

Lanthanoids: The Atomic No. 58-71

Actinoids: The elements with At. No: 90-103 are Actinoids.

Electronic Config: $(n-2) f^{1-14} (n-1) d^{1-10} ns^2$.

General Characteristics of lanthanoids:

Oxidation States: +3 for lanthanoids. $Eu^{+2} (4f^7)$
 $Yb^{+2} (4f^{14})$

Reducing Properties: Ions with +2 O.S. are ~~oxidising~~ reducing.

Oxidising Property: Ions with +4 O.S. are oxidising agent.

Paramagnetism: Most metals & ions are paramagnetic due to the presence of unpaired electrons.

Colour: All metals are silvery white.

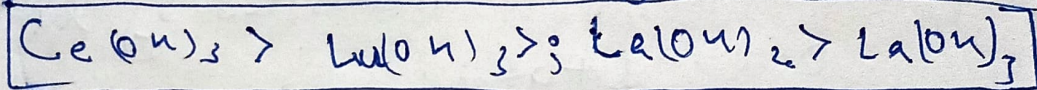
Lanthanoid Contraction: The contraction of size of lanthanoid, with

inc in atomic No going down due to inc in nuclear charge & screening effect.

Effect of Lanthanoid Contraction

due to the Lanthanoid Contraction the size almost becomes similar & it becomes hard to separate them. But plus point is similar technique of similar atom can be used to separate it from ores.

Basic strength: $\text{Ce(OH)}_3 > \text{Lu(OH)}_3 > \text{La(OH)}_2 > \text{La(OH)}_3$



Radii of element on same group from 4th to 12th group in 4d & 5d series are very close & these elements in each group are called chemical twins eg: Zn & Hf

Complex formation: ↑ La to Lu due inc. in Atomic charge & size ratio.

There is very slight inc. in E.N. from La to Lu.

General Characteristics of Actinoids:

They show higher O.S of +4, +5, +6 & +7 beside +3.

Along the series atomic radius continuously dec. (iii) Oxides & hydroxide are more basic than lanthanoids.

Ions have unpaired e^- are coloured (except f^0 & f^7) & are paramagnetic.