

Answer on Question #54134 – Chemistry – General chemistry

Question

Weight of oxygen in a.m.u. in 4000 a.m.u of glucose?

Solution

Molecular formula of glucose is $C_6H_{12}O_6$.

Relative atomic weight of constituent elements, respectively are

C – 12 a.m.u.

H – 1 a.m.u.

O – 16 a.m.u.

So, the weight of one glucose molecule is

$$12 \cdot 6 + 1 \cdot 12 + 16 \cdot 6 = 180 \text{ a.m.u.}$$

One glucose molecule of weight 180 a.m.u. contains six oxygen atoms of total weight

$$16 \cdot 6 = 108 \text{ a.m.u.}$$

Thus, we may write the proportion:

$$\begin{aligned} 180 \text{ a.m.u. (glucose)} &- 108 \text{ a.m.u. (oxygen)} \\ 4000 \text{ a.m.u. (glucose)} &- x \text{ a.m.u. (oxygen),} \end{aligned}$$

whence

$$x = 4000 \cdot 108 / 180 = 2400 \text{ a.m.u.}$$

Answer: Weight of oxygen in 4000 a.m.u. of glucose is equal to **2400** a.m.u.