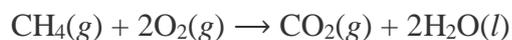


## Mole Concept and Stoichiometry

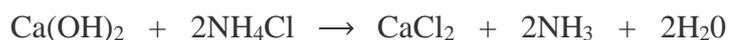
- Mass of H<sub>2</sub>O in 1000 kg CuSO<sub>4</sub>·5H<sub>2</sub>O is:  
(a) 3605 g      (b) 360.5 g      (c) 36.05 g      (d) 3.605 g
- A compound was found to contain 5.37% nitrogen. What is the minimum molecular weight of the compound?  
(a) 260.7 g      (b) 26.07 g      (c) 2.607 g      (d) None of these
- One mole of CO<sub>2</sub> contains:  
(a)  $6.023 \times 10^{23}$  atoms of O      (b) 3 g atoms of CO<sub>2</sub>  
(c)  $6.023 \times 10^{23}$  atoms of C      (d) 8 g atoms of CO<sub>2</sub>
- Molecular mass of benzene (C<sub>6</sub>H<sub>6</sub>) is:  
(a) 58 amu      (b) 68 amu      (c) 78 amu      (d) 468 amu
- Which of the following would weigh most?  
(a) 1 mole of H<sub>2</sub>O      (b) 1 mole of CO<sub>2</sub>      (c) 1 mole of NH<sub>3</sub>      (d) 1 mole of CO.
- Calculate the percentage of nitrogen in ammonium nitrate (NH<sub>4</sub>NO<sub>3</sub>). [H = 1, N = 14, O = 16]
- How many molecules are there in 1 litre of any gas at STP?
- How many grams are there in:  
(a) 2 moles of molecular oxygen?  
(b) 0.01 mole of molecular nitrogen? [O = 16, N = 14]
- How many mole atoms are there in:  
(a) 112 g of iron? [Fe = 56]  
(b) 48 g of oxygen? [O = 16]
- Find the number of molecules in 3.2 g of SO<sub>2</sub>. [S = 32, O = 16]
- What amount of sulphuric acid will be required to dissolve 3 g of magnesium carbonate?  
MgCO<sub>3</sub> + H<sub>2</sub>SO<sub>4</sub> → MgSO<sub>4</sub> + H<sub>2</sub>O + CO<sub>2</sub> [Mg = 24, C = 12, S = 32, O = 16]
- (a) Calculate the number of moles of methane in 0.8 g of it.  
(b) Calculate the number of moles of CO<sub>2</sub> which contain 8 g of O<sub>2</sub>.

13. Calculate the mass of a mixture of gases of 11.2 litres of hydrogen and 8 litres of nitrogen at STP.

14. 80 cm<sup>3</sup> of methane is mixed with 200 cm<sup>3</sup> of pure oxygen at room temperature and pressure. The mixture is then ignited when it burns as illustrated by equation. Calculate the composition of resulting mixture if it is cooled to initial room temperature and pressure.



15. Calcium hydroxide reacts with ammonium chloride to give ammonia, according to the following equation.



If 5.35 g of ammonium chloride is used, calculate the:

(a) Weight of calcium chloride formed.

(b) Volume of ammonia liberated at STP.

[Ca = 40, H = 1, O = 16, N = 14, Cl = 35.5]