

Study Guide for Chemistry Test:

Key

Density: Directions: Follow the format of the sample question. You must have correct UNITS and follow the same procedure for each question.

Sample question: Mass = 10g

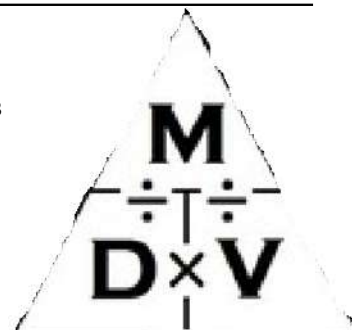
Volume = 2cm³

Density = ???g/cm³

Equation: $D = M/V$

Substitution: $D = 10g / 2cm^3$

Solution: $D = 5g/cm^3$



1. Mass = 50 g

Volume = 10 cm³

Density = ???g/cm³

Equation: $D = M/V$

Substitution: $D = 50g / 10cm^3$

Solution: $D = 5g/cm^3$

2. Mass = ???

Volume = 25 cm³

Density = 3 g/cm³

Equation: $M = DV$

Substitution: $M = (3g/cm^3)(25cm^3)$

Solution: $M = 75g$

3. Mass = 14g

Volume = 28ml

Density = ???

Equation: $D = M/V$

Substitution: $D = 14g / 28mL$

Solution: $D = 0.5g/mL$

4. Mass = 40g

Volume = ???

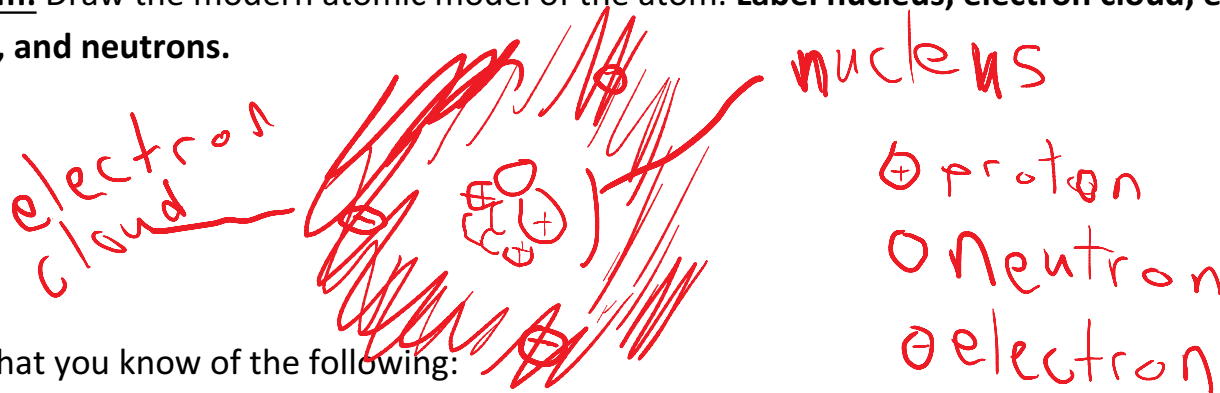
Density = 8 g/cm³

Equation: $V = M/D$

Substitution: $V = 40g / 8g/cm^3$

Solution: $V = 5cm^3$

The Atom: Draw the modern atomic model of the atom. Label nucleus, electron cloud, electrons, protons, and neutrons.



Write what you know of the following:

Protons	Neutrons	Electrons
Where? nucleus	Where? nucleus	Where? electron cloud
Charge? +1	Charge? 0	Charge? -1
How to find the number of protons: # of p = atomic #	How to find the number of neutrons: atomic mass – atomic #	How to find the number of electrons: same as # of p in a neutral atom

Why is the electron cloud a foggy, cloudy area instead of neat round circular orbits?

Electrons move about the nucleus in complicated and seemingly random ways and the electron cloud represents where electrons are most likely to be.

Elements, Compounds & Mixtures

Part 1: Read the following information on elements, compounds and mixtures. Fill in the blanks where necessary.

Elements:

- A pure substance containing only one kind of **atom**.
- An element **cannot** be separated into simpler materials (except during nuclear reactions).
- Over 100 existing elements are listed and classified on the **periodic table**.

Compounds:

- A pure substance containing two or more kinds of **elements**.
- The atoms are **chemically** combined in some way. Often times (but not always) they come together to form groups of atoms called molecules.
- Compounds **cannot** be separated by physical means. Separating a compound requires a chemical reaction.
- The properties of a compound are usually different than the properties of the elements it contains.

