

Exam 1 Study guide, anything from the beginning of the semester to 9/16/09 is possible material for the exam

- Be able to recognize the different areas of the periodic chart, whether metal, nonmetal, alkaline, alkali earth, transition metal, metalloid..
- Be able to describe what an element is.
- Be able to describe what a substance is
- Be able to describe what a pure substance is.
- Be able to describe and recognize a compound.
- Be able to describe and recognize a mixture whether it is homogeneous or heterogeneous.
- Be able to distinguish between a diatomic, polyatomic molecule.
- Be able to use Avagadro's number for the number of particles or atoms
- Be able to define the changes of state, from liquid, gas, solid
- Be able to explain the difference between melting and dissolving.
- Be able to get Molarity, percent concentration
- Be able to distinguish between a physical and chemical change as it applies to color, formation of a gas, another solid.....
- Be able to write the name and formula of compounds (nomenclature)
- Be able to do unit conversions
- Be able to convert from grams to moles, moles to moles,

Remember any and all bold face words from the reading sections are possible questions on the test.

Remember word problem have extraneous information in them. Read the questions carefully to make sure what the question is asking.

Following are some typical questions types, some are multiple choice some are not. Remember any nomenclature questions are possible even though they are not in the listed questions.

1. How many cubic inches are in 1.00 liter?

- A) 61.0 in³ B) 155 in³ C) 394 in³ D) 1.64×10^4 in³ E) none of these

2. Express 7500 nm as pm.

- A) 7.50 pm B) 75.0 pm C) 750 pm D) 7.5×10^6 pm E) 7.5×10^{12} pm

3. How many significant figures are there in 1.3070 g?

- A) 6 B) 5 C) 4 D) 3 E) 2

4. How many significant figures does the result of the following operation contain? 8.52010×7.9

- A) 2 B) 3 C) 4 D) 5 E) 6

5. How many significant figures does the sum of the following contain? $8.5201 + 1.93$

- A) 1 B) 2 C) 3 D) 4 E) 5

6. Express 201 g in mg.

- A) 0.201 mg B) 2.01 mg C) 2.01×10^3 mg D) 2.01×10^5 mg E) 2.10×10^8 mg

7. Silver has a density of 10.5 g/cm^3 . What mass of silver would be required to cover a football playing surface of $120 \text{ yds} \times 60 \text{ yds}$ to a depth of 1.0 mm?

- A) 570 kg B) 6.3×10^8 g C) 6.0×10^6 g D) 63 Mg E) 6.9×10^5 g

8. How many significant figures does the number 0.00721 contain?

9. What is the density of a salt solution if 50.0 mL of the solution has a mass of 57.0 g?

10. An investor paid a large price for a chunk of gold that he was told was pure. The gold bar had a mass of 440 g, but was slightly irregular so an exact volume could not be calculated. The investor filled a large graduated cylinder with water, immersed the chunk of gold, and observed an increase in the apparent volume of material in the graduated cylinder of 25.0 mL. Pure gold has a density of 19.3 g/mL . Did the investor get his money's worth? Why or Why not?

11. A reaction requires 10.0 g ethanol. What volume of an ethanol/water mixture that is 60% ethanol by mass would be required? The density of this mixture is 0.8937.

- A) 6.71 mL B) 5.36 mL C) 536 mL D) 18.6 mL

12. An aluminum can weighs 15.8 g. The Wall Street Journal metal price for aluminum is \$.528 per pound. How much is this can worth? 1 pound = 454 grams

13. How many mL is 0.005 L?

- A) 0.5 mL B) 5 mL C) 0.50 mL D) 0.000005 mL E) 200 mL

26. Which one of the following compounds is most likely to be a covalent compound?

- A) RbS B) SrCl_2 C) CS_2 D) CaO E) MgI_2

1. Which of the following particles have the smallest mass?

- A) electrons B) protons C) neutrons D) ions

8. Which of the following particles represent the atomic number?

- A) protons B) electrons C) neutrons D) protons and electrons

9. Neutrons can have the following charge:

- A) positive B) negative C) neutral D) either positive or negative

3) (5pt) A 35.0 mL sample of a liquid weighs 27.2 g. What is the density of the liquid? Show all work, including units for credit.

