# AP Chemistry: *13EQ*

***Directions: Write a “proper” equation for each chemical reaction, using the guidelines established previously in this course. Also, answer any questions that follow a given reaction. Here are some additional reaction patterns you should recognize:***

**heating of solid sulfates/sulfites yields sulfur dioxide gas (among other things)**

**heating of solid metal sulfides in air (i.e., in oxygen) yields sulfur dioxide gas (among other things)**

**heating of solid metal chlorates yields the metal chloride and oxygen gas**

1. Solutions of chloric acid and barium hydroxide are mixed.

1Q. Suppose the concentration of the chloric acid is unknown, while that of the barium hydroxide is not. What is the name of the procedure used to determine the barium hydroxide’s concentration?

2. Sulfur in its standard state is burned in air.

2Q. Compared to sulfur pellets, at what rate would powdered sulfur burn? Explain.

3. Solid ammonium carbonate decomposes as it is heated.

4. A solution of bromous acid is added to a solution of strontium hydroxide.

5. Solid potassium chlorate is strongly heated.

6. A solution of copper(II) sulfate is spilled onto a sheet of freshly-polished aluminum metal.

7. Ammonia gas is mixed with hydrogen chloride gas.

7Q. Which intermolecular force predominates in ammonia? In hydrogen chloride?

8. Sulfur dioxide gas is bubbled into a beaker of water.

8Q. If the resulting solution were tested with litmus, what color would appear? Explain.

9. Solutions of lithium phosphate and iron(II) nitrate are mixed.

10. Solid cesium oxide is added to water.

10Q. Is there any hydronium ion in the resulting solution? Explain.

11. Excess nitric acid is added to solid calcium carbonate.

11Q. Briefly explain why statues made of marble (calcium carbonate) displayed outdoors in urban areas are deteriorating.

12. Solutions of lead(II) nitrate and potassium sulfate are mixed.

12Q. What is the molecular geometry of the sulfate ion?

13. Equal volumes of equimolar solutions of ammonia and hydrochloric acid are combined.

13Q. If the reaction proceeds to completion and the resulting solution is boiled away, state what remains behind in the reaction vessel.

14. Solutions of silver nitrate and sodium chloride are mixed.

15. Solid sodium acetate is added to 1.0 M hydrobromic acid.