Chemistry 115 Name

Dr. Cary Willard

Quiz 5a (20 points) March 13, 2013

All work must be shown to receive credit. Give answers to the correct number of significant figures. Avogadro’s number = 6.022 x 1023/mol

1. (6 points)Calculate the empirical formula of a compound composed of 28.46% Cu and 71.56% Br.

$$28.46 g Cu×\frac{1 mol Cu}{63.55 g Cu}=0.4478 mol Cu$$

$$71.56 g Br×\frac{1 mol Br}{79.90 g Br}=0.8956 mol Br$$

$$Cu\_{\frac{0.4478}{0.4478}}Br\_{\frac{0.8956}{0.4478}}\rightarrow \rightarrow CuBr\_{2}$$

1. (4 points) Determine the molecular formula of a compound with an empirical formula CH2N and a molar mass of 84 g/mol.

$$CH\_{2}N=28 g/mol\rightarrow \rightarrow \frac{84 g/mol}{28 g/mol}= 3 units needed$$

$$\left(CH\_{2}N\right)\_{3}=C\_{3}H\_{6}N\_{3}$$

1. (2 points) What is the purpose of balancing chemical equations?

To satisfy the law of conservation of mass.

1. (2 points) Give an example of the type of evidence that would lead a chemist to conclude that a chemical reaction had taken place.

A color change, a precipitate formation, a gas formation, or a change in temperature

1. (6 points) Balance the chemical reactions below:
	1. CaCl2 + K3PO4 🡪 Ca3(PO4)2 + KCl

3 CaCl2 + 2 K3PO4 🡪 Ca3(PO4)2 + 6 KCl

* 1. C4H10 + O2 🡪 CO2 + H2O

2 C4H10 + 13 O2 🡪 8 CO2 + 10 H2O

Chemistry 115 Name

Dr. Cary Willard

Quiz 5b (20 points) March 13, 2013

All work must be shown to receive credit. Give answers to the correct number of significant figures. Avogadro’s number = 6.022 x 1023/mol

1. (6 points)Calculate the empirical formula of a compound composed of 12.39% Mn and 87.39% I.

$$12.39 g Mn×\frac{1 mol Mn}{54.94 g Mn}=0.2255 mol Mn$$

$$87.39 g I×\frac{1 mol I}{126.9 g I}=0.6887 mol I$$

$$Mn\_{\frac{0.2255}{0.2255}}I\_{\frac{0.6887}{0.2255}}\rightarrow \rightarrow MnI\_{3}$$

1. (4 points) Determine the molecular formula of a compound with an empirical formula CH2N and a molar mass of 140 g/mol.

$$CH\_{2}N=28 g/mol\rightarrow \rightarrow \frac{140 g/mol}{28 g/mol}= 5 units needed$$

$$\left(CH\_{2}N\right)\_{5}=C\_{5}H\_{10}N\_{5}$$

1. (2 points) What is the purpose of balancing chemical equations?

To satisfy the law of conservation of mass.

1. (2 points) Give an example of the type of evidence that would lead a chemist to conclude that a chemical reaction had taken place.

A color change, a precipitate formation, a gas formation, or a change in temperature

1. (6 points) Balance the chemical reactions below:
	1. NiBr3 + Na2CO3 🡪 Ni2(CO3)3 + NaBr

2 NiBr3 + 3 Na2CO3 🡪 Ni2(CO3)3 + 6 NaBr

* 1. C6H14 + O2 🡪 CO2 + H2O

2 C6H14 + 19 O2 🡪 12 CO2 + 14 H2O

Chemistry 115 Name

Dr. Cary Willard

Quiz 5c (20 points) March 13, 2013

All work must be shown to receive credit. Give answers to the correct number of significant figures. Avogadro’s number = 6.022 x 1023/mol

1. (6 points)Calculate the empirical formula of a compound composed of 32.84% Cr and 67.16% Cl.

$$32.84 g Cr×\frac{1 mol Cr}{52.00 g Cr}=0.6315 mol Cr$$

$$67.16 g Cl×\frac{1 mol Cl}{35.45 g Cl}=1.894 mol Cl$$

$$Cr\_{\frac{0.6315}{0.6315}}Cl\_{\frac{1.894}{0.6315}}\rightarrow \rightarrow CrCl\_{3}$$

1. (4 points) Determine the molecular formula of a compound with an empirical formula CH2N and a molar mass of 112 g/mol.

$$CH\_{2}N=28 g/mol\rightarrow \rightarrow \frac{112 g/mol}{28 g/mol}= 4 units needed$$

$$\left(CH\_{2}N\right)\_{4}=C\_{4}H\_{8}N\_{4}$$

1. (2 points) What is the purpose of balancing chemical equations?

To satisfy the law of conservation of mass.

1. (2 points) Give an example of the type of evidence that would lead a chemist to conclude that a chemical reaction had taken place.

A color change, a precipitate formation, a gas formation, or a change in temperature

1. (6 points) Balance the chemical reactions below:
	1. CaCl2 + K3PO4 🡪 Ca3(PO4)2 + KCl

3 CaCl2 + 2 K3PO4 🡪 Ca3(PO4)2 + 6 KCl

* 1. C4H10 + O2 🡪 CO2 + H2O

2 C4H10 + 13 O2 🡪 8 CO2 + 10 H2O

Chemistry 115 Name

Dr. Cary Willard

Quiz 5d (20 points) March 13, 2013

All work must be shown to receive credit. Give answers to the correct number of significant figures. Avogadro’s number = 6.022 x 1023/mol

1. (6 points)Calculate the empirical formula of a compound composed of 23.05% Ti and 76.95% Br.

$$23.05 g Ti×\frac{1 mol Ti}{47.88 g Ti}=0.4814 mol Ti$$

$$76.95 g Br×\frac{1 mol Br}{79.90 g Br}=0.9631 mol Br$$

$$Ti\_{\frac{0.4814}{0.4814}}Br\_{\frac{0.9631}{0.4814}}\rightarrow \rightarrow TiBr\_{2}$$

1. (4 points) Determine the molecular formula of a compound with an empirical formula CH2N and a molar mass of 168 g/mol.

$$CH\_{2}N=28 g/mol\rightarrow \rightarrow \frac{168 g/mol}{28 g/mol}= 6 units needed$$

$$\left(CH\_{2}N\right)\_{3}=C\_{6}H\_{12}N\_{6}$$

1. (2 points) What is the purpose of balancing chemical equations?

To satisfy the law of conservation of mass.

1. (2 points) Give an example of the type of evidence that would lead a chemist to conclude that a chemical reaction had taken place.

A color change, a precipitate formation, a gas formation, or a change in temperature

1. (6 points) Balance the chemical reactions below:
2. NiBr3 + Na2CO3 🡪 Ni2(CO3)3 + NaBr

2 NiBr3 + 3 Na2CO3 🡪 Ni2(CO3)3 + 6 NaBr

1. C6H14 + O2 🡪 CO2 + H2O

2 C6H14 + 19 O2 🡪 12 CO2 + 14 H2O