Mixtures:

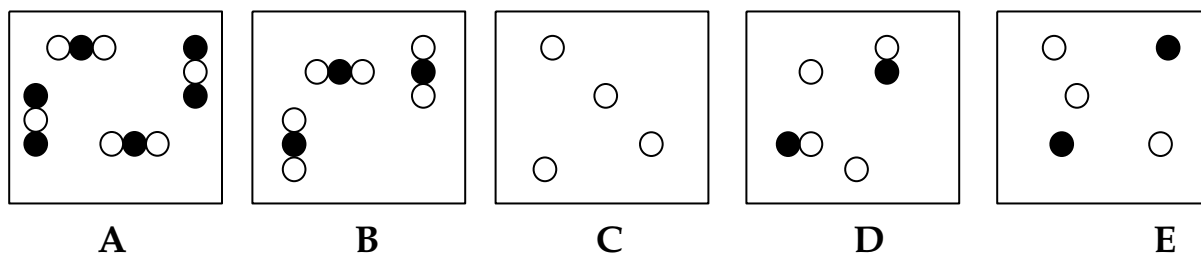
- Two or more **elements** or **compounds** NOT chemically combined.

- No reaction between substances.
- Mixtures can be uniform (called **homogeneous**) and are known as solutions.
- Mixtures can also be non-uniform (called **heterogeneous**).
- Mixtures can be separated into their components by chemical or physical means.
- The properties of a mixture are similar to the properties of its components.

Part 2: Classify each of the following as elements (E), compounds (C) or Mixtures (M). Write the letter X if it is none of these.

E Diamond (C)	C Sugar (C ₆ H ₁₂ O ₆)	M Milk
M Air	C Sulfuric Acid (H ₂ SO ₄)	M Gasoline
E Krypton (K)	E Bismuth (Bi)	E Uranium (U)
C Water (H ₂ O)	C Alcohol (CH ₃ OH)	M Pail of garbage
C Ammonia (NH ₃)	C Salt (NaCl)	M Ink
M Wood	M Bronze *	E Titanium (Ti)
C Dry Ice (CO ₂)	C Baking Soda (NaHCO ₃)	M Popcorn

Part 3: Match each diagram with its correct description. Diagrams will be used once.



- C** 1. Pure Element – only one type of atom present.
- E** 2. Mixture of two elements – two types of uncombined atoms present.
- B** 3. Pure compound – only one type of compound present.
- A** 4. Mixture of two compounds – two types of compounds present.
- D** 5. Mixture of a compound and an element.

List properties of metals

Malleable, ductile, lustrous, conductors of electricity/heat, most are solid at room

temp.

List properties of metalloids

Some properties like metals, some like nonmetals. Often have luster but are brittle. Can act like nonmetals when bonding with metals and can act like metals when bonding with nonmetals. Semiconductors; their ability to conduct electricity can be manipulated with temperature.

List properties of nonmetals

Brittle if in a solid state, most are gases, good insulators, dull in color. The elements of life are primarily nonmetals.

Define: malleability: Ability to be pounded flat without breaking.

Luster: Ability to reflect light well.

Ductility: Ability to be pulled into wires without breaking.

Brittleness: Inability to withstand bending without breaking.

Semiconductor: Ability to conduct electricity can be manipulated with temperature changes.

Valence electrons: The electrons on the outermost shell that are used in bonding.

Page 82: Calculate the number of protons, neutrons, and electrons for the following elements:

Lithium (Li)	Tungsten (W)	Zirconium (Zr)	Scandium (Sc)	Potassium (K)
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# protons: 3	# protons: 74	# protons: 40	# protons: 21	# protons: 19
# neutrons: 4	# neutrons: 110	# neutrons: 51	# neutrons: 24	# neutrons: 20
# electrons: 3	# electrons: 74	# electrons: 40	# electrons: 21	# electrons: 19

Families: Matching: Every letter is used once

1. **F** Elements of life
2. **D** Magnetic and radioactive
3. **H** Inert
4. **G** Highly reactive to metals
5. **A** Highest reactivity of all metals
6. **E** Semiconductors
7. **B** Second highest reactivity of metals
8. **C** Strongest metals

A. Alkali Metals

B. Alkaline Earth Metals

C. Transition Metals

D. Lanthanides and Actinides

E. Metalloids

F. Other nonmetals

G. Halogens

H. Noble Gases

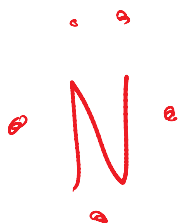
Bohr diagram for Lithium:

	# valence electrons
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Bohr diagram for Nitrogen:

	# valence electrons
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Acids and Bases:

Acid, Base, or Neutral? For each phrase, identify whether it is describing acid (A), base (B), or neutral (N)

- N pH of 7
- A Produces Hydronium ions in water (H_3O^+)
- A Commonly found in foods
- A pH lower than 7
- ~~Turns red litmus paper blue~~
- B Bitter taste
- A Sour taste
- B Produces Hydroxide ions in water (OH^-)
- B Commonly found in household products
- B pH above 7
- ~~Turns blue litmus paper red~~
- N Distilled water (pH=7)

Sort the following items given their pH: (4 points)

[Drain cleaner: 13]

[Ammonia: 11.9]

[Stomach acid: 1.5]

[Detergent: 9]

- a) Most acidic/least basic: Stomach acid
- b) detergent
- c) Ammonia
- d) Most basic/least acidic: Drain cleaner