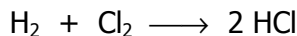


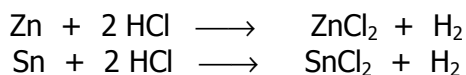
1. A model car kit is designed to contain one body, four wheels, two bumpers, and one steering wheel. How many model car kits can a manufacturer produce from a parts inventory of 137 bodies, 532 wheels, 246 bumpers, and 139 steering wheels?

2. If 74.30 g of HCl were produced from 2.13 g of hydrogen and an excess of chlorine according to the reaction



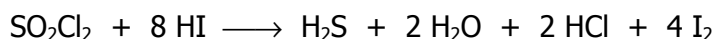
what was the percent yield of HCl? (molar masses $\text{H}_2 = 2.02$, $\text{Cl}_2 = 70.91$ $\text{HCl} = 36.46$)

3. A mixture of composition 64.0% Zn and 36.0% Sn, by mass, is dissolved in hydrochloric acid solution to produce the metal chlorides and hydrogen. The reactions that occur are



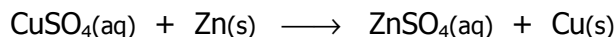
How many grams of HCl are needed to react completely with 50.0 g of the mixture? (molar masses: $\text{Zn} = 65.39$, $\text{Sn} = 118.71$, $\text{HCl} = 36.46$)

4. If 50.0 g of SO_2Cl_2 and 200.0 g of HI are allowed to react according the equation



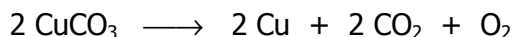
What is the combined total number of moles of hydrogen-containing products produced? (Molar masses: $\text{SO}_2\text{Cl}_2 = 134.97$, $\text{HI} = 127.91$)

5. An **impure sample** of CuSO_4 weighing 7.53 g was dissolved in water. The dissolved CuSO_4 , but not the impurities, then reacted with excess zinc.



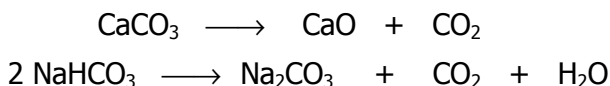
What was the mass percent CuSO_4 in the sample if 1.33 g of Cu were produced? (molar masses: $\text{CuSO}_4 = 159.61$, $\text{Cu} = 63.55$)

6. Copper metal can be recovered from an **ore** containing CuCO_3 by the decomposition reaction



What mass of **copper ore**, in grams, is needed to produce 500 g of Cu if the **ore** is 13.22% by mass CuCO_3 ? Assume complete decomposition of the CuCO_3 . (molar masses: $\text{Cu} = 63.55$, $\text{CuCO}_3 = 123.56$)

7. A 13.20-g sample of a **mixture** of CaCO_3 and NaHCO_3 was heated, and the compounds decomposed as follows:



The decomposition of the sample yields 4.35 g of CO_2 and 0.873 g of H_2O . What percent, by mass, of the original sample was CaCO_3 ? (molar masses: $\text{CaCO}_3 = 100.09$, $\text{NaHCO}_3 = 84.01$, $\text{CO}_2 = 44.01$, $\text{H}_2\text{O} = 18.02$)

8. Under appropriate reaction conditions Al and S produce Al_2S_3 according to the equation:



In a certain experiment with 55.0 g of Al and an excess of S, a percent yield of 85.6% was obtained. What was the actual yield of Al_2S_3 , in grams, for this experiment? (molar masses: $\text{Al} = 26.98$, $\text{Al}_2\text{S}_3 = 150.16$)