Practice Chapter 3 and 4 Chem. 115 key

1. Define the term physical property and give an example of a physical property.

A physical property is a property of a substance which can be observed without changing the identity of the substance. Some examples of physical properties are color, hardness and melting point

|  |  |
| --- | --- |
| Fat | 9.0 Cal/g |
| Protein | 4.0 Cal/g |
| Carbohydrate | 4.0 Cal/g |

1. You have just consumed a serving of trail mix with 8.3 g of fat, 12.7 g of carbohydrate, and 3.9 g of protein. Calculate the number of Calories from fat, carbohydrate, and protein, as well as the total Calories you have consumed.

$$8.3 g fat × \frac{9.0 Cal}{1 g fat} = 75 Cal$$

$$12.7 g carbohydrate ×\frac{4.0 Cal}{ 1 g carbohydrate} = 51 Cal$$

$$3.9 g protein × \frac{4.0 Cal}{1 g protein} = 16 Cal$$

Calories from fat 75

Calories from carbohydrate 51

Calories from protein 16

Total Calories 142

1. If you wish to exercise just long enough to burn off 142 calories, how many hours would you need to swim if swimming uses 500. kcal/hr?
2. $Cal×\frac{1 kcal}{1 Cal}×\frac{1 hr}{500. kcal}=0.284 hr$
3. Enter the name and number of atoms of each element in acetic acid, HC2H3O2, a major component of vinegar:

|  |  |  |
| --- | --- | --- |
| Element Symbol | Name | Number of Atoms |
| H | Hydrogen | 4 |
| C | Carbon | 2 |
| O | Oxygen | 2 |

1. Identify the following statements as true or false (4 points):
	1. Sodium, Na, is an alkali metal. \_\_\_true\_\_\_\_\_\_\_\_\_\_
	2. Silicon, Si, is a metal. \_\_\_false\_\_\_\_\_\_\_\_\_
	3. Mercury, Hg, is a solid at room temperature. \_\_\_false\_\_\_\_\_\_\_\_\_
	4. Nitrogen exists as N­2 in nature. \_\_\_true\_\_\_\_\_\_\_\_\_\_
2. Some solids have a crystalline structure, while others have an amorphous structure. For each of the following statements, determine whether it refers to a crystalline solid or an amorphous solid.
3. It has a regular repeating pattern. \_\_\_\_\_crystalline solid\_\_\_\_\_\_
4. Plastic \_\_\_\_\_\_amorphous solid\_\_\_\_
5. It melts over a long range of temperature. \_\_\_\_amorphous solid\_\_\_\_\_
6. Gold \_\_\_\_\_crystalline solid\_\_\_\_\_\_
7. The number of kilojoules needed to raise the temperature of 48.7 g of water from 22.8 °C to 62.0 °C. The specific heat of water is 4.184 J/g °C

$$q=mc∆T$$

$$q=\left(48.7 g\right)\left(4.184\frac{J}{g ℃}\right)\left(62.0 ℃-22.8 ℃\right)×\frac{1 kJ}{1000 J}$$

$$q=\left(48.7 g\right)\left(4.184\frac{J}{g ℃}\right)\left(39.2 ℃\right)×\frac{1 kJ}{1000 J}$$

$$q=7.98742336 kJ≈7.99 kJ$$