

# 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,  $^{90}\text{Sr}$ , 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 <sup>-3</sup>	2540 (293K)
Ground State Electron Configuration	[Kr]5s <sup>2</sup>
Electron Affinity (M-M <sup>-</sup> )/kJ mol <sup>-1</sup>	-146

## Key Isotopes

Nuclide	<sup>82</sup> Sr	<sup>84</sup> Sr	<sup>85</sup> Sr	<sup>86</sup> Sr	<sup>87</sup> Sr	<sup>88</sup> 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	<sup>89</sup> Sr	<sup>90</sup> Sr				
Atomic mass	88.91	89.91				
Natural abundance	0%	0%				
Half-life	52.7 days	28.1 yrs				

## Ionisation Energies/kJ mol<sup>-1</sup>

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

## Other Information

Enthalpy of Fusion/kJ mol <sup>-1</sup>	9.16
Enthalpy of Vaporisation/kJ mol <sup>-1</sup>	154.4

### Oxidation States

Sr<sup>II</sup>

### Covalent Bonds/kJ mol<sup>-1</sup>

Not applicable