CHEMISTRY

BOOKS - EVERGREEN CHEMISTRY (ENGLISH)

ANALYTICAL CHEMISTRY- USE OF AMMONIUM HYDROXIDE AND SODIUM HYDROXIDE

Worksheet 1

1. Give one word for the following :

The process of fonnation of a solid substance by mixing the solutions of substances

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2. Give one word for the following :

The least soluble alkali

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3. Give one word for the following :

Colour of ferric salts

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4. Give one word for the following :

Dirty green precipitates are formed by

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5. Give one word for the following :

Soluble complex formed when zinc nitrate reacts with sodium hydroxide

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6. Give one word for the following :

A non-metal which evolves hydrogen when treated with hot and conc. caustic soda

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7. Give one word for the following :

A substance which reacts with another substance

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8. Give one word for the following :

. Reagent which for deep blue solution with copper sulphate

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9. Give one word for the following :

A metal whose salts do not produce any precipitates with excess of sodium hydroxide

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10. Give one word for the following :

Colour of potassium permanganate

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11. Complete the solubility chart. First one is done for you.

S.No.	Salt	Precipitate	Reagent Choosen	Solubility
1.	Ferrous sulphate	$Fe(OH)_2$	NaOH	Insoluble
2.	Zinc sulphate	$Zn(OH)_2$		Soluble
3.		$Cu(OH)_2$		Soluble
4.		$Mg(OH)_2$	NaOH	
5.	Lead nitrate			Soluble

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12. A metal 'X' normally used for making calorimeters is heated in abundant supply of air until a black coloured residue ' Y' is obtained. This Y reacts with sulphuric acid to

form blue coloured salt 'Z'. When to this solution little of ammonium hydroxide was added, pale blue precipitates of 'A' are obtained. This 'A' dissolves in excess of ammonium hydroxide to form a deep blue solution B. Identify the metal X and write the equations for the formation of various compounds i.e., Y, Z, A and B.

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13. Complete the following equations :

$Si + NaOH + H_2O \rightarrow$

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14. Complete the following equations :

$PbO + NaOH \rightarrow$

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15. Complete the following equations :

$Zn(OH)_2 + Na$

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16. Complete the following equations :

$Al_2O_3 + NaOH \rightarrow$

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17. Fill in the blanks with appropriate words :

Sodium and potassium salts are . . . .

. . . . in colour.

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18. Fill in the blanks with appropriate words :

Ferrous salts on oxidation form .. ..

Salts.

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19. Fill in the blanks with appropriate words :

Potassium permanganate is .... in colour.

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20. Fill in the blanks with appropriate words :

..... react with metal cations to produce coloured insoluble hydroxides.

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21. Fill in the blanks with appropriate words :

..... is the least soluble of the common fluoride alkalies.

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22. Fill in the blanks with appropriate words :

Lead hydroxide is soluble in ..... but insoluble in ..... .

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23. Fill in the blanks with appropriate words :

Pale blue precipitates are formed by .....

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24. Fill in the blanks with appropriate words :

Zinc hydroxide for gelatinous . .. .

..... ppts.

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25. Fill in the blanks with appropriate words :

Complex formed by zinc sulphate and excess of ammonium hydroxide is .....

26. Fill in the blanks with appropriate words :

Dirty green precipitates are formed by ..... salts

27. A black solid P dissolves in warm and dilute HCI to form greenish blue solution Q, but does not give off any gas. The solution Q on treating with ammonium hydroxide forms bluish white precipitates of R. The precipitates of R dissolve in excess of ammonium hydroxide. solution to form deep-blue colouration. Identify solid P and bluish white precipitates of R.

Write equations for

Action of less amount of ammonium hydroxide on Q.

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28. A black solid P dissolves in warm and dilute HCI to form greenish blue solution Q, but does not give off any gas. The solution Q on treating with ammonium hydroxide forms bluish white precipitates of R. The precipitates of R dissolve in excess of ammonium hydroxide. solution to form deep-blue colouration. Identify solid P and bluish white precipitates of R.

Write equations for

Action of less amount of ammonium hydroxide on Q.

