

Introduction to Stoichiometry

(Honors Chemistry)

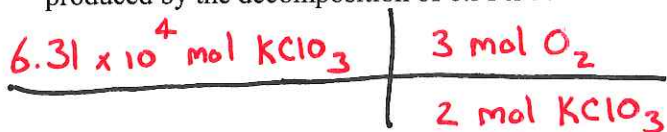
Write and balance the equation, then use stoichiometry to answer the question. *Show all work!*

1. Nitrogen gas and hydrogen gas react to produce gaseous nitrogen trihydride, how many moles of hydrogen are needed to completely react with 2.4×10^7 moles of nitrogen? $\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$



$$7.2 \times 10^7 \text{ mol H}_2$$

2. Solid Potassium chlorate decomposes into solid potassium chloride and oxygen gas, how many moles of oxygen are produced by the decomposition of 6.31×10^4 moles of potassium chlorate? $2\text{KClO}_3 \rightarrow 2\text{KCl} + 3\text{O}_2$



$$9.47 \times 10^4 \text{ mol O}_2$$

3. Solid zinc reacts with aqueous hydrochloric acid producing aqueous zinc chloride and hydrogen gas, how many moles of hydrogen are produced from the reaction of 3.56×10^4 moles of zinc with an excess of HCl? $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$



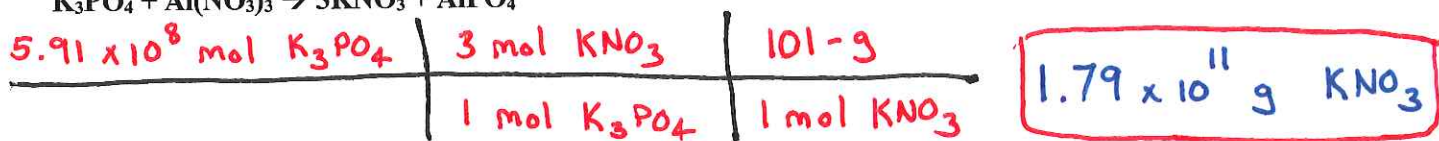
$$3.56 \times 10^4 \text{ mol H}_2$$

4. Liquid propane (C_3H_8) combusts with the oxygen gas in the air to produce gaseous carbon dioxide and water vapor, how many moles of oxygen are necessary to react completely with 4.78×10^9 moles of propane? $\text{C}_3\text{H}_8 + 5\text{O}_2 \rightarrow 3\text{CO}_2 + 4\text{H}_2\text{O}$



$$2.39 \times 10^{10} \text{ mol O}_2$$

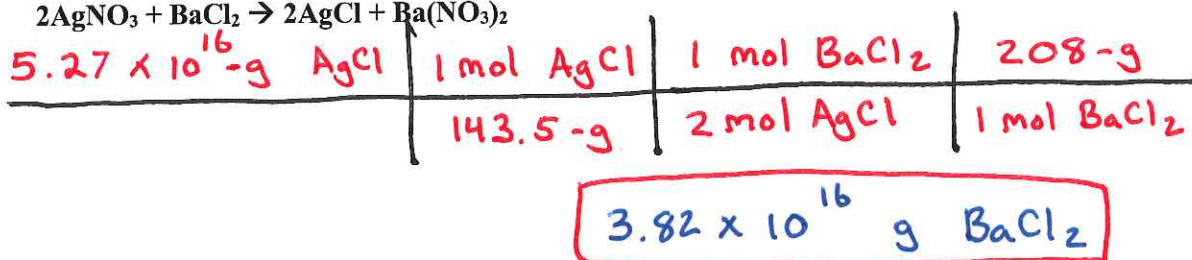
5. Aqueous Potassium phosphate reacts with aqueous aluminum nitrate in a double replacement reaction, what mass of potassium nitrate can be produced from 5.91×10^8 moles of potassium phosphate with an excess of aluminum nitrate?
 $K_3PO_4 + Al(NO_3)_3 \rightarrow 3KNO_3 + AlPO_4$



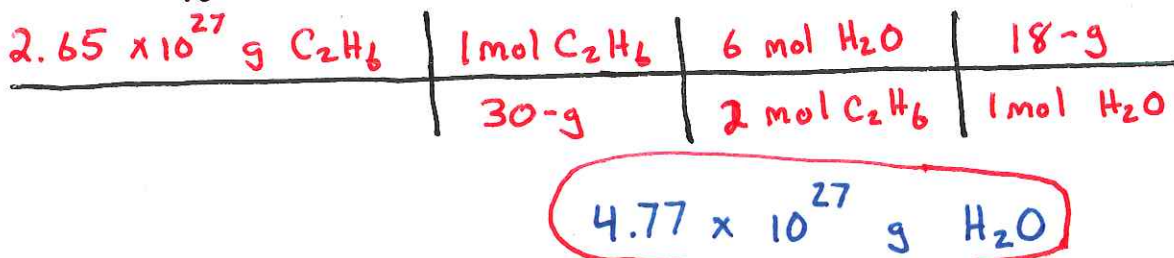
6. Magnesium metal reacts with oxygen gas producing magnesium oxide, how much product (in grams) is produced from 4.81×10^6 grams of oxygen gas with an excess of magnesium? $2Mg + O_2 \rightarrow 2MgO$



7. Aqueous silver nitrate reacts with aqueous barium chloride in a double replacement reaction, how many grams of barium chloride are needed to produce 5.27×10^{16} g of silver chloride with an excess of silver nitrate?
 $2AgNO_3 + BaCl_2 \rightarrow 2AgCl + Ba(NO_3)_2$



8. How many grams of water vapor is produced from the combustion of 2.65×10^{27} grams of ethane gas (C_2H_6) with an excess of oxygen? $2C_2H_6 + 7O_2 \rightarrow 4CO_2 + 6H_2O$



9. Aluminum metal reacts with aqueous Lead (II) nitrate in a single replacement reaction, what mass of lead metal is produced from 5.64×10^{14} grams of aluminum metal with an excess of lead (II) nitrate?
 $2Al + 3Pb(NO_3)_2 \rightarrow 3Pb + 2Al(NO_3)_3$

