

Chem 121 Rybolt Exam 1 Fall 2008 Name _____

Numerical constants may be listed below. Other needed information is given in the problem or written on the board or found in the periodic tables you will use during exam. For numerical problems, be sure to **show your work**, include units and circle your final answer. If several choices are given, **circle the correct answer**. Your written answers should be brief and to the point. You can use your own calculator on the exam, but no notes, books, external information, or other electronic devices are to be used. No cell phone is to be used in Exam room.

1) Identify each of the following as element, compound, homogeneous mixture, or heterogeneous mixture

layers of oil above layer of water -

hydrogen -

water -

sugar dissolved in water-

2) You have an older car that has iron parts that are slowly combining with oxygen and water to form rust
This process is a chemical change or physical change

3) Moisture from the air freezes on the window of your car in the winter
This process is a chemical change or physical change

4) Write the answer to each problem to the correct number of significant figures

$$0.00784057/3.52 =$$

$$70.2435 - 68.2 =$$

5) The primary isotope of oxygen found in nature is oxygen 16. The number of protons and neutrons in an atom of $^{16}_8\text{O}$

$$\#p =$$

$$\#n =$$

6) One of the isotopes of oxygen is ^{18}O but it makes up only 0.2% of all oxygen. Identify the number of neutrons and electrons in the ion $^{18}\text{O}^{2-}$

$$\#n =$$

$$\#e =$$

7) A fighter jet taking off from the deck of an aircraft carrier travels at 62m/s as it leaves the deck. What is the plane's speed in miles per hour (mi/hr)? There are 1.61 km in one mile.

8) Write the correct atomic symbol for the following elements

silver-

tungsten-

nickel -

nitrogen -

9) Joe's boss tells him he wants him to determine the exact length in feet of a long coil of copper tubing, but Joe has only a meter stick and he doesn't want to uncoil all the tubing. However, he does have a rather accurate balance, and he sees some short pieces of identical tubing on the floor. He finds that one of these pieces is 34.8 cm long and has a mass of 205 g. He then weighs the entire coil and finds that the total mass of the coil is 16468g. Therefore the total length of the coil is ? Recall that 1 in = 2.54 cm and 12 in = 1 ft

10) An element has two isotopes whose natural abundance and masses are given as

fractional abundance	mass (amu)
50.69%	79.00
49.31%	81.00

then the average atomic weight of this element is (answer to 4 significant figures)

11) At a vet clinic a dog is found to have a temperature of 107°F. What is the dog's temperature in Kelvin? Recall that $^{\circ}\text{C} = (\text{^{\circ}\text{F}} - 32) / 1.8$ and $\text{K} = ^{\circ}\text{C} + 273$.

12) Name the following compounds



13) Name the following compounds



14) Write the correct formula for the following compounds

aluminum nitrate

iron(III) bromide

15) Write the correct formula for the following compounds

hydrogen nitrite

magnesium(II) hypochlorite

16) a) Which of the following is likely to be shiny (have luster)

Ti Si P S

b) And which would not conduct heat well

Ca Ti Cu S

17) A sample of a compound is decomposed into its elements and the number ratio is found to be 2 oxygen atoms for each 1 carbon atom, and the mass ratio is found to be 2.667=(mass oxygen/mass of carbon). If the average atomic mass of carbon is 12.01amu then the average mass of oxygen is (write your answer to 4 sig fig and show work clearly).

18) Circle the element to the right that correctly fits each category given

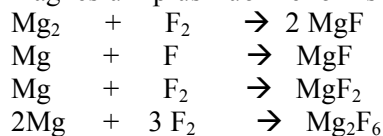
noble gas	Cs	Ba	Au	Rn	U
transition element	Cs	Ba	Au	Rn	U
alkali metal	Cs	Ba	Au	Rn	U
actinide	Cs	Ba	Au	Rn	U

19) Recall our classroom demonstration of burning methanol vapor in a plastic bottle. What two new compounds were produced in this chemical reaction?

20) Balance (no fractions left) the following reaction for the combustion of rubbing alcohol (isopropyl alcohol)



21) Circle the one equation below that correctly expresses the statement magnesium plus fluorine forms magnesium fluoride



22) Democritus and Dalton both believed in what?

23)The size of an atom is due to what subatomic particle.

24) The element most likely to form a -2 charge is

K Ca Ti S Cl Ar

25) The density of platinum is 21.5 g/cm³. Recall that 1 lb (pound) = 454 g and that 2.54cm=1.00 inch. Therefore the mass of one cubic foot (1.00 ft on each side) of Pt is how many pounds.