

# PHYSICAL VS CHEMICAL CHANGES QUESTIONS

1) Define atoms and molecules. Please explain the differences between them with an example.

2) What is the difference between  $2N$  and  $N_2$ ?

3) What were the drawbacks of Dalton's atomic theory?

4) What are ions?

5) What is the law of multiple proportions?

# PHYSICAL VS CHEMICAL CHANGES QUESTIONS

## Answers

1) Define atoms and molecules. Please explain the differences between them with an example.

An atom is the smallest particle in matter that can undergo a chemical reaction. On the other hand, the smallest particle of a substance that retains its properties is called a molecule.

Molecules are made up of and can be further split into atoms. For instance, the chlorine atom is represented as Cl, and the chlorine molecule is represented as Cl<sub>2</sub>.

2) What is the difference between 2N and N<sub>2</sub>?

There are a few differences between 2N and N<sub>2</sub>. These include:

- 2N indicates two atoms of nitrogen while N<sub>2</sub> is a symbol used to indicate a single molecule of nitrogen.
- 2N does not give any indication of whether the nitrogens are bonded, while N<sub>2</sub> includes two nitrogen atoms that are connected via a triple bond.
- 2N is unstable and nascent, while N<sub>2</sub> is stable.

3) What were the drawbacks of Dalton's atomic theory?

There were two major drawbacks of Dalton's atomic theory:

- Dalton stated that atoms were supposedly indivisible. However, as we now know, atoms are made up of subatomic particles like protons, electrons, and neutrons.
- While Dalton's theory stated that all atoms of an element had the same mass, the existence of isotopes - which all belong to the same element while having different masses - disproves it.

4) What are ions?

An ion is an atom that has gained or lost one or more electrons to acquire an electrical charge.

5) What is the law of multiple proportions?

The law of multiple proportions states, "When two elements react to form more than a single compound, the ratio in which the elements react remains fixed."