



Chem!stry

Name: ()

Class:

Date: / /

Questions on Qualitative Analysis – Assignment 2 – Answers

Question One:

a) Barium ion, Ba^{2+}

b)

B Barium sulfate, BaSO_4

C Sodium bromide, NaBr

D Barium carbonate, BaCO_3

E Silver bromide, AgBr

F Bromine, Br_2

A Barium bromide, BaBr_2

c) $\text{BaBr}_{2(\text{aq})} + \text{Na}_2\text{CO}_{3(\text{aq})} \rightarrow \text{BaCO}_{3(\text{s})} + 2\text{NaBr}_{(\text{aq})}$

d) Carbon dioxide, CO_2

e) $\text{Cl}_{2(\text{aq})} + 2\text{Br}^{-}(\text{aq}) \rightarrow 2\text{Cl}^{-}(\text{aq}) + \text{Br}_{2(\text{aq})}$

This is a redox reaction. The chlorine is reduced to chloride while the bromide is oxidised to bromine.

Question Two:

a) $\text{FeCl}_{3(\text{aq})} + 3\text{NaOH}_{(\text{aq})} \rightarrow \text{Fe}(\text{OH})_{3(\text{s})} + 3\text{NaCl}_{(\text{aq})}$

b) ● Between 1.0 and 5.0 cm^3 of sodium hydroxide, the iron(III) chloride is in excess. This can be seen because the level of the precipitate increases.

● At 6.0 cm^3 of sodium hydroxide, the ratio of sodium hydroxide to iron(III) chloride is correct for both chemicals to react completely.

● Between 7.0 and 10.0 cm^3 of sodium hydroxide, the sodium hydroxide is in excess. This can be seen because the level of the precipitate remains almost constant.

● Therefore, 5.0 cm^3 of FeCl_3 reacts with 6.0 cm^3 of NaOH .

● moles of $\text{NaOH} = c \times v \times 10^{-3} = 0.1 \times 6.0 \times 10^{-3} = \underline{0.0006}$

● From the balanced chemical equation:

$$\text{moles of FeCl}_3 = \text{moles of NaOH} \div 3 = 0.0006 \div 3 = \underline{0.0002}$$

● Therefore, there are 0.0002 mol of FeCl_3 in 5.0 cm^3 of solution.

$$\text{moles of FeCl}_3 \text{ in } 1000 \text{ cm}^3 = (0.0002 \div 5) \times 1000 = 0.04 = \underline{0.04 \text{ mol dm}^{-3}}$$

Question Three:

a)

P Lead(II) iodide, PbI_2

R Zinc chloride, ZnCl_2

T Silver chloride, AgCl

Q Calcium hydroxide, Ca(OH)_2

S Hydrogen, H_2

X Calcium Iodide (CaI_2) and zinc (Zn)



Question Four:

a)

A Copper(II) carbonate, CuCO_3

C Calcium carbonate, CaCO_3

E Sulphuric acid, H_2SO_4

G Barium sulfate, BaSO_4

I Zinc, Zn

K Zinc sulfate, ZnSO_4

M Sulphur trioxide or sulphur(VI) oxide, SO_3

B Carbon dioxide, CO_2

D Copper(II) oxide, CuO

F Copper(II) sulfate, CuSO_4

H Copper(II) hydroxide, Cu(OH)_2

J Copper, Cu

L Zinc oxide, ZnO

