

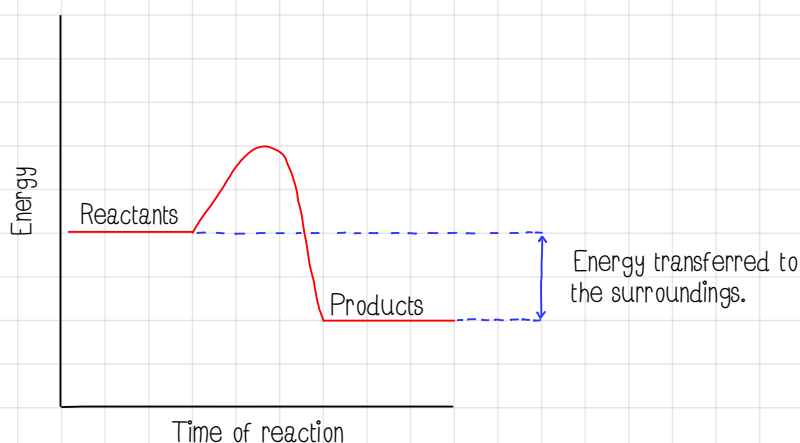
Exothermic and endothermic reactions

Exothermic reactions

- Gas burning on a kitchen stove is an example of an exothermic reaction.
- Exothermic reactions transfer energy from the reacting molecules to the environment. This means the surroundings will **increase** in **temperature**.
- Examples of exothermic reactions include: combustion, certain oxidation reactions and neutralisation.

Exothermic energy profile diagram

- Energy changes that occur in a reaction are represented in an energy profile diagram.



- The **products** have **less energy** than the reactants. This is because energy has been transferred from the reaction to the surroundings.
- The difference between the energy level of the products and the energy level of the reactants tells us how much energy has been transferred into the surroundings.
$$\text{Energy of reactants} - \text{energy of products} = \text{energy transferred}$$

Uses of exothermic reactions

- Hand warmers
- Self heating cans used for food or drink.

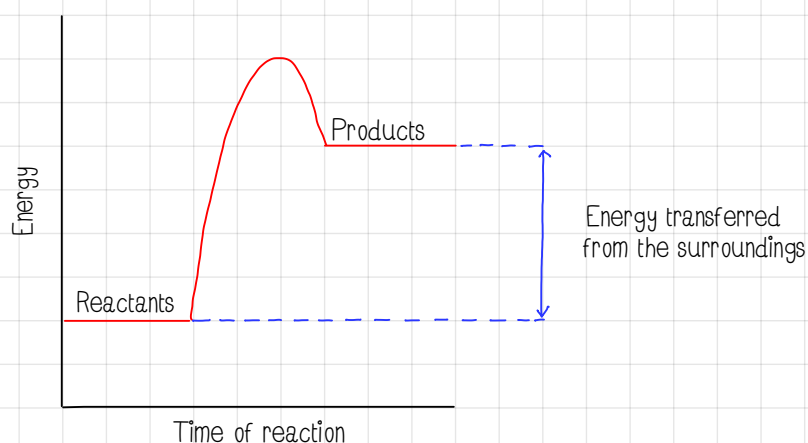
Exothermic and endothermic reactions...

Endothermic reactions

Endothermic reactions transfer energy from the surroundings into the reaction. The **temperature** of the surroundings will **decrease** (get colder).

Examples of endothermic reactions include: thermal decomposition

Endothermic energy profile diagram

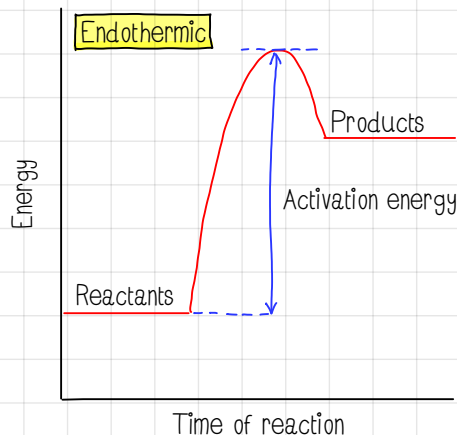
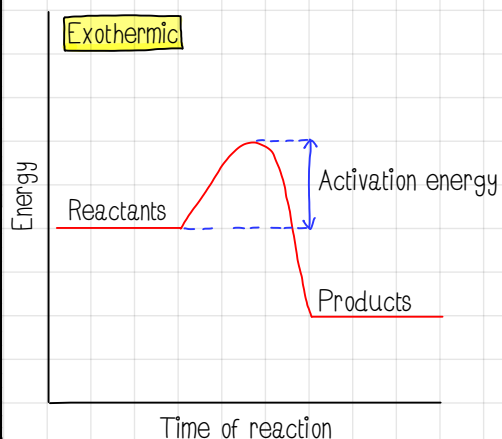


In an endothermic reaction the **products** have **more energy** than the reactants because energy has been transferred from the surroundings to the reaction.

Activation energy

A reaction can only occur when particles collide with sufficient energy. The **minimum** amount of **energy** the particles need to have is called the **activation energy**.

Activation energy is the energy difference between the reactants and the energy at the peak of the graph.



watch video