2. Practice Problem (page 169)

Using the appropriate activity series, write a balanced chemical equation for the single displacement reaction. If you predict that no reaction will occur, write "NR."

$Br_2(\ell) + KF(aq) \rightarrow$

What Is Required?

If a single displacement reaction will occur, the chemical formulas for the products are required.

What Is Given?

Reactants: $Br_2(\ell)$ and KF(aq)
Type of reaction: single displacement

Plan Your Strategy

Locate the elements involved in the activity series and determine if a reaction will occur.
Predict the products that will form if a reaction does occur and write the formulas for the products.
Write a balanced equation for the reaction.

Act on Your Strategy

Bromine is below fluorine in the activity series of halogens. Bromine will not displace fluorine. There is no reaction.

$Br_2(\ell) + KF(aq) \rightarrow NR$

Check Your Solution

Based on the activity series of halogens, bromine cannot displace fluorine from potassium fluoride.

3. Practice Problem (page 169)

Using the appropriate activity series, write a balanced chemical equation for the single displacement reaction. If you predict that no reaction will occur, write "NR."

$Zn(s) + H_2SO_4(aq) \rightarrow$

What Is Required?

If a single displacement reaction will occur, the chemical formulas for the products are required.

What Is Given?
Reactants: Zn(s) and H_2SO_4(aq)
Type of reaction: single displacement

Plan Your Strategy
Locate the elements involved in the activity series and determine if a reaction will occur.
Predict the products that will form if a reaction does occur and write the formulas for the products.
Write a balanced equation for the reaction.

Act on Your Strategy
Zinc is above hydrogen in the activity series of metals. Zinc will displace the hydrogen from sulfuric acid to produce hydrogen gas and a solution of zinc sulfate.

$$Zn(s) + H_2SO_4(aq) \rightarrow ZnSO_4(aq) + H_2(g)$$

Check Your Solution
Check to see that the formulas are correct and that the equation is balanced. Based on the activity series of metals, zinc can displace hydrogen from sulfuric acid.

4. Practice Problem (page 169)
Using the appropriate activity series, write a balanced chemical equation for the single displacement reaction. If you predict that no reaction will occur, write "NR."

$$F_2(g) + MgI_2(aq) \rightarrow$$

What Is Required?
If a single displacement reaction will occur, the chemical formulas for the products are required.

What Is Given?
Reactants: F_2(g) and MgI_2(aq)
Type of reaction: single displacement

Plan Your Strategy
Locate the elements involved in the activity series and determine if a reaction will occur.
Predict the products that will form if a reaction does occur and write the formulas for the products.
Write a balanced equation for the reaction.

Act on Your Strategy
Fluorine is above iodine in the activity series of halogens. Fluorine will displace the iodine from magnesium iodide to produce solid iodine and a solution of magnesium iodide.

$F_2(g) + MgI_2(aq) \rightarrow MgF_2(aq) + I_2(s)$

Check Your Solution
Check to see that the formulas are correct and that the equation is balanced. Based on the activity series of halogens, fluorine can displace iodine from a solution of magnesium iodide.

5. **Practice Problem (page 169)**
Using the appropriate activity series, write a balanced chemical equation for the single displacement reaction. If you predict that no reaction will occur, write "NR."

$Cl_2(g) + NaI(aq) \rightarrow$

What Is Required?
If a single displacement reaction will occur, the chemical formulas for the products are required.

What Is Given?
Reactants: $Cl_2(g)$ and $NaI(aq)$
Type of reaction: single displacement

Plan Your Strategy
Locate the elements involved in the activity series and determine if a reaction will occur.
Predict the products that will form if a reaction does occur and write the formulas for the products.
Write a balanced equation for the reaction.

Act on Your Strategy
Chlorine is above iodine in the activity series of halogens. Chlorine will displace the iodine from sodium iodide to produce solid iodine and a solution of sodium chloride.

$Cl_2(g) + 2NaI(aq) \rightarrow 2NaCl(aq) + I_2(s)$

Check Your Solution
Check to see that the formulas are correct and that the equation is balanced. Based on the activity series of halogens, chlorine can displace iodine from a solution of sodium iodide.

6. **Practice Problem (page 169)**
Using the appropriate activity series, write a balanced chemical equation for the single displacement reaction. If you predict that no reaction will occur, write "NR."

$Ni(s) + H_2O(\ell) \rightarrow$

What Is Required?
If a single displacement reaction will occur, the chemical formulas for the products are required.

