

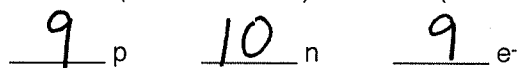
Name: KEY

## WP Practice

### Exam 2: Models of the Atom

(Also review unit 1 and unit 2 pretest packets and unit 2 test prep check sheet)

1. a. An atom with Z (atomic number) = 9 and A (mass number) = 19 contains



- b. If an atom is neutral, what can be said about the number of protons and electrons?

they are equal  $\#p = \#e^-$

2. Atoms of the same element that differ in the number of neutrons are called isotopes.

3. Elements in the same group/  
family have similar chemical properties.

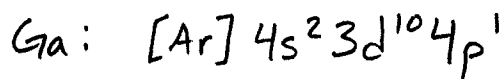
4. Write the symbolic notation for an atom with 17 protons, 18 neutrons, and 18 electrons.



5. An imaginary element Xy consists of two isotopes having masses of 122.0 amu and 124.0 amu. A sample of Xy was found to contain 65.0% of the  $^{122}\text{Xy}$  isotope and 35.0% of the  $^{124}\text{Xy}$  isotope. Calculate the atomic mass of Xy (give your answer to one decimal place).

$$122.0 \text{ amu} (0.650) + 124.0 \text{ amu} (0.350) = \boxed{122.7 \text{ amu}}$$

6. a. Gallium ( $_{31}\text{Ga}$ ) has two cations with a +2 and +3 charge. Write the electron configuration for a neutral gallium atom and and explain why its electronic structure (electron configuration) leads to these two ions (use electron configurations in your explanation).



- b. Boron is in the same family as gallium. Why doesn't boron also display this ionization pattern?

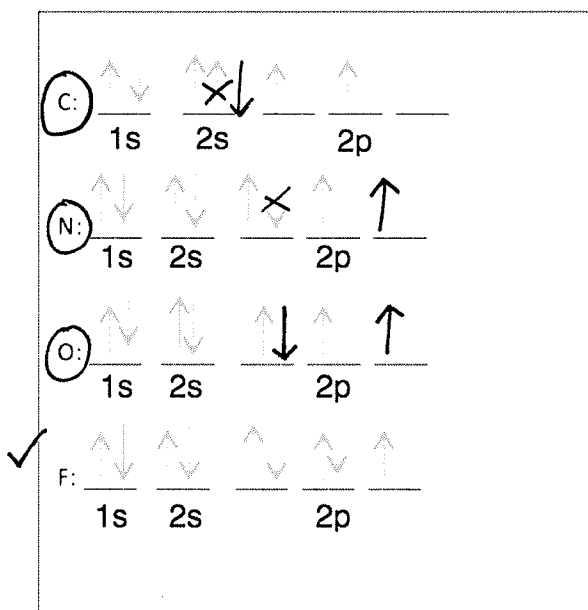
Boron is a smaller atom and has a tighter hold on its electrons. Boron is also not a metal, so it does not like to lose electrons.

7. Copper occurs naturally as  $^{63}\text{Cu}$  and  $^{65}\text{Cu}$ . Which isotope is more abundant?

$^{63}\text{Cu}$   
 (atomic mass 63.55)

8. Below is a representation of the valence electrons of several period 2 elements.

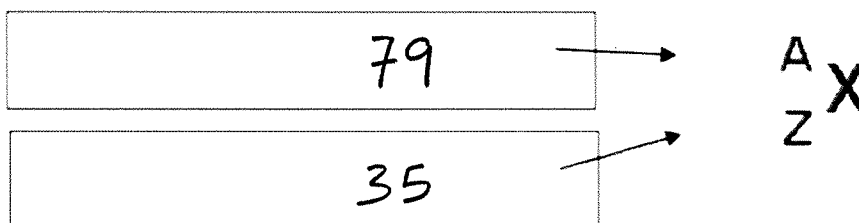
- Identify which is incorrect (more than one are incorrect).
- Show the corrected electron configuration.
- Which rule does it violate?



Pauli Exclusion Principle  
 (must have opposite spins)  
 Hund's Rule  
 (1  $e^-$  in each orbital in a  
 sublevel before 2<sup>nd</sup> is added)  
 not enough  $e^-$

9. Bromine has two stable isotopes (Br-79 and Br-81). Look at the periodic table and answer the following questions about Bromine, Br.

- Fill in the isotope notation below for the most abundant isotope of bromine (give values for A and Z).



- Fill in the table below for the bromine isotope:

Protons	Neutrons	Electrons	Electrons in Br <sup>-</sup> ion
35	44	35	36