Chemistry 115 Name Key

Dr. Cary Willard

Quiz 3a (20 points) September 21, 2010

All work must be shown to receive credit

1. (8 points) A bag of M&M’s says that there are 210 Cal in a 42 gram serving of the dark chocolate variety.
	1. Determine the Cal/g for M&Ms.

$$\frac{210 Cal}{42}={5.0 Cal}/{g}$$

* 1. If jogging requires 0.173 Cal/kg min, how many grams of M&Ms would need to be ingested in order to provide enough energy for a 160 lb person to jog for three hours?

$$Energy required=180 min×\frac{0.173 Cal}{kg min}×\left(160 lb×\frac{1 kg}{2.20 lb}\right)=2300 Cal$$

$$Mass M\&M=2300 Cal×\frac{1 g}{5.0 Cal}=460 g M\&M$$

1. (4 points) Define the terms orbit and orbital and distinguish between them.

An orbit was defined by Bohr as the circular path he believed electrons followed around the nucleus of an atom

An orbital is defined as the region in space occupied by an electron. This is a volume, not a path.

1. (2 points) How many electrons will fit into one orbital?

2

1. (6 points) Write out the complete electron configuration for the following atoms
	1. Carbon

1s2 2s2 2p2

* 1. Nickel

1s2 2s2 2p6 3s2 3p6 4s2 3d8

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1. (8 points) A bag of M&M’s says that there are 210 Cal in a 42 gram serving of the dark chocolate variety.
	1. Determine the Cal/g for M&Ms.

$$\frac{210 Cal}{42}={5.0 Cal}/{g}$$

* 1. If jogging requires 0.173 Cal/kg min, how many grams of M&Ms would need to be ingested in order to provide enough energy for a 140 lb person to jog for three hours?

$$Energy required=180 min×\frac{0.173 Cal}{kg min}×\left(140 lb×\frac{1 kg}{2.20 lb}\right)=2000 Cal$$

$$Mass M\&M=2000 Cal×\frac{1 g}{5.0 Cal}=400 g M\&M$$

1. (4 points) Define the terms orbit and orbital and distinguish between them.

An orbit was defined by Bohr as the circular path he believed electrons followed around the nucleus of an atom

An orbital is defined as the region in space occupied by an electron. This is a volume, not a path.

1. (2 points) How many electrons will fit into one orbital?

2

1. (6 points) Write out the complete electron configuration for the following atoms
	1. nitrogen

1s2 2s2 2p3

* 1. Vanadium

1s2 2s2 2p6 3s2 3p6 4s2 3d3