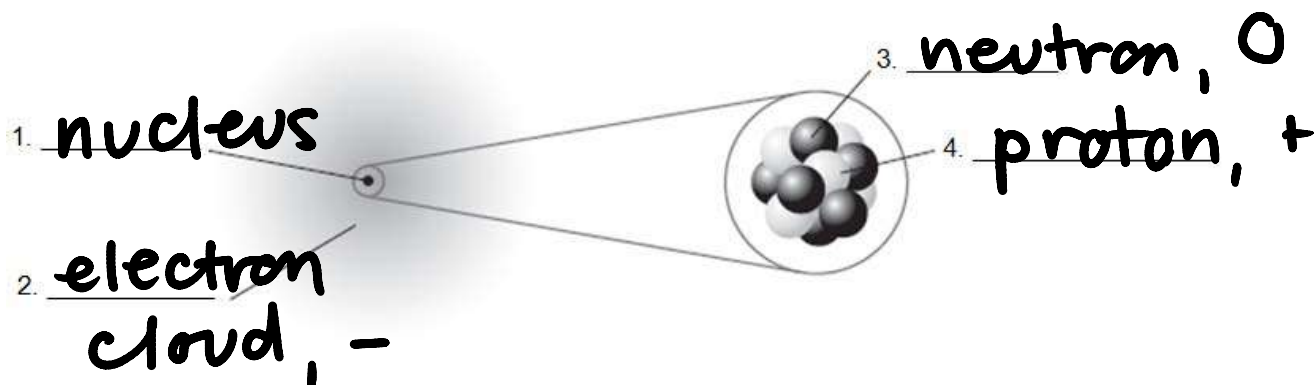


Study Guide for Chemistry Test (Atoms to Elements)

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? +	Charge? 0	Charge? -
How to find the number of protons: atomic number	How to find the number of neutrons: atomic mass - atomic number	How to find the number of electrons: atomic number (in neutral atom)

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

Electrons are moving so quickly + unpredictably that they form a "cloud."

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 atoms.

- 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.

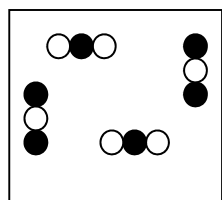
Mixtures:

- 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.

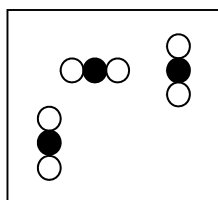
Part 2: Classify each of the following as elements (E), compounds (C) or Mixtures (M). Write the letter X if it is none of these.

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

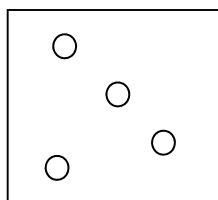
Part 3: Match each diagram with its correct description. Diagrams will be used once.



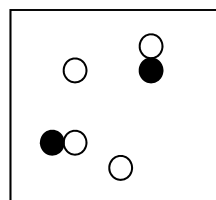
A



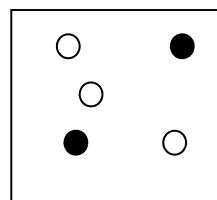
B



C



D



E

- 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.

Physical properties of metals	Chemical properties of metals
malleable ductile luster good conductor poor insulator	reactive (alkali)

Physical properties of metalloids	Chemical properties of metalloids
semiconductor	some properties of metals + nonmetals

Physical properties of nonmetals	Chemical properties of nonmetals
brittle dull some are gases good insulator poor conductor	reactive (halogens) unreactive (noble gases)

Define: malleability: ability to be pounded out flat

Luster: how shiny an object is

Ductility: ability to be pulled into wires

Brittleness: tendency to crack or break

Semiconductor: conducts @ high temp., insulates @ low

Valence electrons: electrons in outermost energy level

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

Lithium (Li)	Tungsten (W)	Zirconium (Zr)	Scandium (Sc)	Potassium (K)
# 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

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

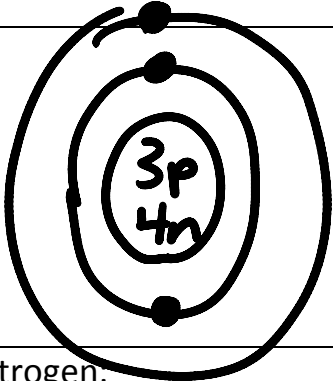
E. Metalloids

F. Other nonmetals

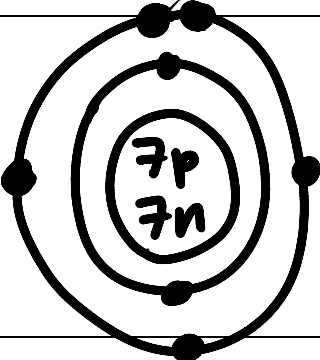
G. Halogens

H. Noble Gases

Bohr diagram for Lithium:

	<p># valence electrons</p> <p style="text-align: center; font-size: 2em;">1</p>
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Bohr diagram for Nitrogen.

	<p># valence electrons</p> <p style="text-align: center; font-size: 2em;">5</p>
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Short Answer Questions:

1. Describe some of the trends of the periodic table. What is a row called? What is a column called? Which directions do metallic properties increase? Atomic masses? Atomic numbers?

Rows are called periods; Columns are groups/families
Metallic properties decrease left to right. Atomic number increases left to right. Atomic mass increases left to right + top to bottom.

2. Contrast metals and nonmetals by describing three ways in which they are different. Then, identify one example of a metal and one example of a nonmetal.

Metals, such as silver, are malleable, ductile, + have luster. Nonmetals, such as sulfur, are brittle, dull, + poor conductors.

HAVE YOUR COLORED PERIODIC TABLE READY FOR YOUR TEST ON THURSDAY