Exercise 5.1 Drawing Orbital Occupancy Diagrams

- 1. Draw an orbital occupancy diagram for all electrons of each of the following neutral atoms. Label each of the subshells.
- (a) C
- (b) S
- 2. Draw an orbital occupancy diagram for the valence electrons of each of the following neutral atoms. Label each of the subshells.
- (a) S
- (b) Co
- (c) Cu
- 3. An orbital occupancy diagram for the valence electrons of Fe is drawn below.



- (a) On this diagram, identify all electrons which have n = 3.
- (b) On this diagram, identify all electrons which have n = 4.
- (c) On this diagram, identify all electrons which have l = 0.
- (d) On this diagram, identify all electrons which have l = 2.
- (e) On this diagram, show one set of valid m_l values for all valence electrons of Fe. To do this, label each box with a valid m_l value. Do not list ranges. In addition to each value being valid, the whole set must be valid.
- (f) How can you tell which electrons in this diagram have the same value for m_s ?