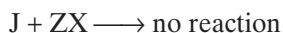


45. How many moles of HCl can be made from 6.15 mol H_2 and an excess of Cl_2 ?
46. What product is missing in the following equation?
- $$\text{MgO} + 2\text{HCl} \longrightarrow \text{MgCl}_2 + \underline{\hspace{2cm}}$$
47. Balance the following equations:
- $\text{Pb}(\text{NO}_3)_2(\text{aq}) + \text{NaOH}(\text{aq}) \longrightarrow \text{Pb}(\text{OH})_2(\text{s}) + \text{NaNO}_3(\text{aq})$
 - $\text{C}_{12}\text{H}_{22}\text{O}_{11}(\text{l}) + \text{O}_2(\text{g}) \longrightarrow \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{l})$
 - $\text{Al}(\text{OH})_3(\text{s}) + \text{H}_2\text{SO}_4(\text{aq}) \longrightarrow \text{Al}_2(\text{SO}_4)_3(\text{aq}) + \text{H}_2\text{O}(\text{l})$

CRITICAL THINKING

48. **Inferring Relationships** Activity series are prepared by comparing single-displacement reactions between metals. Based on observations, the metals can be ranked by their ability to react. However, reactivity can be explained by the ease with which atoms of metals lose electrons. Using information from the activity series, identify the locations in the periodic table of the most reactive metals and the least reactive metals. Using your knowledge of electron configurations and periodic trends, infer possible explanations for the metals' reactivity and position in the periodic table.
49. **Analyzing Results** Formulate an activity series for the hypothetical elements A, J, Q, and Z by using the following reaction information:



USING THE HANDBOOK

50. Find the common-reactions section for Group 1 metals in the *Elements Handbook*. Use this information to answer the following:
- Write a balanced chemical equation for the formation of rubidium hydroxide from rubidium oxide.
 - Write a balanced chemical equation for the formation of cesium iodide.
 - Classify the reactions you wrote in (a) and (b).
 - Write word equations for the reactions you wrote in (a) and (b).
51. Find the common-reactions section for Group 13 in the *Elements Handbook*. Use this information to answer the following:
- Write a balanced chemical equation for the formation of gallium bromide prepared from hydrobromic acid.
 - Write a balanced chemical equation for the formation of gallium oxide.
 - Classify the reactions you wrote in (a) and (b).
 - Write word equations for the reactions you wrote in (a) and (b).

RESEARCH & WRITING

52. Trace the evolution of municipal water fluoridation. What advantages and disadvantages are associated with this practice?
53. Research how a soda-acid fire extinguisher works, and write the chemical equation for the reaction. Check your house and other structures for different types of fire extinguishers, and ask your local fire department to verify the effectiveness of each type of extinguisher.

ALTERNATIVE ASSESSMENT

54. **Performance Assessment** For one day, record situations that show evidence of a chemical change. Identify the reactants and the products, and determine whether there is proof of a chemical reaction. Classify each of the chemical reactions according to the common reaction types discussed in the chapter.