Key:

Test Prep for Lecture Test 1: SI session 3/9/21

Warm-up:

Solve the following riddle:

Riddle: What is the dullest element?

B O H R I U M

1 2 3 4 5 6 7

Key:

1. The non- space holding digits in a reported measurement	O. Physical properties
2. Properties used to identify a substance.	R. conversion Factor
3. Is copper a Type 1 of 2 cation?	U. Fahrenheit
4. A ratio of 2 or more equal quantities that uses different units.	H. Type 2
5. Is used in scientific notation, it shows how many spaces the decimal has been moved.	M. exothermic
6. The temperature scale where the freezing point is 32 degrees	B. Significant Figures
7. Expressed by a negative empathy	I. exponent

Test Review Worksheet: Chapters 1 through 8:

1. What does the number of electrons in a neutral atom tell about the atom?

# of Protons, Atomic #

a.
b.

2. What did the Gold Foil Experiment discover?
   a. Atoms are mostly empty space
   - internal arrangement of an atom

3. Who created the plum Pudding model?
   a. JJ Thomson

4. How are ions formed in chemical reactions?
   a. gaining
   b. loosing electrons.

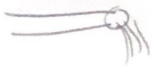
5. What are non- place holding digits in a measurement?
   a. Exact numbers
   b. Coefficients
   c. Place holding digits
   d. Significant figures

6. What is another name for a mole?
   a. Avogadro's # = 6.022×10^{23} Particles

7. Is the energy needed to raise one gram of water by one degree C.
   a. Calorie

8. Is the amount of heat needed to raise one gram of a substance by 1 degree C.
   a. Specific Heat

9. What are isotopes?
   a. Atoms of a particular element that have different masses (due to different # of neutrons).

10. Illustrate a substance with a low and high viscosity:
   a.
Low  Water

   b. High  Syrup

11. What are the four types of chemical reaction equations:
   a. Synthesis - A+B → AB

   b. Single replacement - A+BC → AC+B

   c. Double replacement / metathesis: AB+CD → AC + BD

   d. Decomposition AB → A + B

12. Describe the structure of both a crystalline and amorphous solid.
   a. Crystalline - orderly internal arrangement (diamond

   b. Amorphous - no internal arrangement (glass)

13. Determine the percent composition for a compound containing 10.25 grams of Sulfur and 3.02 grams of Sodium.
   a.

$$\frac{10.25\text{g S}}{13.27\text{ g Na}_2\text{S}} \times 100 = 77.24\%\ \text{S}$$

$$\frac{3.02\text{g Na}}{13.27\text{g Na}_2\text{S}} \times 100 = 22.76\%\ \text{Na}$$

14. Identify the charges of the following subatomic particles as well as their location in an atom:
   a. Neutron = Ø
   b. Proton = +
   c. Electron = −

15.

	1. A brief statement that summarizes experimental facts. D	a. Hypothesis
	2. A falsifiable tentative explanation for observations that fit all the facts available. A	b. kilogram
	3. The hypothesis survives peer review and is established in the scientific community. F	c. accuracy
	4. Base unit for mass B	d. Scientific law
	5. SI unit for volume G	e. Precision.
C	6. How closely the measurements are to the true value C	f. Theory
E	7. How close a set of measurements are to each other? E	g. Cubic meter

15. Give one example of a crystalline solid:

a. Diamond

16. Give one example of an amorphous solid:

a. glass

17. Illustrate an example of a miscible and immiscible substance

Miscible
Water + Vinegar

immiscible
vinegar + oil

18. What is the formula for gold (iii) iodide

AuI_3

19. Name the following compound: $Mg(IO4)2$

Magnesium Periodate

20.

D	1. Homogeneous mixture of 2 or more substances D	a. Intensive property

F.	2. Smallest indivisible particles that retain the properties of an element	b. Joule
A.	3. Relates to a substance's identity	c. Calorie
B.	4. SI unit for heat	d. solution
C.	5. What is the metric unit for heat?	e. Specific heat
e	6. The amount of heat needed to raise 1 gram of a substance by 1 degree C	f. atoms

20. Convert 200 grams to pounds.

0.4411b

21. If the empirical formula for water is H2O, and it has a molar mass of 64.08. Determine its molecular formula.

$H_2O = 18.02g$

$\frac{64.08}{18.02} = 3.55 \times 2 = 7$

$H_{2\times7}$ $H_{14}O_7$

22. An atom naturally has 3 occurring isotopes. Isotope 1 has an atomic mass of 89.637amu with a relative abundance of 20%, Isotope 2 has an atomic mass of 88.963 with a relative abundance of 60%, and Isotope 3 has an atomic mass of 90.036 with a relative abundance of 20%. Determine the atomic mass of the element.

$89.637 \times .20 = 17.93$

$88.963 \times .60 = +53.38$

$90.036 \times .20 = 18.00$

89.31

89.31amu

23. What is the percent composition for a compound formed from 8.45 grams of zinc and 3.00 grams of Oxygen?

11.45 ZnO

$\frac{8.45}{11.45} \times 100 =$ 73.8% Zn

$\frac{3.00}{11.45} \times 100 =$ 26.2% O

24. The specific heat of Al is 0.900J/g degree C. How many joules of energy are required to raise the temperature of 30.g Al from 40. Degrees C to 60 degrees C?

$Q = MC\Delta T$

$Q = (30g)(0.900)(20)$

$Q = 540J$

25. Determine the limiting reactant when Carbon monoxide and Hydrogen react to form Methanol:

a. $CO(g) + 2H_2(g) \longrightarrow CH_3OH(l)$

$$13g\ H_2 \left| \frac{1\ mol\ H}{2.02g\ H_2} \right| \frac{1\ mol\ CH_3OH}{2\ mols\ H_2} \left| \frac{CH_3OH\ 32.04g}{1\ mol\ CH_3OH} \right.$$

~~26.~~ If 50 grams of Co react with 13 grams of H2, how many grams of methanol can be produced?

$2\ H_2 = 103.1g\ CH_3OH$

$$50g\ CO \left| \frac{1\ mol\ CO}{28.01g} \right| \frac{1\ mol\ CH_3OH}{1\ mol\ CO} \left| \frac{32.04g\ CH_3OH}{1\ mol\ CH_3OH} \right.$$

Limiting reactant

$CO = 57.20g\ CH_3OH$

Theoretical yield

Other important info:

- Look over Test Review on canvas
- Look at laws