

Ch 100: Fundamentals for Chemistry
Chapter 5: Worksheet (Naming Compounds)

Naming elements (part 1):

Using the periodic table (or table of elements) write the chemical formula for each element and determine whether each element is a metal, metalloid, or non-metal.

- | | | | |
|-------------|----------------------------|-------------|-----------------------------|
| a) hydrogen | H ₂ , non-metal | e) chlorine | Cl ₂ , non-metal |
| b) helium | He, non-metal | f) silicon | Si, metalloid |
| c) calcium | Ca, metal | g) sodium | Na, metal |
| d) gold | Au, metal | h) sulfur | S, non-metal |

Naming elements (part 2):

Using a Table of Elements write the chemical name for each element and determine whether each element is a metal, metalloid, or non-metal

- | | | | |
|-------|------------------|-------|--------------------|
| a) Pb | lead, metal | e) Hg | mercury, metal |
| b) K | potassium, metal | f) As | arsenic, metalloid |
| c) Ag | silver, metal | g) Ne | neon, non-metal |
| d) Pt | platinum, metal | h) Fe | iron, metal |

Identifying Ions using the Periodic Table:

Identify the type of ion (cation or anion) and charge (2+, 1-, etc.) that is formed by each of the following elements:

- | | | | |
|-------|---|-------|--------------------------|
| a) H | cation, H ⁺ or anion, H ⁻ | d) Ca | cation, Ca ²⁺ |
| b) Cl | anion, Cl ⁻ | e) Al | cation, Al ³⁺ |
| c) Ne | does not form an ion | f) O | anion, O ²⁻ |

Naming the Ions:

Name the ion formed by the following elements (use the textbook if necessary):

- | | | | |
|-------|----------------------|-------|----------------------------|
| a) Na | sodium ion | d) Mg | magnesium ion |
| b) I | iodide ion | e) Al | aluminum ion |
| c) He | does not form an ion | f) Hg | mercury(I) or mercury (II) |

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Naming Simple Compounds (part 1):

Write the chemical name (systemic) for each substance.

- | | | | |
|----------------------|----------------------|----------------------------------|---------------------|
| a) KCl | potassium chloride | d) N ₂ O ₃ | dinitrogen trioxide |
| b) MgCl ₂ | magnesium chloride | e) Ag ₂ S | silver sulfide |
| c) CCl ₄ | carbon tetrachloride | f) PbO ₂ | lead(IV) oxide |

Naming Simple Compounds (part 2):

Write the chemical formula for each substance.

- | | | | |
|---------------------|-------------------|--------------------------|-------------------------------|
| a) oxygen | O ₂ | d) iron(III) chloride | FeCl ₃ |
| b) lithium sulfide | Li ₂ S | e) copper(I) oxide | Cu ₂ O |
| c) nitrogen dioxide | NO ₂ | f) tricarbon octahydride | C ₃ H ₈ |

Naming Polyatomic Ions (Part 1):

Name the following ions:

- | | | | |
|---------------------------------|----------|----------------------------------|--------------------|
| a) CN ⁻ | cyanide | d) HCO ₃ ⁻ | hydrogen carbonate |
| b) NH ₄ ⁺ | ammonium | e) SO ₄ ²⁻ | sulfate |
| c) NO ₂ ⁻ | nitrite | f) OH ⁻ | hydroxide |

Naming Polyatomic Ions (Part 2):

Write the chemical formula for the following ions:

- | | | | |
|--------------|---|--------------|-------------------------------|
| a) carbonate | CO ₃ ²⁻ | d) sulfide | S ²⁻ |
| b) peroxide | O ₂ ²⁻ | e) nitrate | NO ₃ ⁻ |
| c) acetate | C ₂ H ₃ O ₂ ⁻ | f) phosphate | PO ₄ ³⁻ |

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Naming Simple Compounds (part 3):

Write the chemical name (systemic) for each substance.

- | | | | |
|---------------------------------|-------------------|---------------------------------|-------------------|
| a) NH_4Cl | ammonium chloride | d) $\text{Fe}_2(\text{SO}_4)_3$ | iron(III) sulfate |
| b) NaNO_3 | sodium nitrate | e) $(\text{NH}_4)_2\text{SO}_4$ | ammonium sulfate |
| c) $\text{Ca}_3(\text{PO}_4)_2$ | calcium phosphate | f) $\text{Ba}(\text{OH})_2$ | barium hydroxide |

Naming Simple Compounds (part 4):

Write the chemical name (systemic) for each substance.

- | | | | |
|------------------------|------------------------|------------------------|---|
| a) potassium nitrate | KNO_3 | d) calcium bicarbonate | $\text{Ca}(\text{HCO}_3)_2$ |
| b) ammonium hydroxide | NH_4OH | e) copper(II) acetate | $\text{Cu}(\text{C}_2\text{H}_3\text{O}_2)_2$ |
| c) sodium hypochlorite | NaClO | f) potassium cyanide | KCN |

Naming Acids (part 1):

Write the chemical name (systemic) for each acid.

- | | | | |
|----------------------------|-------------------|----------------------------|--------------------|
| a) HCl | hydrochloric acid | d) H_2SO_3 | sulfurous acid |
| b) HNO_3 | nitric acid | e) HClO | hypochlorous acid |
| c) H_3PO_4 | phosphoric acid | f) H_2S | hydrosulfuric acid |

Naming Acids (part 2):

Write the chemical name (systemic) for each acid.

- | | | | |
|----------------------|-------------------------|---------------------|-----------------------------------|
| a) hydrofluoric acid | HF | d) hydrocyanic acid | HCN |
| b) nitrous acid | HNO_2 | e) acetic acid | $\text{HC}_2\text{H}_3\text{O}_2$ |
| c) phosphorous acid | H_3PO_4 | f) carbonic acid | H_2CO_3 |

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