Atoms, Molecules, and Ions

1. By knowing the number of protons a neutral atom has, you should be able to determine
   A) the number of neutrons in the neutral atom
   B) the number of electrons in the neutral atom
   C) the name of the atom
   D) two of the above
   E) none of the above

2. $^{40}_{20}Ca^{2+}$ has
   A) 20 protons, 20 neutrons, and 18 electrons
   B) 22 protons, 20 neutrons, and 20 electrons
   C) 20 protons, 22 neutrons, and 18 electrons
   D) 22 protons, 18 neutrons, and 18 electrons
   E) 20 protons, 20 neutrons, and 22 electrons

3. Which of the following statements is (are) true?
   A) $^{18}_{8}O$ and $^{19}_{9}F$ have the same number of neutrons.
   B) $^{14}_{6}C$ and $^{14}_{7}N$ are isotopes of each other because their mass numbers are the same.
   C) $^{18}_{8}O^{2-}$ has the same number of electrons as $^{20}_{10}Ne$.
   D) A and B
   E) A and C

4. The numbers of protons, neutrons, and electrons in $^{39}_{19}K^{+}$ are:
   A) 20 p, 19 n, 19 e
   B) 20 p, 19 n, 20 e
   C) 19 p, 20 n, 20 e
   D) 19 p, 20 n, 19 e
   E) 19 p, 20 n, 18 e

5. An ion is formed
   A) By either adding or subtracting protons from the atom.
   B) By either adding or subtracting electrons from the atom
   C) By either adding or subtracting neutrons from the atom.
   D) All of the above are true.
   E) Two of the above are true.

6. Which of the following are incorrectly paired?
   A) K, alkali metal
   B) Ba, alkaline earth metal

C) O, halogen
D) Ne, noble gas
E) Ni, transition metal

7. Which of the following are *incorrectly* paired?
   A) Sr, alkaline earth metal
   B) Ta, transition metal
   C) F, halogen
   D) H, noble gas
   E) Ru, transition metal

8. Which of the following has 61 neutrons, 47 protons, and 46 electrons?
   A) $^{80}_{61}\mathrm{Pm}$
   B) $^{108}_{47}\mathrm{Ag}^{+}$
   C) $^{108}_{46}\mathrm{Pd}^{-}$
   D) $^{108}_{47}\mathrm{Cd}^{+}$
   E) $^{108}_{47}\mathrm{Ag}$

9. How many protons and electrons does the most stable ion for oxygen have?

	# protons	# electrons
A)	10 p	8 e
B)	8 p	6 e
C)	6 p	8 e
D)	8 p	8 e
E)	8 p	10 e

10. You are given a compound with the formula MCl_2, in which M is a metal. You are told that the metal ion has 26 electrons. What is the identity of the metal?
    A) Fe
    B) Al
    C) Zn
    D) Co
    E) Ni

11. Complete the following table.

Symbol	# Protons	# Neutrons	# Electrons	Net Charge
^{206}Pb				
	31	38		3_+
	52	75	54	
Mn^{2+}		30		2_+

12. Arsenopyrite is a mineral containing As, Fe, and S. Classify each element as metal, nonmetal, or metalloid.

As = Fe = S =

Name: _____ Class: _____ Date: _____ ID: A

Periodic Trends Practice

Multiple Choice
Identify the letter of the choice that best completes the statement or answers the question.

____ 1. All atoms are ____.
a. positively charged, with the number of protons exceeding the number of electrons
b. negatively charged, with the number of electrons exceeding the number of protons
c. neutral, with the number of protons equaling the number of electrons
d. neutral, with the number of protons equaling the number of electrons, which is equal to the number of neutrons

____ 2. The atomic number of an element is the total number of which particles in the nucleus?
a. neutrons
b. protons
c. electrons
d. protons and electrons

____ 3. Isotopes of the same element have different ____.
a. numbers of neutrons
b. numbers of protons
c. numbers of electrons
d. atomic numbers

____ 4. Using the periodic table, determine the number of neutrons in ^{16}O.
a. 4
b. 8
c. 16
d. 24

____ 5. Which of the following statements is NOT true?
a. Atoms of the same element can have different masses.
b. Atoms of isotopes of an element have different numbers of protons.
c. The nucleus of an atom has a positive charge.
d. Atoms are mostly empty space.

____ 6. If E is the symbol for an element, which two of the following symbols represent isotopes of the same element?
1. $^{20}_{10}E$ 2. $^{20}_{11}E$ 3. $^{21}_{9}E$ 4. $^{21}_{10}E$

a. 1 and 2
b. 3 and 4
c. 1 and 4
d. 2 and 3

____ 7. Which of the following sets of symbols represents isotopes of the same element?
a. $^{91}_{42}J$ $^{92}_{42}J$ $^{93}_{40}J$
b. $^{50}_{19}L$ $^{50}_{20}L$ $^{50}_{21}L$
c. $^{84}_{38}M$ $^{86}_{38}M$ $^{87}_{38}M$
d. $^{138}_{59}Q$ $^{133}_{55}Q$ $^{133}_{54}Q$

____ 8. How is the number of neutrons in the nucleus of an atom calculated?
a. Add the number of electrons and protons together.
b. Subtract the number of electrons from the number of protons.
c. Subtract the number of protons from the mass number.
d. Add the mass number to the number of electrons.

____ 9. Which of the following isotopes has the same number of neutrons as phosphorus-31?
a. $^{32}_{15}P$
b. $^{32}_{16}S$
c. $^{29}_{14}Si$
d. $^{28}_{14}Si$