Chemistry 115 - Name KEY

Dr. Cary Willard

Quiz 4A (20 points) October 6, 2008

All work must be shown to receive credit.

Avogadro’s number = 6.022 x 1023/mol

1. (8 points) Calculate the empirical formula of a compound that is composed or 55.3% potassium (K), 14.6% phosphorus (P) and 30.1% oxygen (O).

$$55.3 g K×\frac{1 mol K}{39.10 g K}=1.41 mol K$$

$$14.6 g P×\frac{1 mol P}{30.97 g P}=0.471 mol P$$

$$30.1 g O×\frac{1 mol O}{16.00 g O}=1.88 mol O$$

$$K\_{\frac{1.41}{0.471}}P\_{\frac{0.471}{0.471}}O\_{\frac{1.88}{0.471}}=K\_{3}PO\_{4}$$

1. (4 points) How many grams of Fe2S3 will contain 7.16 x 1023 atoms of iron (Fe)?

$$?g Fe\_{2}S\_{3}=7.16×10^{23} atom Fe×\frac{1 unit Fe\_{2}S\_{3}}{2 atom Fe}×\frac{1 mol Fe\_{2}S\_{3}}{6.022×10^{23} unit Fe\_{2}S\_{3} }×\frac{207.9 g Fe\_{2}S\_{3}}{1 mol Fe\_{2}S\_{3}}=124 g Fe\_{2}S\_{3}$$

1. (2 points) What are two indicators of a chemical reaction (ie they are evidence that a chemical reaction has taken place.)
* Permanent color change
* Temperature change
* Formation of a precipitate
* Formation of a gas
1. (6 points) Balance the following chemical reactions by inspection.
	1. 2 SO2 + O2 🡪 2 SO3
	2. Mg3N2 + 6 H2O 🡪 3 Mg(OH)2 + 2 NH3

Chemistry 115 - Name KEY

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Quiz 4B (20 points) October 6, 2008

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Avogadro’s number = 6.022 x 1023/mol

1. (8 points) Calculate the empirical formula of a compound that is composed or 38.9% barium (Ba), 29.4% chromium (Cr) and 31.7% oxygen (O).

$$38.9 g Ba×\frac{1 mol Ba}{137.3 g Ba}=0.283 mol Ba$$

$$29.4 g Cr×\frac{1 mol Cr}{52.00 g Cr}=0.565 mol Cr$$

$$31.7 g O×\frac{1 mol O}{16.00 g O}=1.98 mol O$$

$$Ba\_{\frac{0.283}{0.283}}P\_{\frac{0.565}{0.283}}O\_{\frac{1.98}{0.283}}=BaCr\_{2}O\_{7}$$

1. (4 points) How many grams of Fe2S3 will contain 5.28 x 1023 atoms of iron (Fe)?

$$?g Fe\_{2}S\_{3}=5.28×10^{23} atom Fe×\frac{1 unit Fe\_{2}S\_{3}}{2 atom Fe}×\frac{1 mol Fe\_{2}S\_{3}}{6.022×10^{23} unit Fe\_{2}S\_{3} }×\frac{207.9 g Fe\_{2}S\_{3}}{1 mol Fe\_{2}S\_{3}}=91.1 g Fe\_{2}S\_{3}$$

1. (2 points) What are two indicators of a chemical reaction (ie they are evidence that a chemical reaction has taken place.)
* Permanent color change
* Temperature change
* Formation of a precipitate
* Formation of a gas
1. (6 points) Balance the following chemical reactions by inspection.
	1. 2 PbO2 🡪 2 PbO + O2
	2. 2 MnO2 + CO 🡪 Mn2O3 + CO2