Chemistry 115 Name

Dr. Cary Willard

Quiz 3a (20 points) September 23, 2010

All work must be shown to receive credit

1. (8 points) A Milky Way Midnight bar says that there are 220 Cal in a 49.9 gram serving.
	1. Determine the Cal/g for Milky Way.

$$\frac{220 Cal}{49.9}={4.41 Cal}/{g}$$

* 1. If bicycling requires 0.127 Cal/kg min, how many grams of Milky Way would need to be consumed in order to provide enough energy for a 130 lb person to bike for three hours?

$$Energy required=180 min×\frac{0.127 Cal}{kg min}×\left(130 lb×\frac{1 kg}{2.20 lb}\right)=1400 Cal$$

$$Mass Milky Way=1400 Cal×\frac{1 g}{4.41 Cal}=320 g Milky Way $$

$$(290 g if round down on Cal)$$

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. Oxygen

1s2 2s2 2p4

* 1. Technetium (Tc)

1s2 2s2 2p6 3s2 3p6 4s2 3d10 4p6 5s2 4d5

Chemistry 115 Name Key

Dr. Cary Willard

Quiz 3b (20 points) September 23, 2010

All work must be shown to receive credit

1. (8 points) A Milky Way Midnight bar says that there are 220 Cal in a 49.9 gram serving.
	1. Determine the Cal/g for Milky Way.

$$\frac{220 Cal}{49.9}={4.41 Cal}/{g}$$

* 1. If bicycling requires 0.127 Cal/kg min, how many grams of Milky Way would need to be consumed in order to provide enough energy for a 150 lb person to bike for four hours?

$$Energy required=240 min×\frac{0.127 Cal}{kg min}×\left(150 lb×\frac{1 kg}{2.20 lb}\right)=2100 Cal$$

$$Mass Milky Way=2100 Cal×\frac{1 g}{4.41 Cal}=480 g Milky Way$$

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. Fluorine

1s2 2s2 2p5

* 1. Zirconium (Zr)

1s2 2s2 2p6 3s2 3p6 4s2 3d10 4p6 5s2 4d2