

Mumowicz chapter 5 # 3, 8, 10, 20, 21, 25

chapter 6 # 3, 8, 9, 11, 21, 27, 31, 38, 1, 10

chapter 7 # 2, 3, 4, 7-10, 13-16, 21, 23, 27, 29, 31, 36, 37, 38, 40, 41

chapter 5

19. Electrons do not really spin. m_s tells us about relative spin. It arises from ~~an intrinsic angular momentum~~.

21. (a) 3d (b) 2p (c) 4f (d) 1s

25. (a) forbidden: $m_s \neq \pm \frac{1}{2}$

(b) forbidden: $|m_l| > l$

(c) forbidden: $l = n$

(d) forbidden: $|m_l| > l$

chapter 6

3. 2s electrons are more shielded than 1s electrons. 2s electrons "see" less of a nuclear charge.

8. No 2 e^- in an atom can have the same quantum #s.

9. They both have duplicate quantum #s and are impossible.

11. (b) is lowest in energy. The other are not forbidden.

21. (a) Be: $[\text{He}]2s^2$

B: $[\text{He}]2s^2 2p^1$

C: $[\text{He}]2s^2 2p^2$

O: $[\text{He}]2s^2 2p^4$

Ne: $[\text{He}]2s^2 2p^6$

(b) Mg: $[\text{Ne}]3s^2$

Al: $[\text{Ne}]3s^2 3p^1$

Si: $[\text{Ne}]3s^2 3p^2$

S: $[\text{Ne}]3s^2 3p^4$

Ar: $[\text{Ne}]3s^2 3p^6$

(c) Ca: $[\text{Ar}]4s^2$

Gd: $[\text{Ar}]4s^2 3d^{10} 4f^7$

Ge: $[\text{Ar}]4s^2 3d^{10} 4p^2$

Se: $[\text{Ar}]4s^2 3d^{10} 4p^4$

Kr: $[\text{Ar}]4s^2 3d^{10} 4p^6$

27. (a) Na (b) Mg (c) Al (d) Si (e) P

31. (a) ground state would be $1s^2 2s^2 2p^1$

(b) ground state would be $1s^2 2s^2 2p^5$

(c) ground state would be $1s^2 2s^2 2p^4$