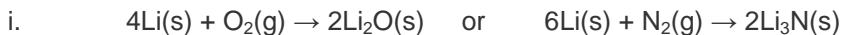


Reaction Prediction – 6

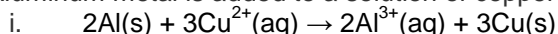
For each of the following eight reactions, in part (i) write a **BALANCED** equation and in part (ii) answer the question about the reaction. In part (i), coefficients should be in terms of lowest whole numbers. Assume that solutions are aqueous unless otherwise indicated. Represent substances in solutions as ions if the substances are extensively ionized. Omit formulas for any ions or molecules that are unchanged by the reaction.

a) Lithium metal is burned in air.



ii. What are the oxidation numbers for lithium before and after the reaction?
 $\text{Li}^0 \rightarrow \text{Li}^{+1}$

b) Aluminum metal is added to a solution of copper (II) chloride.



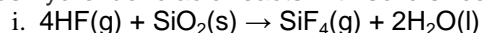
ii. Explain how to separate/ collect the non-aqueous product of the reaction.
Filter it.

c) Manganese (II) nitrate solution is mixed with sodium hydroxide solution.



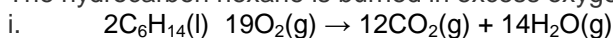
ii. What observation indicates a reaction occurred?
Precipitate formed

d) Gaseous hydrofluoric acid reacts with solid silicon dioxide.



ii. A student observes that the reaction “started to boil and melt at the same time”. Explain what actually happened.
The “boiling” was gas escaping as it was formed.

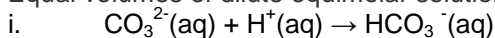
e) The hydrocarbon hexane is burned in excess oxygen.



ii. If one mole of hexane is burned, how many moles of product are produced?

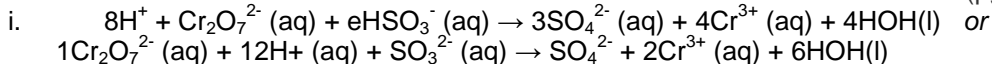
$$1\text{molC}_6\text{H}_{14} = 6\text{molCO}_2 + 7\text{mol H}_2\text{O} = \boxed{13 \text{ mol product}}$$

f) Equal volumes of dilute equimolar solutions of sodium carbonate and hydrochloric acid are mixed.



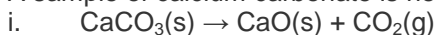
ii. If the solutions were more concentrated, how would that change the reaction?
It would happen faster

g) Potassium dichromate solution is added to an acidified solution of sodium sulfite. (pg68)



ii. What are the spectator ions?
Potassium + Sodium

h) A sample of calcium carbonate is heated.



ii. Explain how the solid’s mass would change and why.
It would decrease $\text{CaCO}_3 \rightarrow \text{CaO}$ less oxygen