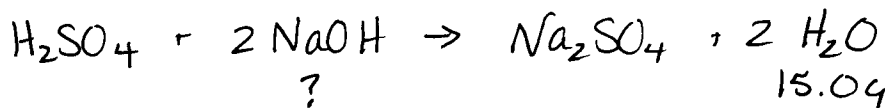
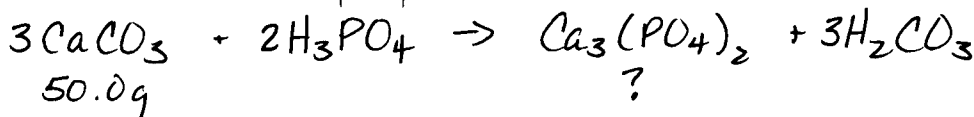


5. If excess sulfuric acid is reacted with sodium hydroxide, 15.0 g of water is formed. What mass of sodium hydroxide was used?



$$\left(\frac{15.0 \text{ g H}_2\text{O}}{18.01528 \text{ g/mol}} \right) \left(\frac{2 \text{ mol NaOH}}{2 \text{ mol H}_2\text{O}} \right) \left(39.997 \text{ g/mol} \right) = \boxed{33.3 \text{ g NaOH}}$$

6. 50.0 g of calcium carbonate was added to excess phosphoric acid. What mass of calcium phosphate was formed?



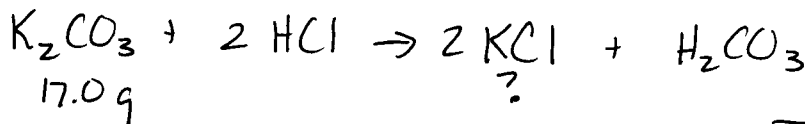
$$\left(\frac{50.0 \text{ g CaCO}_3}{100.0872 \text{ g/mol}} \right) \left(\frac{1 \text{ mol Ca}_3(\text{PO}_4)_2}{3 \text{ mol CaCO}_3} \right) \left(310.17672 \text{ g/mol} \right) = \boxed{51.7 \text{ g Ca}_3(\text{PO}_4)_2}$$

7. Calculate the mass of barium nitrate that must decompose in order to produce 112 g of oxygen.



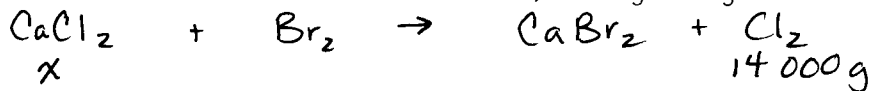
$$\left(\frac{112 \text{ g O}_2}{31.9988 \text{ g/mol}} \right) \left(\frac{1 \text{ mol Ba}(\text{NO}_3)_2}{1 \text{ mol O}_2} \right) \left(261.3398 \text{ g/mol} \right) = \boxed{915 \text{ g Ba}(\text{NO}_3)_2}$$

8. Calculate the mass of potassium chloride that is produced when 17.0 g of potassium carbonate reacts with hydrochloric acid.



$$\left(\frac{17.0 \text{ g K}_2\text{CO}_3}{138.2058 \text{ g/mol}} \right) \left(\frac{2 \text{ mol KCl}}{1 \text{ K}_2\text{CO}_3} \right) \left(74.5513 \text{ g/mol} \right) = \boxed{18.3 \text{ g KCl}}$$

9. When "x" grams of calcium chloride was reacted with an excess of bromine, 14.0 kg of a gas was formed. Calculate "x".

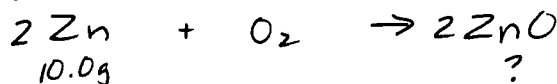


$$\left(\frac{14\,000\text{ g Cl}_2}{70.906\text{ g/mol}} \right) \left(\frac{1\text{ mol CaCl}_2}{1\text{ mol Cl}_2} \right) (110.984\text{ g/mol}) = 21\,913.18$$

$$= \boxed{21.9\text{ kg CaCl}_2}$$

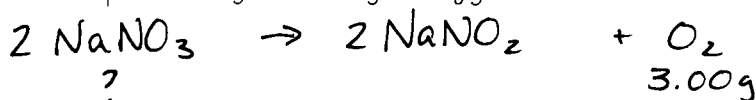
21 900 g
or 21 900 g

10. How many grams of zinc oxide are formed when 10.0 g of zinc reacts with oxygen?



$$\left(\frac{10.0\text{ g Zn}}{65.38\text{ g/mol}} \right) \left(\frac{2\text{ mol ZnO}}{2\text{ mol Zn}} \right) (81.3794\text{ g/mol}) = \boxed{12.4\text{ g ZnO}}$$

