

Chemical Equations

Definition of physical change

Properties such as shape, size, colour and state of a substance are called its physical properties. A change in which a substance undergoes a change in its physical properties is called a physical change.

Example is crystallisation.

Example

Physical change

When the shape, size, appearance or state, of a substance is altered, but its chemical composition remains same a physical change of matter takes place. No new substance is formed. It is usually a change, which is reversible that is, by reversing the process the original substance can be obtained. During melting of ice, it converts into water. It is a physical change as composition is not changed.

Definition

Conditions for chemical change

The criteria for chemical change is the production of one or more new substances.

Conditions are: Minimum amount of energy to initiate reaction, collision between molecules for reaction to occur.

Definition

Definition of chemical change

A change in which one or more new substances are formed is called a chemical change. A chemical change is also called a chemical reaction.

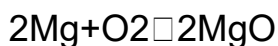
Examples are burning of any substance, rusting of iron.

Definition

Burning magnesium in air.

Clean the tip of strip of magnesium with sandpaper. Bring the tip near a candle flame. It burns with a brilliant white, light. When it is completely burnt, it leaves behind a powdery ash.

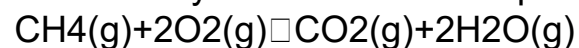
Chemical reaction will be:



Writing chemical reaction

A chemical equation consists of the chemical formulas of the reactants (on the left) and the products (on the right). The two are separated by an arrow symbol (" \rightarrow " usually read aloud as "yields"). Each individual substance's chemical formula is separated from others by a plus sign.

The state of matter, i.e., solid, liquid, gas or aqueous, of each compound or molecule is indicated by an abbreviation in parentheses. For example,



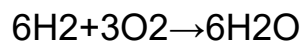
Problems on balancing chemical equations by hit and trial method

Balance the following chemical reaction. $2\text{H}_2 + 3\text{O}_2 \rightarrow 2\text{H}_2\text{O}$.

Step 1. Balance the number of oxygen atoms on both sides. On the reactant side, there are 6 oxygen atoms. Therefore, in order to balance, we will multiply the product side by 3.

Step 2. Now we will balance the number of hydrogen atoms. As we have 12 hydrogen atoms on the product side, so we will multiply the H_2 by 3.

Balanced reaction becomes-



Properties of chemical reactions

Chemical reactions take place by loss or gain of energy in form of heat and a new substance is formed with different properties

Importance of balanced chemical equations

It is important to balance chemical equations because there must be an equal number of atoms on both sides of the equation to follow the Law of the Conservation of Mass. Importance of balanced chemical equations

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