

Aqueous Solutions Lab Report

Dixie State University

Chemistry 1215-50

Name: Max Stetter

Partner: Austin Turner

Partner: Grace Gardner

Date of Experiment: 9/30/21

Professor: Dave Burr

Procedure:

Materials - 2 well plates, 23 toothpicks

Place 4-5 drops of each reactant into an empty spot on the well plate. Stir the solution using a fresh toothpick. Record what happens to the solution.

This is repeated for all 23 reactions. Clean well plates and wash with soap and water when done.

Results:

The table below displays the molecular formula, complete ionic formula, net ionic formula and the observations that were made for each solution.

#	Molecular	Complete Ionic	Net Ionic	Observation
1	$\text{AgNO}_3(\text{aq}) + \text{NaCl}(\text{aq}) \rightarrow \text{NaNO}_3(\text{aq}) + \text{AgCl}(\text{s})$	$\text{Ag}^+(\text{aq}) + \text{NO}_3^-(\text{aq}) + \text{Na}^+(\text{aq}) + \text{Cl}^-(\text{aq}) \rightarrow \text{Na}^+(\text{aq}) + \text{NO}_3^-(\text{aq}) + \text{AgCl}(\text{s})$	$\text{Ag}^+(\text{aq}) + \text{Cl}^-(\text{aq}) \rightarrow \text{AgCl}(\text{s})$	White Precipitate
2	$\text{AgNO}_3(\text{aq}) + \text{HCl}(\text{aq}) \rightarrow \text{AgCl}(\text{s}) + \text{HNO}_3(\text{aq})$	$\text{Ag}^+(\text{aq}) + \text{NO}_3^-(\text{aq}) + \text{H}^+(\text{aq}) + \text{Cl}^-(\text{aq}) \rightarrow \text{AgCl}(\text{s}) + \text{H}^+(\text{aq}) + \text{NO}_3^-(\text{aq})$	$\text{Ag}^+(\text{aq}) + \text{Cl}^-(\text{aq}) \rightarrow \text{AgCl}(\text{s})$	White Precipitate
3	$2\text{AgNO}_3(\text{aq}) + \text{H}_2\text{SO}_4(\text{aq}) \rightarrow \text{Ag}_2\text{SO}_4(\text{s}) + 2\text{HNO}_3(\text{aq})$	$2\text{Ag}^+(\text{aq}) + 2\text{NO}_3^-(\text{aq}) + 2\text{H}^+(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \rightarrow 2\text{Ag}^+(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) + 2\text{H}^+(\text{aq}) + 2\text{NO}_3^-(\text{aq})$	$2\text{Ag}^+ + \text{SO}_4^{2-}(\text{aq}) \rightarrow \text{Ag}_2\text{SO}_4(\text{s})$	White Precipitate
4	$2\text{AgNO}_3(\text{aq}) + \text{Na}_2\text{SO}_4(\text{aq}) \rightarrow \text{Ag}_2\text{SO}_4(\text{s}) + 2\text{NaNO}_3(\text{aq})$	$2\text{Ag}^+(\text{aq}) + 2\text{NO}_3^-(\text{aq}) + 2\text{Na}^+(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \rightarrow 2\text{Ag}^+(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) + 2\text{Na}^+(\text{aq}) + 2\text{NO}_3^-(\text{aq})$	$2\text{Ag}^+(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \rightarrow \text{Ag}_2\text{SO}_4(\text{s})$	White Precipitate
5	$2\text{AgNO}_3(\text{aq}) + \text{Na}_2\text{CO}_3(\text{aq}) \rightarrow \text{Ag}_2\text{CO}_3(\text{s}) + 2\text{NaNO}_3(\text{aq})$	$2\text{Ag}^+(\text{aq}) + 2\text{NO}_3^-(\text{aq}) + 2\text{Na}^+(\text{aq}) + \text{CO}_3^{2-}(\text{aq}) \rightarrow \text{Ag}_2\text{CO}_3(\text{s}) + 2\text{Na}^+(\text{aq}) + 2\text{NO}_3^-(\text{aq})$	$2\text{Ag}^+(\text{aq}) + \text{CO}_3^{2-}(\text{aq}) \rightarrow \text{Ag}_2\text{CO}_3(\text{s})$	Yellow Precipitate

