**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.

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| --- | --- | --- | --- | --- |
| **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:1.
2.
 | **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:1.
2.
3.

Note: the electron affinity for many of these elements is \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (\_\_\_\_\_\_\_ is unstable) |

**SUMMARY**

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