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29. A black solid P dissolves in warm and dilute HCI to form greenish yellow solution Q, but does not give off any gas. The solution Q on treating with ammonium hydroxide forms bluish white precipitates of R. The precipitates of R dissolve in excess of ammonium hydroxide. solution to form deep-blue

colouration. Identify solid P and bluish white precipitates of R.

Write equations for action of excess of ammonium hydroxide on R.

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30. A metal whose alloy finds use in the construction of air crafts in the powdered form is added to sodium hydroxide solution. A colourless gas was evolved. After the reaction was over, the solution was colourless

Name the powdered metal added to sodium hydroxide solution.

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31. A metal whose alloy finds use in the construction of air crafts in the powdered form is added to sodium hydroxide solution. A colourless gas was evolved. After the reaction was over, the solution was colourless

Name the gas evolved.

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32. A metal whose alloy finds use in the construction of air crafts in the powdered form is added to sodium hydroxide solution. A colourless gas was evolved. After the reaction was over, the solution was colourless

Name the salt present in the colourless solution.

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Additional Questions For Practice

1. Define reagent and precipitate

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2. Name :

a coloured metallic oxide which dissolves in alkalis to yield colourless solutions.

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3. Name two bases which are not alkalis but dissolve in strong alkalis.

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4. Name :

a metallic hydroxide soluble in excess of NH_4OH.

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5. Name :

a metallic oxide soluble in excess of caustic soda solution.

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6. Name :

a strong alkali.

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7. Name :

a weak alkali

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8. Name :

two colourless metal ions.

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9. Name :

two coloured metal ions.

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10. Name :

a metal that evolve a gas which bums with a pop sound when boiled with alkali solutions.

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11. What do you observe when caustic soda solution is added to the following solution : first a little and then in excess.

$FeCl_3$

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12. What do you observe when caustic soda solution is added to the following solution : first a little and then in excess.

$ZnSO_4$

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13. What do you observe when caustic soda solution is added to the following solution : first a little and then in excess.

$Pb(NO_3)_2$

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14. What do you observe when caustic soda solution is added to the following solution :

first a little and then in excess.

$CuSO_4$

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15. A yellow solution of a salt yields a reddish brown precipitate with caustic soda solution.The precipitate does not dissolve in excess of the alkali. The reddish brown precipitate on strong heating leaves behind a red powder, insoluble in water but soluble in

dilute HCI.

Identify the metal of the salt.

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16. A yellow solution of a salt yields a reddish brown precipitate with caustic soda solution.The precipitate does not dissolve in excess of the alkali. The reddish brown precipitate on strong heating leaves behind a red powder, insoluble in water but soluble in

dilute HCI.

Write the equation of the reaction involved.

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17. Name a yellow monoxide that dissolves in hot and concentrated alkali. Give equation.

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18. Name a white insoluble oxide that dissolves when fused with caustic soda or caustic

potash.

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19. What is the reaction of freshly precipitated aluminium hydroxide with caustic soda solution? Give equation.

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20. Identify a blue solution that turns deep blue on addition of an excess of NH_4OH.

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21. Name a hydroxide which is soluble in excess of ammonium hydroxide.

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22. A colourless solution of a salt yields a white precipitate with dropwise addition of caustic alkali, which however. dissolves in excess of the alkali. The salt is a (a) zinc salt,

(b) aluminium salt, (c) either a zinc salt or an aluminium salt, (d) none of (a) or (b).

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23. Name a metallic hydroxide which does not get precipitated by NH_4OH in the presence of NH_4Cl.

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24. Name a metallic hydroxide which gets precipitated by NH_4OH even in the presence of NH_4Cl.

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25. Name a metallic hydroxide that is insoluble in NH_4OH but dissolves readily in solution of NH_4CI.

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26. Identify the cation in each of the following case

Sodium hydroxide solution when added to the solution 'A' gives reddish brown precipitate.

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27. Identify the cation in each of the following case

Ammonium hydroxide solution when added to the solution B gives white precipitate which dissolves in excess

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28. Identify the cation in each of the following case

Sodium hydroxide solution when added to solution C gives bluish white precipitate which is insoluble in excess.

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29. Identify the cation in each of the following case

Ammonium hydroxide solution when added to solution D gives dirty green precipitate which changes to reddish brown after some time.

