

**C. C. C. Heep Woh College**  
**Form 4 Chemistry Quiz 9**  
**Unit 14 : Acids (Concentrated Acids)**

Suggested Answer

1. (a) Nitric acid slowly decomposes in the presence of light, yellow / brown colour is due to dissolved nitrogen dioxide. ½  
½  
 $4\text{HNO}_3(\text{aq}) \longrightarrow 4\text{NO}_2(\text{g}) + \text{O}_2(\text{g}) + 2\text{H}_2\text{O}(\text{l})$  1
- (b) Store in dark / use brown bottle 1
- (c) the acid should be added slowly 1  
with stirring 1  
to a large amount of water. 1
2. (a) Sulphur dioxide /  $\text{SO}_2$  1
- (b) Bubble the gas into acidified potassium dichromate solution 1  
colour change from orange to green 1  
 $\text{Cr}_2\text{O}_7^{2-}(\text{aq}) + 2\text{H}^+(\text{aq}) + 3\text{SO}_2(\text{g}) \longrightarrow 2\text{Cr}^{3+}(\text{aq}) + \text{H}_2\text{O}(\text{l}) + 3\text{SO}_4^{2-}(\text{aq})$  1
3. (a) Pure nitric acid consists of covalent molecules / no ionization / no ion. 1  
Dilute nitric acid is completely ionized / mobile ions are present. 1  
 $\text{HNO}_3(\text{l}) + \text{aq} \longrightarrow \text{H}^+(\text{aq}) + \text{NO}_3^-(\text{aq})$  1
- (b) Hot conc. nitric acid behaves as an oxidizing agent. 1  
 $\text{Cu}(\text{s}) + 2\text{HNO}_3(\text{l}) + 2\text{H}^+(\text{aq}) \longrightarrow \text{Cu}^{2+}(\text{aq}) + 2\text{NO}_2(\text{g}) + 2\text{H}_2\text{O}(\text{l})$  1  
Very dilute nitric acid behaves as an acid. 1
- (c) Hot conc. sulphuric acid behaves as an oxidizing agent, itself being reduced to sulphur dioxide; 1  
 $\text{Mg}(\text{s}) + 2\text{H}_2\text{SO}_4(\text{l}) \longrightarrow \text{MgSO}_4(\text{aq}) + \text{SO}_2(\text{g}) + 2\text{H}_2\text{O}(\text{l})$  ½  
Dilute sulphuric acid behaves as a typical acid to liberate hydrogen 1  
 $\text{Mg}(\text{s}) + \text{H}_2\text{SO}_4(\text{aq}) \longrightarrow \text{MgSO}_4(\text{aq}) + \text{H}_2(\text{l})$  ½
- (d) Conc. sulphuric acid is a dehydrating agent. 1  
It removes water from glucose and forms carbon which is the black solid. 1  
 $\text{C}_6\text{H}_{12}\text{O}_6(\text{s}) \xrightarrow{\text{H}_2\text{SO}_4(\text{l})} 6\text{C}(\text{s}) + 6\text{H}_2\text{O}(\text{l})$  1

**The End**