4) (5pt) What is the volume of a gold nugget that weighs 2.20 kg? The density of gold is 19 g/cm^3 . Show all work, including units for credit.

5) (5pt) How many centimeters are in 64.53 km? Show all work, including units for credit.

6) (5pt) Do the following operations and show all work, including units for credit.

(a) $78.32 \text{ m} - 45.1 \text{ m} =$

(b) $(32.10 \text{ mL})(1.20 \text{ g/mL}) =$

7) (5pt) Convert 34.5 kg/mL to mg/L . Show all work, including units for credit.

8) (10pt) A person weighs 150 lbs, and the correct dosage of a drug is given as 1.5 mg per kilogram of body weight. How many milligrams of the drug should be given? ($2.20 \text{ lb} = 1 \text{ kg}$)

Show all work, including units for credit.

1.

2. When solid sulfur is heated, which of the following would be true?

- decomposition will occur first
- melting will occur first
- a chemical change will occur first
- when the melting point of 159°C is reached, the S_8 molecules break apart

3. The dissolving of sugar crystals in water to produce a solution is a _____.

- physical process
- chemical process
- melting process
- freezing process

4. Sublimation occurs when a _____.

- liquid changes to a gas
- gas changes to a liquid
- solid changes to a gas
- solid changes to a liquid

5. The density of a material is _____.

- its mass
- its quantity of matter
- ratio of volume to mass
- ratio of mass to volume

6. A U.S. penny is considered to be a(n) _____.

- element
- compound
- homogeneous mixture
- heterogeneous mixture

7. Which of the following cannot be separated into single components?
- mixture
 - compounds
 - elements
 - colloids
8. What substance is added to iron as a component of stainless steel?
- charcoal
 - silicon
 - mercury
 - nickel
9. Which formula represents three chlorine atoms?
- NaClO_3
 - FeCl_3
 - $\text{Ba}(\text{ClO}_2)_2$
 - MgCl_2
10. Which of the following is a polyatomic molecule?
- CO
 - H_2O
 - H_2
 - NaCl
11. Which of the following are called condensed states of matter?
- gases
 - liquids
 - solids
 - b and c
12. Another term for a homogeneous mixture is a _____.
13. Which of the following is an element?
- salt
 - alcohol
 - water
 - silicon
14. Which of the following is a nonmetal?
- vanadium
 - chromium
 - radon
 - radium
15. Which of the following is a METALLOID?
- silicon
 - arsenic
 - carbon
 - iron

Classify each of the following as a likely element, compound, homogeneous mixture, or heterogeneous mixture based upon what you know about the substance.

16. Your skin:

17. White sugar:

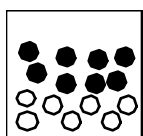
18. Wood:

19. Nickel:

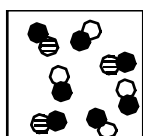
20. Ocean water:

21. A well-stirred mixture of salt and pepper:

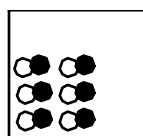
For the next 3 questions which picture best represents a



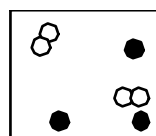
(a)



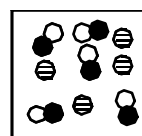
(b)



(c)



(d)



(e)

22. element having an extended network

23. pure substance composed of diatomic molecules

24. pure substance composed of polyatomic molecules

25. solution of two molecular substances

26. heterogeneous mixture.

27. homogeneous mixture

28. How are compounds, mixtures, and alloys different from one another? How are they the same?

27. Which do you think is heavier, 100 aluminum atoms or 100 lead atoms? Explain your answer using both information in the text and what you know about each of these elements from your own experience.

28. Sucrose is a pure substance whose molecules each contain 12 atoms of carbon, 22 of hydrogen, and 11 of oxygen. What is its formula?

29. Explain how the process of dissolving a solid differs from that of melting it.

30. Helium gas is less dense ("lighter") than air. Xenon gas is more dense ("heavier") than air. If you filled two balloons, one with each gas, would both rise in air? Would one fall?