**AP CHEMISTRY CHAPTER 7: PERIODIC PROPERTIES OF THE ELEMENTS (Pgs. 256 - 273)**

EQ: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Questions:

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| **Development of the Periodic Table-2**  Which two scientists independently came to the same conclusion about how elements should be grouped? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | **Mendeleev and the Periodic Table-3**  Why is Mendeleev mostly credited?  What is one of the missing elements he predicted? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Atomic Number-4**  Mendeleev’s table was based on \_\_\_\_\_\_\_\_\_\_\_\_\_.  \_\_\_\_\_\_\_\_\_\_\_\_ later, the nuclear atom was discovered by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ developed the concept of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ experimentally.  What was considered the basis for the periodic properties of elements? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | **Periodicity-5**  Periodicity is:  Properties being discussed:  What is a fundamental property that leads to many of the trends? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Effective Nuclear Charge-6**  What do many properties depend on?  Electrons are both \_\_\_\_\_\_\_\_\_\_\_ to the nucleus and \_\_\_\_\_\_\_\_\_\_\_ by other electrons.  Forces an electron experiences depends on both. | **Effective Nuclear Charge-7**  How do we find the effective nuclear charge?:  Z is the \_\_\_\_\_\_\_\_\_\_\_\_\_ and S is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, usually close to the number of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  Effective nuclear charge is a \_\_\_\_\_\_\_\_\_\_\_\_\_ property. It:  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ across a period  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ down a group |
| **What Is the Size of an Atom?-9**  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is also called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and is half of the shortest distance separating \_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | **Sizes of Atoms-10**  Bonding atomic radius is \_\_\_\_\_\_\_\_\_\_ the internuclear distance when atoms are \_\_\_\_\_\_\_\_\_.  Bonding radius:  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from left to right  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from top to bottom |
| **Sizes of Ions-11**  How are sizes of ions determined?  What three things does ionic size depend on? | **Sizes of Ions-12**  Cations \_\_\_\_\_\_\_\_\_\_ than parent atoms.  Why?:  Anions \_\_\_\_\_\_\_\_\_\_\_\_ than parent atoms.  Why?: |
| **Sizes of Ions: Isoelectronic Series-13**  Ions have the same number of electrons in an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  Ionic size \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with \_\_\_\_\_\_\_\_\_\_\_ nuclear charge.  **An Isoelectronic Series (10 electrons)**  Note \_\_\_\_\_\_\_\_\_\_\_\_ nuclear charge with \_\_\_\_\_\_\_\_\_\_\_\_\_ ionic radius as atomic number increases.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **O2–** | **F–** | **Na+** | **Mg2+** | **Al3+** | | **1.26 Å** | **1.19 Å** | **1.16 Å** | **0.86 Å** | **0.68 Å** | | **Ionization Energy (*I*)-14**  The minimum energy required to \_\_\_\_\_\_\_\_\_\_\_ an electron from the ground state of a gaseous atom or ion is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  -First ionization energy:  -Second ionization energy:  The higher the ionization energy, the more \_\_\_\_\_\_\_\_\_\_\_\_\_\_ it is to remove an \_\_\_\_\_\_\_\_\_\_. |
| **Ionization Energy-15**  When all \_\_\_\_\_\_\_\_\_\_\_ electrons have been removed, it takes a great deal more energy to remove the next \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | |
| **Periodic Trends in First Ionization Energy (*I*1)-16**   1. I1 generally \_\_\_\_\_\_\_\_\_\_\_\_ across a period. 2. I1 generally \_\_\_\_\_\_\_\_\_\_\_\_ down a group. 3. The s- and p-block elements show a \_\_\_\_\_\_\_\_\_\_\_ range of values for I1.   D block-  F block- | **Factors that Influence Ionization Energy-17**  Smaller atoms have \_\_\_\_\_\_\_\_\_\_\_\_ I values.  I values depend on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the electron from the nucleus. |
| **Irregularities in the General Trend-18**  The trend is NOT followed when the added valence electron in the next element: | **Electron Configurations of Ions-19**  Cations: The electrons are lost from the \_\_\_\_\_\_\_\_\_\_\_\_\_ energy level (\_\_\_\_ value)  Example:  Anions: The electron configurations are filled to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  Example: |
| **Electron Affinity-20**  Electron affinity is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the addition of an electron to a gaseous atom.  Is it exothermic or endothermic?: \_\_\_\_\_\_\_\_\_\_\_\_  Positive or negative?: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | **General Trend in Electron Affinity-21**  Not much change in a \_\_\_\_\_\_\_\_\_\_\_\_\_.  Across a period it generally \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  Three notable exceptions:        Note: the electron affinity for many of these elements is \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (\_\_\_\_\_\_\_ is unstable) |

**SUMMARY**

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