#	Molecular	Complete Ionic	Net Ionic	Observation
6	$\text{AgNO}_3(\text{aq}) + \text{NH}_4\text{Cl}(\text{aq}) \rightarrow \text{AgCl}(\text{s}) + \text{NH}_4\text{NO}_3(\text{aq})$	$\text{Ag}^+(\text{aq}) + \text{NO}_3^-(\text{aq}) + \text{NH}_4^+(\text{aq}) + \text{Cl}^-(\text{aq}) \rightarrow \text{AgCl}(\text{s}) + \text{NH}_4^+(\text{aq}) + \text{NO}_3^-(\text{aq})$	$\text{Ag}^+(\text{aq}) + \text{Cl}^-(\text{aq}) \rightarrow \text{AgCl}(\text{s})$	White Precipitate
7	$\text{AgNO}_3(\text{aq}) + \text{KI}(\text{aq}) \rightarrow \text{AgI}(\text{s}) + \text{KNO}_3(\text{aq})$	$\text{Ag}^+(\text{aq}) + \text{NO}_3^-(\text{aq}) + \text{K}^+(\text{aq}) + \text{I}^-(\text{aq}) \rightarrow \text{AgI}(\text{s}) + \text{K}^+(\text{aq}) + \text{NO}_3^-(\text{aq})$	$\text{Ag}^+(\text{aq}) + \text{I}^-(\text{aq}) \rightarrow \text{AgI}(\text{s})$	Yellow Precipitate
8	$2\text{AgNO}_3(\text{aq}) + \text{BaCl}_2(\text{aq}) \rightarrow 2\text{AgCl}(\text{s}) + \text{Ba}(\text{NO}_3)_2(\text{aq})$	$2\text{Ag}^+(\text{aq}) + 2\text{NO}_3^-(\text{aq}) + \text{Ba}^{2+}(\text{aq}) + 2\text{Cl}^-(\text{aq}) \rightarrow 2\text{AgCl}(\text{s}) + \text{Ba}^{2+}(\text{aq}) + 2\text{NO}_3^-(\text{aq})$	$\text{Ag}^+(\text{aq}) + \text{Cl}^-(\text{aq}) \rightarrow \text{AgCl}(\text{s})$	White Precipitate
9	$2\text{KOH}(\text{aq}) + \text{BaCl}_2(\text{aq}) \rightarrow 2\text{KCl}(\text{aq}) + \text{Ba}(\text{OH})_2(\text{aq})$	$2\text{K}^+(\text{aq}) + 2\text{OH}^-(\text{aq}) + \text{Ba}^{2+}(\text{aq}) + 2\text{Cl}^-(\text{aq}) \rightarrow 2\text{K}^+(\text{aq}) + 2\text{Cl}^-(\text{aq}) + \text{Ba}^{2+}(\text{aq}) + 2\text{OH}^-(\text{aq})$	N/A	None
10	$2\text{KOH}(\text{aq}) + \text{CuSO}_4(\text{aq}) \rightarrow \text{K}_2\text{SO}_4(\text{aq}) + \text{Cu}(\text{OH})_2(\text{s})$	$2\text{K}^+(\text{aq}) + 2\text{OH}^-(\text{aq}) + \text{Cu}^{2+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \rightarrow 2\text{K}^+(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) + \text{Cu}(\text{OH})_2(\text{s})$	$\text{Cu}^{2+}(\text{aq}) + 2\text{OH}^-(\text{aq}) \rightarrow \text{Cu}(\text{OH})_2(\text{s})$	Blue Precipitate
11	$2\text{KOH}(\text{aq}) + \text{Na}_2\text{CO}_3(\text{aq}) \rightarrow \text{K}_2\text{CO}_3(\text{aq}) + 2\text{NaOH}(\text{aq})$	$2\text{K}^+(\text{aq}) + 2\text{OH}^-(\text{aq}) + 2\text{Na}^+(\text{aq}) + \text{CO}_3^{2-}(\text{aq}) \rightarrow 2\text{K}^+(\text{aq}) + \text{CO}_3^{2-}(\text{aq}) + 2\text{Na}^+(\text{aq}) + 2\text{OH}^-(\text{aq})$	N/A	None
