Year 11 Chemistry

Equations, Water and Energy Revision Questions 2

1. Write the following as formulae and indicate solubility

   (a) ammonium oxide
   (b) iron (III) bromide
   (c) copper hydroxide
   (d) sodium bicarbonate
   (e) potassium sulphate
   (f) lead (IV) iodide
   (g) barium carbonate
   (h) mercury (I) phosphate
   (i) gold fluoride
   (j) potassium phosphide
   (k) nickel chloride
   (l) manganese sulphide

2. An unknown ionic solution forms a precipitate in iodides, oxides or sulphates, but not in nitrates. Deduce the cation, giving reasons.

3. Write balanced ionic equations for the following:
   (a) chromium sulphate solution plus lead nitrate solution
   (b) potassium metal plus water
   (c) solid silver carbonate plus sulphuric acid
   (d) combustion of pentane gas (C_5H_{12}) in air
   (e) liquid iodine plus barium metal
   (f) nitric acid plus sodium hydroxide solution
   (g) phosphoric acid plus calcium metal
   (h) solid lithium bicarbonate plus hydrochloric acid

4. State the difference between the latent heat of fusion and the latent heat of vaporisation.

5.
   (a) Calculate the heat energy 2.69 g of a substance absorbs to boil, given its latent heat of vaporisation is 439 Jg^{-1}
   (b) Calculate the expected final temperature for 783 g of a substance which absorbs 4.68 kJ of heat energy, if it starts at 27.8°C and has a specific heat capacity of 3.32 $Jg^{-1}°C^{-1}$

6.
   (a) Explain why hard water reduces the effectiveness of soaps
   (b) State two differences between permanent and temporary hardness

7. Describe the problem caused if:
   (a) flocculation and sedimentation are not done before filtration
   (b) the water is not disinfected before storage and distribution

8. Explain why:
   (a) water has a high latent heat of vaporisation
   (b) water is good at dissolving ionic compounds
   (c) water ice is less dense than liquid water