## Chapter 3 Homework Answer Key

- 48) Give the electronic configuration of each of the following
- a) C 182282p2
- b)  $P 1s^2 2s^2 2p^6 3s^2 3p^3$
- c) V 15252p6352p64523d3
- d) Sb 182222p63823p64823d104p65824d105p3
- e) Sm 1525226 35236452301046552401056654455
  - 51) What additional info do we need to answer the guestion "which ion has the electronic Configuration 152252p6352p6"?

Specifically we need to know the charge

$$\sum_{1} s^{2} 2 s^{2} 2 p^{6} 3 s^{2} 3 p^{6} \int_{1}^{+3} = G a^{3+}$$

$$\sum_{1} s^{2} 2 s^{2} 2 p^{6} 3 s^{2} 3 p^{6} \int_{1}^{+2} = C a^{2+}$$

$$[1s^{2}2s^{2}2p^{6}3s^{2}3p^{6}] = P^{3}$$

$$[1s^{2}2s^{2}2p^{6}3s^{2}3p^{6}] = S^{2}$$

$$[1s^{2}2s^{2}2p^{6}3s^{2}3p^{6}] = S^{2}$$

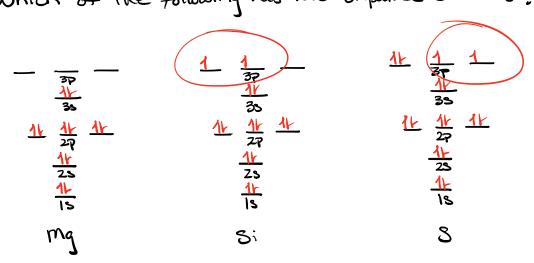
$$[1s^{2}2s^{2}2p^{6}3s^{2}3p^{6}] = Ci$$

- 54) Give the electronic configuration of the following ions.
- a)  $1^{3-}$   $\left[1s^22s^22p^4\right]^{3-}$
- b) Ca2+ [1522822p63823p6]2+
- c) s [1s<sup>2</sup>2s<sup>2</sup>2p<sup>4</sup>3s<sup>2</sup>3p<sup>5</sup>]
- d) Cs2+ [1822524352748230"4555240"555]
- e) Cr2+ [152252p43523p4452302]2+
- f) Gd3+ [152526435236452310465524d"566544"]
- 56) Which atom has the electron configuration 1822822p63823p63d74827

57) Which ion with a +1 charge has the electronic Configuration 182282 2p6 382 3p63010 4824p6? Which ion with a 2-charge has the same Configuration?

 $18^{2}28^{2}2p^{6}38^{2}3p^{6}3d^{10}48^{2}4p^{6} = Kr$   $\left[18^{2}28^{2}2p^{6}38^{2}3p^{6}3d^{10}48^{2}4p^{6}\right]^{2} = Se^{2}$ 

- 58) Which of the following atoms contain only 3 valence e: L:, B, H, F, Ne?
  only Group IIIA => B
- 59) Which of the following has two unpaired electrons?



- a) mg
- b) 5i
- c) S

- d) both mg & S
- e) both Si & S

- 60) Which atom would be expected to have a half-filled 6p subshell?

  Bi Bismuth (Xe] 65250 6p3
- 61) Which atom would be expected to have a half-filled 4s subshell?

  K Potassium [Ar] 45!
- 64) Write the electronic Configurations for the following atoms or Tons:
- a)  $B^{3+}$  [ $1s^2$ ]  $^{3+}$
- b) 0 [1522822p]
- c) C13+ [1822822p63823p2]3+
- d) Ca2+ [1822822p63823p6]2+
- e) T: [15²25²2p635²3p645²3d²]

- 87) Using the periodic table, classify each of the following elements as a metal or a non-metal, and then further classify each as a main-group element, transition metal, or inner transition metal:
  - a) Uranium U metal, Transition metal
  - 6) Bromine Br nonmetal, Main-group
  - c) strontium Sr Metal, main-group
  - d) Neon Me nonmetal, Main-group
  - e) Gold Au metal, Transition metal
  - f) Americium Am metal, Inner Transition Metal
  - g) Rhodium Rh metal, Transition Metal
  - h) Sulfur S nonmetal, main-group
  - i) Carbon C non metal, main-group
  - j) Potassium K metal, main-group

