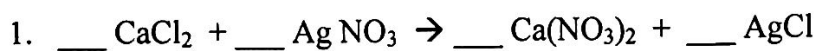
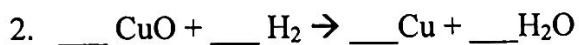


Supplemental Stoichiometry Practice Problems

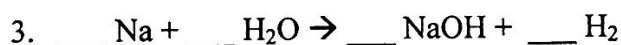
For each of the following, balance the chemical equation and then solve the corresponding question.



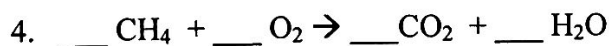
How many grams of AgCl are produced when 45 g of CaCl₂ react with excess silver nitrate?



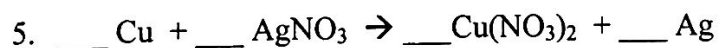
AT STP, how many liters of hydrogen gas are needed to react with 88 g of copper (II) oxide?



If 3 liters of hydrogen gas (at STP) is produced by the above reaction, what mass of sodium was used?

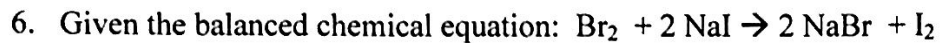


What volume of methane is needed to react completely with 500 liters of oxygen gas?

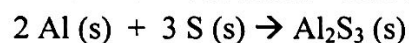
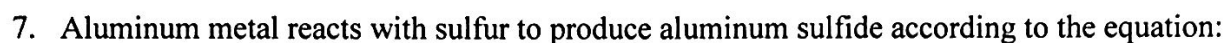


How many grams of silver will be produced if 86 g of copper are used?

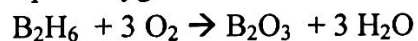
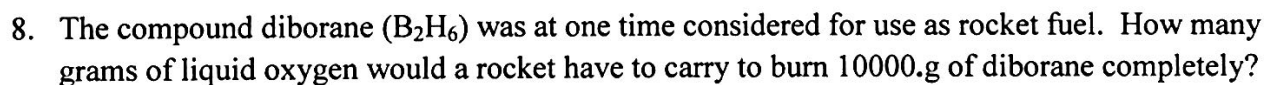
Solve each of the following problems using your knowledge of chemistry.



How many moles of sodium bromide could be produced from the reaction of 0.172 mol Br_2 ?



Determine the mass in grams of sulfur needed to react with 0.65 mol aluminum metal.

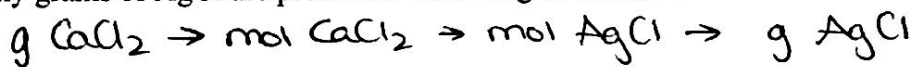


Supplemental Stoichiometry Practice Problems

CaCl_2 For each of the following, balance the chemical equation and then solve the corresponding question.

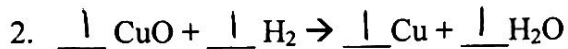
$$\begin{array}{l} 1 \times 40.08 = 40.08 \\ 2 \times 35.45 = 70.90 \\ \hline 110.98 \text{ g} \end{array}$$

$\text{CaCl}_2 + 2 \text{AgNO}_3 \rightarrow \text{Ca(NO}_3)_2 + 2 \text{AgCl}$
How many grams of AgCl are produced when 45 g of CaCl_2 react with excess silver nitrate?



$$45 \text{ g CaCl}_2 \left(\frac{1 \text{ mol CaCl}_2}{110.98 \text{ g CaCl}_2} \right) \left(\frac{2 \text{ mol AgCl}}{1 \text{ mol CaCl}_2} \right) \left(\frac{143.32 \text{ g}}{1 \text{ mol AgCl}} \right) = 116.226347$$

120 g AgCl

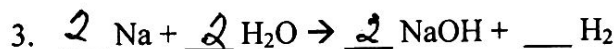


AT STP, how many liters of hydrogen gas are needed to react with 88 g of copper (II) oxide?

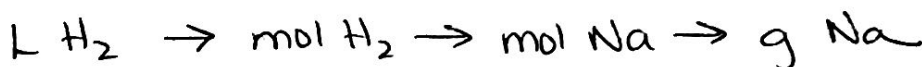


$$88 \text{ g CuO} \left(\frac{1 \text{ mol CuO}}{79.55 \text{ g CuO}} \right) \left(\frac{1 \text{ mol H}_2}{1 \text{ mol CuO}} \right) \left(\frac{22.4 \text{ L}}{1 \text{ mol H}_2} \right) = 24.77938$$

25 L H₂

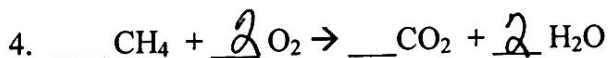


If 3 liters of hydrogen gas (at STP) is produced by the above reaction, what mass of sodium was used?