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30. Identify the cation in each of the following case

Ammonium hydroxide solution when added to

the solution gives bluish white precipitate which dissolves in excess to give deep blue solution.

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31. What happens when ammonium hydroxide is added dropwise in excess to :

copper sulphate solution ?

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32. What happens when ammonium hydroxide is added dropwise in excess to : zinc sulphate solution ?

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33. What happens when ammonium hydroxide is added dropwise in excess to : aluminium sulphate solution ?

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34. How does ammonium hydroxide help in distinguishing between :

Iron II chloride and iron Ill chloride

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35. How does ammonium hydroxide help in distinguishing between :

Zinc nitrate and lead nitrate

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36. How does ammonium hydroxide help in distinguishing between :

Lead hydroxide and zinc hydroxide.

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37. What do you observe when :

Ammonium hydroxide is added to copper sulphate solution first a little, then in excess.

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38. What do you observe when :

Sodium hydroxide is added to zinc sulphate solution first in a little then in excess.

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39. What do you observe when :

Calcium nitrate is added to sodium hydroxide solution.

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40. What do you observe when :

Sodium hydroxide solution is added to iron (III) chloride solution.

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41. What do you observe when :

Ammonium hydroxide solution is added to lead nitrate first a little then in excess.

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42. Name :

a yellow monoxide that dissolves in hot and concentrated caustic alkali.

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43. Name :

a white, insoluble oxide that dissolves when fused with caustic soda or caustic potash.

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44. Name :

a hydroxide which is soluble in excess of ammonium hydroxide.

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45. Salts M, N, O, P and Q undergo reactiom (i) to (v) respectively.

Identify the cation present in these salts on the basis of these reaction. Tabulate your answer in the format given below.

1. When sodium hydroxide solution is added to the salt M, and heated strongly a colourless gas with a pungent smell is evolved which turm red litmus paper blue and gives dense white fumes with a moist glass rod with hydrochloric acid.

2. Addition of dilute hydrochloric acid to a solution of N gives a thick white precipitate which is soluble in hot water.

3. When ammonium hydroxide solution is added to the solution of 0 a light blue precipitate is obtained which is soluble in excess of ammonium hydroxide to form an

inteme deep blue solution.

4. When ammonium hydroxide solution is added to the solution of P reddish brown (mustard colour) precipitate is obtained which ,is insoluble even in the excess of ammonium hydroxide solution.

5. When sodium hydroxide solution is added to the solution of Q a which coloured gelatinous precipitate is obtained which is soluble in excess of sodium hydroxide to form

a clear solution

Salt	Cation	
M	1	.....
N	2	.....
O	2	.....
P	2	.....
Q	2	.....

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46. What do you observe when ?

Sodium hydroxide solution is slowly added to zinc sulphate solution.

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47. What do you observe when ?

Ammonium hydroxide solution is slowly added to copper sulphate solution

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48. What do you observe when ammonium hydroxide solution is added to :

Silver nitrate solution

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49. What do you observe when ammonium hydroxide solution is added to :

Lead nitrate solution

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50. What do you observe when ammonium hydroxide solution is added to :

Calcium nitrate solution

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51. What do you observe when ammonium hydroxide solution is added to :

Zlnc nitrate solutioo in little amount and then in excess.

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Questions From Previous Icse Board Papers

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

Zinc nitrate solution and calcium nitrate solution.

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

Sodium nitrate solution and sodium chloride solution.

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

Iron (III) chloride solution and copper chloride solution.

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4. Dilute sulphuric acid will produce a white precipitate when added to a solution of

A. Copper nitrate

B. Zinc nitrate

C. Lead nitrate

D. Sodium nitrate

Answer:

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5. The salt which in solution gives a pale green precipitate with sodium hydroxide solution and a white precipitate with barium chloride solution is

A. Iron (III) Sulphate

B. Iron (II) Sulphate

C. Iron (II) Chloride

D. Iron (III) Chloride

Answer:

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6. Give one chemical test to distinguish between the following pairs of compounds.

Zinc sulphate solution and Zinc chloride solution.

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7. Give one chemical test to distinguish between the following pairs of compounds.

