

## C2 Moles Quiz Answers

What is a mole?

An amount of substance. Specifically, a mole represents the number  $6.023 \times 10^{23}$

What is the mass of one mole of HCl?

36.5g

What is the mass of 2 moles of carbon?

Mass = Mr x mole

$2 \times 12 = 24\text{g}$

What is an empirical formula by definition?

The simplest ratio of elements in a compound. For example if the molecular formula is  $\text{C}_6\text{H}_{12}\text{O}_6$ , the empirical formula is  $\text{CH}_2\text{O}$

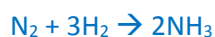
How do you work out the empirical formula from mass or % by mass data?

Divide each mass or % by the relative atomic mass of the appropriate element. Work out the simplest whole number ratio by dividing all answers by the smallest answer.

Why is the % yield rarely 100% in an experiment?

If the reaction is reversible, some product reacts back to the reactant. Reactants might be impure. Side reactions might occur, some product lost during filtration processes.

A company wants to make 6.8 tonnes of ammonia from nitrogen and hydrogen. How much nitrogen and hydrogen do they need?



(Assume grams instead of tonnes then change it later!)

$$6.8 / 17 = 0.4\text{moles}$$

According to the equation for every 2 moles of  $\text{NH}_3$  you need 1 mole of  $\text{N}_2$  so:

$$0.4/2 = 0.2\text{ moles} \quad 0.2\text{moles} \times 28 (\text{Mr of } \text{N}_2) = 5.6\text{g of Nitrogen}$$

According to the equation for every 2 moles of  $\text{NH}_3$  you need 3 moles of  $\text{H}_2$  so:

$$(0.4/2) \times 3 = 0.6\text{ moles} \quad 0.6\text{ moles} \times 6 (\text{Mr of } \text{H}_2) = 3.6\text{g of Hydrogen}$$

REMEMBER answers should have tonnes instead of grams, therefore:

**Nitrogen = 5.6 tonnes and Hydrogen = 3.6 tonnes**

How do you calculate percentage yield?

$$(\text{Actual yield/theoretical yield}) \times 100$$

What is the relative formula mass on water?

$$18. \text{H} = 1, \text{O} = 16; \text{H}_2\text{O} = 2 + 16 = 18$$