Ex. 1  An isotope detected in a mass spectrometer has atomic number 82 and relative mass 205. Write the symbol for this isotope, and list the subatomic particles composing it.

\[
\begin{array}{c}
\text{Pb} \\
82 \\
\end{array} \quad \begin{array}{c}
205 \\
82 \text{ protons, 82 electrons, 123 neutrons} \\
\end{array}
\]

Ex. 2  From the following list, find the groups of compounds that have the same empirical formula:

- C₂H₂, C₆H₆  \text{Empirical formula: CH}
- N₂O₄, NO₂  \text{Empirical formula: NO₂}
- C₂H₄, C₃H₆, C₄H₈  \text{Empirical formula: CH₂}

Ex. 3  Predict formulas for compounds formed from
a. Polonium (Po) and strontium (Sr) \text{SrPo}
b. Mg²⁺ and PO₄³⁻ \text{Mg₃(PO₄)₂}
c. Gallium (Ga) and fluorine (F) \text{GaF₃}

Ex. 4  Many familiar substances have common, unsystematic names. For each of the following, give the correct systematic name:

a. saltpeter (KNO₃) \text{potassium nitrate}
b. soda ash (Na₂CO₃) \text{sodium carbonate}
c. lime (CaO) \text{calcium oxide}
d. muriatic acid (HCl) \text{hydrochloric acid}
e. Epsom salts (MgSO₄) \text{magnesium sulfate}
f. milk of magnesia (Mg(OH)₂) \text{magnesium hydroxide}

Ex. 5  Iodic acid has the molecular formula HIO₃. Write the formulas for the following:

a. the iodate anion \text{IO₃⁻}
b. the periodate anion \text{IO₄⁻}
c. the hypoiodite anion \text{IO⁻}
d. hypoiodous acid \text{HIO}
e. periodic acid \text{HIO₄}

Ex. 6  From the following list of elements – Ar, H, Ga, Al, Ca, Br, Ge, K, O – pick the one that best fits each description; use each element only once:

a. an alkali metal \text{K}
b. an alkaline earth metal \text{Ca}
c. a noble gas \text{Ar}
d. a halogen \text{Br}
e. a metalloid \text{Ge}
f. a nonmetal listed in group IIA \text{H}
g. a metal that forms a 3+ ion \text{Al}
h. a nonmetal that forms a 2⁻ ion \text{O}
i. an element that resembles aluminum \text{Ga}