

Krypton

Kr

General Information

Discovery

Krypton was discovered by Sir William Ramsay and M.W. Travers in 1898 in London, in the residue remaining after nitrogen and oxygen had boiled away from liquid air.

Appearance

Krypton is a colourless, odourless gas.

Source

Krypton is obtained by distillation from liquid air.

Uses

Krypton is used commercially as a low-pressure filling gas for fluorescent lights. It is also used in certain photographic flash lamps for high-speed photography. Radioactive krypton was used to estimate Soviet nuclear production. The gas is a product of all nuclear reactors, so the Russian share was found by subtracting the amount that comes from Western reactors from the total in the air.

Biological Role

Krypton has no known biological role.

General Information

The spectral lines of krypton - brilliant green and orange - are easily produced and very sharp. The orange-red line of ^{86}Kr is used as the fundamental unit of length: 1 metre = 1650763.73 wavelengths. Some krypton compounds can be made, including krypton(II) fluoride, and some clathrates.

Physical Information

Atomic Number	36
Relative Atomic Mass ($^{12}\text{C}=12.000$)	83.8
Melting Point/K	117
Boiling Point/K	121
Density/kg m ⁻³	3.75 (gas, 273K)
Ground State Electron Configuration	[Ar]3d ¹⁰ 4s ² 4p ⁶
Electron Affinity (M-M ⁻)/kJ mol ⁻¹	+39

Key Isotopes

Nuclide	⁷⁸ Kr	⁸⁰ Kr	⁸² Kr	⁸³ Kr	⁸⁴ Kr	⁸⁵ Kr
Atomic mass	77.92	79.92	81.91	82.91	83.91	84.91
Natural abundance	0.35%	2.25%	11.6%	11.5%	57.0%	0%
Half-life	stable	stable	stable	stable	stable	10.76 yrs
Nuclide	⁸⁶ Kr					
Atomic mass	85.91					
Natural abundance	17.3%					
Half-life	stable					

Ionisation Energies/kJ mol⁻¹

M - M ⁺	1350.7
M ⁺ - M ²⁺	2350
M ²⁺ - M ³⁺	3565
M ³⁺ - M ⁴⁺	5070
M ⁴⁺ - M ⁵⁺	6240
M ⁵⁺ - M ⁶⁺	7570
M ⁶⁺ - M ⁷⁺	10710
M ⁷⁺ - M ⁸⁺	12200
M ⁸⁺ - M ⁹⁺	22229
M ⁹⁺ - M ¹⁰⁺	28900

Other Information

Enthalpy of Fusion/kJ mol ⁻¹	1.64
Enthalpy of Vaporisation/kJ mol ⁻¹	9.05
Oxidation States	
	Kr ⁰ , Kr ⁺²