CHEMISTRY

BOOKS - EVERGREEN CHEMISTRY (ENGLISH)

ANALYTICAL CHEMISTRY-USE OF AMMONIUM & SODIUM HYDROXIDE

Equation Worksheet

1. Action of Sodium Hydroxide -On solutions of salts

1. Calcium nitrate & Magnesium chloride

2. Iron [II] sulphate

3. Iron [III] chloride

4. Copper [II] sulphate

5. Zinc sulphate

6. Lead nitrate

Complete and balanced the equations:

$Ca(NO_3)_2 + NaOH \rightarrow \quad \_\_\_\_ + \_\_\_\_ \quad \downarrow$

$MgCl_2 + NaOH \rightarrow \quad \_\_\_\_\_ + \_\_\_\_ \quad \downarrow$

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2. Action of Sodium Hydroxide -On solutions of salts

1. Calcium nitrate & Magnesium chloride

2. Iron [II] sulphate

3. Iron [III] chloride

4. Copper [II] sulphate

5. Zinc sulphate

6. Lead nitrate

Complete and balanced the equations:

$FeSO_4 + NaOH \rightarrow \quad \_\_\_\_\_ + \_\_\_\_ \quad \downarrow$

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3. Complete and balanced the equations:

$FeCl_3 + NaOH \rightarrow \quad \_\_\_\_\_ + \_\_\_\_ \quad \downarrow$

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4. Complete and balanced the equations:

$CuSO_4 + NaOH \rightarrow \quad \_\_\_\_\_ + \_\_\_\_ \quad \downarrow$

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5. Complete and balanced the equations:

$ZnSO_4 + NaOH \rightarrow \quad \_\_\_\_\_ + \_\_\_\_ \quad \downarrow$

$\left[Zn(OH)_2 + NaOH[\text{in excess}] \rightarrow \quad \_\_\_\_\_ + \_\_\_\_ \quad \right]$

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6. Complete and balanced the equations:

$Pb(NO_3)_2 + NaOH \rightarrow \quad \_\_\_\_\_ + \_\_\_\_ \quad \downarrow$

$[Pb(OH)_2 + NaOH[\text{in excess}] \rightarrow \quad \_\_\_\_\_ + \_\_\_\_ \quad]$

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7. Action of Ammonium Hydroxide- On solution of salts

Magnesium chloride Iron [III] chloride

Copper [II] sulphate

Zinc sulphate

Lead nitrate

Complete and balanced the equations:

$MgCl_2 + NH_4OH \rightarrow \quad \_\_\_\_\_ + \_\_\_\_ \quad \downarrow$

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8. Action of Ammonium Hydroxide- On solution of salts

Magnesium chloride Iron [III] chloride

Copper [II] sulphate

Zinc sulphate

Lead nitrate

Complete and balanced the equations:

$ZnSO_4 + NH_4OH \rightarrow \quad \_\_\_\_\_ + \_\_\_\_ \quad \downarrow$

$\left[Zn(OH)_2 + (NH_4)_2SO_4 + NH_4OH \rightarrow [\text{in excess}] \quad \_\_\_\_\_ + \_\_\_\_ \right]$

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9. Complete and balanced the equations:

$FeCl_3 + NH_4OH \rightarrow \quad \_\_\_\_\_ + \_\_\_\_ \quad \downarrow$

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10. Complete and balanced the equations:

$CuSO_4 + NH_4OH \rightarrow \quad \_\_\_\_ + \_\_\_\_ \quad \downarrow$

$\left[Cu(OH)_2 + (NH_4)_2SO_4 + NH_4OH \rightarrow [\text{in excess}] \quad \_\_\_\_ + \_\_\_\_ \right]$

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11. Action of Ammonium Hydroxide- On solution of salts

Magnesium chloride Iron [III] chloride

Copper [II] sulphate

Zinc sulphate

Lead nitrate

Complete and balanced the equations:

$ZnSO_4 + NH_4OH \rightarrow \quad \_\_\_\_ + \_\_\_\_ \quad \downarrow$

$\left[Zn(OH)_2 + (NH_4)_2SO_4 + NH_4OH \rightarrow [\text{in excess}] \quad \_\_\_\_ + \_\_\_\_ \right]$

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12. Complete and balanced the equations:

$Pb(NO_3)_2 + NH_4OH \rightarrow \quad \_\_\_\_\_ + \_\_\_\_ \quad \downarrow$

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13. Action of Alkalis -On certain metals

$Zn + NaOH \rightarrow \quad \_\_\_\_\_ + \_\_\_\_$

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14. Complete and balance the equation.

$Zn + KOH \rightarrow$ ____+ ____

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15.

Complete and balance the equations:

$Pb + NaOH \rightarrow$ ____+ ____

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16. Complete and balanced the equations:

$Pb + KOH \rightarrow$ ____+ ____

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17. Complete and balanced the equations: $Al + NaOH + H_2O \rightarrow$

____+ ____

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18. Complete and balanced the equations:

$Al + KOH + H_2O \rightarrow$ ____+ ____

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19. Complete and balanced the equations:

$ZnO + NaOH \rightarrow$ ____+ ____

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20. Complete and balanced the equations:

$Zn(OH)_2 + NaOH \rightarrow$ ____+ ____

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21. Complete and balanced the equations:

$PbO + NaOH \rightarrow$ ____+ ____

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22. Complete and balanced the equations:

$Pb(OH)_2 + NaOH \rightarrow$ ____+ ____

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23. Complete and balanced the equations:

$Al_2O_3 + NaOH \rightarrow$ ____+ ____

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24. Complete and balanced the equations:

$Al(OH)_3 + NaOH \rightarrow$ ____+ ____

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Questions

1. Sodium hydroxide solution is added first in a small quantity, then in excess to the aqueous salt solutions of copper [II] sulphate, zinc nitrate, lead nitrate, calcium chloride and iron [III] sulphate. For each of the aqueous salt solutions, state - a] the colour of the precipitate when NaOH is added in a small quantity,b] the nature of precipitate [i.e. soluble or insoluble, when NaOH is added in excess.

