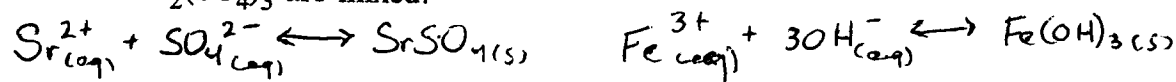


Solubility #1

1. Write the net ionic equation(s) for the reaction(s) when equal volumes of 0.2 M $\text{Sr}(\text{OH})_2$ and 0.2 M $\text{Fe}_2(\text{SO}_4)_3$ are mixed.



2. Describe the equilibrium that exists in a saturated solution of BaSO_4 in contact with some solid residue of BaSO_4 .

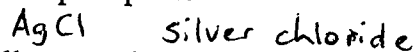


at equilibrium the $[\text{Ba}^{2+}]$ and $[\text{SO}_4^{2-}]$ are constant

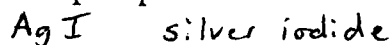
3. In an experiment, 0.1 M AgNO_3 is added to 0.1 M NaCl , resulting in the formation of a white precipitate. When 0.1 M NaI is added to this mixture, the white precipitate dissolves and a yellow precipitate forms.

- (a) Write the formula and name for each of the following:

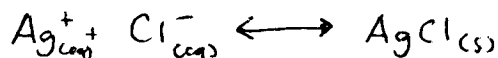
- (i) the white precipitate



- (ii) the yellow precipitate

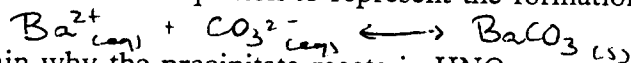


- (b) Write the net ionic equation to represent the formation of the more soluble precipitate.



4. A solution of $\text{Ba}(\text{NO}_3)_2$ is added to a solution of Na_2CO_3 , resulting in the formation of a white precipitate the reacts with HNO_3 .

- (a) Write a net ionic equation to represent the formation of the white precipitate.



- (b) Explain why the precipitate reacts in HNO_3 .



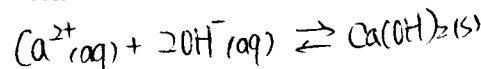
carbonates react with acids.

5. A student is given three beakers, each containing 100 mL of solution. The first beaker contains 0.20 M CaS ; the second contains 0.20 M CuSO_4 ; the third contains 0.20 M $\text{Sr}(\text{OH})_2$. The student is asked to select two solutions which, when combined, would result in the formation of a mixture containing a single precipitate.

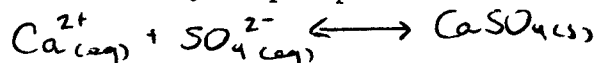
- (a) Which two solutions should the student use?



- (b) Write the net ionic equation for the precipitation reaction.



6. If a solution of calcium nitrate is added to a saturated solution of calcium sulphate, a precipitate is observed to form. Explain why this occurs, including any relevant equation(s) and identify the precipitate.



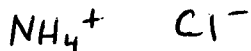
Adding $\text{Ca}(\text{NO}_3)_2$ increases the $[\text{Ca}^{2+}]$ causing the equilibrium to shift to the right and to form more solid product.

Key.

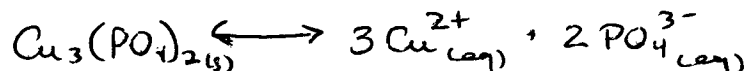
7. Write an equation that describes a saturated solution of NaCl.



8. A solution containing Al^{3+} , NH_4^+ and Mg^{2+} ions is added to a solution containing S^{2-} , Cl^- and OH^- ions. Identify the ions that do **not** form a precipitate.



9. Write an equation that describes the equilibrium present in a saturated solution of $\text{Cu}_3(\text{PO}_4)_2$.

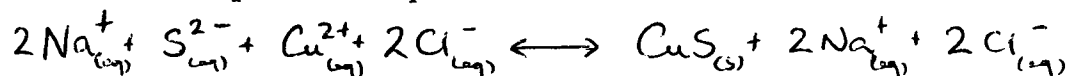


10. A 1.0 M solution of sodium sulphide is added to a 1.0 M solution of copper(II) chloride resulting in the formation of a precipitate.

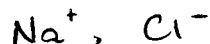
- (a) Identify the precipitate.



- (b) Write the **complete** ionic equation for the reaction.



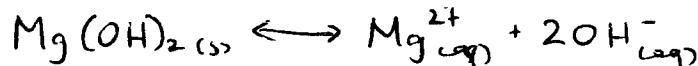
- (c) Identify all spectator ions.



11. Identify a salt that could be added to a saturated solution of BaSO_4 that would result in more solid barium sulphate forming.



12. Write an equation that describes a saturated solution of magnesium hydroxide.



13. When solid $\text{Ca}(\text{NO}_3)_2$ is added to a saturated solution of MgCO_3 , more MgCO_3 dissolves. Explain.

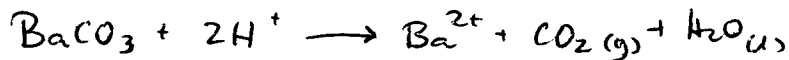
The Ca^{2+} reacts with the CO_3^{2-} to form solid CaCO_3 . This decreases the $[\text{CO}_3^{2-}]$ and more MgCO_3 dissolves.

14. A student mixes equal volumes of 0.20 M Na_2CO_3 and 0.20 M $\text{Ba}(\text{NO}_3)_2$, forming a white precipitate.

- (a) Write the net ionic equation for the precipitation reaction.



- (b) Explain why the precipitate dissolves when HCl is added.



Carbonates react with acid to form CO_2 and water.

15. Write an equation that represents the solubility equilibrium of a saturated solution of barium sulphate.

