Chemistry 115 - Name

Dr. Cary Willard

Quiz 5A (20 points) October 13, 2008

All work must be shown to receive credit.

Avogadro’s number = 6.022 x 1023/mol

1. (20 points) Answerthe following questions using the balanced reaction shown below:

4 FeS2 + 11 O2 🡪 2 Fe2O3 + 8 SO2

* 1. How many molecules of O2 are required to react with 16 formula units of FeS2

$$?molec O\_{2}=16 units FeS\_{2}×\frac{11 molecules O\_{2}}{4 units FeS\_{2}}=44 molecules O\_{2}$$

* 1. How many moles of SO2 will be formed by the complete reaction of 5.92 moles of O2?

$$?mol SO\_{2}=5.92 mol O\_{2}×\frac{8 mol SO\_{2}}{11 mol O\_{2}}=4.31 mol SO\_{2}$$

* 1. What is the molar mass of Fe2O3?

$$2\left(Fe\right)+ 3\left(O\right)=2\left(55.85\right)+3\left(16.00\right)=111.70+48.00=159.70 amu$$

* 1. How many grams of Fe2O3 will be formed by the reaction of 5.00 mol of FeS2 with excess oxygen?

$$?g Fe\_{2}O\_{3}=5.00 mol FeS\_{2}×\frac{2 mol Fe\_{2}O\_{3}}{4 mol FeS\_{2}}×\frac{159.7 g Fe\_{2}O\_{3}}{1 mol Fe\_{2}O\_{3}}=4.00×10^{2} g Fe\_{2}O\_{3}$$

* 1. How many moles of SO2 will be formed by the reaction of 5 moles of FeS2 with 5 moles of O2?

$$?mol SO\_{2}=5 mol FeS\_{2}×\frac{8 mol SO\_{2}}{4 mol FeS\_{2}}=10 mol SO\_{2}$$

$$?mol SO\_{2}=5 mol O\_{2}×\frac{8 mol SO\_{2}}{11 mol O\_{2}}=4 mol SO\_{2}$$

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Avogadro’s number = 6.022 x 1023/mol

1. (20 points) Answerthe following questions using the balanced reaction shown below:

4 FeS2 + 11 O2 🡪 2 Fe2O3 + 8 SO2

* 1. How many molecules of O2 are required to react with 12 formula units of FeS2

$$?molec O\_{2}=12 units FeS\_{2}×\frac{11 molecules O\_{2}}{4 units FeS\_{2}}=33 molecules O\_{2}$$

* 1. How many moles of SO2 will be formed by the complete reaction of 3.85 moles of O2?

$$?mol SO\_{2}=3.85 mol O\_{2}×\frac{8 mol SO\_{2}}{11 mol O\_{2}}=2.80 mol SO\_{2}$$

* 1. What is the molar mass of Fe2O3?

$$2\left(Fe\right)+ 3\left(O\right)=2\left(55.85\right)+3\left(16.00\right)=111.70+48.00=159.70 amu$$

* 1. How many grams of Fe2O3 will be formed by the reaction of 7.00 mol of FeS2 with excess oxygen?

$$?g Fe\_{2}O\_{3}=7.00 mol FeS\_{2}×\frac{2 mol Fe\_{2}O\_{3}}{4 mol FeS\_{2}}×\frac{159.7 g Fe\_{2}O\_{3}}{1 mol Fe\_{2}O\_{3}}=5.59 ×10^{2} g Fe\_{2}O\_{3}$$

* 1. How many moles of SO2 will be formed by the reaction of 7 moles of FeS2 with 7 moles of O2?

$$?mol SO\_{2}=7 mol FeS\_{2}×\frac{8 mol SO\_{2}}{4 mol FeS\_{2}}=14 mol SO\_{2}$$

$$?mol SO\_{2}=7 mol O\_{2}×\frac{8 mol SO\_{2}}{11 mol O\_{2}}=5 mol SO\_{2}$$