12	$\text{Pb}(\text{NO}_3)_2(\text{aq}) + 2\text{NaCl}(\text{aq}) \rightarrow \text{PbCl}_2(\text{s}) + 2\text{NaNO}_3(\text{aq})$	$\text{Pb}^{2+}(\text{aq}) + 2\text{NO}_3^-(\text{aq}) + 2\text{Na}^+(\text{aq}) + 2\text{Cl}^-(\text{aq}) \rightarrow \text{PbCl}_2(\text{s}) + 2\text{Na}^+(\text{aq}) + 2\text{NO}_3^-(\text{aq})$	$\text{Pb}^{2+}(\text{aq}) + 2\text{Cl}^-(\text{aq}) \rightarrow \text{PbCl}_2(\text{s})$	White Precipitate
13	$\text{Pb}(\text{NO}_3)_2(\text{aq}) + 2\text{KI}(\text{aq}) \rightarrow \text{PbI}_2(\text{s}) + 2\text{KNO}_3(\text{aq})$	$\text{Pb}^{2+}(\text{aq}) + 2\text{NO}_3^-(\text{aq}) + 2\text{K}^+(\text{aq}) + 2\text{I}^-(\text{aq}) \rightarrow \text{PbI}_2(\text{s}) + 2\text{K}^+(\text{aq}) + 2\text{NO}_3^-(\text{aq})$	$\text{Pb}^{2+}(\text{aq}) + 2\text{I}^-(\text{aq}) \rightarrow \text{PbI}_2(\text{s})$	Yellow Precipitate
14	$\text{Pb}(\text{NO}_3)_2(\text{aq}) + \text{H}_2\text{SO}_4(\text{aq}) \rightarrow \text{PbSO}_4(\text{s}) + 2\text{HNO}_3(\text{aq})$	$\text{Pb}^{2+}(\text{aq}) + 2\text{NO}_3^-(\text{aq}) + 2\text{H}^+(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \rightarrow \text{PbSO}_4(\text{s}) + 2\text{H}^+(\text{aq}) + 2\text{NO}_3^-(\text{aq})$	$\text{Pb}^{2+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \rightarrow \text{PbSO}_4(\text{s})$	White Precipitate
15	$\text{Pb}(\text{NO}_3)_2(\text{aq}) + \text{BaCl}_2(\text{aq}) \rightarrow \text{PbCl}_2(\text{s}) + \text{Ba}(\text{NO}_3)_2(\text{aq})$	$\text{Pb}^{2+}(\text{aq}) + 2\text{NO}_3^-(\text{aq}) + \text{Ba}^{2+}(\text{aq}) + 2\text{Cl}^-(\text{aq}) \rightarrow \text{PbCl}_2(\text{s}) + \text{Ba}^{2+}(\text{aq}) + 2\text{NO}_3^-(\text{aq})$	$\text{Pb}^{2+}(\text{aq}) + 2\text{Cl}^-(\text{aq}) \rightarrow \text{PbCl}_2(\text{s})$	White Precipitate
16	$\text{Pb}(\text{NO}_3)_2(\text{aq}) + 2\text{HCl}(\text{aq}) \rightarrow \text{PbCl}_2(\text{s}) + 2\text{HNO}_3(\text{aq})$	$\text{Pb}^{2+}(\text{aq}) + 2\text{NO}_3^-(\text{aq}) + 2\text{H}^+(\text{aq}) + 2\text{Cl}^-(\text{aq}) \rightarrow \text{PbCl}_2(\text{s}) + 2\text{H}^+(\text{aq}) + 2\text{NO}_3^-(\text{aq})$	$\text{Pb}^{2+}(\text{aq}) + 2\text{Cl}^-(\text{aq}) \rightarrow \text{PbCl}_2(\text{s})$	White Precipitate
17	$\text{Pb}(\text{NO}_3)_2(\text{aq}) + \text{CuSO}_4(\text{aq}) \rightarrow \text{PbSO}_4(\text{s}) + \text{Cu}(\text{NO}_3)_2(\text{aq})$	$\text{Pb}^{2+}(\text{aq}) + 2\text{NO}_3^-(\text{aq}) + \text{Cu}^{2+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \rightarrow \text{PbSO}_4(\text{s}) + \text{Cu}^{2+}(\text{aq}) + 2\text{NO}_3^-(\text{aq})$	$\text{Pb}^{2+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \rightarrow \text{PbSO}_4(\text{s})$	White Precipitate

