Name _____ Date: _____ Period: _____

Chemistry 09-13 Ionic Equations

In many chemical reactions, some or all of the reactants and products may be ions, rather than molecules or atoms. Equations for single replacement and double replacement reactions are often written as ionic equations. Ionic equations can then be converted into net ionic equations by the omission of spectator ions.

Single Replacement Reaction $2\ HCl\ (aq) + Zn\ (s) \rightarrow ZnCl_2\ (aq) + H_2\ (g)$

Ionic Equation $2\ H^{+1}\ (aq) + 2\ Cl^{-1}\ (aq) + Zn\ (s) \rightarrow Zn^{2+}\ (aq) + 2\ Cl^{-1}\ (aq) + H_2\ (g)$

Net Ionic Equation $2\ H^{+1}\ (aq) + Zn\ (s) \rightarrow Zn^{2+}\ (aq) + H_2\ (g)$

1) For each reaction below, balance the single replacement equation and convert it into ionic and net ionic equations.

a) _____ $Cl_2\ (g)$ + _____ $NaI\ (aq) \rightarrow$ _____ $I_2\ (g)$ + _____ $NaCl\ (aq)$

b) Ionic equation _____

Net ionic equation _____

b) _____ $Al\ (s)$ + _____ $H_2SO_4\ (aq) \rightarrow$ _____ $Al_2(SO_4)_3\ (aq)$ + _____ $H_2\ (g)$

Ionic equation _____

Net ionic equation _____

c) _____ $Cu(NO_3)_2\ (aq)$ + _____ $Zn\ (s) \rightarrow Zn(NO_3)_2\ (aq) + Cu\ (s)$

Ionic equation _____

Net ionic equation _____

Double Replacement Reaction $BaCl_2\ (aq)\ +\ K_2CrO_4\ (aq)\ \rightarrow\ BaCrO_4\ (s)\ +\ 2\ KCl\ (aq)$

Ionic Equation

$Ba^{2+}\ (aq)\ +\ 2\ Cl^{-1}\ (aq)\ +\ 2\ K^{+1}\ (aq) + CrO_4^{2-}\ (aq)\ \rightarrow\ BaCrO_4\ (s)\ +\ 2\ K^{+1}\ (aq) + 2\ Cl^{-1}\ (aq)$

Net Ionic Equation $Ba^{2+}\ (aq)\ +\ CrO_4^{2-}\ (aq)\ \rightarrow\ BaCrO_4\ (s)$

2) For each reaction below, balance the double replacement equation and convert it into ionic and net ionic equations.

a) _____ $H_3PO_4\ (aq)$ + _____ $KOH\ (aq)\ \rightarrow\ K_3PO_4\ (aq)$ + _____ $HOH\ (l)$

Ionic equation _____

_____

Net ionic equation _____

b) _____ $AgNO_3\ (aq)$ + _____ $CaCl_2\ (aq)\ \rightarrow$ _____ $AgCl\ (s)$ + _____ $Ca(NO_3)_2\ (aq)$

Ionic equation _____

_____

Net ionic equation _____

c) _____ $Na_2CO_3\ (aq)$ + _____ $HCl\ (aq)\ \rightarrow$ _____ $NaCl\ (aq)$ + ___ $H_2O\ (l)$ + _____ $CO_2\ (g)$

Ionic equation _____

_____

Net ionic equation _____