an ill-founded belief that some sort of fusion process ("cold" D-D fusion in particular) is the underlying mechanism that is responsible for various types of anomalous phenomena', on the face of it in order to promote his own theory of LENR. However, his own paper admits 'final products ... may have fairly high A [atomic number]'. By the dictionary definition this implies fusion (my dictionary gives as one meaning of to fuse: 'to join or become combined', and you can't get a high A from lower A parts without combining things. Should I consider posting him a dictionary in order to encourage him to stop creating confusion (confuse: to make unclear) in this way?

****

http://www.cbsnews.com/8601-100_162-4952167-3.html?assetTypeId=30&blogId=&tag=contentMain;contentBody

by **lewisglarsen** May 6, 2009 7:31 PM EDT

Professor Josephson:

It is axiomatic that use of precise language is very important in science, unlike everyday informal conversation and online Internet banter. My apologies, but you sir are attempting to play sophistic intellectual semantic games with the definition of "fusion." You are trying to employ some sort of 'poetic license' to dramatically broaden the accepted scientific definition of nuclear "fusion" to include neutron capture processes (a key element of the Widom-Larsen theory of LENRs). Your assertion is patently incorrect and violates longstanding common practice in nuclear physics.

The general 'dictionary definition' of "fusion" that you so confidently state in your post: "to join or become combined" is certainly true for broad English usage of that word outside the domain of science. However, as you well know, the word/concept "fusion" takes on a narrower, much more specific meaning in the context of science in general and nuclear physics in particular.

Speaking of dictionaries, in the Oxford Dictionary of Physics (Oxford University Press, Fourth edition, 2000) the entry for "nuclear fusion" on page 323 reads in part as follows:

"Nuclear fusion. 1. A type of nuclear reaction in which atomic nuclei of low atomic number fuse to form a heavier nucleus with the release of large amounts of energy.... in nuclear fusion the two reacting nuclei themselves have to be brought into collision. As both nuclei are positively charged there is a strong repulsive [Coulomb] force between them, which can only be overcome if the reacting nuclei have very high kinetic energies. These high kinetic energies imply temperatures on the order of 10*8 K. As the kinetic energy required increases with the nuclear charge (i.e., atomic number), reactions involving low atomic-number nuclei are the easiest to produce."

So according to the above definition, to be considered a conventionally defined "fusion" process at least two conditions must be fulfilled: (Condition 1) the reacting nuclei must generally have a low atomic number; and (Condition 2) the reacting nuclei are positively charged, i.e, there is a large Coulomb energetic barrier that must either be surmounted with high kinetic energies or somehow tunneled through.

However, neutrons are uncharged particles, which violates Condition 2. By your arbitrary, ad hoc expansion of the definition of "fusion," you are also effectively asserting and in fact explicitly state that nuclear fusion processes take place between elements at high atomic numbers, i.e., high A, which violates Condition 1.

Since your opportunistically 'revised' definition of "fusion" violates both conditions listed in the Oxford Dictionary of Physics, it is incorrect. Your assertion is therefore false. Neutron captures on nuclei at any value of atomic number are not "fusion" processes, at least as far as commonly accepted usage of that term by nuclear physicists is concerned.

Agreeing completely with the definition listed the Oxford Dictionary of Physics, an identical concept of the word "fusion" in a nuclear context is echoed in the well respected nuclear physics textbook by Yang and Hamilton, "Modern Atomic and Nuclear Physics," McGraw-Hill 1996, pp. 592 - 595.

Interestingly, this particular semantic ploy has been attempted before (i.e., ad hoc redefinition of the word "fusion"). Specifically, this issue is discussed in Issue #30 (October 14, 2008) of the e-zine "New Energy Times" at the following,

Source URL = http://www.newenergytimes.com/v2/news/2008/NET30-jgk39gh12f.shtml#looklike

In Item # 24. "Response to 'Anon' on the 24 MeV Belief and the Krivit ACS Presentation" in the subsection 3 titled, "A New Definition of Fusion?"

In conclusion: your self-revised definition of "fusion" is scientifically incorrect and misleading. This will be my final comment in this venue on this subject matter.

****

http://www.cbsnews.com/8601-100_162-4952167-2.html?assetTypeId=30

by **Brian_Josephson** May 9, 2009 4:37 AM EDT

In response to Lewis Larsen: yes, precise use of language is important in science -- in its place. If it were the general practice to use the word fusion to make the distinction Larsen refers to (overcoming the Coulomb barrier being the key factor), it would indeed be an error to use it in a way that ignores that distinction. But as far as I know it is only 2 or 3 people who do insist on the distinction, and I think the lexical opinions of that small minority, which I shall critique in a moment can reasonably be disregarded by the rest.

The Oxford Dictionary of Physics (not the same Oxford Dictionary that places a consciousness conference Ramachandran and I organised in Oxford, I trust, just because the proceedings were pubished by a publisher based in Oxford)? Nice point, but note that the fundamental role of dictionaries is to list the ways in which words are actually used. The editors, logically, should have made reference to cold fusion but may have excluded it on the grounds that it was an error and it was not part of their purpose to include errors in their scholarly work. In other words, it would have been a policy decision not to include cold fusion in their listing of uses of the word fusion. Had it been an accepted phenomenon at the time, I'm sure it would have been included.

Definitions are not meant to be set in stone, but change as science advances. This applies even with fundamental units, whose definitions are changed from time to time since definitions are tied to experimental techniques and sticking to particular definitions may limit the accuracy obtainable while the constant defined differently and it may be better to change it, for example changing which atomic transition is used to define the unit of time.

Point made, I trust, but I'd like to make some other points as well:

1) The term CF has largely been abandoned by the active community in favour of LENR (low energy nuclear reactions). That is not ideal either since there are other LENRs, e.g. reactions involving slow neutrons. Other suggested alternatives have not become popular. The ideal, in my opinion, would have been 'catalysed nuclear reactions', making the point that the reactions go faster than normal but without any commitment to mechanism.

2) Saying 'this is not fusion' is liable to be misinterpreted as casting doubt on the evidence for something anomalous happening, which I think is not your intention. If you were precede the remarks you feel compelled to make with something like 'strictly speaking' the problem would be avoided.

3) The fact that your lexical point is nearly always accompanied by reference to your own theory gives the unfortunate impression that your real aim is publicity for your work, rather than clarifying definitions.

Brian J.

Read more: http://www.cbsnews.com/8601-100_162-4952167-2.html?assetTypeId=30#ixzz0t8vxV0fo

****

http://www.cbsnews.com/8601-100_162-4952167-1.html?assetTypeId=30

by **Brian_Josephson** May 11, 2009 6:23 PM EDT

In answer to Larsen's blind reliance on the dictionary definition of nuclear fusion: "Nuclear fusion. 1. A type of nuclear reaction in which atomic nuclei of low atomic number fuse to form a heavier nucleus with the release of large amounts of energy." I could simply have quoted

http://www.answers.com/topic/transuranium-element

where it says

"Super-heavy atoms have all been created during the latter half of the 20th century and are continually being created during the 21st century as technology advances. They are created through the bombardment of elements in a particle accelerator, for example the nuclear fusion of californium-249 and carbon-12 creates rutherfordium."

Hardly 'low atomic numbers' there (californium has atomic number 98). Definitions move with the times; new technology, new definition.

Read more: http://www.cbsnews.com/8601-100_162-4952167-1.html?assetTypeId=30#ixzz0t8vGz0hp