

34. (a) The number of different m_l 's is $2l + 1 = 3$, and the number of different m_s 's is 2. Thus, the number of combinations is $N = (3 \times 2)^2 / 2 = 18$.
- (b) There are six states disallowed by the exclusion principle, in which both electrons share the quantum numbers

$$(n, l, m_l, m_s) = \left(2, 1, 1, \frac{1}{2}\right), \left(2, 1, 1, -\frac{1}{2}\right), \left(2, 1, 0, \frac{1}{2}\right), \left(2, 1, 0, -\frac{1}{2}\right), \left(2, 1, -1, \frac{1}{2}\right), \left(2, 1, -1, -\frac{1}{2}\right) .$$