

Name: Key

Date: 19-20



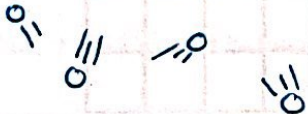
Period: 6

Unit 3 : Atomic Structure and Periodic Properties Practice

Metals, Nonmetals, and Metalloids: Know where they are found on the periodic table

Type of Atom	Characteristics
Metal	Left of p.+; Luster, Malleable, Ductile, Mostly Solids, High densities, Conduct Heat/Electricity
Nonmetal	Right of p.+; Brittle, Low densities, Do not conduct Heat/Electricity
Metalloid	Some props of metals + nonmetals; semiconductors

THROWBACK TO UNIT 2: Complete the table below regarding states of matter.

States of Matter Characteristics				
	Particle Diagram (What it looks like)	Motion (Relative Speed)	Shape and Volume	Density (High, Medium, Low)
Solid		Low/Slow	Defined	High
Liquid		Moderate	Definite volume but Δ's shape	Medium
Gas		Fast	Takes shape + volume of container	Low

- In general, how are electrons arranged around the nucleus of an atom?

Atom
 ↳ Energy Levels

- What causes an atom to be neutral?

Protons = Electrons

Convert: 450 nm to meters

$$\frac{450 \text{ nm}}{1 \text{ nm}} \times \frac{10^{-9} \text{ m}}{1 \text{ nm}} = 4.5 \times 10^{-7} \text{ m}$$

Using the table to the right, answer the questions below:
Which group has a predicted charge of 0?

AC

An element from which group gains 1 electron when it forms its common ion?

AB

Which group possesses the most reactive metals?

A

Which group(s) has/have metals that can form multiple charges?

C, E

How many valence electrons do the following elements have?

a. Oxygen (O) 6

c. Sodium (Na) 1

b. Carbon (C) 4

d. Bromine (Br) 7

Match the group of elements with the correct description of its properties:

1. Alkali Metals

3. Alkaline Earth Metals

5. Transition Metals

2. Noble Gases

4. Halogens

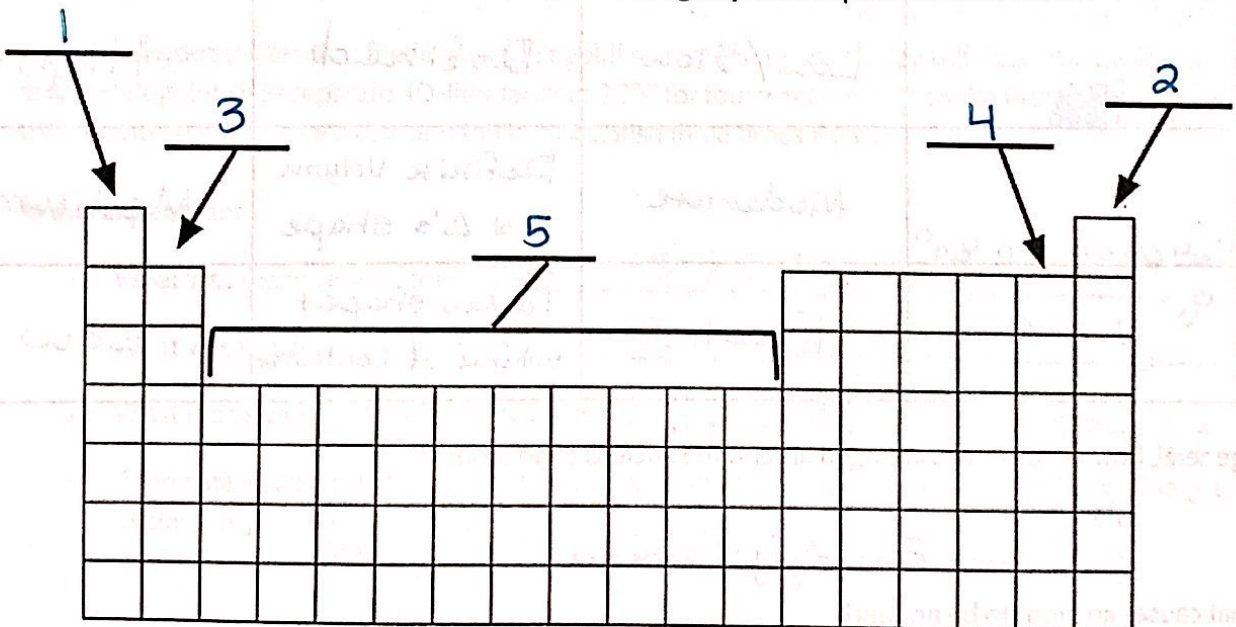
2 Colorless gases; completely unreactive; 8 valence electrons

