Word equations – The reaction between acids and metal carbonates

When an acid reacts with a metal carbonate, a salt, water and carbon dioxide are produced:

\[ \text{acid} + \text{metal carbonate} \rightarrow \text{salt} + \text{water} + \text{carbon dioxide} \]

An example:

\[ \text{sulfuric acid} + \text{zinc carbonate} \rightarrow \text{zinc sulfate} + \text{water} + \text{carbon dioxide} \]

The salt that is produced depends upon which acid and which metal react.

The following table provides a summary of the name of the salt produced by different reactions between acids and metal carbonates.

1. Complete the table *(Hint – look for the patterns)*:

<table>
<thead>
<tr>
<th>Name of metal carbonate</th>
<th>Name of acid</th>
<th>Hydrochloric acid</th>
<th>Nitric acid</th>
<th>Sulfuric acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper carbonate</td>
<td>Copper nitrate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zinc carbonate</td>
<td></td>
<td></td>
<td></td>
<td>Zinc sulfate</td>
</tr>
<tr>
<td>Iron carbonate</td>
<td>Iron chloride</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Complete the following word equations:

\[ \text{(acid} + \text{metal carbonate} \rightarrow \text{salt} + \text{water} + \text{carbon dioxide}) \]

hydrochloric acid + magnesium carbonate → _____________ + water + carbon dioxide

nitric acid + ___________________________ → iron nitrate + water + carbon dioxide