Rubidium Rb

General Information

Discovery

Rubidium was discovered in 1861 by R.W. Bunsen and G. Kirchoff in Heidelberg, Germany, by spectroscopic examination of the mineral lepidolite.

Appearance

Rubidium is a very soft, silvery-white metal with a lustre when cut.

Source

Rubidium is the 16th most abundant element in the earth's crust. It occurs in the minerals pollucite, carnallite, leucite and lepidolite, from which it is recovered commercially. Potassium minerals and brines also contain this element and are a further commercial source.

Uses

Rubidium is used little outside research. It is easily ionised so was considered for use in ion engines, but was found to be less effective than caesium. It has been proposed for use as a working fluid for vapour turbines and in thermoelectric generators. It is used as a photocell component and in special glasses.

Biological Role

Rubidium has no known biological role and is non-toxic. It is slightly radioactive and so has been used to locate brain tumours, as it collects in tumours but not in normal tissue.

General Information

Rubidium can be liquid at room temperature. It ignites spontaneously in air and reacts violently with water, igniting the liberated hydrogen. It forms amalgams with mercury and alloys with gold, caesium, potassium and sodium. It colours a flame yellowish-violet.

Physical Information

Atomic Number	37
Relative Atomic Mass (^{12}C=12.000)	85.47
Melting Point/K	312.2
Boiling Point/K	961
Density/kg m^{-3}	1532 (293K)
Ground State Electron Configuration	$[Kr]5s^1$
Electron Affinity ($M-M^-$)/kJ mol^{-1}	46.9

Key Isotopes

Nuclide	^{83}Rb	^{85}Rb	^{86}Rb	^{87}Rb
Atomic mass		84.91	85.91	86.91
Natural abundance	0%	72.17%	0%	27.83%
Half-life	83 days	stable	18.66 days	$5x10^{11}$ yrs

Ionisation Energies/kJ mol^{-1}

$M - M^+$	403
$M^+ - M^{2+}$	2632
$M^{2+} - M^{3+}$	3900
$M^{3+} - M^{4+}$	5080
$M^{4+} - M^{5+}$	6850
$M^{5+} - M^{6+}$	8140
$M^{6+} - M^{7+}$	9570
$M^{7+} - M^{8+}$	13100
$M^{8+} - M^{9+}$	14800
$M^{9+} - M^{10+}$	26740

Other Information

Enthalpy of Fusion/kJ mol^{-1}	2.2
Enthalpy of Vaporisation/kJ mol^{-1}	75.7

Oxidation States

Rb^{-I}, Rb^{I}

Covalent Bonds/kJ mol^{-1}

Not applicable