ANSWER KEY.

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Net Ionic Equations Lab

Chemistry | ANSWER KEY

Expected observations for the data table on page 3 of the student handout.

Data Table

Accept any observation that describes the same evidence in the student's own words. The net ionic equations are for your reference and for the follow-up work.

	Reaction	Observations	Reaction? (yes/no)
1	Sodium chloride + copper (II) sulfate $NaCl + CuSO_4$	**Clear light blue solution. No solid forms. It may look slightly greener than plain copper (II) sulfate.** **Net ionic:** No reaction. Both possible products (Na_2SO_4 and $CuCl_2$) are soluble.	**No**
2	Lead (II) nitrate + potassium iodide $Pb(NO_3)_2 + KI$	**Bright yellow cloudy precipitate forms right away.** **Net ionic:** $Pb^{2+}(aq) + 2I^-(aq) \rightarrow PbI_2(s)$	**Yes**
3	Silver nitrate + sodium chloride $AgNO_3 + NaCl$	**Thick white cloudy precipitate forms right away. It may turn light purple or gray in bright light.** **Net ionic:** $Ag^+(aq) + Cl^-(aq) \rightarrow AgCl(s)$	**Yes**
4	Copper (II) sulfate + sodium hydroxide $CuSO_4 + NaOH$	**Light blue, jelly-like precipitate forms right away.** **Net ionic:** $Cu^{2+}(aq) + 2OH^-(aq) \rightarrow Cu(OH)_2(s)$	**Yes**
5	Zinc + copper (II) sulfate $Zn + CuSO_4$	**A reddish-brown to black coating of copper forms on the zinc over a few minutes. The blue color may fade slightly.** **Net ionic:** $Zn(s) + Cu^{2+}(aq) \rightarrow Zn^{2+}(aq) + Cu(s)$	**Yes**
6	Lead (II) nitrate + sodium chloride $Pb(NO_3)_2 + NaCl$	**White cloudy precipitate forms. It may look like fine white crystals.** **Net ionic:** $Pb^{2+}(aq) + 2Cl^-(aq) \rightarrow PbCl_2(s)$	**Yes**
7	Magnesium + hydrochloric acid $Mg + HCl$	**Gas bubbles form right away on the magnesium. The metal shrinks and may disappear. The watch glass may feel warm.** **Net ionic:** $Mg(s) + 2H^+(aq) \rightarrow Mg^{2+}(aq) + H_2(g)$	**Yes**

Teaching Notes

- **Station 1 is the only "no".** It is the best place to talk about spectator ions. A slight green tint comes from chloride ions attaching to copper ions in solution. No precipitate forms, so students should mark it "no".
- **White precipitates** at stations 3 and 6 are easy to miss on white paper. Remind students to check over black paper.

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- **Station 5 is slow.** If a group sees nothing after a minute, have them leave it and check back.
- **Station 7 makes hydrogen gas.** Keep flames away. HCl is a strong acid, so students write it as $H^+(aq)$ and $Cl^-(aq)$, and Cl^- is the spectator ion.

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