

Activity 7A: Ionic equations and solubility rules

Ans p. 30

1. Write an ionic equation for the formation of iron(II) hydroxide when sodium hydroxide is added to freshly prepared iron(II) sulfate solution.
2. Write ionic equations for the precipitation of:
 - a. copper(II) hydroxide
 - b. copper(II) carbonate
 - c. barium sulfate
 - d. silver chloride
3. Write balanced ionic equations for the formation of the precipitate when the following solutions are mixed:
 - a. sodium sulfate, Na_2SO_4 , and calcium nitrate, $\text{Ca}(\text{NO}_3)_2$
 - b. potassium hydroxide, KOH , and magnesium chloride, MgCl_2
 - c. lead nitrate, $\text{Pb}(\text{NO}_3)_2$, and potassium chloride, KCl
 - d. aluminium sulfate, $\text{Al}_2(\text{SO}_4)_3$, and sodium hydroxide, NaOH
 - e. sodium carbonate, Na_2CO_3 , and magnesium nitrate, $\text{Mg}(\text{NO}_3)_2$
 - f. silver nitrate, AgNO_3 , and sodium iodide, NaI
4. Write ionic equations for the formation of the precipitate when the following pairs of solutions are mixed:
 - a. sodium carbonate and calcium chloride
 - b. lead nitrate and potassium iodide
 - c. potassium hydroxide and copper sulfate
 - d. silver nitrate and zinc chloride
 - e. barium nitrate and aluminium sulfate
 - f. iron(III) chloride and sodium hydroxide

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1. $\text{Fe}^{2+}(\text{aq}) + 2\text{OH}^{-}(\text{aq}) \rightarrow \text{Fe}(\text{OH})_2(\text{s})$
2.
 - a. $\text{Cu}^{2+}(\text{aq}) + 2\text{OH}^{-}(\text{aq}) \rightarrow \text{Cu}(\text{OH})_2(\text{s})$
 - b. $\text{Cu}^{2+}(\text{aq}) + \text{CO}_3^{2-}(\text{aq}) \rightarrow \text{CuCO}_3(\text{s})$
 - c. $\text{Ba}^{2+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \rightarrow \text{BaSO}_4(\text{s})$
 - d. $\text{Ag}^{+}(\text{aq}) + \text{Cl}^{-}(\text{aq}) \rightarrow \text{AgCl}(\text{s})$
3.
 - a. $\text{Ca}^{2+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \rightarrow \text{CaSO}_4(\text{s})$
 - b. $\text{Mg}^{2+}(\text{aq}) + 2\text{OH}^{-}(\text{aq}) \rightarrow \text{Mg}(\text{OH})_2(\text{s})$
 - c. $\text{Pb}^{2+}(\text{aq}) + 2\text{Cl}^{-}(\text{aq}) \rightarrow \text{PbCl}_2(\text{s})$
 - d. $\text{Al}^{3+}(\text{aq}) + 3\text{OH}^{-}(\text{aq}) \rightarrow \text{Al}(\text{OH})_3(\text{s})$
 - e. $\text{Mg}^{2+}(\text{aq}) + \text{CO}_3^{2-}(\text{aq}) \rightarrow \text{MgCO}_3(\text{s})$
 - f. $\text{Ag}^{+}(\text{aq}) + \text{I}^{-}(\text{aq}) \rightarrow \text{AgI}(\text{s})$
4.
 - a. $\text{Ca}^{2+}(\text{aq}) + \text{CO}_3^{2-}(\text{aq}) \rightarrow \text{CaCO}_3(\text{s})$
 - b. $\text{Pb}^{2+}(\text{aq}) + 2\text{I}^{-}(\text{aq}) \rightarrow \text{PbI}_2(\text{s})$
 - c. $\text{Cu}^{2+}(\text{aq}) + 2\text{OH}^{-}(\text{aq}) \rightarrow \text{Cu}(\text{OH})_2(\text{s})$
 - d. $\text{Ag}^{+}(\text{aq}) + \text{Cl}^{-}(\text{aq}) \rightarrow \text{AgCl}(\text{s})$
 - e. $\text{Ba}^{2+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \rightarrow \text{BaSO}_4(\text{s})$
 - f. $\text{Fe}^{3+}(\text{aq}) + 3\text{OH}^{-}(\text{aq}) \rightarrow \text{Fe}(\text{OH})_3(\text{s})$