

CHEM 225/221: PROBLEM SET 5

1. Write down a properly symmetrized wave function for a lithium (Li) atom in the electronic configuration $1s^1 2s^2$ in the independent electron approximation. What are the possible term symbols for this configuration?
2. Use the Madelung principle to derive the atomic number of the first element with a filled $6p$ shell. (The Madelung principle says that the energy ordering of orbitals is determined by $n + l$, and by n when this is ambiguous.)
3. What is the ground state electronic configuration of bromine (Br)? What is that of iodine (I)?
4. Write down the possible term symbols for the following electronic configuration of beryllium (Be):
 - $1s^2 2s^2$
 - $1s^2 2s^1 2p^1$