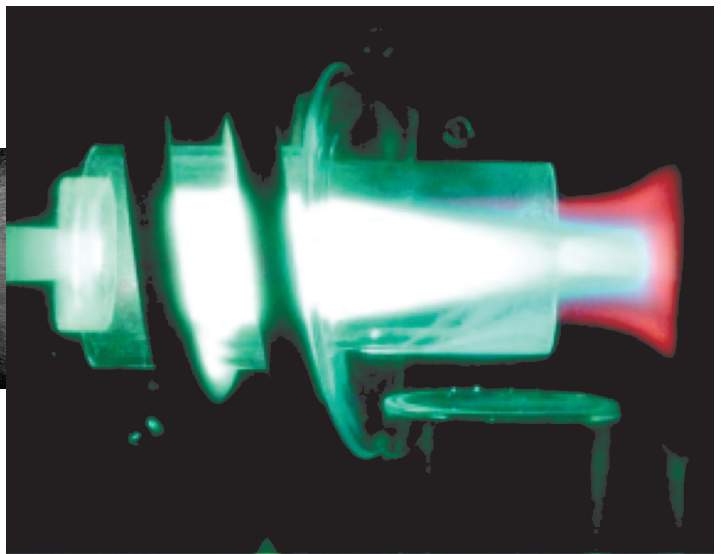


Metals analysis by Inductively Coupled Plasma (ICP)

There are two types of ICP. The first measures light (Optical Emission Spectroscopy) and is known as ICP-OES and the second measures atomic mass/charge ratio (Mass Spectroscopy) and is known as ICP-MS.

Periodic Table

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac															
		Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu		
		Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr		



Liquid samples → are sprayed → into the plasma

Excitation and Decay

The electrons in the atoms are excited to a higher energy state and then decay back to lower energy state emitting energy in the form of light. By applying more energy, electrons are lost and the atoms become ions.

In the plasma they are instantly **dried** and **atomised**

ICP-MS
Negatively charged electrons are lost giving the ion a positive charge. The positively charged ions of a specific metal are turned into an electrical current proportional to its concentration.

ionised

ICP-OES
Electrons decay back to a lower energy level emitting light(λ) proportional to the concentration of the metal.

decay

Electrons excited to a higher energy level

excited

atomised

Increasing applied energy

Increasing applied energy