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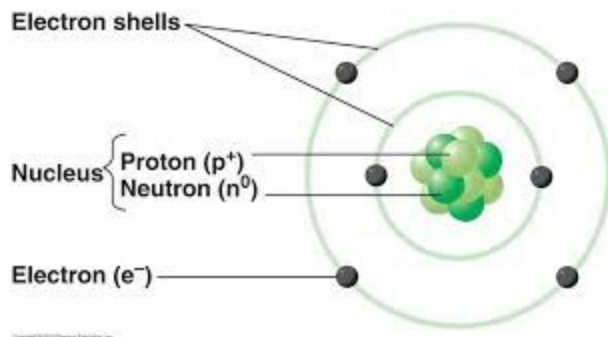
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### Atomic Structure Study Guide

1. What are the **charges** of the following subatomic particles?

- a. Proton- positive +
- b. Neutron- Neutral 0
- c. Electron- Negative -

2. Where is each subatomic particle located in an atom? Draw a diagram and label it.



3. What happens when an atom loses or gains one of the following subatomic particles?

- a. Proton- changes the element's identity
- b. Neutron- becomes an isotope, has a diff # of neutrons and diff mass
- c. Electron- becomes an ion, gains or loses electrons, becomes a charged atom

4. What subatomic particle tells us the identity of an atom?

**Protons or the atomic number**

5. Where is the majority of the mass located in an atom?

**In the nucleus where protons and neutrons are found, both weigh about 1 amu**

6. Why *aren't* electrons calculated in the mass of an atom?

**Because an electron's mass is about 1/1840 of that of a proton and neutron**

7. How do you find the number of each of the following subatomic particles in an atom? (how do you calculate to find how many of each)

- a. Protons- equal to the atomic number
- b. Neutrons- atomic mass - protons
- c. Electrons - equal to the # of protons in a neutrally charged atom

8. What is the difference between an atom and an **isotope** of the same atom?

**The atom and isotope will have a different # of neutrons, which means the isotope will have a different atomic mass**

9. What is the difference between an atom and an **ion** of the same atom?

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**The atom and ion will have a different # of electrons, ions gain or lose electrons turning the atom from neutral to having a positive or negative charge**

10. Metals **gain/lose** electrons to form **positive/negative** ions.
11. Nonmetals **gain/lose** electrons to form **positive/negative** ions.
12. Where can you find each of the following on the periodic table?
  - a. **Metals- left of the stair step**
  - b. **Metalloids- touching the stair step**
  - c. **Nonmetals- right of the stair step (don't forget about hydrogen)**
13. The vertical columns on the periodic table labeled 1-18 are called what? What do they tell us about an atom of an element?  
**groups/families- how many valence electrons are in each atom**
14. The horizontal rows on the periodic table labeled 1-7 are called what? What do they tell us about an atom of an element?  
**Periods- the number of energy levels an atom has (how many orbitals)**
15. Which group of elements on the periodic table make good conductors of heat and electricity?  
**Metals**
16. Which group of elements on the periodic table make good insulators and do not conduct heat or electricity?  
**Nonmetals**
17. Which group of elements on the periodic table are considered semiconductors, which can conduct heat and electricity periodically?  
**Metalloids**
18. How many valence electrons are in the following atoms?
  - a. Si    \_\_\_4\_\_\_
  - b. Ne    \_\_\_8\_\_\_
  - c. Sr    \_\_\_2\_\_\_
  - d. Fr    \_\_\_1\_\_\_
  - e. F     \_\_\_7\_\_\_
  - f. Al    \_\_\_3\_\_\_
19. What charge will the following atoms make when they form ions to become stable?
  - a. Be    \_\_\_+2\_\_\_
  - b. Ar    \_\_\_0\_\_\_
  - c. B     \_\_\_+3\_\_\_
  - d. S     \_\_\_-2\_\_\_
  - e. C     \_\_\_+4\_\_\_
  - f. N     \_\_\_-3\_\_\_

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20. Find the each of the following for the atom in the diagram to the right.

- a. Atomic number   37
- b. Atomic mass   86
- c. Protons   37
- d. Neutrons   49
- e. Electrons   37
- f. Ve-   1
- g. Ion Charge   +1
- h. Group #   1
- i. Period #   5
- j. m, md, nm   m

