

Strontium

Sr

General Information

Discovery

Strontium was isolated by Sir Humphry Davy in 1808 in London, but recognised as an element by A. Crawford in 1790.

Appearance

Strontium is a silvery-white, soft metal which rapidly forms the yellowish colour of the oxide when cut.

Source

Strontium is found mainly in the minerals celestite and strontianite. It can be prepared by electrolysis of the fused chloride with potassium chloride, or by reducing strontium oxide with aluminium.

Uses

Strontium is mainly used for producing glass for colour television sets. It is also used in producing ferrite magnets and refining zinc. One of the radioactive isotopes of strontium, ^{90}Sr , is a product of nuclear fallout and presents a health problem. It has a half-life of 28 years. It is absorbed by bone tissue instead of calcium and can destroy bone marrow and cause cancer. However, it is also a useful isotope as it is one of the best high-energy beta-emitters known.

Biological Role

Strontium has no known biological role, and it is non-toxic. It replaces and mimics calcium.

General Information

Strontium will burn in air and reacts with water more vigorously than calcium. It is usually kept under paraffin to prevent oxidation.

Physical Information

Atomic Number	38
Relative Atomic Mass ($^{12}\text{C}=12.000$)	87.62
Melting Point/K	1042
Boiling Point/K	1657
Density/kg m ⁻³	2540 (293K)
Ground State Electron Configuration	[Kr]5s ²
Electron Affinity (M-M ⁻)/kJ mol ⁻¹	+146

Key Isotopes

Nuclide	⁸² Sr	⁸⁴ Sr	⁸⁵ Sr	⁸⁶ Sr	⁸⁷ Sr	⁸⁸ Sr
Atomic mass		83.91	84.91	85.91	86.91	87.91
Natural abundance	0%	0.56%	0%	9.86%	7%	82.58%
Half-life	25 days	stable	64 days	stable	stable	stable
Nuclide	⁸⁹ Sr	⁹⁰ Sr				
Atomic mass	88.91	89.91				
Natural abundance	0%	0%				
Half-life	52.7 days	28.1 yrs				

Ionisation Energies/kJ mol⁻¹

M - M ⁺	549.5
M ⁺ - M ²⁺	1064.2
M ²⁺ - M ³⁺	4210
M ³⁺ - M ⁴⁺	5500
M ⁴⁺ - M ⁵⁺	6910
M ⁵⁺ - M ⁶⁺	8760
M ⁶⁺ - M ⁷⁺	10200
M ⁷⁺ - M ⁸⁺	11800
M ⁸⁺ - M ⁹⁺	15600
M ⁹⁺ - M ¹⁰⁺	17100

Other Information

Enthalpy of Fusion/kJ mol ⁻¹	9.16
Enthalpy of Vaporisation/kJ mol ⁻¹	154.4
Oxidation States	
Sr ⁺²	