

Atomic Electronic States

In Class Problem

- calculate how many microstates the d^4 configuration has
 - $n=2 \cdot 5=10$, $n_e=4$ and $n_h=6$

$$N = \frac{10!}{4!6!} = \frac{10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}{(6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1)(4 \cdot 3 \cdot 2 \cdot 1)} = \frac{10 \cdot 9 \cdot 8 \cdot 7}{4 \cdot 3 \cdot 2 \cdot 1} = \frac{5040}{24} = 210$$

In Class Problem

- if $l=2$ how many states are there and what are the m_l values?
 - if $l=2$ then there are $2l+1$ states $=2 \cdot 2+1=5$ states
 - if $l=2$ m_l values span $-l, (-l+1) \dots (l-1), l$ thus the values are $-2, -1, 0, 1, 2$
 - these are just the l and m_l values for the dAOs!