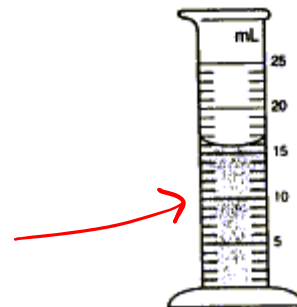


Chemistry Themed 1st Semester Final Exam Review Questions

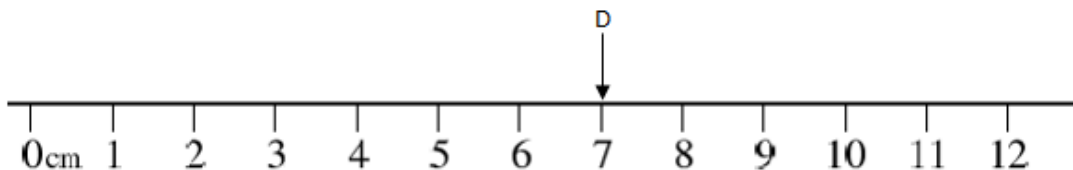
These questions represent a random sampling of content covered throughout the semester. NOT ALL OBJECTIVES ARE NECESSARILY REPRESENTED! Use your packets and Objective Checklists to study all objectives.

- Answer the following questions regarding scientific notation.
 - Write 345,000 cm in scientific notation
 - Write 8.91×10^{-4} mg in standard notation.
- Perform the following metric conversions.
 - Convert 723.5 g into kilograms.
 - Convert 42.09 dkg into dcg.
- A student reports a measurement of 430.0 mL
 - How many significant figures are in this measurement?
 - Is this a measurement of length, mass or volume?
 - Is this measurement most likely the volume of a glass of water or a bucket of water?
- Use a T chart to convert 34.9 miles into centimeters.
NOTE: 2.54 cm = 1 inch; 12 in = 1 ft; 5280 ft = 1 mile

- What is the volume of liquid in the graduated cylinder to the right?



- What is the measurement at point D below?

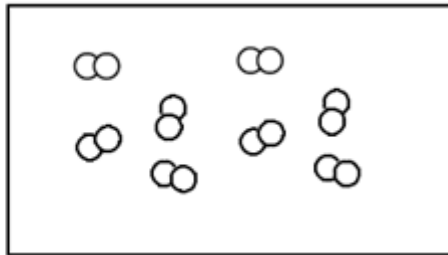
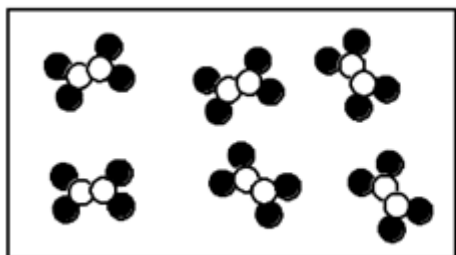


- A student reports the length of a 21.5 cm piece of wood three times:
11.09 cm; 13.54 cm and 9.06 cm.
 - Was the student accurate? Explain.
 - Was the student precise? Explain.
- Perform the following calculations using proper sig figs (as always!)
 - $62.09\text{g} + 4.9821\text{g} + 194.2\text{g} =$
 - $793.318\text{ cm} \times 3.21\text{ cm} \times 4.0\text{ cm} =$
 - $(4.31\text{ g} + 7.5\text{ g}) / (2.1962 \times 10^2)\text{mL} =$
- The density of copper is 8.96 g/mL.
 - How many significant figures are in 8.96?
 - If you had 86.2 g of copper, what would its volume be?

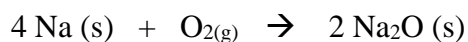
c. A piece of copper has a volume of 16.0 cm^3 . What is its mass?

9. Classify the following as chemical or physical properties.
- Ice melts when left at room temperature.
 - Milk curdles when left at room temperature.

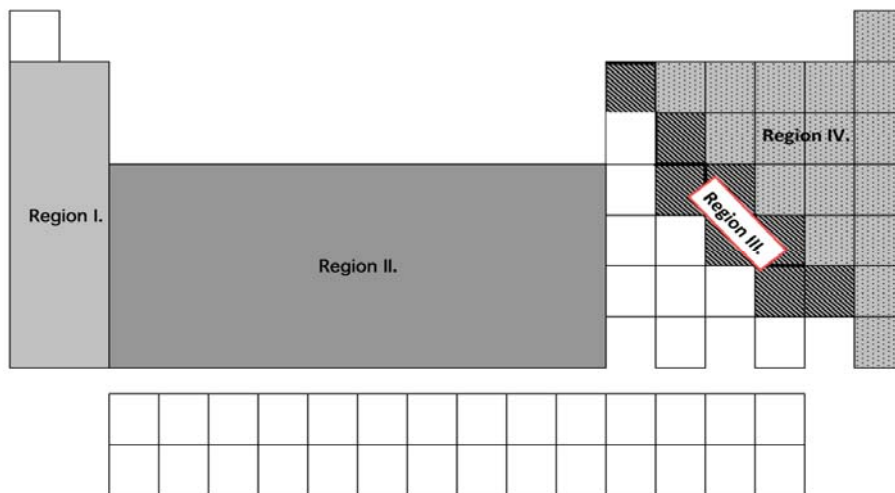
10. Look at the pictures below. For each, determine if they represent:
- Atoms or molecules
 - Element or compound