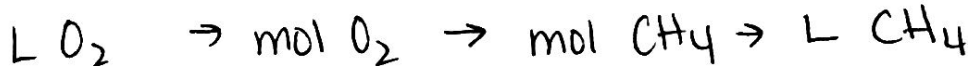


$$3 \text{ L H}_2 \left(\frac{1 \text{ mol H}_2}{22.4 \text{ L H}_2} \right) \left(\frac{2 \text{ mol Na}}{1 \text{ mol H}_2} \right) \left(\frac{22.99 \text{ g Na}}{1 \text{ mol Na}} \right) = 6.1580357$$

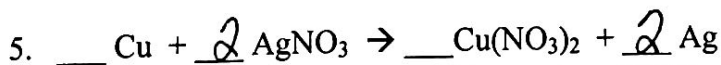
6g Na



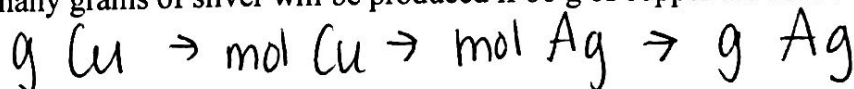
What volume of methane is needed to react completely with 500 liters of oxygen gas?



$$500 \text{ L O}_2 \left(\frac{1 \text{ mol O}_2}{22.4 \text{ L O}_2} \right) \left(\frac{1 \text{ mol CH}_4}{2 \text{ mol O}_2} \right) \left(\frac{22.4 \text{ L CH}_4}{1 \text{ mol CH}_4} \right) = 250 \text{ L CH}_4$$



How many grams of silver will be produced if 86 g of copper are used?



$$86 \text{ g Cu} \left(\frac{1 \text{ mol Cu}}{63.55 \text{ g Cu}} \right) \left(\frac{2 \text{ mol Ag}}{1 \text{ mol Cu}} \right) \left(\frac{107.87 \text{ g}}{1 \text{ mol Ag}} \right) = 291.95$$

290 g Ag!

Solve each of the following problems using your knowledge of chemistry.

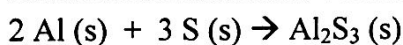
6. Given the balanced chemical equation: $\text{Br}_2 + 2 \text{NaI} \rightarrow 2 \text{NaBr} + \text{I}_2$

How many moles of sodium bromide could be produced from the reaction of 0.172 mol Br_2 ?

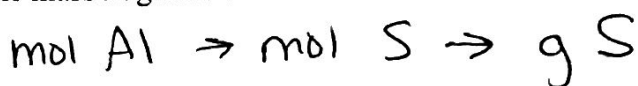


$$0.172 \text{ mol Br}_2 \left(\frac{2 \text{ mol NaBr}}{1 \text{ mol Br}_2} \right) = \boxed{0.344 \text{ mol NaBr}}$$

7. Aluminum metal reacts with sulfur to produce aluminum sulfide according to the equation:



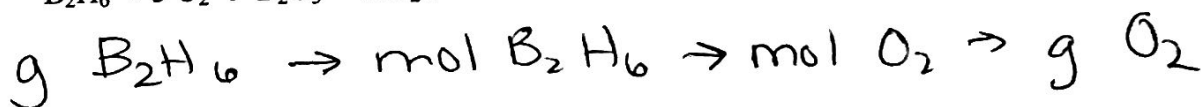
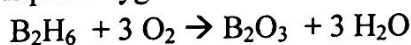
Determine the mass in grams of sulfur needed to react with 0.65 mol aluminum metal.



$$0.65 \text{ mol Al} \left(\frac{3 \text{ mol S}}{2 \text{ mol Al}} \right) \left(\frac{32.07 \text{ g S}}{1 \text{ mol S}} \right) = 31.26825$$

$$\boxed{31 \text{ g S}}$$

8. The compound diborane (B_2H_6) was at one time considered for use as rocket fuel. How many grams of liquid oxygen would a rocket have to carry to burn 10000. g of diborane completely?



$$\begin{array}{l} \text{B } 2 \times 10.81 = 21.62 \\ \text{H } 6 \times 1.01 = 6.06 \\ \hline 27.68 \end{array}$$

$$10000 \text{ g B}_2\text{H}_6 \left(\frac{1 \text{ mol B}_2\text{H}_6}{27.68 \text{ g B}_2\text{H}_6} \right) \left(\frac{3 \text{ mol O}_2}{1 \text{ mol B}_2\text{H}_6} \right) \left(\frac{32.00 \text{ g}}{1 \text{ mol O}_2} \right) =$$

$$341082.08092$$

$$\boxed{341082 \text{ g O}_2}$$