Question#45195 – Chemistry – Inorganic Chemistry

Question:

There is 10g of mixture of NaCl and NaBr. if the amount of sodium is 25% of weight of total mixture calculate amount of NaCl and NaBr present in the mixture?

Answer:

The total mass of sodium in the mixture:

$$m(Na) = \omega \times 10 = 2.5g$$

Total mass consists of sodium from NaCl and from NaBr.

Let's consider m(NaCl) = x g, than m(NaBr) = 10 – x g.

The weight percent of sodium in NaCl:

$w_1 = 23/58.5 = 0.39$

The weight percent of sodium in NaBr:

$w_2 = 23/103 = 0.22$

$$m_1(Na) = 0.39x$$
$$m_2(Na) = 0.22(10 - x)$$
$$m(Na) = m_1(Na) + m_2(Na)$$
$$2.5 = 0.39x + 0.22(10 - x)$$
$$2.5 = 0.39x + 2.2 - 0.22x$$
$$0.3 = 0.17x$$
$$x = 1.765$$

The mass of NaCl is 1.76 g. The weight percentage of it in the mixture is:

$$\omega(NaCl) = \frac{1.76}{10} = 0.176 = 17.6\%$$
$$\omega(NaBr) = 100 - 17.6 = 82.4\%$$