

Endothermic Reactions Encyclopedia Article

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Endothermic Reactions

Chemical changes alter the composition and structure of a substance. These kinds of changes are always accompanied by **energy** changes. If there is net energy released in forming the new structure, the reaction is said to be *exothermic*. If more **heat** than is available from the reactants must be absorbed from the surroundings to create the new structure, the reaction is said to be *endothermic*.

The change in heat content of the products relative to the reactants in a chemical reaction is known as the change in **enthalpy**. If the heat content of the products is greater than the heat content of the reactants, the change in enthalpy is positive, and the reaction is endothermic. If the change in enthalpy is negative the reaction is exothermic.

Because the change in enthalpy that accompanies any given reaction varies with **temperature**, scientific convention has adopted the standard of reporting heat data at 25°C and 1 bar pressure. The standard enthalpy of formation is the change in enthalpy that accompanies the formation of a compound from its elements with all substances in their standard states at 25°C.

An example of an endothermic reaction is the decomposition of **mercury (II) oxide**. To dissociate two moles of mercury (II) oxide into mercury and molecular **oxygen**, one must supply 43,400 calories of energy to the system.

The energy changes that accompany chemical reactions are not always limited to heat. In voltaic cells, for example, energy is produced in the form of **electricity**. In **photosynthesis**, the conversion of **water** and **carbon** dioxide into sugar and oxygen, energy is absorbed in the form of light.