Answer on Question #44707–Chemistry–Organic Chemistry

Questions

Q.1

If 3.5 moles of $Ca(OH)_2$ are present in the reaction mixture how many moles of sulfuric acid are needed to complete the equation?

Q.2

What will happen to MgO reacted with copper? Explain your answer.

Q.3

Which compound has 48 g of carbon and 12 g of hydrogen if the RMM is 30?

Q.4

When sodium carbonate is added to magnesium chloride solution the reaction that occur is represented by which equation?

Q.5

Which compound has 3 g of carbon and 0.5 g of hydrogen if RMM is 42?

Q.6

20 g [of sodium] is burned. What mass of sodium oxide is formed?

Answers

Q.1

 $Ca(OH)_2 + H_2SO_4 \rightarrow CaSO_4 + 2 H_2O$

As is clear from the chemical equation $Ca(OH)_2$ and H_2SO_4 react in equimolar ratio. So, **3.5 moles** of sulfuric acid are needed for 3.5 moles of $Ca(OH)_2$ to react completely.

Q.2

No reaction occurs, because Mg is more active (it is oxidized more easily) than Cu. And red-ox reaction would occur in reverse direction only

 $CuO + Mg \rightarrow Cu + MgO$ MgO + Cu \rightarrow no reaction

Q.3

 $M(C_xH_y) = 12 \cdot x + 1 \cdot y = 30 \text{ g/mol}$ n(C) = m(C)/M(C) = 48g / 12g/mol = 4 mol n(H) = m(H)/M(H) = 12g / 1g/mol = 12 mol x / y = n(C)/n(H) = 4 / 12 = 1 / 3, whence y = 3x. Thus, we have the set of two linear equations: $\begin{cases} 12x + y = 30 \\ y = 3x \\ 12x + 3x = 30 \\ 15x = 30 \\ x = 30/15 = 2 \\ y = 3 \cdot 2 = 6 \\ \text{So, the compound is } C_2H_6 \text{ (ethane)} \end{cases}$

Q.4

 $Na_2CO_3 + MgCl_2 \rightarrow 2 NaCl + MgCO_3$ (s)

Q.5

 $M(C_xH_y) = 12 \cdot x + 1 \cdot y = 42 \text{ g/mol}$ n(C) = m(C)/M(C) = 3g / 12g/mol = 0.25 mol n(H) = m(H)/M(H) = 0.5g / 1g/mol = 0.5 mol x / y = n(C)/n(H) = 0.25 / 0.5 = 1 / 2, whence y = 2x.Thus, we have the set of two linear equations: $\begin{cases} 12x + y = 42 \\ y = 2x \\ 12x + 2x = 42 \\ 14x = 42 \\ x = 42/14 = 3 \\ y = 2 \cdot 3 = 6 \\ \text{So, the compound is } C_3H_6 \text{ (ethene)} \end{cases}$

Q.6