| | Marks |
|---|---|
| • The relative atomic mass of magnesium is reported as 24.3.  Show how this figure is calculated given the natural abundances of the following isotopes of magnesium: $^{24}$Mg (79.0 %); $^{25}$Mg (10.0 %); $^{26}$Mg (11.0 %). | **2** |

**The relative atomic mass of magnesium is the weighted average of the masses of its isotopes:**

$$\left(24 \times \frac{79.0}{100}\right) + \left(25 \times \frac{10.0}{100}\right) + \left(26 \times \frac{11.0}{100}\right) = 24.3 \, \text{g mol}^{-1}$$

• With examples, briefly explain what allotropes are.      **2**

**Allotropes are different structural arrangements of the same atoms of an element.**

**Carbon occurs naturally as either graphite, which consists of sheets of planar hexagonal rings, and diamond, a three dimensional structure with tetrahedrally coordinated carbon. carbon. Oxygen exists as either the gaseous diatomic $O_2$ molecule or the gaseous triatomic $O_3$ (ozone).**

• Complete the following table.      **2**

| Formula | Name |
|---|---|
| $Na_2CO_3$ | **sodium carbonate** |
| **$Fe_2O_3$** | iron(III) oxide |
| $PCl_3$ | **phosphorus trichloride** |
| **$NH_3$** | ammonia |