

# Quiz 10 – Atomic Structure

## AP Chemistry

**This quiz must be completed and brought to my room before the start of first period on Tuesday. Failure to do so will incur a 25% penalty unless there is a legal reason.**

**You must show all work in order to receive credit.**

1. Explain why the following quantum numbers are real or not?
  - a.  $n=5, l=2, m_l=0$
  - b.  $n=3, l=2, m_l=3$
2. The first ionization energy for Li is 520 kJ/mol and for Na it is 495 kJ/mol. Explain why these values are as close as they are if the size of the Na atom is 22% larger than the Li atom.
3. Using principles of atomic structure, ionization energy etc. Explain why as you go down the alkali metal group, the density of the metals increase. (Hint: which forces are stronger?)
4. Compare the electronegativity trends across a row and down a column of the periodic table. Compare these trends with those of ionization energies and atomic radii. How are they related?
5. Rank the following bonds in order of increasing ionic character N-O, N-H, F-H, C-H
6. Write the electron configurations for the most stable ion formed by S and Cs.
7. Place these atoms and/or ions in order of decreasing size:  $O^{2-}$ ,  $S^{2-}$ , S, O
8. Which compound in the following pair of ionic substances has the most exothermic lattice energy? Justify your answer.  $BaCl_2$ , BaO
9. Calculate the lattice energy for the LiF(s) given the following:

Sublimation energy for Li(s)	+166 kJ/mol
$\Delta H_f$ for F(g)	+ 77 kJ/mol
first ionization energy of Li(g)	+520 kJ/mol
electron affinity of F(g)	-328 kJ/mol
enthalpy of formation of LiF(s)	-617 kJ/mol