CHEM 103
Ionic and Molecular Compounds

Lecture Notes
February 2, 2006
Prof. Sevian

Agenda

- Finish atomic symbols & isotopes
- What kinds of compounds exist?
- How do we name them?
- Pre-assessment of chemistry understanding
What Information does the Symbol Contain?

Where is each piece of information contained?

- How many protons?
- Why is the quantity of protons called the atomic number?
- How many neutrons?
- How many total particles in the nucleus? Why is this called the mass number?
- What element is it?

\[
\begin{align*}
\text{Mass number} & \quad 13 \\
\text{Atomic number} & \quad 6 \\
\text{Difference} = & \quad \text{Neutrons}
\end{align*}
\]

Catching up on some vocabulary

How would you define these words now?

- Isotope
- Nucleus
- Neutral
- Mass number
- Atomic number
Think-Pair-Share

Fill in the missing information

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Protons</th>
<th>Neutrons</th>
<th>Mass Number</th>
<th>Electrons (in neutral atom)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$^{11}_{5}$B</td>
<td></td>
<td>20</td>
<td>37</td>
<td></td>
</tr>
</tbody>
</table>

What does % mean in chemistry?

\[ \% = \frac{\text{part}}{\text{whole}} \times 100 \]

Example: How would you figure out what % of students in the room are between the ages of 20-29?
Isotopes and Natural Abundances

The mass of a typical sample of an element is a weighted average of the masses of the isotopes.

<table>
<thead>
<tr>
<th>Isotopes of magnesium</th>
<th>Natural Abundance</th>
<th>Mass of Isotope (amu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 p^+ 12 n^o</td>
<td>78.99%</td>
<td>23.9850</td>
</tr>
<tr>
<td>12 p^+ 13 n^o</td>
<td>10.00%</td>
<td>24.9858</td>
</tr>
<tr>
<td>12 p^+ 14 n^o</td>
<td>11.01%</td>
<td>25.9826</td>
</tr>
</tbody>
</table>

\[
18.95 + 2.499 + 2.861 = 24.31
\]

This is the atomic weight on the periodic table.

Reading the Periodic Table

- Symbol: Mg
- Atomic number: 12
- Atomic weight: 24.31