

10.9: I- Catalog of Misconceptions

Effective teaching does not simply teach students what is correct—it also insures that students do not believe what is incorrect. There are a number of prevalent misconceptions in statistical mechanics. For example, an excellent history of statistical mechanics is titled *The Kind of Motion We Call Heat*. This title is wonderfully memorable and historically justifiable, but it embodies no fewer than three different physics misconceptions: heat is confused with thermal energy; thermal energy is confused with kinetic energy; and kinetic energy is confused with motion. Below is a list of misconceptions that are explicitly mentioned in this book, together with the page number where that misconception is pointed out and corrected.

- a microstate (a configuration) has an entropy, 32
- all gases are ideal, 44
- at high temperature, the most probable microstate has high energy, 107
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