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2. Write balanced equations for - (a) Aluminium (b) Zinc- is warmed with NaOH [caustic soda] soin.

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3. The questions below refers to the following salt solutions listed A to F:

A: Copper nitrate, B: Iron [II] sulphate, C: Iron [III] chloride, D: Lead nitrate, E: Magnesium sulphate, F: Zinc, chloride.

Which solution gives a white precipitate with excess ammonium hydroxide solution.

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4. From the list of substances given- Amonium sulphate, Lead carbonate, Copper nitrate, Ferrous sulphate- State a solution of the compound which gives a dirty green precipitate with sodium hydroxide.

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5. Write a balanced equation for the reaction betwee- aluminium oxide & sodium hydroxide solution.

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6. Give one test each to distinguish between the following pairs of chemicals :

Iron (III) chloride solution and copper chloride solution.

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7. The salt which in soln. gives a pale green precipitate with NaOH soln. and a white ppt. with $BaCl_2$ soln.

(a) Iron [III] sulphate (b) Iron [II] sulphate (c) Iron [II] chloride (d) Iron [III] chloride.

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8. Find the odd one with reasons [valency is not a ceriterion]: $Al(OH)_3, Pb(OH)_2, Mg(OH)_2, Zn(OH)_2$

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9. Identify the substances P, Q and R in each case based on the information given below:

The salt P turns yellow on dissolving in water and gives a reddish brown precipitate with sodium hydroxide solution.

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10. Give an equation for - (i) ZnO reacts with NaOH soln. (ii) Conversion of - $Zn(NO_3)_2$ to $Zn(OH)_2$

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11. Select the correct answer from A,B,C-

A: Sodium hydroxide soln.

B: A weak acid

C: Dil. Sulphuric acid. The solution which with zinc sulphate solution will give a white precipitate.

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12. Choose the correct answer from the options given below :

Hydroxide of this metal is soluble in sodium hydroxide solution.

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13. Sodium hydroxide solution is added to the solutions containing the ions mentioned in List X. Use Y gives the details of the

precipitate. Match the ions with their coloured precipitates.

List X	List Y
(i) Pb^{2+}	A. Reddish brown
(ii) Fe^{2+}	B. White insoluble in excess
(iii) Zn^{2+}	C. Dirty green
(iv) Fe^{3+}	D. White soluble in excess
(v) Cu^{2+}	E. White soluble in excess
(vi) Ca^{2+}	F. Blue

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14. Give balanced equations for - (i) Zinc oxide dissolves in NaOH. (ii) Zinc is heated with NaOH solution.

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15. Name the gas in the following :

The gas evolved on reaction of Aluminium with boiling concentrated caustic alkali solution.

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16. State one observation for. (i) Excess NH_4OH soln. is added to $Pb(NO_3)_2$ soln. (ii) NaOH soln. is added to $FeCl_3$ soln. in excess.

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17. State two relevant observations for each of the following:

Ammonium hydroxide· solution is added to copper (II) nitrate solution in small quantities and then in excess.

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18. State your observation : When sodium hydroxide is added to magnesium nitrate solution

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19. To a salt soln 'Y' a small quantity of NH_4OH soln. is added slowly & then in excess. A pale blue precipitate is formed which dissolves in excess to form a clear inky blue soln. Identify the positive ion in the salt 'Y'

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20. State your observations when ammonium hydroxide solution is added drop by drop and then in excess to each of the following solutions :

copper sulphate solution

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21. State one relevant observation- Action of sodium hydroxide solution on iron [II] sulphate solution.

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22. Answer the following question :

How will you distinguish between Ammonium hydroxide and Sodium hydroxide using copper sulphate solution?

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23. Choose the correct answer from the options given below :

The salt solution which does not react with ammonium hydroxide is :

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24. Write a balanaed chemical equation for each of the following:

Reaction of sodium hydroxide solution with iron (III) chloride solution.

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25. State one relevant observation for the following :

Lead nitrate solution is treated with sodium hydroxide solution drop wise till it is in excess

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26. Write balanced chemical equation for: Ammonium hydroxide is added to ferrous sulphate solution.

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27. Copper [II] sulphate solution. Reacts with sodium hydroxide solution to form a precipitate of copper hydroxide. State the colour of the precipitate formed.

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Additional Questions

1. Salts of _____ [normal/transition] elements are generally coloured. From the ions $k^{1+}, Cr^{3+}, Fe^{2+}, Ca^{2+}, SO_3^{2-}, MnO_4^{1-}, NO_3^{1-}$ the ions generally coloured are _____

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2. The hydroxide which is soluble in excess of NaOH is _____ $\left[Zn(OH)_2 / Fe(OH)_3 / Fe(OH)_2\right]$

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3. The salt which will not react with NH_4OH solution _____ $[ZnCl_2 / CuCl_2 / NH_4Cl / FeCl_2]$

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4. The substance/s which react with hot conc. NaOH soln. & undergoes an eutralization reaction _____ $[Al_2O_3 / Al / Al(OH)_3]$

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5. To distinguish soluble salts of zinc and lead, _____ $[NaOH / NH_4OH]$ can be used

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6. Oxides and hydroxides of certain metals i.e. _____ [iron (zinc/copper/aluminium/magnesium/ lead] are amphoteric acid react with _____[acids/alkalis/acids & alkalis] to give salt and water.

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