**Ions**

- An ion is an atom or group of atoms that have a net electrical charge.

- An ion is formed when electrons are gained or lost by an atom.

- This is different than a neutral atom that has equal numbers of protons and electrons so there is no net electrical charge.

- If an atom loses electrons, the ion has a positive charge. This kind of ion is called a cation. Cations are normally metals.

- If an atom gains electrons, the ion will have a negative charge. This kind of ion is called an anion. Anions are normally non-metals.
How are ions created from neutral atoms?

In three ways:

a) Compounds, such as salt compounds, can come apart in certain solutions. The substances that form ions in solutions are called electrolytes.

b) Neutral atoms with radiation

c) Heating a substance at high temperatures
NOTE: Some transition metals can form more than one ion, so a Roman numeral follows the name of the metal to indicate the charge of the atom.

Example: Copper(I) would be written as Cu\(^{1+}\)

Copper(II) would be written as Cu\(^{2+}\)

**ROMAN NUMERAL CHART**

<table>
<thead>
<tr>
<th>Roman Numeral</th>
<th>Number</th>
<th>Charge</th>
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<tbody>
<tr>
<td>I</td>
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<td>1+</td>
</tr>
<tr>
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<td>2+</td>
</tr>
<tr>
<td>III</td>
<td>3</td>
<td>3+</td>
</tr>
<tr>
<td>IV</td>
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