**Trends: Ion Charge in the Main Block Elements**

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

* Octet Rule states:
* If you change the (electrons/protons) in an atom, you change the identity of that atom ●The **charge** on an atom is due to the change in(electrons/protons)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Group** | **Element****That Represents the Group** | **Noble-Gas Notation****(Helps identify outer-most electrons)** | **# of valence e-** | **Draw the****electron dot diagram** | **How many electrons must be gained to obey the octet rule?** | **How many electrons must be gained to obey the octet rule?** | **What is the easiest way to obey the octet rule?** | **Resulting in more protons or electrons?** | Is it a cation or anion? | **Ion Symbol** | **Trend** **Main Block Elements Ion Charge**  | **Electron Configuration of the ION****Identical to which noble gas** |  **Atomic Size Change**  |
| **1** | Na | **[Ne]3s1** | **1** | **Na•** | **7** | **1** | **lose 1 e-** | **1 more p+** | **[x]** cation[ ] anion | **Na+** | **Group 1 IONS**have \_1+\_ charge | 1s22s22p6Identical to \_**Neon\_** | **Smaller** b/c lost e- =more p+ than e-= more nucleus attraction |
| **2** | Mg |  |  |  |  |  |  |  | **[ ]** cation[ ] anion |  | **Group 2 IONS**have \_\_\_\_\_\_ charge | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Identical to \_\_\_\_\_\_\_\_\_\_\_\_ |  |
| **13** | Al |  |  |  |  |  |  |  | **[ ]** cation[ ] anion |  | **Group 13 IONS**have \_\_\_\_\_\_ charge | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Identical to \_\_\_\_\_\_\_\_\_\_\_\_ |  |
| **14** | ***There is no trend for the Group 14 Elements. Lead (Pb) & Tin (Sn) are like most of the Transition Metals.***  |
| **15** | P | **[Ne] 3s23p3** | **5** |  | **3** | **5** | **gain 3 e-** | **3 more e-** | **[ ]** cation[ ] anion | **P3-** | **Group 15 IONS**have \_**3-\_** charge | 1s22s22p63s23p6Identical to \_\_\_\_**Argon**\_\_\_ | **Bigger** b/c gain e-=more e- than p+= less nucleus attraction |
| **16** | S |  |  |  |  |  |  |  | **[ ]** cation[ ] anion |  | **Group 16 IONS**have \_\_\_\_\_\_ charge | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Identical to \_\_\_\_\_\_\_\_\_\_\_\_ |  |
| **17** | Cl |  |  |  |  |  |  |  | **[ ]** cation[ ] anion |  | **Group 17 IONS**have \_\_\_\_\_\_ charge | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Identical to \_\_\_\_\_\_\_\_\_\_\_\_ |  |
| **18** | Ne |  |  |  |  |  |  |  | Neither  | A complete octet (8 valence e-) makes Neon (a Noble gas) unreactive | **Group 18** Noble Gases **do NOT form ions** | Keeps its own e- configuration1s22s22p6Does not lose or gain electrons |  |



Every atom in a **period** has the same: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Number each group (use group name when applicable)



* **Write** the **group** e- configuration

(use quantum letter **n** pg 160 table 4)

* **Draw** the general electron dot diagrams (pg 184 table 10)



Every atom in a

**group** has the

same: \_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Valence e- |  |  |  |  |  |  |  |  |  |
| Gain/lose e- |  |  |  |  |  |  |  |  |  |
| charge |  |  |  |  |  |  |  |  |  |