

PART 1. MULTIPLE CHOICE and FILL IN THE BLANK. Circle the best answer or fill in the blank. **CAUTION:** Some questions may appear similar to homework questions but are probably not exactly the same.

- The atomic number of an atom gives the number of (1 pt.)
*a. protons
b. neutrons
c. protons plus neutrons
d. neutrons plus electrons
- Calcium bromide is an example of (2 pts.)
a. a cation
b. an anion
c. a covalent compound
*d. an ionic compound
e. an isotope
- Name the group that contains Li, Na and K. alkali metals. (1 pt.)
- Elements Fe, Co, and Ni are classified as transition metals. (1 pt.)
- Magnesium and calcium are in the group named alkaline earth metals. (1 pt.)
- Argon and xenon are in the group called noble gases. (1 pt.)
- Chlorine and iodine are in the group called halogens. (1 pt.)
- The mass number of ^{27}Al is 27. (1 pt.)
- A row on the Periodic Table is called a period. (1 pt.)
- Atoms that have the same number of protons but different numbers of neutrons are called isotopes. (2 pts.)
- 11. Fill in the chemical name of the given chemical symbol.** (1 pt. each)
a) Ti titanium b) Au gold
c) B boron d) Mn manganese
- 12. Fill in the chemical symbol of the given chemical name.** (1 pt. each)
a) mercury Hg b) sodium Na
c) arsenic As d) lead Pb

13. Identify each of the following as a **metal**, **nonmetal**, or **metalloid**. (1 pt. each)

a) sodium metal b) phosphorus nonmetal

c) potassium metal d) silicon metalloid

14. How many protons does ^{31}P have? 15 (the atomic number) (2 pts.)

15. How many neutrons does ^{31}P have? 16 (31-15=16) (2 pts.)

16. How many total electrons does ^{31}P have? 15 (the atomic number if it is a neutral atom) (2 pt.)

18. Identify the number of **valence electrons** for each of the following. (1 pt. each)

a. oxygen 6 b. chlorine 7

c. phosphorus 5 d. lithium 1

19. How many total electrons does P^{-3} have? (2 pt) 18 (it started with 15 and gained 3 e-)

20. Write the chemical formula for all of the naturally occurring diatomics. (4 pts.)

$\text{H}_2, \text{N}_2, \text{O}_2, \text{F}_2, \text{Cl}_2, \text{Br}_2, \text{I}_2$

21. Which of the following has the largest atomic radii? (2 pts.)

a. B b. C *c. Al d. Si

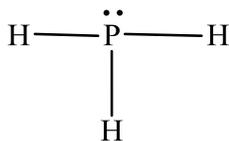
22. Which of the following has the largest ionization energy? (2 pts.)

a. B *b. C c. Al d. Si

24. Which of the following has the largest electronegativity? (2 pts.)

a. B *b. C c. Al d. Si e. Ne

26. (a) Draw the Electron Dot Structure for PH_3 . (4 pts.)



(b) What is the molecular geometry of this molecule? (2 pts.) trigonal pyramidal

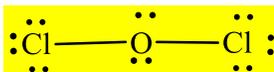
(c) Is this molecule polar or nonpolar? (1 pt.)

*A. polar
B. nonpolar

(d) Will a sample of this compound have: (1 pt.)

- (1) dipole-dipole force (2) hydrogen bonding (3) dispersion forces *(4) answers 1) and 3)
 (5) all of the above

27. (a) Draw the Electron Dot Structure for OCl_2 . (4 pts.)



(b) What is the molecular geometry of this molecule? (2 pts.) bent

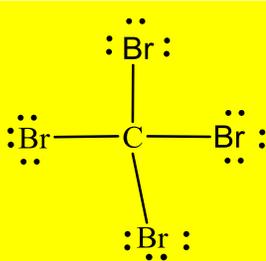
(c) Is this molecule polar or nonpolar? (1 pt.)

- *A. polar
 B. nonpolar

(d) Will a sample of this compound have: (1 pt.)

- (1) dipole-dipole force (2) hydrogen bonding (3) dispersion forces *(4) answers 1) and 3)
 (5) all of the above

28. (a) Draw the Electron Dot Structure for CBr_4 . (4 pts.)



(b) What is the molecular geometry of this molecule? (2 pts.) tetrahedral

(c) Is this molecule polar or nonpolar? (1 pt.)

- A. polar
 *B. nonpolar

(d) Will a sample of this compound have: (1 pt.)

- (1) dipole-dipole force (2) hydrogen bonding *(3) dispersion forces (4) answers 1) and 3)
 (5) all of the above

PART 3. Fill in the chemical name or the chemical formula, whichever is missing. (2 pts. each)

<u>Chemical Name</u>	<u>Chemical Formula</u>
a. carbonate ion	CO_3^{-2}
b. chlorite ion	ClO_2^{-1}
c. lithium chlorate	LiClO_3
d. nickel (I) nitride	Ni_3N
e. iron (III) nitrate	$\text{Fe}(\text{NO}_3)_3$
f. aluminum sulfate	$\text{Al}_2(\text{SO}_4)_3$
g. calcium hydroxide	$\text{Ca}(\text{OH})_2$
h. nitrite ion (a polyatomic ion)	NO_2^{-1}
i. nitrogen dioxide (a covalent compound)	NO_2
j. hydrogen peroxide (common name)	H_2O_2
k. nickel (II) bromide	NiBr_2
L. aluminum oxide	Al_2O_3
m. lead (IV) sulfite	$\text{Pb}(\text{SO}_3)_2$
n. tetraphosphorus hexasulfide	P_4S_6
o. iron (II) chlorite	$\text{Fe}(\text{ClO}_2)_2$