NAME \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ UNIT 1 REVIEW: TAKE HOME!!!!

DIRECTIONS: This is graded … so we are going to generate some points here. It is a review of Unit 1, Matter and Energy. Answer each of the following questions, by selecting or by providing the most correct response. You may, of course, use your notes and you may work with a friend. Please be sure to place every answer on the answer sheet.



http://www.snwa.com/html/wq\_taste\_tests.html

1) An ice cube is placed into a room temperture glass of water.

 Describe the flow of energy between the ice cube and the drink.

 1) energy flows from the ice to the water

 2) energy flows from the water to the ice

 3) energy flows in both directions, simultaneously, from ice to water and

 water to ice.

2) The following diagram represents a crude representation of a bond being made between two atoms.

bond of overlapping or shared electrons

 atom 1 atom 2 atom 1 atom 2 molecule

 Diagram 1 Diagram 2 Diagram 3

 As the bond production proceeds from diagram 1 to diagram 3, the potential energy of the chemicals

 1) increases and energy is absorbed from the environment

 2) decreases and energy is released into the environment

 3) remains the same and there is no energy conversion or transfer

3) 4.0 grams of hydrogen gas are reacted completely with 32 grams of oxygen gas to produce water.

 Which of these is accurate?

 1) Approximately 4.0 grams of water can be produced

 2) Approximately 32 grams of water can be produced

 3) Approximately 28 grams of water can be produced

 4) Approximately 36 grams of water can be produced

4) When a **chemical reaction** is said to have occurred, there must have been a change in

 1) the nucleus of the atoms 3) the electrons (cloud) of the atoms

 2) the atomic number of the atoms 4) the neutrons of the atoms

5) Which of the following has the **highest** average kinetic energy?

 1) 50 grams of water at 35.0°C 3) 1,000 grams of water at 50.0°C

 2) 100 grams of water at 75.0°C 4) 25 grams of water at 40.0°C

For questions 6-8, use the following table of Rf values, and your grasp of chromatography.

The following are the calculations of Rf values for a chromatography experiment of standard natural dyes

and of unknown samples related to those dyes.

|  |  |
| --- | --- |
| Dye | Rf Values percomponent |
| Standard 1 | 0.8910.399 |
| Standard 2 | 0.5510.219 |
| Standard 3 | 0.7220.6110.124 |
| Standard 4 | 0.400 |
| Unknown A | 0.7190.6090.3980.125 |
| Unknown B | 0.5530.2220.8900.401 |

6) Which standard dye is probably a single substance?

7) Unknown A is the effective equivalent of which dye(s)? (You may need to “X” more than one response)

8) Unknown B is the effective equivalent of which dye(s)? (You may need to “X” more than one response)

|  |  |
| --- | --- |
| Standard Dye Mixture | Components and Rf Values |
| Standard Dye 1 | A = 0.24B = 0.71 |
| Standard Dye 2 | A = 0.53B = 0.49C = 0.99 |
| Standard Dye 3 | A = 0.11B = 0.21 |
| Standard Dye 4 | A = 0.81B = 0.56C = 0.50 |
| Unknown Mixture | **A = 0.55** **B = 0.51** **C = 0.73** **D = 0.80** **E = 0.24**  |

9) Use the table of Rf values found to the right.

 Identify the standard dye(s) in Unknown Mixture

 The unknown mixture contains

 1) Standard dyes 1 & 4 3) Standard dyes 3 & 1

 2) Standard dyes 2 & 1 4) Standard Dyes 2 & 4

10) Which of the following terms represents what is known as “substances”?

 1) compounds and mixtures 3) just mixtures

 2) elements and mixtures 4) elements and compounds

11) Which of the following is an example of matter?

 1) All of These 3) heat

 2) air 4) sound

12) The change in weight of an astronaut on the moon relative to her weight on the Earth is due to

 1) a difference in the chemicals of the surrounding atmosphere

 2) a loss in body mass

 3) changes in the gravitational forces

 4) the means by which we measure mass in different environments

13) In a closed system, 12 grams of carbon *reacted completely* with 32 grams of oxygen to produce

 carbon dioxide according to the reaction equation: C(s) + O2(g) → CO2(g)

 Based upon the concepts covered in our class, which statement is most accurate?

