Relative Formula Mass

- **Relative Formula mass (Mr)** is the addition of all the relative atomic masses of atoms in the molecular formula.

EXAMPLE

Q: What is the relative formula mass of $CaCO3$?

1. **Find the relative atomic masses of each Element** . We need to know the relative atomic masses of each atom in the compound. To do this, we can use a periodic table.

Calcium = 40

Carbon = 12

Oxygen = 16

2. **Check for multipliers and subscript numbers**. In this Formula , oxygen has a subscript 3 after it, indicating that there are three atoms.

This means that we need to multiply the (Relative atomic Mass) **Ar of oxygen by 3.**

3 atoms of oxygen

16 x 3 = 48

3. **Add up the total.** To find the relative formula mass, we simply need to add up all our relative atomic masses.

40 + 12 + (16 x 3) = 100

Mr of $CaCO_3$ = 100

Percentage by Mass

By using formula mass and atomic mass, we can work out what percentage of a molecule's mass a given element makes up.

$$\text{Percentage by mass of elements} = \frac{\text{Mass of element}}{\text{Mass of whole sample}} \times 100\%$$

EXAMPLE

Q: The relative formula mass of the molybdenum compound MoOCl4 is 254. Calculate the percent by mass of Molybdenum , (Mo, Ar96) in this compound.

Using This Formula:

$$\text{Percentage by mass of elements} = \frac{\text{Mass of element}}{\text{Mass of whole sample}} \times 100\%$$

= 96 * 100 / 254

= 0.38 *100 = 38%