

Precipitation Reactions Worksheet Key

For each of the following reactants, predict whether a precipitation reaction will take place between them. If there is no reaction, write "no reaction". If there is a reaction, write the complete, complete ionic, and net ionic equations that describe the reaction.

- a. $\text{Li}_2\text{CO}_3(aq) + \text{Co}(\text{C}_2\text{H}_3\text{O}_2)_2(aq) \rightarrow 2\text{LiC}_2\text{H}_3\text{O}_2(aq) + \text{CoCO}_3(s)$
 $2\text{Li}^+(aq) + \text{CO}_3^{2-}(aq) + \text{Co}^{2+}(aq) + 2\text{C}_2\text{H}_3\text{O}_2^-(aq) \rightarrow 2\text{Li}^+(aq) + 2\text{C}_2\text{H}_3\text{O}_2^-(aq) + \text{CoCO}_3(s)$
 $\text{CO}_3^{2-}(aq) + \text{Co}^{2+}(aq) \rightarrow \text{CoCO}_3(s)$
- b. $2\text{Fe}(\text{NO}_3)_3(aq) + 3\text{K}_2\text{S}(aq) \rightarrow \text{Fe}_2\text{S}_3(s) + 6\text{KNO}_3(aq)$
 $2\text{Fe}^{3+}(aq) + 6\text{NO}_3^-(aq) + 6\text{K}^+(aq) + 3\text{S}^{2-}(aq) \rightarrow \text{Fe}_2\text{S}_3(s) + 6\text{K}^+(aq) + 6\text{NO}_3^-(aq)$
 $2\text{Fe}^{3+}(aq) + 3\text{S}^{2-}(aq) \rightarrow \text{Fe}_2\text{S}_3(s)$
- c. $\text{Pb}(\text{NO}_3)_2(aq) + \text{Li}_2\text{SO}_4(aq) \rightarrow \text{PbSO}_4(s) + 2\text{LiNO}_3(aq)$
 $\text{Pb}^{2+}(aq) + 2\text{NO}_3^-(aq) + 2\text{Li}^+(aq) + \text{SO}_4^{2-}(aq) \rightarrow \text{PbSO}_4(s) + 2\text{Li}^+(aq) + 2\text{NO}_3^-(aq)$
 $\text{Pb}^{2+}(aq) + \text{SO}_4^{2-}(aq) \rightarrow \text{PbSO}_4(s)$
- d. $\text{NH}_4\text{Cl}(aq) + \text{Cu}(\text{C}_2\text{H}_3\text{O}_2)_2(aq)$ **No reaction**

CHEMISTRY 151 - PRECIPITATION REACTIONS KEY

For each of the following reactants, predict whether a precipitation reaction will take place between them. If there is no reaction, write "no reaction". If there is a reaction, write the complete, complete ionic, and net ionic equations that describe the reaction.

- a. $2\text{K}_3\text{PO}_4(aq) + 3\text{Cd}(\text{C}_2\text{H}_3\text{O}_2)_2(aq) \rightarrow 6\text{KC}_2\text{H}_3\text{O}_2(aq) + \text{Cd}_3(\text{PO}_4)_2(s)$
 $6\text{K}^+(aq) + 2\text{PO}_4^{3-}(aq) + 3\text{Cd}^{2+}(aq) + 6\text{C}_2\text{H}_3\text{O}_2^-(aq) \rightarrow 6\text{K}^+(aq) + 6\text{C}_2\text{H}_3\text{O}_2^-(aq) + \text{Cd}_3(\text{PO}_4)_2(s)$
 $2\text{PO}_4^{3-}(aq) + 3\text{Cd}^{2+}(aq) \rightarrow \text{Cd}_3(\text{PO}_4)_2(s)$
- b. $\text{K}_2\text{S}(aq) + \text{ZnCl}_2(aq) \rightarrow 2\text{KCl}(aq) + \text{ZnS}(s)$
 $2\text{K}^+(aq) + \text{S}^{2-}(aq) + \text{Zn}^{2+}(aq) + 2\text{Cl}^-(aq) \rightarrow 2\text{K}^+(aq) + 2\text{Cl}^-(aq) + \text{ZnS}(s)$
 $\text{S}^{2-}(aq) + \text{Zn}^{2+}(aq) \rightarrow \text{ZnS}(s)$
- c. $2\text{NH}_4\text{Br}(aq) + \text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2(aq) \rightarrow 2\text{NH}_4\text{C}_2\text{H}_3\text{O}_2(aq) + \text{PbBr}_2(s)$
 $2\text{NH}_4^+(aq) + 2\text{Br}^-(aq) + \text{Pb}^{2+}(aq) + 2\text{C}_2\text{H}_3\text{O}_2^-(aq) \rightarrow 2\text{NH}_4^+(aq) + 2\text{C}_2\text{H}_3\text{O}_2^-(aq) + \text{PbBr}_2(s)$
 $2\text{Br}^-(aq) + \text{Pb}^{2+}(aq) \rightarrow \text{PbBr}_2(s)$
- d. $\text{Na}_2\text{SO}_4(aq) + \text{Ba}(\text{NO}_3)_2(aq) \rightarrow 2\text{NaNO}_3(aq) + \text{BaSO}_4(s)$
 $2\text{Na}^+(aq) + \text{SO}_4^{2-}(aq) + \text{Ba}^{2+}(aq) + 2\text{NO}_3^-(aq) \rightarrow 2\text{Na}^+(aq) + 2\text{NO}_3^-(aq) + \text{BaSO}_4(s)$
 $\text{SO}_4^{2-}(aq) + \text{Ba}^{2+}(aq) \rightarrow \text{BaSO}_4(s)$
- e. $\text{K}_3\text{PO}_4(aq) + (\text{NH}_4)_2\text{CO}_3(aq)$ **No Reaction**