#	Molecular	Complete Ionic	Net Ionic	Observation
18	$\text{BaCl}_2(\text{aq}) + \text{Na}_2\text{CO}_3(\text{aq}) \rightarrow \text{BaCO}_3(\text{s}) + 2\text{NaCl}(\text{aq})$	$\text{Ba}^{2+}(\text{aq}) + 2\text{Cl}^{-}(\text{aq}) + 2\text{Na}^{+}(\text{aq}) + \text{CO}_3^{2-}(\text{aq}) \rightarrow \text{BaCO}_3(\text{s}) + 2\text{Na}^{+}(\text{aq}) + 2\text{Cl}^{-}(\text{aq})$	$\text{Ba}^{2+}(\text{aq}) + \text{CO}_3^{2-}(\text{aq}) \rightarrow \text{BaCO}_3(\text{s})$	White Precipitate
19	$\text{BaCl}_2(\text{aq}) + \text{Na}_2\text{SO}_4(\text{aq}) \rightarrow \text{BaSO}_4(\text{s}) + 2\text{NaCl}(\text{aq})$	$\text{Ba}^{2+}(\text{aq}) + 2\text{Cl}^{-}(\text{aq}) + 2\text{Na}^{+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \rightarrow \text{BaSO}_4(\text{s}) + 2\text{Na}^{+}(\text{aq}) + 2\text{Cl}^{-}(\text{aq})$	$\text{Ba}^{2+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \rightarrow \text{BaSO}_4(\text{s})$	White Precipitate
20	$\text{BaCl}_2(\text{aq}) + \text{H}_2\text{SO}_4(\text{aq}) \rightarrow \text{BaSO}_4(\text{s}) + 2\text{HCl}(\text{aq})$	$\text{Ba}^{2+}(\text{aq}) + 2\text{Cl}^{-}(\text{aq}) + 2\text{H}^{+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \rightarrow \text{BaSO}_4(\text{s}) + 2\text{H}^{+}(\text{aq}) + 2\text{Cl}^{-}(\text{aq})$	$\text{Ba}^{2+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \rightarrow \text{BaSO}_4(\text{s})$	White Precipitate
21	$\text{BaCl}_2(\text{aq}) + \text{CuSO}_4(\text{aq}) \rightarrow \text{BaSO}_4(\text{s}) + \text{CuCl}_2(\text{aq})$	$\text{Ba}^{2+}(\text{aq}) + 2\text{Cl}^{-}(\text{aq}) + \text{Cu}^{2+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \rightarrow \text{BaSO}_4(\text{s}) + \text{Cu}^{2+}(\text{aq}) + 2\text{Cl}^{-}(\text{aq})$	$\text{Ba}^{2+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \rightarrow \text{BaSO}_4(\text{s})$	White Precipitate
22	$\text{NaCl}(\text{aq}) + \text{Na}_2\text{CO}_3(\text{aq}) \rightarrow \text{Na}_2\text{CO}_3(\text{aq}) + \text{NaCl}(\text{aq})$	$\text{Na}^{+}(\text{aq}) + \text{Cl}^{-}(\text{aq}) + 2\text{Na}^{+}(\text{aq}) + \text{CO}_3^{2-}(\text{aq}) \rightarrow 2\text{Na}^{+}(\text{aq}) + \text{CO}_3^{2-}(\text{aq}) + \text{Na}^{+}(\text{aq}) + \text{Cl}^{-}(\text{aq})$	N/A	None
23	$\text{Pb}(\text{NO}_3)_2(\text{aq}) + 2\text{NH}_4\text{Cl}(\text{aq}) \rightarrow \text{PbCl}_2(\text{s}) + 2\text{NH}_4\text{NO}_3(\text{aq})$	$\text{Pb}^{2+}(\text{aq}) + 2\text{NO}_3^{-}(\text{aq}) + 2\text{NH}_4^{+}(\text{aq}) + 2\text{Cl}^{-}(\text{aq}) \rightarrow \text{PbCl}_2(\text{s}) + 2\text{NH}_4^{+}(\text{aq}) + 2\text{NO}_3^{-}(\text{aq})$	$\text{Pb}^{2+}(\text{aq}) + 2\text{Cl}^{-}(\text{aq}) \rightarrow \text{PbCl}_2(\text{s})$	White Precipitate