

Explanation of thermodynamics assignment



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A Layman's Explanation of Two Laws of Thermodynamics Energy is encountered in many forms, such as mechanical, chemical (food and fuel), electrical, nuclear, heat, and radiant (light). Energy has the ability to bring about change or to do work. Thermodynamics is the study of energy. The field of thermodynamics studies the behavior of energy flow in natural systems. These studies have rendered two laws of thermodynamics. The first law of thermodynamics is also known as the law of conservation of energy.

This law suggests that energy can be transferred from one system to another in many forms. Also, it cannot be created or destroyed, (Encyclopedia Britannica, 2012). Ultimately, the total amount of energy available is a constant. Einstein's equation, $E=mc^2$, describes the relationship between energy and matter. In the equation, energy (E) is equal to matter (m) times the square of a constant (c). Energy and matter are interchangeable in Einstein's equation and due to the constant the equation also indicates that there is a fixed quantity of energy and matter, (Boulle, 2012).

The second law of thermodynamics is also known as the second law of energy. Because of the first law, where energy cannot be created nor destroyed, one might be led to think there will always be a store of energy. In looking at the second law of energy, it explains how energy differs in its quality or ability to do useful work. In order for useful work to occur, energy must go from a level of high-quality energy (which is more concentrated), to a level of lower-quality (less concentrated) energy.

The second law also tells us that high-quality energy can never be used again. The natural processes that involve the transfer of energy must have

at least one direction, and that all natural processes are irreversible, (Encyclopedia Britannica, 2012). The reason a barrel of oil can only be used as a fuel, is explained by the second law of thermodynamics. The law explains that once a high-quality energy source is used, it cannot be recycled and used again as a high-quality energy source.

Once the high-quality energy in the oil is transferred to another energy form, the oil is then diminished to a lower-quality energy, either heat or motion, and is then a non-recyclable and non-reusable energy source. The laws of thermodynamics and how they are regarded in terms of energy are as such: the first law pretty much indicates that you can't get something for nothing and the second law pretty much indicates that you cannot break-even; energy will be lesser than it was before the transfer.

The first law governs the quality of energy available from an energy conversion process, whereas the second law governs the quality of the energy available. According to the first law, we will never run out of energy, but according to the second law, we can run out of high-quality (useful) energy. The second law also tells us that high-quality energy can never be used again. In terms easily understood, not only can we not get something for nothing (the first law), but we cannot ever break even in terms of energy quality (the second law). In this we can realize that we can recycle matter, but we can never recycle high-quality energy. References Boule, P. (2012). In Encyclopedia Britannica. Retrieved from <http://www.britannica.com/EBchecked/topic/75554/Pierre-Boule> Conservation of energy. (2012). In Encyclopedia Britannica. Retrieved from <http://www.britannica.com/EBchecked/topic/187240/conservation-of-energy> Second law of <https://assignbuster.com/explanation-of-thermodynamics-assignment/>

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