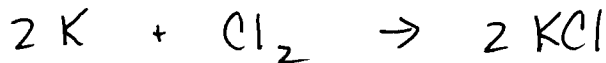
11. Sodium nitrate decomposes to give 3.00 g of oxygen. Calculate the mass of sodium nitrate used.



$$\left(\frac{3.00\text{ g O}_2}{31.9988\text{ g/mol}} \right) \left(\frac{2\text{ mol NaNO}_3}{1\text{ mol O}_2} \right) (84.99467\text{ g/mol})$$

$$= \boxed{15.9\text{ g NaNO}_3}$$

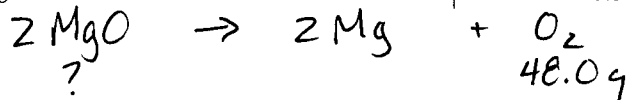
12. Potassium metal reacts with 70.0 g of chlorine. Calculate the mass of product.



$$\left(\frac{70.0\text{ g Cl}_2}{70.906\text{ g/mol}} \right) \left(\frac{2\text{ mol KCl}}{1\text{ mol Cl}_2} \right) (74.5513\text{ g/mol})$$

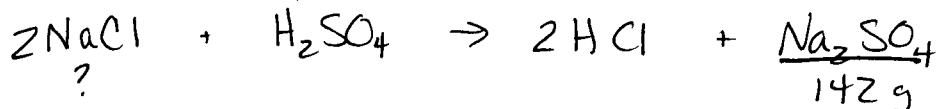
$$= \boxed{147\text{ g KCl}}$$

13. Calculate the mass of magnesium oxide that must be decomposed in order to produce 48.0 g of oxygen.



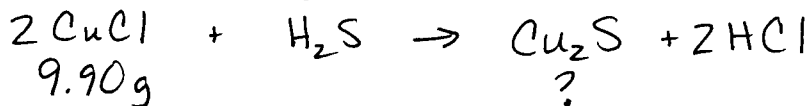
$$\left(\frac{48.0 \text{ g O}_2}{31.9988 \text{ g/mol}} \right) \left(\frac{2 \text{ mol MgO}}{1 \text{ mol O}_2} \right) (40.3044 \text{ g/mol}) = \boxed{121 \text{ g MgO}}$$

14. Sodium chloride was reacted with an excess of sulfuric acid to give hydrochloric acid and 142 g of a second product. What is the product, and how much sodium chloride was reacted?



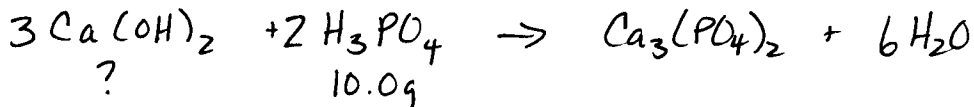
$$\left(\frac{142 \text{ g Na}_2\text{SO}_4}{142.04314 \text{ g/mol}} \right) \left(\frac{2 \text{ mol NaCl}}{1 \text{ mol Na}_2\text{SO}_4} \right) (58.44277 \text{ g/mol}) = \boxed{117 \text{ g NaCl}}$$

15. What mass of copper(I) sulfide can be produced from 9.90 g of copper(I) chloride reacting with an excess of hydrogen sulfide gas?



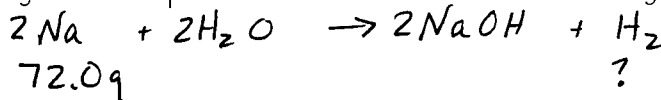
$$\left(\frac{9.90 \text{ g CuCl}}{98.999 \text{ g/mol}} \right) \left(\frac{1 \text{ mol Cu}_2\text{S}}{2 \text{ mol CuCl}} \right) (159.158 \text{ g/mol}) = \boxed{7.96 \text{ g Cu}_2\text{S}}$$

