

# Mole Concept

## DPP-5



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- The two acids  $\text{H}_2\text{SO}_4$  and  $\text{H}_3\text{PO}_4$  are neutralised separately by the same amount of an alkali when sulphate and dihydrogen orthophosphate are formed respectively. Find the ratio of the equivalent masses of  $\text{H}_2\text{SO}_4$  and  $\text{H}_3\text{PO}_4$ .
- Equivalent weight of sulphur in  $\text{SCl}_2$  is 16, what is the equivalent weight of S in  $\text{S}_2\text{Cl}_2$ ? (S = 32, Cl = 35.5)
- The equivalent weight of chlorine is 35.5 and the equivalent weight of copper chloride is 99.5. Find the formula of copper chloride if the atomic weight of Cu is 63.5.
- 14.7 g sulphuric acid was needed to dissolve 16.8 g of a metal. Calculate the equivalent weight of the metal and the volume of hydrogen liberated at NTP.
- What volume of a 0.232 N solution contains  
(a) 3.17 meq of solute (b) 6.5 eq of solute?
- How many equivalents of solute are contained in  
(a) 1 L of 2 N solution, (b) 1 L of 0.5N solution,  
(c) 0.5 L of 0.2 N solution?
- (a) What volume of 5.00 N  $\text{H}_2\text{SO}_4$  is required to neutralize a solution of 2.50g NaOH?  
(b) How many g of pure  $\text{H}_2\text{SO}_4$  are required?
- Compute the volume of concentrated  $\text{H}_2\text{SO}_4$  (density 1.835 g/mL, 93.2%  $\text{H}_2\text{SO}_4$  by weight) required to make up 500 mL of 3.00 N acid for complete neutralization.
- Compute the volume of conc. HCl (density 1.19 g/cm<sup>3</sup>, 38% HCl by weight) required to make up 18 L of N/50 acid.
- A 50.0 mL sample of NaOH solution requires 27.8 mL of 0.100 N acid in titration. What is this normality? How many mg NaOH are in each mL?
- What is the equivalent weight of an acid 1.243 g of which required 31.72 cm<sup>3</sup> of 0.1923 N standard base for neutralization?
- The largest number of molecules is in  
(a) 36 g of water (b) 28 g of  $\text{CO}_2$  (c) 46 g of  $\text{CH}_3\text{OH}$  (d) 58 g of  $\text{N}_2\text{O}_5$
- If  $1\frac{1}{2}$  moles of oxygen combine with Al to form  $\text{Al}_2\text{O}_3$ , the weight of Al used in the reaction is (Al = 27)  
(a) 27 g (b) 54 g (c) 40.5 g (d) 81 g
- The equation  $2\text{Al} + \frac{3}{2}\text{O}_2 \rightarrow \text{Al}_2\text{O}_3$  shows that  
(a) 2 g of aluminium react with 3/2g of oxygen to produce 1 g of aluminium oxide  
(b) 2 g of aluminium react with 3/2 litres of oxygen to produce 1 g of aluminium oxide  
(c) 2 moles of aluminium react with 3/2 moles of oxygen to produce one mole of aluminium oxide  
(d) 2 moles of aluminium react with 3/2 moles of oxygen to produce 7/2 moles of aluminium oxide.

- 15.** The number of water molecules present in a drop of water (volume = 0.0018 ml) at room temperature is  
 (a)  $6.023 \times 10^{19}$  (b)  $1.084 \times 10^{18}$  (c)  $4.84 \times 10^{17}$  (d)  $6.023 \times 10^{23}$
- 16.** If 0.5 mol of  $\text{BaCl}_2$  is mixed with 0.2 mol of  $\text{Na}_3\text{PO}_4$ , the maximum number of mole of  $\text{Ba}_3(\text{PO}_4)_2$  that can be formed is  
 (a) 0.7 (b) 0.5 (c) 0.30 (d) 0.10
- 17.** Which has the highest mass ?  
 (a) 50 g of iron (b) 5 moles of  $\text{N}_2$   
 (c) 0.1 g atom of Ag (d)  $10^{23}$  atoms of carbon
- 18.** The total number of electrons present in 18 ml of water (density of water is  $1 \text{ g ml}^{-1}$ ) is  
 (a)  $6.02 \times 10^{23}$  (b)  $6.02 \times 10^{22}$  (c)  $6.02 \times 10^{24}$  (d)  $6.02 \times 10^{25}$
- 19.** The number of water molecules in 1 litre of water is  
 (a) 18 (b)  $18 \times 1000$  (c)  $N_A$  (d)  $55.55 N_A$

## ANSWERS

- |                                  |                |                                   |                             |
|----------------------------------|----------------|-----------------------------------|-----------------------------|
| <b>1.</b> 1 : 2                  | <b>2.</b> 32   | <b>3.</b> $\text{CuCl}$           | <b>4.</b> 56, 3.36 Litres   |
| <b>5.</b> (a) 13.7 mL, (b) 28.0L |                | <b>6.</b> (a) 2, (b) 0.5, (c) 0.1 |                             |
| <b>7.</b> (a) 12.5mL (b) 3.07g   |                | <b>8.</b> 43.0 mL                 | <b>9.</b> $29 \text{ cm}^3$ |
| <b>10.</b> 0.0556N, 2.22 mg/mL   |                | <b>11.</b> 203.8 g/eq             | <b>12.</b> (a)              |
| <b>13.</b> (b)                   | <b>14.</b> (c) | <b>15.</b> (a)                    | <b>16.</b> (d)              |
| <b>17.</b> (b)                   | <b>18.</b> (c) | <b>19.</b> (d)                    |                             |