What Is Given?
Reactants: Ni(s) and $H_2O(\ell)$
Type of reaction: single displacement

Plan Your Strategy
Locate the elements involved in the activity series and determine if a reaction will occur.
Predict the products that will form if a reaction does occur and write the formulas for the products.
Write a balanced equation for the reaction.

Act on Your Strategy
Nickel is above hydrogen in the activity series of metals but is not active enough to displace hydrogen to form water. There is no reaction.

$Ni(s) + H_2O(\ell) \rightarrow NR$

Check Your Solution
Based on the activity series of metals, nickel will not react with water.

7. **Practice Problem (page 169)**
Using the appropriate activity series, write a balanced chemical equation for the single displacement reaction. If you predict that no reaction will occur, write "NR."
$Pb(s) + Sn(ClO_3)_4 \rightarrow$

What Is Required?
If a single displacement reaction will occur, the chemical formulas for the products are required.

What Is Given?
Reactants: Pb(s) and $Sn(ClO_3)_4$
Type of reaction: single displacement

Plan Your Strategy
Locate the elements involved in the activity series and determine if a reaction will occur.
Predict the products that will form if a reaction does occur and write the formulas for the products.
Write a balanced equation for the reaction.

Act on Your Strategy
Lead is below tin in the activity series of metals. Lead will not displace tin. No reaction will occur.

$Pb(s) + Sn(ClO_3)_4 \rightarrow NR$

Check Your Solution
Based on the activity series of metals, lead cannot displace tin from tin(IV) chlorate.

8. **Practice Problem (page 169)**
Using the appropriate activity series, write a balanced chemical equation for the single displacement reaction. If you predict that no reaction will occur, write "NR."
$K(s) + H_2O(\ell) \rightarrow$

What Is Required?
If a single displacement reaction will occur, the chemical formulas for the products are required.

What Is Given?
Reactants: $K(s)$ and $H_2O(\ell)$
Type of reaction: single displacement

Plan Your Strategy
Locate the elements involved in the activity series and determine if a reaction will occur.
Predict the products that will form if a reaction does occur and write the formulas for the products.
Write a balanced equation for the reaction.

Act on Your Strategy
Potassium is above hydrogen in the activity series of metals and is active enough to displace the hydrogen from water to produce a solution of potassium hydroxide and hydrogen gas.

$2K(s) + 2H_2O(\ell) \rightarrow 2KOH(aq) + H_2(g)$

Check Your Solution
Check to see that the formulas are correct and that the equation is balanced. Based on the activity series of metals, potassium can displace hydrogen from water.

9. Practice Problem (page 169)
Using the appropriate activity series, write a balanced chemical equation for the single displacement reaction. If you predict that no reaction will occur, write "NR."

$HCl(aq) + Cd(s) \rightarrow$

What Is Required?
If a single displacement reaction will occur, the chemical formulas for the products are required.

What Is Given?
Reactants: HCl(aq) and Cd(s)
Type of reaction: single displacement

Plan Your Strategy
Locate the elements involved in the activity series and determine if a reaction will occur.
Predict the products that will form if a reaction does occur and write the formulas for the products.
Write a balanced equation for the reaction.

Act on Your Strategy
Cadmium is above hydrogen in the activity series of metals. Cadmium will displace the hydrogen from hydrochloric acid to produce hydrogen gas and a solution of cadmium chloride.

$2HCl(aq) + Cd(s) \rightarrow CdCl_2(aq) + H_2(g)$

Check Your Solution
Check to see that the formulas are correct and that the equation is balanced. Based on the activity series of metals, cadmium can displace hydrogen from hydrochloric acid.

10. Practice Problem (page 169)

Using the appropriate activity series, write a balanced chemical equation for the single displacement reaction. If you predict that no reaction will occur, write "NR."

$Pb(ClO_3)_4(aq) + Al(s) \rightarrow$

What Is Required?

If a single displacement reaction will occur, the chemical formulas for the products are required.

What Is Given?

Reactants: $Pb(ClO_3)_4(aq)$ and $Al(s)$
Type of reaction: single displacement

Plan Your Strategy

Locate the elements involved in the activity series and determine if a reaction will occur.
Predict the products that will form if a reaction does occur and write the formulas for the products.
Write a balanced equation for the reaction.

Act on Your Strategy

Aluminum is above lead in the activity series of metals. Aluminum will displace the lead from lead(IV) chlorate to produce lead solid and a solution of aluminum chlorate.

$3Pb(ClO_3)_4(aq) + 4Al(s) \rightarrow 4Al(ClO_3)_3 + 3Pb(s)$

Check Your Solution

Check to see that the formulas are correct and that the equation is balanced. Based on the activity series of metals, aluminum can displace lead from lead(IV) chlorate.