Do not assume any chemical reaction is balanced

1. (**2 pts.**) Given the reaction: $Ca + AlCl_3 \rightarrow CaCl_2 + Al$
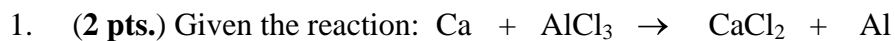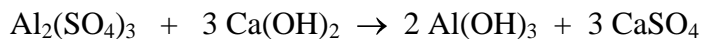
    How many moles of calcium chloride are produced when 0.975 moles of aluminum chloride are reacted with excess calcium?

2. (**3 pts.**) Given the reaction: $SiO_2 + HF \rightarrow SiF_4 + H_2O$
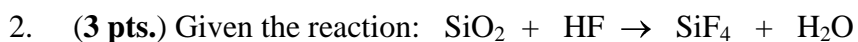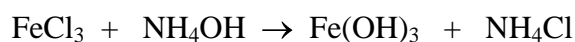
    How many grams of silicon tetrafluoride are produced if 45.67 grams of silicon dioxide are reacted with excess hydrofluoric acid?

3. (**2 pts.**) The following reaction was carried out in the lab. The theoretical yield of aluminum hydroxide was calculated to be 15.77 grams. If 13.65 grams of $Al(OH)_3$ were actually obtained, what was the percent yield?

$$Al_2(SO_4)_3 \ + \ 3\,Ca(OH)_2 \ \rightarrow \ 2\,Al(OH)_3 \ + \ 3\,CaSO_4$$

4. (**3 pts.**) Given the reaction:

$$FeCl_3 \ + \ NH_4OH \ \rightarrow \ Fe(OH)_3 \ + \ NH_4Cl$$

a. If 9.75 grams of $FeCl_3$ react with excess NH_4OH, what is the theoretical yield of ammonium chloride?

b. If 8.953 grams of ammonium chloride were actually produced, what was the percent yield?

Extra Credit (1 pt):

Convert name to formula or visa versa … from the list of names in unit 5