

1.9: In-Text References

- [illegible]

29. It is these factors that made the report of cold fusion so strange and so exciting to physicists. The temperatures and pressures required for fusion are so high that they are extremely difficult to achieve under controlled conditions. The failure to reproduce the original cold fusion report reinforces our understanding of how atoms interact. That scientists around the world attempted to reproduce the original observation (and failed), illustrates the open-mindedness of the scientific community. The fact that badly controlled and irreproducible observations were published, illustrates how scientific effort and resources (that is, research funds) can be wasted by inadequate pre-publication review. But science, like all human activities, is imperfect. The price for open-mindedness may be be wasted time and effort, yet it remains critical to scientific process and progress. At the same time, once the replication efforts failed, it became a waste of time (or a delusional obsession) to pursue cold fusion. ↩
30. According to Robert Parson, “At 1 atmosphere pressure, Helium does not melt at ANY temperature - it stays liquid down to absolute zero. (If you want to be picky, it is a liquid down to the lowest temperatures that anyone has ever achieved, which are orders of magnitude less than 1 K (http://en.Wikipedia.org/wiki/Dilution_refrigerator), and our best theories predict that it will remain a liquid no matter how low the temperature.) To get solid helium you have to increase the pressure to 25 atmospheres or above. This is one of the most dramatic consequences of zero-point energy: the intermolecular forces in He are so weak that it melts under its own zero point energy. (This leads to the peculiar consequence that Helium at zero Kelvin is a liquid with zero entropy.) ↩
31. In fact this is known as the bond energy – the energy required to break the bond – which in the case of H_2 is 432 kJ/mol ↩

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