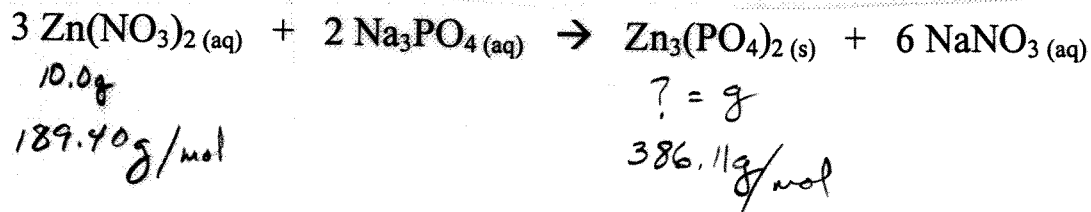


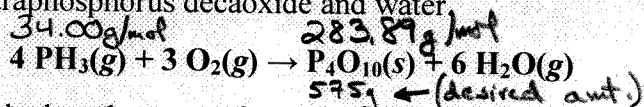
Chemistry 210 – Stoichiometry 2

1. Consider the reaction of 10.0 g of zinc nitrate with excess sodium phosphate in aqueous solution. What mass of precipitate could be formed?



$$\frac{10.0\text{g}}{189.40\text{g}} \times \frac{1\text{ mol Zn(NO}_3)_2}{1\text{ mol Zn(NO}_3)_2} \times \frac{1\text{ mol Zn}_3(\text{PO}_4)_2}{3\text{ mol Zn(NO}_3)_2} \times \frac{386.11\text{g}}{1\text{ mol}} = 6.80\text{g Zn}_3(\text{PO}_4)_2$$

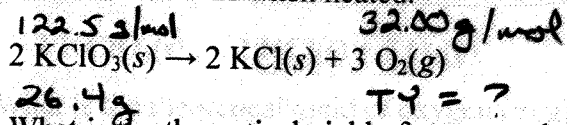
2. Phosphine, an extremely poisonous and highly reactive gas, will react with oxygen to form tetraphosphorus decaoxide and water.



Calculate the mass of PH₃ required to react with excess oxygen and to produce 575 g of tetraphosphorus decaoxide.

$$\frac{575\text{g P}_4\text{O}_{10}}{283.89\text{g}} \times \frac{1\text{ mol P}_4\text{O}_{10}}{1\text{ mol P}_4\text{O}_{10}} \times \frac{4\text{ mol PH}_3}{1\text{ mol P}_4\text{O}_{10}} \times \frac{34.00\text{g PH}_3}{1\text{ mol PH}_3} = 275\text{g PH}_3$$

3. Potassium chlorate (used in fireworks, flares and safety matches) forms oxygen and potassium chloride when heated.



What is the theoretical yield of oxygen when 26.4 g of potassium chlorate is heated?

$$\frac{26.4\text{g KClO}_3}{122.5\text{g KClO}_3} \times \frac{1\text{ mol KClO}_3}{1\text{ mol KClO}_3} \times \frac{3\text{ mol O}_2}{2\text{ mol KClO}_3} \times \frac{32.00\text{g O}_2}{1\text{ mol O}_2}$$

$$= \boxed{10.3\text{g O}_2}$$