

## Energy changes in chemical reactions

### 1) Heat:

Is the transfer of thermal energy between two bodies that are at different temperatures.

### 2) Temperature:

Is a measure of thermal energy

## Types of systems

### Open system:

Exchange mass and energy in the form of heat with its surrounding.

### Closed system:

Which allow transfer of energy (Heat) only but not mass.

### Isolated system:

System, which does not allow transfer of energy or mass.

❖ Any energy lost by the system must be gained by the surrounding.

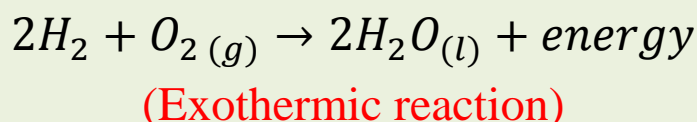
Ex: The heat generated by the combustion process is transferred to its surroundings.

## Types of processes

### ❖ Exothermic process:

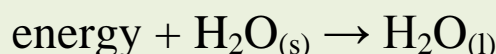
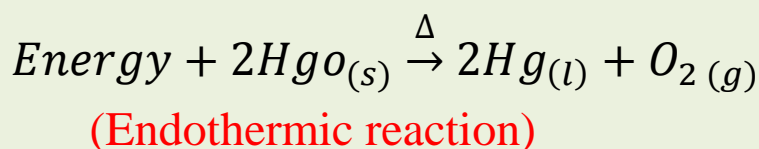
Process in which heat gives off or transfer thermal energy from the system to the surroundings.

**Ex:** The combustion of hydrogen gas in oxygen is one of many chemical reactions that release considerable quantities of energy.



❖ **Endothermic process:** Process in which heat has to be supplied to the system by the surroundings.

**Ex:** The decomposition of mercury (II) oxide at high temperatures need energy



**Note:** In exothermic reactions, the total energy of the product is less than the total energy of the reactant, and in endothermic reactions, the total energy of product is higher than the total energy of the reactant.

**Choose:-**

1) The specific part of the universe is...

A) System

C) Heat

B) Surrounding

D) None of them

2) The transfer of thermal energy between two bodies at different temperature is ...

A) Energy

C) Calories

B) Heat

D) Temperature

3) Surrounding is ...

A) A rest part of universe outside the system

C) Transfer of energy

B) Specific part of universe

D) all of them

4) Types of system are ...

A) Open system

C) Isolated system

B) Closed system

D) All of above

5) There are ... types of system.

A) 3

C) 5

B) 2

D) 4

6) System, which allows transfer of energy and mass, is ...

- A) Open system                      C) Isolated system  
B) Closed system                      D) both A and B

7) Open system is opposite to ...

- A) Closed system                      C) Isolated system

8) Closed system is ...

- A) System which allow transfer of energy only                      C) System which allow transfer of both mass and energy  
B) System which allow transfer of mass only                      D) System doesn't allow transfer of mass and energy

9) System, which does not allow transfer of mass and energy, is ...

- A) Open system                      C) Closed system  
B) Isolated system                      D) both B and C

10) Process in which heat transfer to the surrounding is ..., while the process in which heat has to be supplied is ...

- A) Endothermic-Exothermic                      C) Exothermic-Endothermic  
B) Exothermic                      D) endothermic

11) In endothermic reaction, the total energy of reactant is ... the total energy of product, while in exothermic reaction; total energy of product is ... the total energy of reactant.

- A) higher-equal  
B) less-higher  
C) less-equal  
D) less-less

12) Any energy lost by the system must be gained by ...

- A) Surroundings  
B) Substance  
C) Other system  
D) both A and C

13) -Exothermic process is ... to endothermic process.

- A) Opposite  
B) Same  
C) equal  
D) both C and B

14) Exothermic process is .....

- A) Process in which heat gives off  
B) Process in which heat has to be supplied  
C) Process in which thermal energy transfer to surroundings  
D) Both (a) and (c)