Quiz لابوكيمياء

2 Formula of a Hydrate

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Name: .....[illegible]..... Section .....

Results and Calculations

A. Potassium Alum:

Mass of empty crucible	22.70 g
Mass of crucible and the alum	23.79 g
Mass of crucible and anhydrous salt	23.27 g
Mass of alum	1.09 g
Mass of anhydrous salt	0.57 g
Mass of water lost upon heating	0.52 g
Number of moles of water lost upon heating (molar mass =18.0 g/mol)	0.029 mol
Number of moles of anhydrous salt ($KAl(SO_4)_2$) molar mass = 258 g/mol	0.0022 mol
Percentage of water of crystallization, by mass	91.2 %
The value "x" in the formula, (number of moles of water of crystallization / number of moles of anhydrous salt)	13.2

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2) A student heated 1.16 g of hydrated sodium sulfate(Na_2SO_4) in a crucible to get 0.51 g of anhydrous salt(molar mass= 142 g/mol). What is the formula of the hydrated salt?

$m_1 = 1.16\,g$

$m_2 = 0.51\,g$

$m_1 - m_2 = 0.65\,g$ → mass of loss water

$\frac{0.51}{142} = 0.0036$ moles of anhydrous salt

moles of water $= \frac{0.65}{18} = 0.036$

value of $x = \frac{0.036}{0.0036} = 10$

$\boxed{Na_2SO_4 \cdot 10H_2O}$

Quiz لاب كيمياء

Quiz 2

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Name: .....حسام محمد عازم..... Section .....

Results and Calculations

$$2\ Na_3PO_{4(aq)} + 3\ BaCl_{2(aq)} \rightarrow Ba_3(PO_4)_{2(s)} + 6\ NaCl_{(aq)}$$

A. Precipitation of $Ba_3(PO_4)_2$:

Mass of salt mixture	0.76 g
Mass of filter paper	0.62 g
Mass of filter paper and $Ba_3(PO_4)_2$	0.81 g

B. Determination of the Limiting Reactant:

Limiting reactant in salt mixture is Na_3PO_4

Excess reactant in salt mixture is $BaCl_2$

Mass of $Ba_3(PO_4)_2$ precipitated	0.190 g
Number of moles of $Ba_3(PO_4)_2$ precipitated (molar mass = 601.64 g/mol)	3.16×10^{-4} mol

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Number of moles of $Na_3PO_4 .12H_2O$ reacted	6.32×10^{-4} mol
Number of moles of $BaCl_2.2H_2O$ reacted	9.47×10^{-4} mol
Mass of $Na_3PO_4 . 12H_2O$ reacted (molar mass = 380.2 g/mol)	0.240 g
Mass of $BaCl_2.2H_2O$ reacted (molar mass = 244.2 g/mol)	0.231 g
Mass percentage of Na_3PO_4	31.58 %

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2.66

2).A mixture of 0.65 g $BaCl_2 . 2H_2O$ (molar mass 244.2 g/mol) and 0.35 g $Na_3PO_4.12\ H_2O$ (molar mass 380.2 g/mol) was dissolved in water. Which of the two reactants is the limiting reactant? Calculate the mass of $Ba_3(PO_4)_2$ (molar mass 601.64 g/mol) precipitate formed.

$$3\,BaCl_2 + 2Na_3PO_4 \longrightarrow Ba_3(PO_4)_2 + 6NaCl$$

$n = \frac{.65}{244.2} = 2.66 \times 10^{-3}$

$n = \frac{0.35}{380.2} = 9.21 \times 10^{-4}$

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$n = [\text{Given from } BaCl_2] = \frac{2.66 \times 10^{-3}}{3} = 0.887 \times 10^{-3}$ mol

$n = [\text{Given from } Na_3PO_4] = \frac{9.21 \times 10^{-4}}{2} = 4.61 \times 10^{-4}$ mol

$BaCl_2$ is the limiting Reactant.

⇒ mass of $Ba_3(PO_4)_2 = 0.887 \times 10^{-3} \times 601.64 = \boxed{0.534\ g}$ #

Quiz لاب كيمياء

Chemistry Department Chem 109 Quiz 3

Name: حسام محمد عاتم Table: Grade: 3/10

Volumertric Analysis

Question 1

Given the following set of data:

Volume of vinegar solution= 20.00 mL

Volume of 0.15 M NaOH solution needed to neutralize acid in above vinegar solution = 18.00 mL.

Density of vinegar solution = 1.05 g/mL.

Calculate the mass percent of acetic acid(molar mass = 60.0 g/mol) in above vinegar solution.

$n = 0.18 \times 0.02 = 2.7 \times 10^{-3}$ mol = n of moles of acetic acid $\Rightarrow m = 2.7 \times 10^{-3} \times 60 = 0.162$ g

$m = 20 \times 1.05 = 21$ g

$100\% \times \frac{16.2}{21} = 77.14\%$

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Question 2

a) Given the following set of data:

Mass of antacid sample = 0.30 g

Volume of 0.12 M HCl solution added = 60.00 mL. $n_1 = 7.2 \times 10^{-3}$ mol

Volume of 0.10M NaOH solution needed for back titration = 16.00 mL. $n_2 = 1.6 \times 10^{-3}$ mol

Calculate the number of moles of HCl neutralized by 1.00 g tablet.

$n_1 - n_2 = 5.6 \times 10^{-3}$ mol

b) Given:

Density of stomach acid is 1.10 g/mL.

Concentration of stomach HCl is 0.10 M.

Neutralization capacity of antacid is 0.030 mol H^+/g tablet.

Calculate the mass of stomach acid that can be neutralized by 1.00 g antacid tablet