

Relative Formula Mass Notes

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When it comes to atoms there are two different masses that we must know about, the relative atomic mass (A_r) and relative formula mass (M_r).

Relative atomic mass: The mean mass of an atom relative to the mass of an atom of carbon – 12. The RAM of an element is the relative mass of the isotopes in the element.

Relative formula mass: the sum of the relative atomic masses of all the atoms in the formula.

The relative atomic mass (also known as the A_r) of an atom can be found using the periodic table. No calculation is needed here. Take the following examples.

Mass number	23	24	35.5
Symbol	Na	Mg	Cl
Atomic number	11	12	17

The A_r of Na = 23

The A_r of Mg = 24

The A_r of Cl = 35.5

That's all there is to it 😊

The relative formula mass (also known as RFM and M_r) can be calculated by adding the relative atomic masses of each of the atoms in the compound.

Take the following examples:

$$1. \text{NaCl} = 23 + 35.5 = 58.5$$

$$2. \text{MgO} = 24 + 16 = 40$$

So, as you can see, all we have to do is add up all the masses of the atoms in the compound

Some involve a bit of addition and multiplication.

Take the following examples:

$$1. \text{Na}_2\text{O} = 2(23) + 16 = 62$$

$$2. \text{CO}_2 = 12 + 2(16) = 44$$

$$3. \text{C}_6\text{H}_{12}\text{O}_6 = 6(12) + 12(1) + 6(16) = 180$$

What about this one? Now there's a two in front of our compound!



Ignore the 2! The M_r of Al_2O_3 is just $2(27) + 3(18) = 108$

Is there a time we do count the big numbers? Of course there is!! 😊

When calculating the atom economy then we count the big numbers as we dealing with the total M_r in atom economy. But this is the only one for GCSE.

That's it really. It doesn't get harder than that. Just practise and you'll be fine 😊

In the exams, if they come up on their own, these usually come up as a two-mark calculation question. Mostly though they come up as part of a larger question.