**FORMING IONS**

* When there are \_\_\_ valence electrons (or a full valence orbit, which is sometimes only 2e−), then the electron arrangement is stable (does not gain or lose electrons).
* Atoms will react to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ electrons to achieve a stable electron arrangement of a full valence orbit.
* Ions are atoms with either extra electrons or missing electrons.

Remember these examples?

|  |  |  |
| --- | --- | --- |
| **Lithium** | **Sodium** | **Potassium** |
| Li  3p  **2e 1e** | Na  11p  **2e 8e 1e** | K  19p  **2e 8e 8e 1e** |

* All members of Group 1 have one valence electron. They are not in a stable configuration. What could they do to reach this state?

**IONS USING BOHR MODELS**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sodium** | | |  | | **Sodium Ion** | |
| 11p | | | Reacts to | | 11p | |
| Element | Number of Protons (p) | | Number of Electrons (e) | | Charge  (p - e) | |
| Sodium |  | |  | |  | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Ion | Number of Protons (p) | | Number of Electrons (e) | | Charge  (p - e) | |
| Sodium |  | |  | |  | |
| **Oxygen** | | |  | | **Oxygen Ion** | |
| 8p | | | Reacts to | | 8p | |
| Element | Number of Protons (p) | | Number of Electrons (e) | | Charge  (p - e) | |
| Oxygen |  | |  | |  | |

|  |  |  |  |
| --- | --- | --- | --- |
| Ion | Number of Protons (p) | Number of Electrons (e) | Charge  (p - e) |
| Oxygen |  |  |  |

**SUMMARY:**

*gain e-*

*lose e-*

Positive Ion 🡨 Neutral Atom 🡪 Negative Ion

*“Cation” “Anion”*

**Examples** Draw the stable ion configuration for each of the following

|  |  |  |
| --- | --- | --- |
| **Chlorine Ion** | **Lithium Ion** | **Potassium Ion** |
| Cl-  17p | Li+  3p | K+  19p |