

# Elements

## List

- describe the nature of elements
- identify the symbols of some elements

## Notes

### Definitions

- ★ substance that cannot be broken down into simpler substances by chemical means
- ★ atom - smallest particle of an element that has the properties of the element
- ★ examples - boron, magnesium, nitrogen, etc.

### Symbols of Elements

- ★ Alchemists symbols - the purpose of alchemists symbols was to conceal the nature of their research since their goal was to make gold
  - ☆ ☉ gold
  - ☆ ♂ iron
  - ☆ ♀ copper
- ★ Modern symbols
  - ☆ Jöns Berzelius (1814), a Swedish chemist devised the system of symbols used by scientists
  - ☆ Rules for writing symbols
    - ★ If possible, use the first letter of the name and capitalize it
      - ★ H - hydrogen
      - ★ O - oxygen
      - ★ N - nitrogen
      - ★ C - carbon
    - ★ In case of duplication of the first letter, use the first letter capitalized together with a second lower case letter
      - ★ Ca - calcium
      - ★ Cd - cadmium
      - ★ Ce - cerium
      - ★ Cs - cesium
      - ★ Cr - chromium
      - ★ Cl - chlorine
      - ★ Co - cobalt
  - ★ Many elements have symbols derived from their Latin (L) or German (G) names
  - ★ Systematic Names - three letter symbols that represent the atomic numbers of unnamed elements (currently, elements beyond 108)
    - ☆ prefixes stand for numbers
    - ☆ the ending *ium* follows the last prefix
    - ☆ example
      - ★ number - 109
      - ★ name - unnilennium
      - ★ symbol - Uue

Element	Symbol	Foreign Name
Antimony	<b>Sb</b>	Stibium (L)
Copper	<b>Cu</b>	Cuprum (L)
Gold	<b>Au</b>	Aurum (L)
Iron	<b>Fe</b>	Ferrum (L)
Lead	<b>Pb</b>	Plumbum (L)
Mercury	<b>Hg</b>	Hydrargyrum (L)
Potassium	<b>K</b>	Kalium (L)
Silver	<b>Ag</b>	Argentum (L)
Sodium	<b>Na</b>	Natrium (L)
Tin	<b>Sn</b>	Stannum (L)
Tungsten	<b>W</b>	Wolfram (G)

Number	Prefix	Symbol	Number	Prefix	Symbol
0	nil	n	5	pent	p
1	un	u	6	hex	h
2	bi	b	7	sept	s
3	tri	t	8	oct	o
4	quad	q	9	enn	e

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**Answer the questions below by circling the number of the correct response**

1. The symbol for potassium is (1) P, (2) K, (3) Sn, (4)Po.
2. A substance that cannot be broken down into simpler substances during a chemical reaction is a[n] (1) element, (2) compound, (3) mixture, (4) none of these.
3. Which of the following is NOT an element? (1) oxygen (2) nitrogen (3) lead (4) sodium chloride
4. Which of the following is the correct symbol for copper? (1) Co (2) Cu (3) CU (4) cu
5. The smallest particle of an element is a[n] (1) atom, (2) molecule, (3) compound, (4) ion.
6. Water can be broken down into hydrogen and oxygen. This is evidence that water is NOT a[n] (1) compound, (2) molecule, (3) element, (4) mixture.
7. The symbol for silver is (1) Si, (2) S, (3) Au, (4) Ag
8. Hg is the symbol for (1) hydrogen, (2) mercury, (3) tin, (4) sodium.
9. The symbol for cadmium is (1) Cd, (2) Ca, (3) C, (4) Cm.
10. Mg is the symbol for (1) manganese, (2) mercury, (3) silver, (4) magnesium.
11. An example of a substance that can be decomposed by a chemical change is (1) ammonia, (2) argon, (3) antimony, (4) arsenic
12. Which substance can not be decomposed by a chemical change? (1) mercury (II) oxide (2) water (3) potassium chlorate (4) copper
13. Which of the following substances can not be decomposed by chemical change? (1) sulfuric acid (2) water (3) ammonia (4) argon