16. How many grams of calcium hydroxide will be needed to react completely with 10.0 g of phosphoric acid?



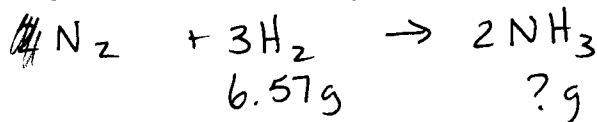
$$\left(\frac{10.0 \text{ g H}_3\text{PO}_4}{97.99518 \text{ g/mol}} \right) \left(\frac{3 \text{ mol Ca(OH)}_2}{2 \text{ mol H}_3\text{PO}_4} \right) (74.09268 \text{ g/mol}) = \boxed{11.3 \text{ g Ca(OH)}_2}$$

17. How many grams of hydrogen can be produced from the reaction of 72.0 g of sodium with an excess of water?



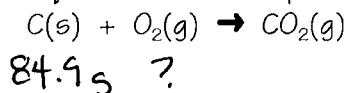
$$\left(\frac{72.0 \text{ g Na}}{22.98977 \text{ g/mol}} \right) \left(\frac{1 \text{ mol H}_2}{2 \text{ mol Na}} \right) \left(2.01588 \frac{\text{g}}{\text{mol}} \right) = \boxed{3.16 \text{ g H}_2}$$

18. An excess of nitrogen reacts with 6.57 g of hydrogen. How many grams of ammonia are produced?



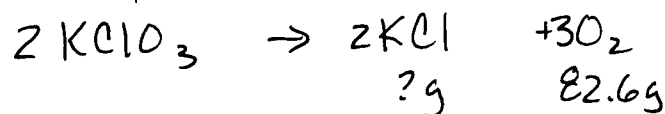
$$\left(\frac{6.57 \text{ g H}_2}{2.01588 \text{ g/mol}} \right) \left(\frac{2 \text{ mol NH}_3}{3 \text{ mol H}_2} \right) \left(17.03052 \frac{\text{g}}{\text{mol}} \right) = \boxed{37.0 \text{ g NH}_3}$$

19. How many grams of oxygen are required to burn completely 84.9 g of carbon?



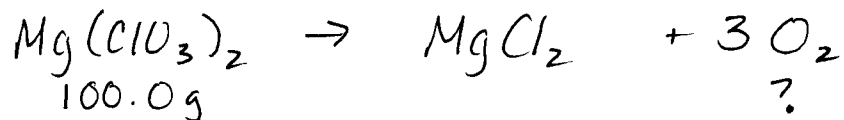
$$\left(\frac{84.9 \text{ g C}}{12.011 \text{ g/mol}} \right) \left(\frac{1 \text{ mol O}_2}{1 \text{ mol C}} \right) \left(31.9988 \frac{\text{g}}{\text{mol}} \right) = \boxed{226 \text{ g O}_2}$$

20. In the decomposition of potassium chlorate, 82.6 g of oxygen are formed. How many grams of potassium chloride are produced?



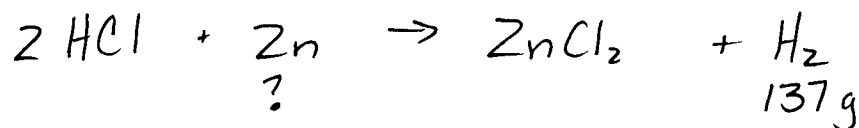
$$\left(\frac{82.6 \text{ g O}_2}{31.9988 \text{ g/mol}} \right) \left(\frac{2 \text{ mol KCl}}{3 \text{ mol O}_2} \right) \left(74.5513 \frac{\text{g}}{\text{mol}} \right) = \boxed{128 \text{ g KCl}}$$

25. How many grams of oxygen gas are formed when 100.0 g of magnesium chlorate are decomposed?



$$\left(\frac{100.0\text{ g Mg}(\text{ClO}_3)_2}{191.2074\text{ g/mol}} \right) \left(\frac{3\text{ mol O}_2}{1\text{ mol Mg}(\text{ClO}_3)_2} \right) \left(31.9988\frac{\text{g}}{\text{mol}} \right) = \boxed{50.2\text{ g O}_2}$$

26. Hydrochloric acid was reacted with zinc to produce 137 g of hydrogen gas. What mass of zinc did you begin with?



$$\left(\frac{137\text{ g H}_2}{2.01588\text{ g/mol}} \right) \left(\frac{1\text{ mol Zn}}{1\text{ mol H}_2} \right) \left(65.38\frac{\text{g}}{\text{mol}} \right)$$

$$= 4443.25$$

$$= \boxed{4.44\text{ kg Zn}}$$