1. $Co(ClO_4)_3$ is

   A. cobalt tri-chlorotetroxide.
   B. cobalt chlorate.
   C. cobaltous chlorate.
   D. cobalt(III) perchlorate.

2. What is the formula of sodium nitrite?

   A. SNO
   B. $NaNO_2$
   C. $NaNO_3$
   D. Na_2NO_2

3. What is NOT a true statement about the following chemical reaction?

$$3\ H_2 + N_2 \rightarrow 2\ NH_3$$

   A. For every nitrogen molecule consumed, two molecules of ammonia are produced.
   B. For every two moles of nitrogen consumed, three moles of ammonia are produced.
   C. For every three moles of hydrogen consumed, two moles of ammonia are produced.
   D. For every two molecules of ammonia made, three molecules of hydrogen are consumed.

4. Volumes of a gas are proportional to the number of moles of gas (under constant pressure and temperature). If 3 liters of hydrogen gas are combined with 1 liter of nitrogen under conditions that favor a complete reaction, what will be the final volume after reaction takes place?

$$3\ H_2(g) + N_2(g) \rightarrow 2\ NH_3(g)$$

   A. 2 liters
   B. 6 liters
   C. 4 liters
   D. 5 liters

5. Volumes of a gas are proportional to the number of moles of gas (under constant pressure and temperature). If 6 liters of hydrogen gas are combined with 2 liters of nitrogen under conditions that favor a complete reaction, what will be the final volume after reaction takes place?

$$3\ H_2(g) + N_2(g) \rightarrow 2\ NH_3(g)$$

A. 2 liters
B. 6 liters
C. 4 liters
D. 10 liters

6. Ozone, O_3, has a characteristic odor and is formed by high voltage electrical discharge in the air. It reacts with potassium iodide, KI, and water to form iodine, I_2, potassium hydroxide and O_2. In the balanced equation, the necessary balancing coefficients are given in order:

$$\_\_O_3 + \_\_KI + \_\_ H_2O \rightarrow \_\_I_2 + \_\_KOH + \_\_O_2$$

A. 2, 1, 2, 2, 1, 2
B. 1, 1, 2, 1, 1, 2
C. 1, 2, 1, 1, 2, 1
D. 1, 1, 1, 2, 2, 2

7. The characteristic "fishy" odor comes from methylamine, CH_3NH_2, that is similar to ammonia, NH_3, in structure and also in its ability to react with acids. Lemon juice and vinegar are good accompaniments to fish that are a little too "fishy" because of this acid-base chemistry. Which equation shows the reaction between methylamine and acetic acid, CH_3COOH, that is found in vinegar?

A. $CH_3NH_2 + CH_3COOH \rightarrow CH_3NH_2CH_3COOH$
B. $CH_3NH_2 + CH_3COOH \rightarrow CH_3NH_3^+ + CH_3COO^-$
C. $CH_3NH_2 + CH_3COOH \rightarrow CH_3CH_3 + NH_2COOH^-$
D. $CH_3NH_2 + CH_3COOH \rightarrow CH_3NH^- + CH_3COHOH^+$