Iron (II) chloride solution and Iron (III) chloride solution.

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8. Give one chemical test to distinguish between the following pairs of compounds.

Calcium nitrate solution and Calcium chloride solution.

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9. Write the equation for each of the following reactions :

Zinc oxide is treated with sodium hydroxide solution.

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10. Write the equation for each of the following reactions :

Ammonium chloride is heated with sodium hydroxide.

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11. What would you observe in the following ?

Ammonium hydroxide is first added in a small

quantity and then in excess to a solution of copper sulphate.

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

Hydroxide of this metal is soluble in sodium hydroxide solution.

A. Magnesium

B. Lead

C. Silver

D. Copper

Answer:

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13. Write the balanced chemical equation for the following reaction :

Zinc is heated with sodium hydroxide solution.

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14. Sodium hydroxide solutions to the solutions containing the ions mentioned in list x list y gives the detail of the precipitate match the ions 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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15. Write balanced chemical equation for the following :

Zinc oxide dissolves in sodium hydroxide.

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16. Name the gas in the following :

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

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17. State one observation for each of the following:

Excess ammonium hydroxide solution is added to lead nitrate solution.

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18. State one observation for each of the following:

Sodium hydroxide solution is added to ferric chloride solution at first a little and then in excess.

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19. Identify the anion present in the following compound : When a solution of compound Y is treated with silver nitrate solution a white precipitate is obtained which is soluble in excess of ammonium hydroxide solution.

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20. State one chemical test between each of the following pairs :

Sodium carbonate and Sodium sulphite

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21. State one chemical test between each of the following pairs :

Ferrous nitrate and Lead nitrate

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22. State one chemical test between each of the following pairs :

Manganese dioxide and Copper (II) oxide

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23. Give a chemical test to distinguish between the following pairs of compounds :

Calcium nitrate solution and zinc nitrate solution.

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24. 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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25. State two relevant observations for each of the following:

Ammonium hydroxide solution is added to zinc nitrate solution in minimum quantities and then in excess

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26. Distinguish between the following pairs of compounds · using test given within brackets : Iron (II) sulphate and iron (III) sulphate (using ammonium hydroxide)

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27. Distinguish between the following pairs of compounds · using test given within brackets : A lead salt and a zinc salt (using excess ammonium hydroxide)

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28. State your observation in the following case:

When excess sodium hydroxide is added to calcium nitrate solution.

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29. Fill in the blank with the choices given in bracket : ..... $(AgCl / PbCl_2)$ a white precipitate is soluble in excess NH_4OH.

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30. 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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31. State your observations when ammonium hydroxide solution is added drop by drop and

then in excess to each of the following solutions :

zinc sulphate solution

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32. Identify the cations in each of the following case :

NaOH solution when added to the Solution (A) gives a reddish brown precipitate

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33. Identify the cations in each of the following case :

NH_4OH Solution when added to the Solution (B) gives white ppt which does not dissolve in excess.

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34. Identify the cations in each of the following case :

NaOH Solution when added to Solution (C) gives white ppt which is insoluble in excess.

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35. Select correct answers from the choices A, B, C, D which are given. Write down only the letter corresponding to the correct answer.

A chloride which forms a precipitate that is soluble in excess of ammonium hydroxide is

A. Calcium chloride

B. Ferrous chloride

C. Ferric chloride

D. Copper chloride

Answer:

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36. Identify the substance underlined, in the following case :

Cation that does not form a precipitate with ammonium hydroxide but forms one with sodium hydroxide.

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37. State one relevant observation for the following reaction :

Action of Sodium hydroxide solution on ferrous sulphate solution.

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38. Answer the following question :

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

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

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

A. Calcium Nitrate

B. Zinc Nitrate

C. Lead Nitrate

D. Copper Nitrate

Answer:

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

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

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

Action of heat on aluminium hydroxide

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

Reaction of zinc with potassium hydroxide solution.

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43. 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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44. Give a chemical test to distinguish between the following pairs of chemicals:

Lead nitrate solution and Zinc nitrate solution

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45. Give a chemical test to distinguish between the following pairs of chemicals:

Sodium chloride solution and Sodium nitrate solution.

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