

GHW#3: CHEM 281 Name: _____

Key Questions (relatively simple to answer using the Focus Information)

- 1) Describe the following concepts used in getting electronic configuration of multielectron atoms:
 - a) Building-Up Principle:
 - b) Electronic Configuration: core and valence orbital box formats
 - c) Pauli Exclusion Principle:
 - d) Hund's rule:
 - e) Exception to Building Up Principle: Transition Metal Elements

- 2) Explain concisely why nitrogen has three electrons in different p orbitals with parallel spins rather than the other possible arrangements.

- 3) Write noble gas core ground state electron configuration for atoms of
 - a) Calcium:
 - b) Iron:
 - c) Silver:

- 4) Write noble gas core ground state electron configuration for ions of
 - a) potassium(+):
 - b) scandium (3+):
 - c) copper (2+):

- 5) Predict the common charge of the Cu ions. Explain your reasoning in terms of electron configurations.

- 6) Determine the number of unpaired electrons in atoms of
 - a) nitrogen;
 - b) aluminum:
 - c) Iron (+3):

- 7) Write the electron configuration expected for element 113 and the configurations for the two cations that it is most likely to form.
- 8) In the text set of orbitals after the f orbitals are g orbitals. How many g orbitals would there be? What would be the lowest principle quantum number n that would process g orbitals? Deduce the atomic number of the first element at which g orbitals would begin to be filled on the basis of the patterns of the d and f orbitals.
- 9) Describe the following atomic properties and their tern in the periodic table:
- a) Atomic size:
 - b) Effective nuclear charge:
 - c) Ionization potential:
 - d) Electron Affinity:
- 10) Describe the types of bonding seen among elements in the periodic table.
- 11) How the periodic table is used in predicting bonding in elements and compounds?
- 12) Predict the bonding in following elements and compounds:
- a. O_2 :

b. SCl_2 :

c. SiO_2 :

d. CuZn :

e. Na :

f. SiCl_4 :

g. KCl :

13) How you distinguish between covalent molecules and network covalent molecules?

14) Draw Lewis dot-symbols and predict number of covalent bonds they will make

a. B

b. C

15) Construct electron-dot diagrams for:

a) Ammonium ion:

b) Carbon tetrachloride:

c) Silicon hexafluoride(2-) ion:

d) Pentafluorosulfate(IV) ion, SF_5^- :

