

Combining Reagents Lab - ANSWER KEY

Procedure:

Reaction 1:

1. Take out the 100 mL beaker. Add approximately 30 mL of the Copper (II) Chloride solution to the beaker. Record a description of the resulting solution.
2. Record a description of the iron filings. Place a small amount of the solid into your beaker. Allow the mixture to react for at least 30 minutes.
3. Record observations of all changes that have taken place after letting the chemical react for half an hour. Proceed to the other part while waiting.
4. To dispose of the solution, pour it down the drain at one of the end sinks. Rinse with a copious (large) amount of water. Dump any remaining solids into the trash. Clean all equipment used.

Reaction 2:

1. Take out one test tube.
2. Pipet 3.00mL of Copper (II) Sulfate solution into your test tube. Record observations.
3. Add five drops of Sodium Hydroxide solution to the Copper (II) Sulfate Solution in your test tube.
4. Record thorough observations of the reaction.
5. Dump the mixture down the drain at one of the end sinks. Rinse with a large amount of water. Clean and dry the outside of your test tube.

Observations - Be specific and thorough, record as many as possible

A. Reaction 1

- Copper (II) Chloride Solution: light blue, liquid, transparent
- Iron Filings: black (dark brown, dark gray), solid
- Chemical Reaction: Greenish-yellow solution, murky, translucent liquid, reddish iron filings

B. Reaction 2

- Copper (II) Sulfate Solution: light blue, translucent, liquid
- Copper (II) Sulfate and Sodium Hydroxide Reaction: light blue solution, cloudy, darker blue precipitate

Questions:

A. Reaction 1

- Write the balanced equation for when the copper (II) Chloride dissolved in the water.
 - $\text{CuCl}_2 (\text{s}) \rightarrow \text{Cu}^{+2} (\text{aq}) + 2\text{Cl}^-$
- What kind of equation shown in question 1?
 - Dissociation equation (Ionic Equation)
- Write the balanced equation for the reaction of Iron (III) with Copper (II) Chloride.
 - $2\text{Fe} (\text{s}) + 3\text{CuCl}_2 (\text{aq}) \rightarrow 2\text{FeCl}_3 (\text{aq}) + 3\text{Cu} (\text{s})$
- What was the substance that collected on the iron (NOT Rust)?
 - Solid Copper metal
- What kind of reaction occurred in the equation shown in question number 3?
 - Redox reaction (Single Replacement)
- Is this an oxidation-reduction reaction? If so, state what is oxidized and reduced; If not, explain why it is not.
 - Yes, it is a Redox reaction; Oxidized = Fe; Reduced = Cu^{+2}
- What are the names of the products in the reaction in question number 3?
 - FeCl_3 = Iron(III) Chloride; Cu = Copper metal

B. Reaction 2

- Write the balanced equation for the reaction of copper (II) sulfate with sodium hydroxide.
 - $\text{CuSO}_4 (\text{aq}) + 2\text{NaOH} (\text{aq}) \rightarrow \text{Na}_2\text{SO}_4 (\text{aq}) + \text{Cu}(\text{OH})_2 (\text{s})$
- What type of reaction occurred?
 - Double Replacement reaction to form a precipitate
- Write the balanced ionic equation for this reaction.
 - $\text{Cu}^{+2} (\text{aq}) + \text{SO}_4^{-2} (\text{aq}) + \text{Na}^+ (\text{aq}) + 2\text{OH}^- (\text{aq}) \rightarrow \text{Na}^+ (\text{aq}) + \text{SO}_4^{-2} (\text{aq}) + \text{Cu}(\text{OH})_2 (\text{s})$
- Write the balanced net ionic equation for this reaction.
 - $\text{Cu}^{+2} (\text{aq}) + 2\text{OH}^- (\text{aq}) \rightarrow \text{Cu}(\text{OH})_2 (\text{s})$
- What are the spectators ions in this reaction?
 - Na^+ and SO_4^{-2}
- State the name(s) of the product(s) of the reaction in Question 4 (specify the state of matter).
 - Solid Copper (II) Hydroxide