

Name _____
 Date _____
 Due Date _____

KEY

Chemistry 11

Unit 7 Review – Stoichiometry

1. Given the balanced equation:



$$\uparrow$$

$$+ (28.1) + 10(1.0) = 122.4$$

- a) What volume of oxygen (STP) is required to react with 204.0 g of Si_4H_{10} ?

$$204.0 \text{ g Si}_4\text{H}_{10} \times \frac{1 \text{ mol Si}_4\text{H}_{10}}{122.4 \text{ g Si}_4\text{H}_{10}} \times \frac{13 \text{ mol O}_2}{2 \text{ mol Si}_4\text{H}_{10}} \times \frac{22.4 \text{ L O}_2}{1 \text{ mol O}_2}$$

$$= 242.7 \text{ L O}_2$$

- b) What mass of SiO_2 is formed when 345.0 g of H_2O are formed?

$$345.0 \text{ g H}_2\text{O} \times \frac{1 \text{ mol H}_2\text{O}}{18.0 \text{ g H}_2\text{O}} \times \frac{8 \text{ mol SiO}_2}{10 \text{ mol H}_2\text{O}} \times \frac{60.1 \text{ g SiO}_2}{1 \text{ mol SiO}_2}$$

$$= 921.5 \text{ g SiO}_2$$

- c) How many molecules of H_2O are formed when 17.92 L of O_2 are used at STP?

$$17.92 \text{ L O}_2 \times \frac{1 \text{ mol O}_2}{22.4 \text{ L O}_2} \times \frac{10 \text{ mol H}_2\text{O}}{13 \text{ mol O}_2} \times \frac{6.02 \times 10^{23} \text{ molec. H}_2\text{O}}{1 \text{ mol H}_2\text{O}}$$

$$= 3.705 \times 10^{23} \text{ molec. H}_2\text{O}$$

- d) How many moles of Si_4H_{10} are needed to just react with 1.204×10^{26} molecules of oxygen?

$$1.204 \times 10^{26} \text{ molec. O}_2 \times \frac{1 \text{ mol O}_2}{6.02 \times 10^{23} \text{ molec. O}_2} \times \frac{2 \text{ mol Si}_4\text{H}_{10}}{13 \text{ mol O}_2} = 30.77 \text{ mol Si}_4\text{H}_{10}$$