

Review Key Ideas and Vocabulary

- Which of the following best describes a chemical family?
 - a group of elements with the same name
 - a group of compounds with similar properties
 - a group of elements with similar physical properties
 - a group of elements with similar physical and chemical properties
- List the elements in each of the following chemical families.
 - noble gases
 - halogens
 - alkaline earth metals
 - alkali metals
- What is the ion charge of an alkaline earth metal?
 - 0
 - 1+
 - 2+
 - 3+
 - 4+
- A gaseous element has a vivid colour and is toxic. Which chemical family does it belong to?
 - the noble gases
 - the halogens
 - the alkaline earth metals
 - the alkali metals
- Which of the following elements is a member of the alkaline earth metals and reacts with water to form hydrogen gas?
 - sodium
 - aluminum
 - strontium
 - calcium
- List three members of the noble gas family.
- Element A and element B belong to the same chemical family. Element A is soft and ductile, conducts electricity, and reacts with ammonia. What properties would you expect element B to have?
- Write the formula for each of the following compounds.
 - sodium chloride
 - potassium chloride
 - potassium oxide
 - magnesium oxide
 - aluminum oxide
 - aluminum nitride
- Write the formula for each of the following ions. Include the ion charge.
 - iron(III)
 - calcium
 - oxide
 - carbonate
 - ammonium
 - bromide
- Write the formula for each of the following compounds.
 - ammonium fluoride
 - ammonium sulfide
 - magnesium chlorate
 - magnesium carbonate
 - magnesium phosphate
 - aluminum phosphate
- Write the formula for each of the following compounds.
 - copper(II) nitrate
 - copper(I) nitrate
 - iron(II) carbonate
 - iron(III) carbonate
 - lead(IV) chloride
 - lead(II) fluoride
- Write the name of each of the following compounds.
 - Al_2O_3
 - CaCO_3
 - NH_4Cl
 - Fe_2S_3
 - $\text{Cr}_3(\text{PO}_4)_2$
 - KOH
- Some compound formulas such as $\text{Mg}(\text{HCO}_3)_2$ include brackets. Explain why the brackets are necessary.

Use What You've Learned

- Copper is reacted with chlorine and the ratio of the ions is determined to be 1:1. In another reaction of the same elements, the ratio of ions is determined to be 1:2. Write the formula for each compound.
- Many people use the compound sodium bicarbonate to settle an upset stomach. "Bicarbonate" is an older name for the polyatomic ion "hydrogen carbonate." Write the formula for this compound.
- The compound strontium dihydrogen phosphate has the formula $\text{Sr}(\text{H}_2\text{PO}_4)_2$. What is the ion charge of the dihydrogen phosphate (H_2PO_4) ion? How did you determine the charge?
- Examine the image in Figure 1. Which chemical family does the metal belong to? What other properties does the metal have?

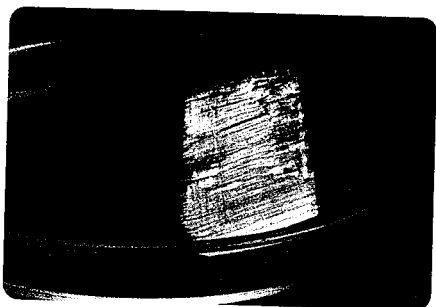


Figure 1

- Baking soda and baking powder are two leavening agents that are used by bakers. Baking powder is a dry mixture of baking soda (sodium hydrogen carbonate) and cream of tartar (potassium hydrogen tartrate).
 - Define the term "leavening" as it applies to baking. Name one other leavening agent.
 - Write a short description of how baking powder and baking soda produce their effects. Include the chemical formulas of the compounds involved.
 - Do you think that it is important for bakers and cooks to have some knowledge of chemistry? Explain.

Think Critically

- Examine the labels of several household items, such as toothpaste, shampoos, breakfast cereals, and cleaners for the chemical ingredients they contain. Write the names of the chemical compounds. Use text and electronic resources to determine their formulas, and research the purposes of the compounds.

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- You may find older chemical names still in use. The table below gives some examples.

Formula	IUPAC name	Old name
Na_2HPO_4	sodium monohydrogen phosphate	disodium phosphate
Na_3PO_4	sodium phosphate	trisodium phosphate or TSP
SnF_4	tin(IV) fluoride	stannous fluoride
CuSO_4	copper(II) sulfate	cuprous sulfate

Conduct research to learn about older naming systems. Why do you think the old names are still used? Should there be a difference between the compound names that scientists use and the names used to market products to consumers?

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- Silver bromide is a light-sensitive compound used for photographic films and papers. Do you think silver iodide could be substituted instead? Explain.

Reflect on Your Learning

- The International Union of Pure and Applied Chemistry (IUPAC) determines what naming systems and other standards will be used by chemists. Write a short paragraph to explain why this organization is important for scientists.

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- Describe everyday situations in which your knowledge of chemical names and formulas could be useful.

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