I Calculate the molecular mass of the following compounds -:

i) $(NH_4)CO_3$

ii) $CaSO_4 \cdot 5H_2O$

[N = 14, H = 1, C = 12, O = 16, Ca = 40, S = 32]

II i Balance the following chemical equation -:

1. Aluminium Hydroxide + Nitric acid ⟶ Aluminium Nitrate + water
2. Zinc nitrate ⟶ Zinc Oxide + Nitrogen dioxide + Oxygen
3. Aluminium chloride + Ammonium Hydroxide ⟶ Aluminium Hydroxide + Ato Ammonium chloride
4. Sodium nitrate + sulphuric acid → Sodium sulpha + Nitric acid.
5. Aluminium + Sodium Hydroxide + water ⟶ Sodium Meta Aluminate + Hydrogen

And Answers

I i) $(NH_4)_2CO_3$

$= 2\times14 + 8\times1 + 1\times12 + 3\times16$

$= 28 + 8 + 12 + 48$

$= 96$ amu

ii) $CaSO_4 \cdot 5H_2O$

$= Ca\ 1\times40 + 1\times32 + 9\times16 + 5\times10\times1 + 5\times$

$= 40 + 32 + 144 + 10$

$= 226$ amu

II 1. $Al(OH)_3 + 3HNO_3 \longrightarrow Al(NO_3)_3 + 3H_2O$

Al =	1	1
O =	3 + 3	9 + 13
H =	3 + 1	26
N =	1	3

∴ The balanced chemical equation is $Al(OH)_3 + 3HNO_3 \rightarrow Al(NO_3)_3 + 3H_2O$

2. $Zn(NO_3)_2 \longrightarrow ZnO + NO_2 + O_2$

Zn	1	1
N	2	1
O	6	1 + 2 + 2

2. $2Zn(NO_3)_2 \longrightarrow 2ZnO + NO_2 + O_2$

Zn =	1 × 2	1 × 2
N =	2	1 × 4
O =	6	2 × 1 + 2 + 2 = 8

∴ The balanced chemical equation is $2Zn(NO_3)_2 \longrightarrow 2ZnO + 4NO_2 + O_2$

3. $AlCl_3 + 3NH_4OH \longrightarrow Al(OH)_3 + NH_4Cl$

Al =	1	1
Cl =	3	× 3
N =	× 3	1 × 3
H =	5 × 3 = 15	3 + 4 = 12
O =	1 × 3	3

∴ The balanced chemical equation is $AlCl_3 + 3NH_4OH \longrightarrow Al(OH)_3 + 3NH_4Cl$

4. $NaNO_3 + H_2SO_4 + H_2O \longrightarrow Na_2SO_4 + HNO_3$

Na =	× 4	2
N =	1 × 4	2 × 4
O =	12	3 + 4 + 1 = 8 + 4 = 12
H =	2 + 2	× 4
S =	1	1

5. $Al + 2NaOH + 2H_2O \rightarrow 2NaAlO_2 + 3H_2$

Al =	1	×2
Na =	×2	×2
O =	2 + ×2	4
H =	2 + ×4	6

∴ The balanced chemical equation is $Al + 2NaOH + 2H_2O \rightarrow 2NaAlO_2 + 3H_2$

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Questions

Q1. Define the following terms:-
i. Sedimentation
ii decantation
iii Filtration

Q2. Differentiate the following:-
i) Sediment and residue
ii Supernatant liquid and filtrate

3. Stat the principle of seperation of
i) Sedimentation and decantation
ii) Filtration

4. Name any four common filter.

Answers

Q1) i) Sedimentation - The settling down of suspended, insoluble, heavy solid particles in a solid-liquid liquid mixture when left undisturbed is called sedimentation.

ii Decantation - The process of pouring out the clear liquid, without disturbing the sediment is called decantation.

Q2 i) Sediment and residue

Sediment	Residue
Solid which settle at the bottom ~~is called the sediment in the~~ ~~to the~~ the process of sedimentation	Solid ~~particles~~ ; Insoluble solid particles left on the filter paper is called the residue.

ii) Supernatant liquid and filtrate

Supernatant liquid	Filtrate
Clear liquid that is seperated from the sediment by the process of sedimentation is known	The liquid that ~~is~~ passes through the filter is known as filterate.

as supernatant liquid

Q3.) i) This is method is used for a heterogeneous mixture of a solid and a liquid, where the solid component is insoluble and heavier than the liquid component and has a tendency to settle down.

ii) This method is used for seperating the component of solid-liquid mixture in which solids are insoluble in liquid. The insoluble solid components being lighter than the liquid component may not settle down.

Q4. Wet Wool, clay and water, Wool, charcoal, filter paper, glass wool.