# Review – Solutions – V1

1.) If you dissolve $1.50\ mol$ of aluminum chloride in $2.25\ L$ of water, calculate [ ] of each ion.

2.) If you dissolve $0.240\ mol$ of ammonium sulphate in $320\ mL$ of water, calculate [ $NH_4^{+1}{}_{(aq)}$].

3.) If the $[Cl^-] = 0.015\ M$ in $75\ mL$ of water, how many moles of iron (III) chloride were there?

4.) How much water would you need if you started with $1.20\ mol$ of sodium oxalate but wanted a solution with $[Na^{+1}] = 0.48M$?

5.) In $1.25\ L$ of a $0.50\ M$ nickel (III) sulphate solution, calculate moles of nickel (III) ions.

6.) How many grams of ammonium chloride are present in a $0.30\ L$ beaker of a $0.40\ M$ solution of ammonium chloride?

7.) How many litres of a $0.250\ M$ potassium chromate solution contains $38.8\ g$ of $K_2CrO_4$ solution?

8.) A chemist evaporated $25.0\ mL$ of a sodium chloride solution to dryness. He found $0.585\ g$ of NaCl. What was the original concentration of the salt?

9.) If you dissolve $316\ g$ of magnesium bromide in $859\ mL$ of water, calculate [ ]'s of each ion.

10.) $31.1\ g$ of aluminum sulphate is dissolved in $756\ mL$ of water. Calculate [ ] of each ion.

11.) $250.0\ mL$ of a $1.2\ M$ $[Pb(NO3)_{2\ (aq)}]$ solution is diluted to $600.0\ mL$. Calculate [$Pb(NO_3)_{2\ (aq)}$] and [$Pb^{+2}{}_{(aq)}$] and [$NO_3^{-1}{}_{(aq)}$].

12.) $0.300\ L$ of a sodium sulphate solution is diluted to $0.750\ L$.The **diluted** concentration of sodium ions is $0.72\ M$. Calculate the **original** concentration of the sodium sulphate solution.

13.) In soda pop, the concentration of dissolved sugar is approximately $0.0125\ M$. However, in the syrup mix, the sugar concentration is $5.6\ M$. How m any millilitres of the syrup would be needed to make $2.0\ L$ of drinkable soda pop?

14.) By accident, $3.57\ mL$ of syrup from the previous question was used instead. Calculate the concentration of the sugar in the $2.0\ L$ soda pop.

15.) A chemist has $46.8\ mL$ of a $0.400\ M$ NaCl solution. How much water must be added to make a $0.250\ M$ solution?

16.) Stephanie adds water to a $125\ mL$ $3.6\ M$ sodium phosphate solution until she has $1.00\ L$. Calculate the [ ] of each ion.

17.) $2.0\ L$ of a $0.60\ M$ ferric chloride (iron (III) chloride) solution are mixed with $1.00\ L$ of a $0.90\ M$ barium chloride solution. Calculate the [ ] of each ion.

18.) $250.0\ mL$ of a $0.30\ M$ potassium sulphate and $450.0\ mL$ of a $0.80\ M$magnesium chloride solutions are mixed. Calculate the [ ] of each ion.

19.) $20.83\ g$ of $BaCl_2$ is dissolved in $75.0\ mL$ of $2.00\ M$ NaCl. Calculate the concentrations of all ions.

20.) $71.0\ g$ of aluminum nitrate and $53.4\ g$ of magnesium nitrate are dissolved in $800.0\ mL$ of water. Calculate [$Al(NO_3)_{3\ (aq)}$], [$Mg(NO_3)_{s\ (aq)}$], and [$NO_3^{-1}{}_{(aq)}$].

21.) $123.0\ g$ of sodium acetate and $0.48\ mol$ of strontium acetate are dissolved in $0.25\ L$ of water. Calculate [$Fe^{+3}{}_{(aq)}$].

22.) $40.3\ g$ of ferric nitrate and $97.38\ g$ of ferric chloride are dissolved in $0.25\ L$ of water. Calculate the concentration of the ferric iron ion ($Fe^{+3}$).

23.) $150.\ mL$ of $0.80\ M$ $Ca(NO_3)_2$ are mixed with $650\ mL$ of $1.20\ M$ $KNO_3$. Calculate the concentration of all ions in the diluted solution.

24.) $25\ mL$ of a $4.4\ M$ magnesium sulphate solution are mixed with $75.0\ mL$ of a $1.25\ M$ magnesium phosphate solution. Calculate the concentrations of all ions of the dilute solution.

25.) $0.200\ L$ of a $0.050\ M$ $AlBr_3$ solution is added to $50.0\ mL$ of a $0.40\ M$ KOH solution.

a.) Will a precipitate form? If so, what is it?

b.) Write a net ionic equation.

c.) Calculate the mass of the precipitate, if a precipitate formed.

d.) If $0.65\ g$ of precipitate are recovered, calculate the % yield.

e.) Calculate the concentrations of spectator ions.

26.) $0.25\ L$ of a $0.24\ M$ zinc iodide solution is mixed with an equal volume of a $0.30\ M$ sodium sulphate solution.

a.) Will a precipitate form? If so, what is it?

b.) Write a net ionic equation.

c.) Calculate the mass of the precipitate, if a precipitate formed.

d.) Calculate the concentrations of spectator ions.

27.) $200.0\ mL$ of a $0.25\ M$ $AgNO_3$ is mixed with $300.0\ mL$ of a $0.10\ M$ $MgCl_2$ solution.

a.) Will a precipitate form? If so, what is it?

b.) Write a net ionic equation.

c.) Calculate the mass of the precipitate, if a precipitate formed.

d.) Calculate the concentrations of spectator ions.

28.) $125\ mL$ of a $0.12\ M$ aluminum sulphate solution is added to $0.25\ L$ of a $0.12\ M$ strontium hydroxide solution.

a.) Will a precipitate form? If so, what is it?

b.) Write a net ionic equation.

c.) Calculate the mass of the precipitate, if a precipitate formed.

d.) Calculate the concentrations of spectator ions. (Hint – yes there are ions left in solution!!)