

Name: \_\_\_\_\_

- For each of the following: indicate how this factor *alone* would affect the ionization energy of the electron (i.e., no other changes than the one stated). What would happen to the ionization energy of the electron if ...
  - ... the nuclear charge were to increase ( $Z$  increases)
  - ... if the electron had more loops? e.g., if it were  $3s$  instead of  $2s$  (new shell)
  - ... if another electron, with fewer loops, were also present? e.g., what would happen to the ionization energy of a  $2p$  electron if there were also a  $1s$  electron present in the atom? (increased shielding)
  - ... if another electron with the same quantum numbers ( $n, l, m_l$ ), but opposite spin ( $m_s$ ), were present? (electron-electron repulsion)
- Complete the following table for all of the elements from He to P (we'll do through Na in lecture!)

Atom	$Z$	Electron	Trend in ionization energy compared to previous atom, and
H	1	$1s^1$	This is the first element
He	2	$1s^2$	$IE$ of He is higher than H because He has a larger nuclear charge, but the electron being ionized is still $n = 1$ .
Li			
Be			
B			
C			
N			
O			
F			
Ne			
Na			
...			<i>Do the remaining elements until Ar in your study groups!</i>