- 89) Using the periodic table identify the lightest member of each of the following groups:
  - a) Mobel Grases Helium He
  - b) Alkaline Earth Metals Berylium Be
  - c) Alkali metals thydrogen, th
  - d) Chalcogens This is the first time I've Seen this name in 20 years. I've learned Something new. This is group GA

    Oxygen, O

- 91) Use the periodic table to give the name and symbol for each of the following elements:
  - a) The nobel gas in the same period as germanium Krypton Kr
  - b) The alkaline earth metal in the same period as Selenium Calcium Ca
  - c) The halogen in the same period as lithium Neon Ne
  - d) The chalcogen in the same period as Cadmium Tellurium Te

- 93) Write a symbol for each of the following neutral isotopes. Include the atomic number and mass number for each.
- a) The alkali metal with 11 protons and a mass number of 23 23 Na 11 protons = Na
- b) The nobel gas element with 75 neutrons in its nucleus and 54 electrons in the neutral atom

129 Xe neutral e= P<sup>†</sup> 54 Xe 54e = 54p = Xe

C) The isotope with 33 protons and 40 neutrons in its nucleus

73 As 33 pt = As

d) The alkaline earth metal with 88 electrons and 138 neutrons

226 - 88 = - 88 = Ra 88 = - 88 = Ra

## 95) Using the Periodic Table, predict whether the following Chlorides are ionic or covalent:

Look for the metals. Metal = ionic

KCI Ionic

NC13 Covalent

ICI Covalent

mgCl2 Ionic

PCI5 Covalent

CC14 Covalent

- 97) For each of the following Compounds, State whether it is ionic or covalent. If it is ionic, write the Symbols for the ions involved:
  - a) NF3 Covalent
  - b) Bao Ionic Ba O
    Barrom Oxide
  - c) (NH4)2CO3 Ionic NH4 CO3
    ammonium carbonate
  - d)  $Sr(H_2PO_4)_2$  Ionic  $Sr^{2+}$   $H_2PO_4$  Strontium dihydrogenphosphale
  - e) IBr Covalent
  - f) Nazo Ionic Nat 02-Sodium oxíde

99) For each of the following pairs of ions, write the symbol for the formula of the compound they will form.

$$\frac{NH_{4}^{+}}{2+} \frac{SO_{4}^{2-}}{2-}$$
  $\frac{NH_{4}}{2} \frac{SO_{4}}{2-}$ 

$$Mg^{2+}$$
  $PO_{4}^{3-}$   $Mg^{2+}$   $PO_{4}^{3-}$   $Mg^{2+}$   $O_{4}^{3-}$ 

- 100) For each of the following pairs of ions, write the symbol for the formula of the compound they will form.
- a)  $K^{+}$ ,  $O^{2-}$   $K^{+}$   $O^{2-}$   $K_{2}O$
- C)  $A|^{3+}$ ,  $O^{2-}$   $A|^{3+} |O^{2-}$   $A|^{3+} |O^{2-}$   $A|^{3+} |O^{2-}$   $O^{2-}$  G+ |G-|
- d)  $Na^{+}$ ,  $CO_{3}^{2-}$   $Na^{+}$   $CO_{3}^{2-}$   $Na_{2}CO_{3}$   $Na_{2}^{+}$   $Na_{3}^{+}$   $Na_{2}^{+}$   $Na_{3}^{+}$   $Na_$
- e) Ba<sup>2+</sup>, PO<sub>4</sub><sup>3-</sup>
  Ba<sup>2+</sup> PO<sub>4</sub><sup>3-</sup>
  Ba<sup>2+</sup> PO<sub>4</sub><sup>3-</sup>
  Ba<sup>2+</sup>
  Ba<sup>2+</sup>
  6+ 6-