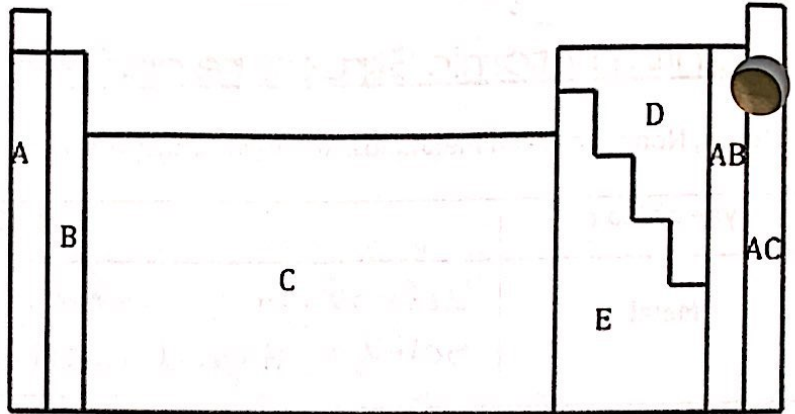
3 Harder than Group 1 elements; very reactive; 2 valence electrons

1 HIGHLY reactive; soft metals; 1 valence electron

4 HIGHLY reactive; three gases, a liquid, and a solid; 7 valence electrons

Using the answer choices in the question above (1-5), label the groups of the periodic table below:





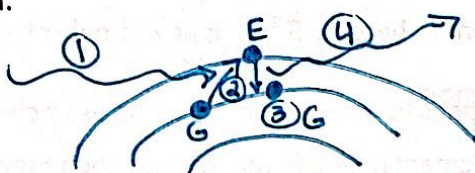
14. Why don't elements in group 18 form ions?

They already have 8v.e.⁻ (full valence level)
so no need to gain/lose electrons

9. Predict the charge (you will NOT have your colored periodic table on the test) of each ion and complete the table below.

Element	Symbol	# Protons	# Electrons	# Valence Electrons	Charge of Common Ion Formed	Cation/Anion?
Lithium	Li	3	3	1	+1	C
Chlorine	Cl	17	17	7	-1	A
Phosphorus	P	15	15	5	-3	A
Calcium	Ca	20	20	2	+2	C
Aluminum	Al	13	13	3	+3	C

15. Draw and label an atom undergoing absorption and emission of energy and display what can happen to one of its electrons as this happens. Label the ground and excited states of the electron. Then, list each of the steps in chronological order.



- 1 - Atom absorbs energy
- 2 - e^- absorbs energy + moves to excited state
- 3 - e^- falls back to ground
- 4 - Energy emitted

16. A student hypothesizes that feeding an adult goldfish more than once a day will make it grow larger. He keeps three adult goldfish in separate 40-liter tanks at 20°C for four weeks. He feeds the first goldfish once a day, the second goldfish twice a day, and the third goldfish three times a day.

In this experiment:

- What was the independent variable? # of feedings
- What was the dependent variable? Fish growth
- What is one variable that was kept constant? 40-L, 20°C, Fish Type, etc.
- If the data at the end of his experiment were graphed, would you use a bar graph or a line graph? Explain why: Bar - 3 sets of data separately

17. Why might noble gases be used in reaction chambers where chemicals could combust (burn)?

They are nonreactive

18. What is the ONLY situation where an atom could change its atomic number (number of protons)?

Nuclear Decay