

Ch 29 Assigned Homework

1. $n=3 \therefore l=0, 1, 2$

l	m_l
0	0
1	-1, 0, 1
2	-2, -1, 0, 1, 2

There are 9 (n, l, m_l) configurations.

$\therefore 2$ ($m_s = \frac{1}{2}$ and $-\frac{1}{2}$) can be placed on each (n, l, m_l) state $\Rightarrow \therefore 18$ electrons can be placed.

2. $E_1 = -13.6 \text{ eV}$, $E_2 = -3.4 \text{ eV}$, $E_3 = -1.51 \text{ eV}$, $E_4 = -0.85 \text{ eV}$

$E_2 - E_1 = 10.2 \text{ eV}$, $E_3 - E_1 = 12.09 \text{ eV}$, $E_4 - E_1 = 12.75 \text{ eV}$

\therefore The electron in the hydrogen will absorb 10.2 eV from the incident energy, and jump from ground state ($n=1$) to the excited state ($n=2$).

3. (c) Please refer to lecture notes.

4. (e) (a) and (c) are not related. (b) and (d) are wrong arguments.

6. The "d state" means $l=2 \therefore$ (e)

9. $n = 1, 2, 3, \dots$
 $l = 0, 1, \dots, n-1$
 $m_l = -l, -l+1, \dots, l-1, l$
 $m_s = -\frac{1}{2}, \frac{1}{2}$

\therefore (i) d
(ii) c, d
(iii) b, c