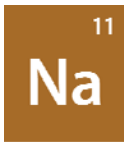
Stable Isotopes of Sodium

Isotope	Z(p)	N(n)	Atomic Mass	Natural Abundance	Nuclear Spin
Na-23	11	12	22.9897697	100.00%	3/2+



Sodium was discovered in 1807 by Sir Humphry Davy. Its name originates from the English word *soda*, and its symbol (*Na*) comes from the Latin word *natrium,* which refers to the Egyptian word *natron,* a natural mineral salt primarily made of hydrated sodium carbonate. Other origins may include the Arabic word *suda,* meaning “headache,” as the headache-alleviating properties of sodium carbonate were well known in early times. Even the English word “salary” derives from the Latin *salarium,* referring to the wafers of salt sometimes given to Roman soldiers along with their other wages.

Sodium is a soft, bright, silvery metal. It is malleable and can be cut readily with a knife or extruded as wire. In an inert atmosphere it appears like mercury with a blue vapor, and it appears brilliant green at high temperatures, imparting a golden-yellow color to flames. It ignites in air when heated to 120 ºC, burning with a yellow flame and forming a dense white smoke with an acrid color. It also reacts violently with water and is soluble in liquid ammonia, forming a deep blue solution.

Alloys can be formed by combining sodium with a number of metals, including lead, chromium, mercury, aluminum, silicon and iron. The sodium-lead alloy is used commercially to produce tetraethyllead, which has been used historically as an additive to gasoline. Sodium vapor lamps are often used for street lighting in cities, giving colors ranging from yellow-orange to peach as the vapor pressure increases. Major applications of sodium use its compound forms. Millions of tons of sodium chloride, hydroxide and carbonate are produced annually.

Properties of Sodium

Name	Sodium
Symbol	Na
Atomic number	11
Atomic weight	22.989770
Standard state	Solid at 298 °K
CAS Registry ID	7440-23-5
Group in periodic table	1
Group name	Alkali metal
Period in periodic table	3
Block in periodic table	s-block

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Properties of Sodium (continued)

Color	Silvery white
Classification	Metallic
Melting point	97.81 °C
Boiling point	882.90 °C
Thermal conductivity	1.42 W/(m·K) at 298.2 °K
Electrical resistivity	4.2 μΩ·cm at 0 °C
Electronegativity	0.9
Specific heat	1.21 kJ/kg K
Heat of vaporization	97.70 $kJ \cdot mol^{-1}$
Heat of fusion	2.60 $kJ \cdot mol^{-1}$
Density of solid	0.97 g/cm^3
Electron configuration	$[Ne]3s^1$
Oxidation state	+1
Atomic radius	1.85 Å
Ionic radius	Na^+: 1.02 Å (coordination number 6)
Ionization potential	5.139 eV

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