

Energy Transformations in Physics

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Energy can be defined as the capacity to do work; therefore, the most basic transfer of energy in physics is between stored energy and energy being used to actively do work. Since energy can take many forms, energy transfers can also occur between these forms. Mastering these energy transfers has enabled science to equip the modern world with advanced technology and devices.



Forms of Energy

- The most basic type of energy transformation in physics centers upon two types of energy, potential and kinetic. Potential energy is energy that is stored in an object due to its position. Kinetic energy is energy that is possessed by an object due to its motion, meaning it is doing work or is in use. For instance, lifting an object is a transformation of kinetic energy to potential energy. Conversely, dropping an object is a conversion of potential energy to kinetic energy.

Types of Energy

- In addition to the two fundamental types of energy, there are a number of forms that energy can take. Energy can be transformed from one form to another in any combination. Regardless of the combination of conversions, the total amount of energy is always conserved, meaning it is neither created nor destroyed. Examples of these forms include thermal, mechanical, chemical, electromagnetic and sound energy.

Thermal (Heat) Energy Transformations

- Thermal energy is also known as heat energy. Thermal energy can be transformed to other forms of energy. For instance, steam in a ship's boiler can be used to turn propellers. This involves a conversion of thermal energy to mechanical energy. Likewise, other forms of energy can be transformed to thermal energy. For instance, a stove's burner can be used to heat water. This involves a conversion of electrical energy to thermal energy.

Mechanical Energy Transformations

- Mechanical energy can be transformed to other forms of energy, such as thermal. For example, friction caused by a mechanical device creates heat. In the same way, other forms of energy can be transformed to mechanical energy. For instance, the chemical energy of batteries can be converted to mechanical energy used to power a motor.

Chemical Energy Transformations

- Chemical energy can be transformed to other forms of energy, such as mechanical energy. For example, sugars in the body are used to enable the body to do work. Likewise, other forms of energy can be converted to chemical energy. For example, photosynthesis converts light to chemical energy.

Electromagnetic Energy Transformations

- Electromagnetic energy can be transformed to other forms of energy. For example, a solar panel converts light energy to electrical energy. In the same way, other forms of energy can be converted to electromagnetic energy. For example, electrical energy is converted to electromagnetic energy in a light bulb.

Sound Energy Transformations

- Sound energy can be transformed to other forms of energy. For example, sound energy is converted to mechanical energy in your ear. Likewise, other forms of energy can be transformed to sound energy. For example, a stereo speaker converts mechanical energy to sound energy.

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