

Homework #8, Graded Answers

Chem20, Elementary Chemistry

7.50) Balance each equation.

- a.) $\text{MgO}_2(\text{s}) + 4 \text{HCl}(\text{aq}) \rightarrow \text{Cl}_2(\text{g}) + \text{MnCl}_2(\text{aq}) + 2 \text{H}_2\text{O}(\text{l})$
b.) $2 \text{CO}_2(\text{g}) + \text{CaSiO}_3(\text{s}) + \text{H}_2\text{O}(\text{l}) \rightarrow \text{SiO}_2(\text{s}) + \text{Ca}(\text{HCO}_3)_2(\text{aq})$
c.) $2 \text{Fe}(\text{s}) + 3 \text{S}(\text{l}) \rightarrow \text{Fe}_2\text{S}_3(\text{s})$
d.) $3 \text{NO}_2(\text{g}) + \text{H}_2\text{O}(\text{l}) \rightarrow 2 \text{HNO}_3(\text{aq}) + \text{NO}(\text{g})$

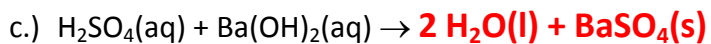
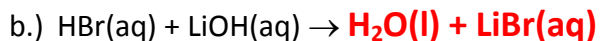
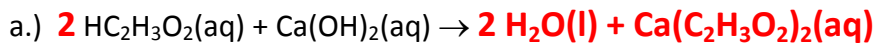
7.57) Determine whether each compound is soluble or insoluble. For each soluble compound, identify the ions present in solution.

- a.) $\text{NaC}_2\text{H}_3\text{O}_2 = \text{soluble}$, $\text{NaC}_2\text{H}_3\text{O}_2(\text{aq}) \rightarrow \text{Na}^+(\text{aq}) + \text{C}_2\text{H}_3\text{O}_2^-(\text{aq})$
b.) $\text{Sn}(\text{NO}_3)_2 = \text{soluble}$, $\text{Sn}(\text{NO}_3)_2(\text{aq}) \rightarrow \text{Sn}^{2+}(\text{aq}) + 2 \text{NO}_3^-(\text{aq})$
c.) $\text{AgI} = \text{insoluble}$, $\text{AgI}(\text{s})$
d.) $\text{Na}_3\text{PO}_4 = \text{soluble}$, $\text{Na}_3\text{PO}_4(\text{aq}) \rightarrow 3 \text{Na}^+(\text{aq}) + \text{PO}_4^{3-}(\text{aq})$

7.72) Write the balanced complete ionic and net ionic equations for each reaction.

- a.) $\text{HI}(\text{aq}) + \text{KOH}(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l}) + \text{KI}(\text{aq})$
TIE: $\text{H}^+(\text{aq}) + \text{I}^-(\text{aq}) + \text{K}^+(\text{aq}) + \text{OH}^-(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l}) + \text{K}^+(\text{aq}) + \text{I}^-(\text{aq})$
Spectators: $\text{I}^-(\text{aq}), \text{K}^+(\text{aq})$
NIE: $\text{H}^+(\text{aq}) + \text{OH}^-(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l})$
- b.) $\text{Na}_2\text{SO}_4(\text{aq}) + \text{CaI}_2(\text{aq}) \rightarrow \text{CaSO}_4(\text{s}) + 2 \text{NaI}(\text{aq})$
TIE: $2 \text{Na}^+(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) + \text{Ca}^{2+}(\text{aq}) + 2 \text{I}^-(\text{aq}) \rightarrow \text{CaSO}_4(\text{s}) + 2 \text{Na}^+(\text{aq}) + 2 \text{I}^-(\text{aq})$
Spectators: $2 \text{Na}^+(\text{aq}), 2 \text{I}^-(\text{aq})$
NIE: $\text{SO}_4^{2-}(\text{aq}) + \text{Ca}^{2+}(\text{aq}) \rightarrow \text{CaSO}_4(\text{s})$
- c.) $2 \text{HC}_2\text{H}_3\text{O}_2(\text{aq}) + \text{Na}_2\text{CO}_3(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l}) + \text{CO}_2(\text{g}) + 2 \text{NaC}_2\text{H}_3\text{O}_2(\text{aq})$
TIE: $2 \text{H}^+(\text{aq}) + 2 \text{C}_2\text{H}_3\text{O}_2^-(\text{aq}) + 2 \text{Na}^+(\text{aq}) + \text{CO}_3^{2-}(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l}) + \text{CO}_2(\text{g}) + 2 \text{Na}^+(\text{aq}) + 2 \text{C}_2\text{H}_3\text{O}_2^-(\text{aq})$
Spectators: $2 \text{C}_2\text{H}_3\text{O}_2^-(\text{aq}), 2 \text{Na}^+(\text{aq})$
NIE: $2 \text{H}^+(\text{aq}) + \text{CO}_3^{2-}(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l}) + \text{CO}_2(\text{g})$
- d.) $\text{NH}_4\text{Cl}(\text{aq}) + \text{NaOH}(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l}) + \text{NH}_3(\text{g}) + \text{NaCl}(\text{aq})$
TIE: $\text{NH}_4^+(\text{aq}) + \text{Cl}^-(\text{aq}) + \text{Na}^+(\text{aq}) + \text{OH}^-(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l}) + \text{NH}_3(\text{g}) + \text{Na}^+(\text{aq}) + \text{Cl}^-(\text{aq})$
Spectators: $\text{Cl}^-(\text{aq}), \text{Na}^+(\text{aq})$
NIE: $\text{NH}_4^+(\text{aq}) + \text{OH}^-(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l}) + \text{NH}_3(\text{g})$

7.80) Complete and balance each acid-base reaction.



7.89) Classify each chemical reaction as synthesis, decomposition, single-displacement, or double-displacement.

