

SCH4U1 - DVORSKY

Some Review Questions

1. Draw energy level diagrams for:

- a) F b) Ca c) Co d) Ba e) N^{3-}

2. Write the short form electron configuration for:

- a) F b) Ca c) Co d) Ba

3. Identify the orbital corresponding to the following quantum numbers:

a) $n = 3, l = 2, m_l = 1, m_s = \pm \frac{1}{2}$

b) $n = 5, l = 3, m_l = -3, m_s = \pm \frac{1}{2}$

c) $n = 4, l = 1, m_l = -1, m_s = \pm \frac{1}{2}$

d) $n = 2, l = 1, m_l = 0, m_s = \pm \frac{1}{2}$

e) $n = 4, l = 2, m_l = -2, m_s = \pm \frac{1}{2}$

4. Which of the following designations are orbitals that are not possible in wave mechanics?

$1d, 4f, 1p, 6d, 2f$

5. Which of the following are sets of quantum numbers for orbitals which are possible in wave mechanics?

a) $n = 1, l = 1, m_l = 1, m_s = \pm \frac{1}{2}$

d) $n = 3, l = 3, m_l = 1, m_s = \pm \frac{1}{2}$

b) $n = 2, l = 1, m_l = 2, m_s = \pm \frac{1}{2}$

e) $n = 3, l = 2, m_l = -2, m_s = \pm \frac{1}{2}$

c) $n = 2, l = 0, m_l = 0, m_s = \pm \frac{1}{2}$

f) $n = 4, l = 3, m_l = 2, m_s = \pm \frac{1}{2}$

6. Write the quantum numbers for the two electrons in a $3s$ orbital.

7. How many electrons in one atom can have a principal quantum number of $n=4$?