

## Stable Isotopes of Cesium

Isotope	Z(p)	N(n)	Atomic Mass	Natural Abundance	Nuclear Spin
Cs-133	55	78	132.905447	100%	7/2+

55

Cs

Cesium, also spelled *caesium*, was discovered in 1860 by Robert Bunsen and Gustav Kirchhoff. Its name derives from the Latin word *caesius*, meaning "sky blue" or "heavenly blue."

Cesium is a golden yellow, soft, ductile metal with a body-centered cubic structure. It is liquid at slightly above room temperature and a soft solid below its melting point. It is highly reactive and decomposes in water, evolving hydrogen, which ignites instantly. It also reacts violently with oxygen, the halogens, sulfur and phosphorus, with spontaneous ignition and/or explosion. Cesium has the highest position in the electromotive series, the lowest melting point of any alkali metal, and the lowest ionization potential of any element. It is soluble in acids and alcohol, reacts explosively with water, and dissolves in liquid ammonia, forming a blue solution. It combines with most nonmetals, forming one or more binary compounds. Combustion with oxygen (or air) first forms the oxide  $\text{Cs}_2\text{O}$ , which converts to the peroxide  $\text{Cs}_2\text{O}_2$ , and then the superoxide  $\text{CsO}_2$ .

Applications of cesium include the following: usefulness as a "getter" in electron tubes, in photoelectric cells, in ion propulsion systems, as heat transfer fluid in power generators, and in atomic clocks. Radioactive Cesium-137 has prospective applications in the sterilization of wheat, flour and potatoes.

Cesium presents a dangerous fire and explosion risk. It ignites spontaneously in moist air, may explode in contact with sulfur or phosphorus, and reacts violently with oxidizing materials. It causes burns on contact with skin.

## Properties of Cesium

<b>Name</b>	Cesium
<b>Symbol</b>	Cs
<b>Atomic number</b>	55
<b>Atomic weight</b>	132.905
<b>Standard state</b>	Solid at 298 °K (but melts only slightly above this temperature)
<b>CAS Registry ID</b>	7440-46-2
<b>Group in periodic table</b>	1
<b>Group name</b>	Alkali metal

## Properties of Cesium (continued)

<b>Period in periodic table</b>	6
<b>Block in periodic table</b>	s-block
<b>Color</b>	Silvery gold
<b>Classification</b>	Metallic
<b>Melting point</b>	28.44 °C
<b>Boiling point</b>	669.30 °C
<b>Thermal conductivity</b>	35.90 W/(m·K) at 298.2 °K
<b>Electrical resistivity</b>	20.00 $\mu\Omega\cdot\text{cm}$ at 20 °C
<b>Electronegativity</b>	0.7
<b>Specific heat</b>	242 J/kg K
<b>Heat of vaporization</b>	65 $\text{kJ}\cdot\text{mol}^{-1}$
<b>Heat of fusion</b>	2.09 $\text{kJ}\cdot\text{mol}^{-1}$
<b>Density of liquid</b>	1.843 $\text{g}/\text{cm}^3$
<b>Density of solid</b>	1.93 $\text{g}/\text{cm}^3$
<b>Mohs hardness scale</b>	0.2
<b>Electron configuration</b>	[Xe]6s <sup>1</sup>
<b>Atomic radius</b>	2.65 Å
<b>Ionic radius</b>	Cs <sup>+</sup> : 1.84 Å
<b>Oxidation state</b>	+1
<b>Ionization potential</b>	3.89 eV