Answer the following questions in the body of the email message.

1. Balance these equations:
   a. \( CH_4 + 2H_2S \rightarrow CS_2 + 4H_2 \)
   b. \( Al(OH)_3 + 3HCl \rightarrow AlCl_3 + 3H_2O \)

2. Classify these reactions as decomposition, single-replacement, double-replacement, or combustion:
   a. \( KNO_3 + AgBr \rightarrow AgNO_3 + KBr \) Double-replacement
   b. \( C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O \) Combustion
   c. \( 2NaCl \rightarrow 2Na + Cl_2 \) Decomposition
   d. \( Cu + 2AgNO_3 \rightarrow Cu(NO_3)_2 + 2Ag \) Single-replacement

3. Write the balanced chemical equation with all phase labels for the combination of aqueous silver nitrate and aqueous potassium sulfide

   \( 2AgNO_3 (aq) + K_2S (aq) \rightarrow Ag_2S (s) + 2KNO_3 (aq) \)

4. Write the net ionic equation for the combination of aqueous potassium sulfate and aqueous strontium iodide

   \( Sr^{2+} (aq) + SO_4^{2-} (aq) \rightarrow SrSO_4 (s) \)

5. What would you observe if you combined aqueous sodium chloride with aqueous potassium nitrate? Why?

   No reaction would occur because the products of the double-replacement reaction, sodium nitrate and potassium chloride, are both soluble according to the solubility chart. Nothing would precipitate and thus no reaction would occur.