 1) 44 grams of CO2 are produced

 2) Fewer than 44 grams but more than 12 grams of CO2 are produced

 3) Fewer than 12 grams of CO2 are produced

 4) More than 44 grams of CO2 are produced

14) Which property could be used to identify a specific substance, such as gold, in the laboratory?

 1) It’s melting point 3) It’s temperature

 2) It’s mass 4) It’s volume

15) Which sample could occupy the volume of a 100 mL flask?

 1) 25 cm3 Cu(s) 3) 50 cm3 SiO2(s)

 2) 30 cm3 CO2(g) 4) 75 cm3 Fe(s)

16) Which of the following would float on pure water at a temperature of 3.98℃? Water at this temperature

 has a density of 1.00 g/mL

 1) A substance with a mass of 1.38 g. and a volume of 1.33 mL

 2) A substance with a mass of 534.23 grams and a volume of 522.3 mL

 3) A substance with a mass of 22.64 g and a volume of 3.35 mL

 4) A substance with a mass of 418.23 g and a volume of 436.2 mL

For question 17, determine the “truth” or accuracy of the Assertion and then the accuracy of of the “Reason”. Then, select a pair of terms from 1-5, which describes the validity of the assertion and the validity and relationship of the reason.

 ASSERTION REASON

1) True True statement and it correctly explains / predicts the assertion

2) True True statement but it does NOT correctly explain / predict the assertion

3) True False

4) False True

5) False False

For example:

 **My professor has brown eyes because My professor wears glasses**

**The answer is "2".** Both statements are true. However, the wearing of glasses is unrelated with eye color.

 **Assertion Reason**

17) **The density of a sample of water is *because*  The density of a substance like water,**

 **doubled by doubling the mass of water. changes as the mass of the sample changes.**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

18) During chemical reactions, mass and energy

 1) absorbed 3) conserved

 2) formed 4) released

 Questions 19 – 24 are on your answer sheet. They are “fill-in” and short answer responses.

NAME \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ GRADED: UNIT 1 REVIEW: TAKE HOME!!!!

DIRECTIONS: Please be sure every answer is placed on this sheet.

 For each multiple-choice question, please place an X through the number of the answer you

 wish to have evaluated.

 e.g.) 1 2 3 4 An “X” through 2 means your answer to the question is

 choice 2

 For questions 19-24 write clearly. If you are unsure you can do that, you may type out

 your answers and staple the sheet to your answer sheet.

1) 1 2 3

2) 1 2 3

3) 1 2 3 4

4) 1 2 3 4

5) 1 2 3 4

6) 1 2 3 4

7) 1 2 3 4

8) 1 2 3 4

9) 1 2 3 4

10) 1 2 3 4

11) 1 2 3 4

12) 1 2 3 4

13) 1 2 3 4

14) 1 2 3 4

15) 1 2 3 4

16) 1 2 3 4

17) 1 2 3 4

18) 1 2 3 4

 Questions 19-24 continue onto the next page

For questions 19 - 20 think of an answer from the point of view of the chemicals and answer

***decreases or increases***

19) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the potential energy of an electron as it moves from an energy shell close to

 the nucleus of its atom, to an outer energy level

20) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the potential energy of hot water vapor as it condenses to a liquid onto a

 bathroom mirror)

21) Identify one difference between what is meant by the term: *mixture*, and the term, *compound*:

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22) Which reaction is **improbable**, assuming the complete reaction of only the pure samples of the reactants,

 in a closed system? Defend your thinking. Circle 1 or 2 and then explain your thinking.

 (1) 3 Fe + 4 H2O → 4 H2 + Fe3O4 + 2 CaSO4

 (2) 2 Al + 3 Fe(NO3)2 → 2 Al(NO3) 3 + 3Fe

 Defense: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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23) A pool ball (#6) is rolling towards two stationary pool balls (#11 and the black).



 <http://quest.nasa.gov/space/teachers/liftoff/images/7.13a.gif>

 i) Compare the kinetic energy of #6 to that of #11 The kinetic energy of ball #6 is \_\_\_\_\_\_ than ball #11

 1) greater, 2) lesser, 3) the same

 ii) There is a potential energy between #6 and #11. What happens to the potential energy as

 # 6 nears #11? The potential energy:

 1) increases 2) decreases 3) remains the same

 Why? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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24) Compare the potential energy of the molecules of a solid substance to the potential energy of those

 same molecules in the gas phase. Be sure to explain why there is or why there is no difference.

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