CHEMISTRY SINGLE REPLACEMENT REACTION WORKSHEET

Practice Reactions:

1. Ag + KNO₃ ---->

2. Zn + AgNO₃ ---->

3. Al + H₂SO₄ ---->

4. Cl₂ + KI ---->

5. Li + H₂O ---->

6. Cu + FeSO₄ ---->

7. Na + H₂O ---->

8. Fe + Pb(NO₃)₂ ---->

9. Cu + H₂O ---->

10. Cu + Al₂(SO₄)₃ ---->
11. \( \text{Al} + \text{Pb(NO}_3\text{)}_2 \rightarrow \)

12. \( \text{Cl}_2 + \text{NaI} \rightarrow \)

13. \( \text{Fe} + \text{AgC}_2\text{H}_3\text{O}_2 \rightarrow \)

14. \( \text{Al} + \text{CuCl}_2 \rightarrow \)

15. \( \text{Br}_2 + \text{CaI}_2 \rightarrow \)

16. \( \text{Al} + \text{HCl} \rightarrow \)

17. \( \text{Mg} + \text{HCl} \rightarrow \)

18. \( \text{Zn} + \text{H}_2\text{SO}_4 \rightarrow \)

19. \( \text{Fe} + \text{CuSO}_4 \rightarrow \)

20. \( \text{Cl}_2 + \text{MgI}_2 \rightarrow \)
# CHEMISTRY SINGLE REPLACEMENT REACTION WORKSHEET

## Reaction Category

### Single Replacement

In these reactions, a free element reacts with a compound to form another compound and release one of the elements of the original compound in the elemental state. There are two different possibilities:

1. One cation (+ ion) replaces another.
2. One anion (- ion) replaces another.

## Reaction Format

1. \( AB + C \rightarrow CB + A \)
2. \( A + BC \rightarrow BA + C \)

## Reaction Guidelines

1. In a single replacement reaction, atoms of one element replace the atoms of a second element in a compound. Whether one metal will replace another metal from a compound can be determined by the relative reactivities of the two metals. To help determine this, an activity series of metals arranges metals in order of decreasing reactivity. A reactive metal will replace any metal listed below it in the activity series.

   **Activity Series of Metals**

<table>
<thead>
<tr>
<th>Metal</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lithium</td>
<td>Li</td>
</tr>
<tr>
<td>Potassium</td>
<td>K</td>
</tr>
<tr>
<td>Calcium</td>
<td>Ca</td>
</tr>
<tr>
<td>Sodium</td>
<td>Na</td>
</tr>
<tr>
<td>Magnesium</td>
<td>Mg</td>
</tr>
<tr>
<td>Aluminum</td>
<td>Al</td>
</tr>
<tr>
<td>Zinc</td>
<td>Zn</td>
</tr>
<tr>
<td>Iron</td>
<td>Fe</td>
</tr>
<tr>
<td>Lead</td>
<td>Pb</td>
</tr>
<tr>
<td>(Hydrogen)</td>
<td>H*</td>
</tr>
<tr>
<td>Copper</td>
<td>Cu</td>
</tr>
<tr>
<td>Mercury</td>
<td>Hg</td>
</tr>
<tr>
<td>Silver</td>
<td>Ag</td>
</tr>
</tbody>
</table>

   *Metals from Li to Na will replace H from acids and water; from Mg to Pb they will replace H from acids only.

2. A nonmetal can also replace another nonmetal from a compound. This replacement is usually limited to the halogens (F\(_2\), Cl\(_2\), Br\(_2\), and I\(_2\)). The activity of the halogens decreases as you go down the Group (17) of the periodic table.

## Reaction Guideline Examples

1. \( Mg + Zn(NO_3)_2 \rightarrow Mg(NO_3)_2 + Zn \)
   
   *Mg replaces Zn; Mg is above Zn on the chart*

2. \( Cl_2 + 2NaBr \rightarrow 2NaCl + Br_2 \)
   
   *Mg replaces Ag; Mg is above Ag on the chart*

3. \( Mg + LiNO_3 \rightarrow No\ Reaction\ (NR) \)
   
   *Mg cannot replace Li; Li is above Mg on the chart*