



Name: ..... ( )

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## Questions on Qualitative Analysis – Assignment 1 – Answers

### Question One:

a)

- |  |   |
|--|---|
| A Nitric acid, HNO <sub>3</sub>  | B Iron, Fe  |
| C Hydrogen, H <sub>2</sub>   | D Iron(II) nitrate, Fe(NO <sub>3</sub> ) <sub>2</sub>                       |
| E Either chloride (Cl <sup>-</sup> ), bromide (Br <sup>-</sup> ) or iodide (I <sup>-</sup> ) ion | F Ammonia, NH <sub>3</sub>  |
| G Iron(II) hydroxide, Fe(OH) <sub>2</sub>  | H Iron(III) hydroxide, Fe(OH) <sub>3</sub>                                  |
| I Either iron(III), Fe <sup>3+</sup> or chromium(III), Cr <sup>3+</sup> ion                      | J Either iron(III), Fe <sup>3+</sup> or chromium(III), Cr <sup>3+</sup> ion |

- b) Fe(NO<sub>3</sub>)<sub>2(aq)</sub> + 2NaOH<sub>(aq)</sub> → Fe(OH)<sub>2(s)</sub> + 2NaNO<sub>3(aq)</sub>  
c) Cr<sub>2</sub>O<sub>7</sub><sup>2-(aq)</sup> + 14H<sup>+(aq)</sup> + 6e<sup>-</sup> → 2Cr<sup>3+(aq)</sup> + 7H<sub>2</sub>O<sub>(l)</sub>

### Question Two:

a)

- |   |  |
|---|--|
| S Barium chloride, BaCl <sub>2</sub>                | T Sodium chloride, NaCl                |
| U Silver chloride, AgCl                             | V Barium carbonate, BaCO <sub>3</sub>  |
| W Barium nitrate, Ba(NO <sub>3</sub> ) <sub>2</sub> | X Barium sulphate, BaSO <sub>4</sub>   |
| Y Carbon dioxide, CO <sub>2</sub>                   | Z Calcium carbonate, CaCO <sub>3</sub> |

- b) AgNO<sub>3(aq)</sub> + NaCl<sub>(aq)</sub> → AgCl<sub>(s)</sub> + NaNO<sub>3(aq)</sub>  
c) BaCl<sub>2(aq)</sub> + Na<sub>2</sub>CO<sub>3(aq)</sub> → BaCO<sub>3(s)</sub> + 2NaCl<sub>(aq)</sub>  
d) Ba<sup>2+(aq)</sup> + SO<sub>4</sub><sup>2-(aq)</sup> → BaSO<sub>4(s)</sub>  
e) 2H<sup>+(aq)</sup> + BaCO<sub>3(s)</sub> → Ba<sup>2+(aq)</sup> + CO<sub>2(g)</sub> + H<sub>2</sub>O<sub>(l)</sub>  
f) Ca(OH)<sub>2(aq)</sub> + CO<sub>2(g)</sub> → CaCO<sub>3(s)</sub> + H<sub>2</sub>O<sub>(l)</sub>