16. Label the reactants and products for this chemical equation:



17. Use the diagram of the periodic table below to answer questions a through c.



- What region(s) are the metals located in?
- What region(s) are the non-metals located in?
- What region(s) are the metalloids located in?
- Determine if each of the following represent metals, non-metals or metalloids.
 - An unknown element is brittle, does not conduct electricity and is dull.
 - An unknown element conducts electricity, does not react with acid and is malleable.
 - An unknown element reacts with acid, is malleable, conducts electricity and has luster.

18. a. Name the alkali metal that is in the same period as copper.
b. How many protons does an atom of this alkali metal have?
c. How many electrons?
d. How many energy levels?
e. How many valence electrons?
19. a. Name the halogen that is in the same period as copper.
b. How many protons does an atom of this halogen have?
c. How many electrons?
d. How many energy levels?
e. How many valence electrons?
20. One isotope of copper is copper-64.
a. Draw the isotopic symbol for this isotope of copper.
b. How many neutrons does this isotope of copper have?
c. Another element has 21 neutrons and 20 protons. Draw its isotopic symbol.
21. Name the following compounds:
a. Na_2S
b. $\text{Ca}(\text{NO}_3)_2$
c. FeCl_3
22. Write the formula for the following compounds”
a. Potassium nitride
b. Lead IV oxide
c. Calcium phosphate
23. Using your activity series, determine if the following reactions will occur:
a. $\text{Al (s)} + \text{CuSO}_4(\text{aq})$
b. $\text{Ni (s)} + \text{MgCl}_2(\text{aq})$
24. Use the following equation to answer the questions below:
 $\text{Fe (s)} + \text{AgCl (aq)} \rightarrow \text{FeCl}_2(\text{aq}) + \text{Ag (s)}$
a. Identify the species oxidized and reduced.
b. Write out the oxidation half reaction.
c. Write out the reduction half reaction.
d. What is the oxidizing agent? Reducing agent?
25. Perform the following calculations for CuSO_4 .
a. What is its molar mass?
b. Calculate the mass percent of each element in the compound.
26. For the following reactions, identify the type of reaction, predict products, write the equation (including states of matter) and balance:
a. Calcium reacting with oxygen
b. Aluminum reacting with zinc sulfate
c. Octane (C_8H_{18}) burning in the presence of oxygen
d. Copper (II) chloride decomposing.
e. Strontium bromide reacting with ammonium carbonate

27. Use your solubility chart to determine if the following reactions will occur:
- $\text{NaCl (aq)} + \text{K}_2\text{SO}_4 \text{ (aq)}$
 - $\text{HCl (aq)} + \text{NaOH (aq)}$
 - $\text{Na}_2\text{SO}_4 \text{ (aq)} + \text{Pb(NO}_3)_2$
28. Perform the following molar conversions:
- How many atoms are in 3.49 moles of iron?
 - How many grams are in 2.96×10^{24} molecules of CO_2 ?
 - How many moles are in 75.0 grams of sodium nitrate?
29. $\text{___ FeCl}_2 \text{ (aq)} + \text{___ Li (s)} \rightarrow \text{___ LiCl (aq)} + \text{___ Fe (s)}$
- How many grams of Li are needed to completely react with 1.35 g of FeCl_2 ?
 - If 0.46 moles of FeCl_2 and 0.46 mol of Li are allowed to react:
 - What is the theoretical yield of Fe (in moles)?
 - What is the Limiting Reactant and Excess Reactant?
 - Calculate the moles of Excess Reactant remaining.
30. A gas occupies a volume of 3.5 liters at 35°C . If someone heats up the gas to 45.5°C , what is the new volume.
31. A container of Argon gas has a pressure of 545 mmHg, 450mL, and a temperature of 32°C . How many grams of Argon gas are present?
32. $\text{___ N}_2 \text{ (g)} + \text{___ H}_2 \text{ (g)} \rightarrow \text{___ NH}_3 \text{ (g)}$
- You have 3 L of nitrogen with excess hydrogen. How many liters of ammonia will you produce?
 - You have 9.81 g of hydrogen gas and excess nitrogen gas. How many grams of ammonia will you produce?