Chemistry SAT (AP) home work, Week of Oct. 21 – 26.

- **Read** Braaon 's SAT Chemistry book, 11th edition, page 79 to 85
- ***Multiple choice questions:***

  Braaon 's SAT Chemistry book, 11th edition, Practice Excises on Page 92, Problem #1 through #9.

- ***Free response questions:***

  1. Read the information below (two pages).
  2. Carefully examine the diagram of the **first ionization potential** diagram on page 2 of this document.
  3. Write down the major differences of between the first and second ionization energy (potential). i.e. which groups of elements have highest and lowest second ionization energy (potential), why?
  4. How about the third ionization energy (potential) trends,

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Ionization Energy Trends in the Periodic Table

The ionization energy of an atom is the amount of energy **required** to remove an electron from the gaseous form of that atom or ion.

1st ionization energy - The energy required to remove the highest energy electron from a neutral gaseous atom.

For Example:

$Na_{(g)} \rightarrow Na^{+}_{(g)} + e^{-}$ $\qquad I_1 = 496$ kJ/mole

Notice that the ionization energy is positive. This is because it **requires** energy to remove an electron.

2nd ionization energy - The energy required to remove a **second** electron from a singly charged gaseous cation (positive charged atom).

For Example:

$Na^{+}_{(g)} \rightarrow Na^{2+}_{(g)} + e^{-}$ $I_2 = 4560$ kJ/mole

The second ionization energy is almost **ten times** that of the first because the number of electrons causing repulsions is reduced.

3rd ionization energy - The energy required to remove a **third** electron from a doubly charged gaseous cation.

For Example:

$Na^{2+}_{(g)} \rightarrow Na^{3+}_{(g)} + e^- \quad I_3 = 6913$ kJ/mole

The third ionization energy is even higher than the second!

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first ionization potential