Chemistry 115 Name

Dr. Cary Willard

Quiz 6A (20 points) March 16, 2009

All work must be shown to receive credit. Avogadro’s number 6.022 x 1023/mol

1. (3 points) Calculate the molar mass of aspartame, (C8H10N4O2)

$$8\left(C\right)+10\left(H\right)+4\left(N\right) + 2\left(O\right)$$

$$=8\left(12.01\right)+10\left(1.008\right)+4\left(14.01\right) + 2\left(16.00\right)$$

$$=96.08+10.08+56.04 + 32.00=194.20 g/mol$$

1. (3 points) Calculate the mass of 3.64 moles of aspartame.

$$?g C\_{8}H\_{10}N\_{4}O\_{2}=3.64 mol C\_{8}H\_{10}N\_{4}O\_{2}×\frac{194.2 g C\_{8}H\_{10}N\_{4}O\_{2}}{1 mol C\_{8}H\_{10}N\_{4}O\_{2}}=707 g C\_{8}H\_{10}N\_{4}O\_{2}$$

1. (3 points) Calculate the number of moles of carbon in 2.97 moles of aspartame.

$$?mol C=2.97 mol C\_{8}H\_{10}N\_{4}O\_{2}×\frac{8 mol C}{1 mol C\_{8}H\_{10}N\_{4}O\_{2}}=23.8 mol C$$

1. (3 points) Calculate the mass of 3.87 x 1018 molecules of aspartame.

$$?g C\_{8}H\_{10}N\_{4}O\_{2}$$

$$=3.87×10^{18} molec C\_{8}H\_{10}N\_{4}O\_{2}×\frac{1 mol C\_{8}H\_{10}N\_{4}O\_{2}}{6.022×10^{23}molec C\_{8}H\_{10}N\_{4}O\_{2} }×\frac{194.2 g C\_{8}H\_{10}N\_{4}O\_{2}}{1 mol C\_{8}H\_{10}N\_{4}O\_{2}}$$

$$=1.25×10^{-3}g C\_{8}H\_{10}N\_{4}O\_{2}$$

1. (3 points) Balance the following equation

2 AgNO3 + Cu 🡪 Cu(NO3)2 + 2 Ag

1. (5 points) Given the following chemical equation, answer the questions

CS2 + 3 Cl2 🡪 CCl4 + S2Cl2

* 1. How many moles of Cl2 will react with 5.23 moles of CS2?

$$?mol Cl=5.23 mol CS\_{2}×\frac{3 mol Cl\_{2}}{1 mol CS\_{2}}=15.7 mol Cl\_{2}$$

* 1. How many grams of CCl4 can be made from the reaction of 10.0 grams of Cl2 with excess CS2?

$$?g CCl\_{4}=10.0 g Cl\_{2}×\frac{1 mol Cl\_{2}}{70.90 g Cl\_{2}}×\frac{1 mol CCl\_{4}}{3 mol Cl\_{2}}×\frac{153.8 g CCl\_{4}}{1 mol CCl\_{4}}=7.23g CCl\_{4}$$

Chemistry 115 Name Key

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Quiz 6B (20 points) March 16, 2009

All work must be shown to receive credit. Avogadro’s number 6.022 x 1023/mol

1. (3 points) Calculate the molar mass of aspartame, (C14H18N2O5)

$$14\left(C\right)+18\left(H\right)+2\left(N\right) + 5\left(O\right)$$

$$=8\left(12.01\right)+18\left(1.008\right)+2\left(14.01\right) + 5\left(16.00\right)$$

$$=168.14+18.14+28.02 + 80.00=294.30 g/mol$$

1. (3 points) Calculate the mass of 3.87 moles of aspartame.

$$?g C\_{8}H\_{10}N\_{4}O\_{2}=3.87 mol C\_{14}H\_{18}N\_{2}O\_{5}×\frac{294.3 g C\_{14}H\_{18}N\_{2}O\_{5}}{1 mol C\_{14}H\_{18}N\_{2}O\_{5}}=1140 g C\_{14}H\_{18}N\_{2}O\_{5}$$

1. (3 points) Calculate the number of moles of carbon in 2.04 moles of aspartame.

$$?mol C=2.04 mol C\_{14}H\_{18}N\_{2}O\_{5}×\frac{14 mol C}{1 mol C\_{14}H\_{18}N\_{2}O\_{5}}=28.6 mol C$$

1. (3 points) Calculate the mass of 5.97 x 1018 molecules of aspartame.

$$?g C\_{14}H\_{18}N\_{2}O\_{5}$$

$$=5.97×10^{18} molec C\_{14}H\_{18}N\_{2}O\_{5}×\frac{1 mol C\_{14}H\_{18}N\_{2}O\_{5}}{6.022×10^{23}molec C\_{14}H\_{18}N\_{2}O\_{5} }×\frac{194.2 g C\_{14}H\_{18}N\_{2}O\_{5}}{1 mol C\_{14}H\_{18}N\_{2}O\_{5}}$$

$$=2.92×10^{-3}g C\_{14}H\_{18}N\_{2}O\_{5}$$

1. (3 points) Balance the following equation

2 AgNO3 + Ni 🡪 Ni(NO3)2 + 2 Ag

1. (5 points) Given the following chemical equation, answer the questions

CS2 + 3 Cl2 🡪 CCl4 + S2Cl2

1. How many moles of Cl2 will react with 3.87 moles of CS2?

$$?mol Cl=3.87 mol CS\_{2}×\frac{3 mol Cl\_{2}}{1 mol CS\_{2}}=11.6 mol Cl\_{2}$$

1. How many grams of CCl4 can be made from the reaction of 15.0 grams of Cl2 with excess CS2?

$$?g CCl\_{4}=15.0 g Cl\_{2}×\frac{1 mol Cl\_{2}}{70.90 g Cl\_{2}}×\frac{1 mol CCl\_{4}}{3 mol Cl\_{2}}×\frac{153.8 g CCl\_{4}}{1 mol CCl\_{4}}=10.8 g CCl\_{4}$$