

# Correcting the Metallicity Page on Wikipedia

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Abstract: A passage from the metallicity page on Wikipedia is corrected in this paper. Explanation is provided of the issues.

From Wikipedia on metallicity in the first paragraph:

*"...in the high-temperature and pressure environment of a star, atoms do not undergo chemical reactions and effectively have no chemical properties."*

This shows the author a few issues.

1. Stars have high pressures and temperatures, but there are parts to the star that are not high temperature and pressure. Saying all stars are always high pressure and high temperature neglects
  - A. The fact that they cool down and become very low temperature (the temperatures of the outer regions of Jupiter, Neptune, Uranus, etc. are very, very cold)
  - B. The pressures are lower in the outer regions of all stars (in the end result the star even loses its atmosphere completely and the area above the surface becomes vacuum! As is the case of Mercury.)
  - C. The density of the Sun's surface is very, very low, as it is comprised of plasma!
  - D. The temperatures of the surfaces of ancient dead stars rests on their location to hotter, younger hosts, and whether they have oceans, or internal heat that can bubble up through cracks in the crust in the form of liquid hot magma.

Conclusion of temperature and pressure argument: Stars are high and low pressure/temperatures as they evolve. In other words, all stars have weather and are suitable for chemical reactions at various times throughout their evolution.

2. The atoms in stars do not have chemical properties nor do they engage in chemical reactions. This is extremely problematic, and an elementary issue.

A. To form rocks and minerals (which are comprised of atomic arrangements called crystals) as well as the air you breathe and all the naturally occurring chemical compounds in existence, you absolutely need chemical reactions to have taken place. As the Earth is the direct end result of a star's evolutionary path over billions of years and is comprised of vast amounts of chemicals (combined atoms that underwent chemical reactions), we can guarantee that all stars experience chemical reactions on vast scales as they evolve.

B. To form rocks and minerals, life and everything we know in existence you absolutely need atoms to have chemical properties.

Conclusion of atoms/chemical reactions argument: To neglect the chemistry of stars is to neglect the stars themselves.

The correction to Wikipedia is as follows:

*"...in the environment of a star as it evolves, atoms undergo chemical reactions and effectively have chemical properties."*

This is easy to correct and I am sure some big money interests will be against it. That is not my problem.