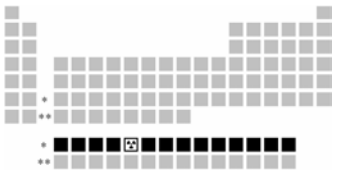

Table L.2 Ground electronic configurations of the lanthanides

Element	Symbol	Atomic number	Electronic Configuration
Lanthanum	La	57	[Xe] $4f^0\ 5d^1\ 6s^2$
Cerium	Ce	58	[Xe] $4f^1\ 5d^1\ 6s^2$
Praseodymium	Pr	59	[Xe] $4f^3\ 6s^2$
Neodymium	Nd	60	[Xe] $4f^4\ 6s^2$
Promethium	Pm	61	[Xe] $4f^5\ 6s^2$
Samarium	Sm	62	[Xe] $4f^6\ 6s^2$
Europium	Eu	63	[Xe] $4f^7\ 6s^2$
Gadolinium	Gd	64	[Xe] $4f^7\ 5d^1\ 6s^2$
Terbium	Tb	65	[Xe] $4f^9\ 6s^2$
Dysprosium	Dy	66	[Xe] $4f^{10}\ 6s^2$
Holmium	Ho	67	[Xe] $4f^{11}\ 6s^2$
Erbium	Er	68	[Xe] $4f^{12}\ 6s^2$
Thulium	Tm	69	[Xe] $4f^{13}\ 6s^2$
Ytterbium	Yb	70	[Xe] $4f^{14}\ 6s^2$
Lutetium	Lu	71	[Xe] $4f^{14}\ 5d^1\ 6s^2$

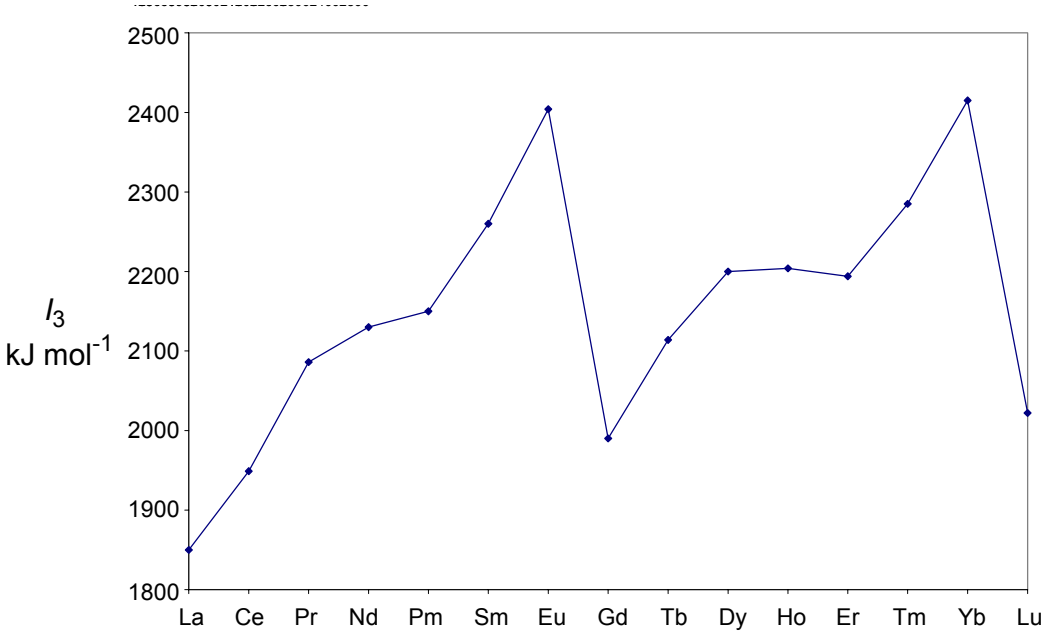

Figure L.1 The variation of the third ionization energy (I_3) of the lanthanides

Table L.3. Number of pairs of parallel spins for the f^n configurations.

Configuration		m	δm*	Configuration	m	δm*
f^1		0	0	f^8	21	0
f^2		1	1	f^9	22	1
f^3		3	2	f^{10}	24	2
f^4		6	3	f^{11}	27	3
f^5		10	4	f^{12}	31	4
f^6		15	5	f^{13}	36	5
f^7		21	6	f^{14}	42	6

* **δm** refers to the number of pairs of parallel spins lost for the process f^n --- f^{n-1}

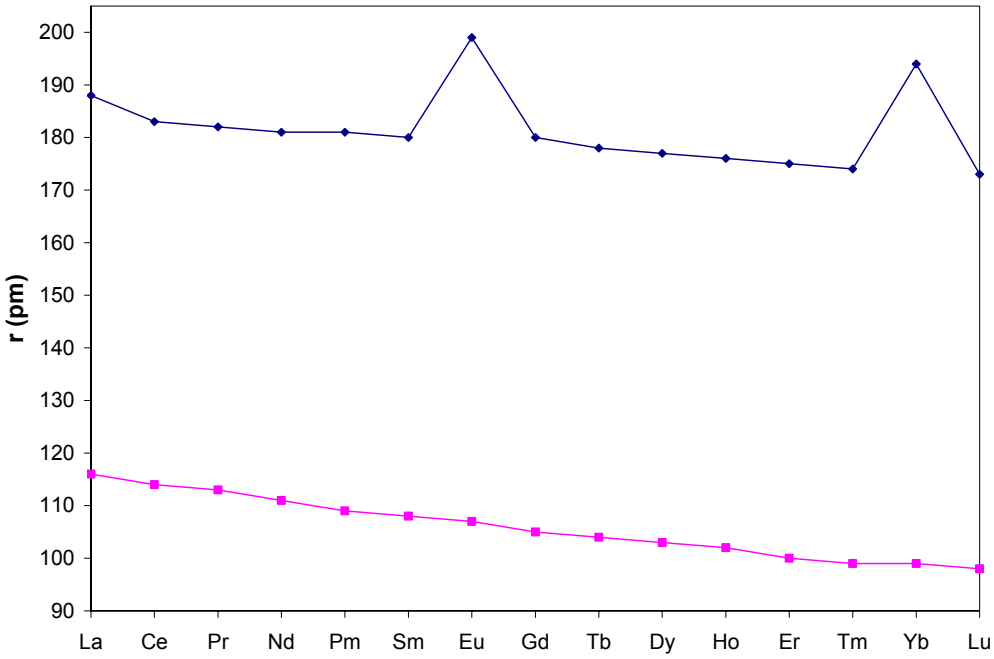

Figure L.2 Variation of metal radius and +3 ionic radius for the lanthanide elements

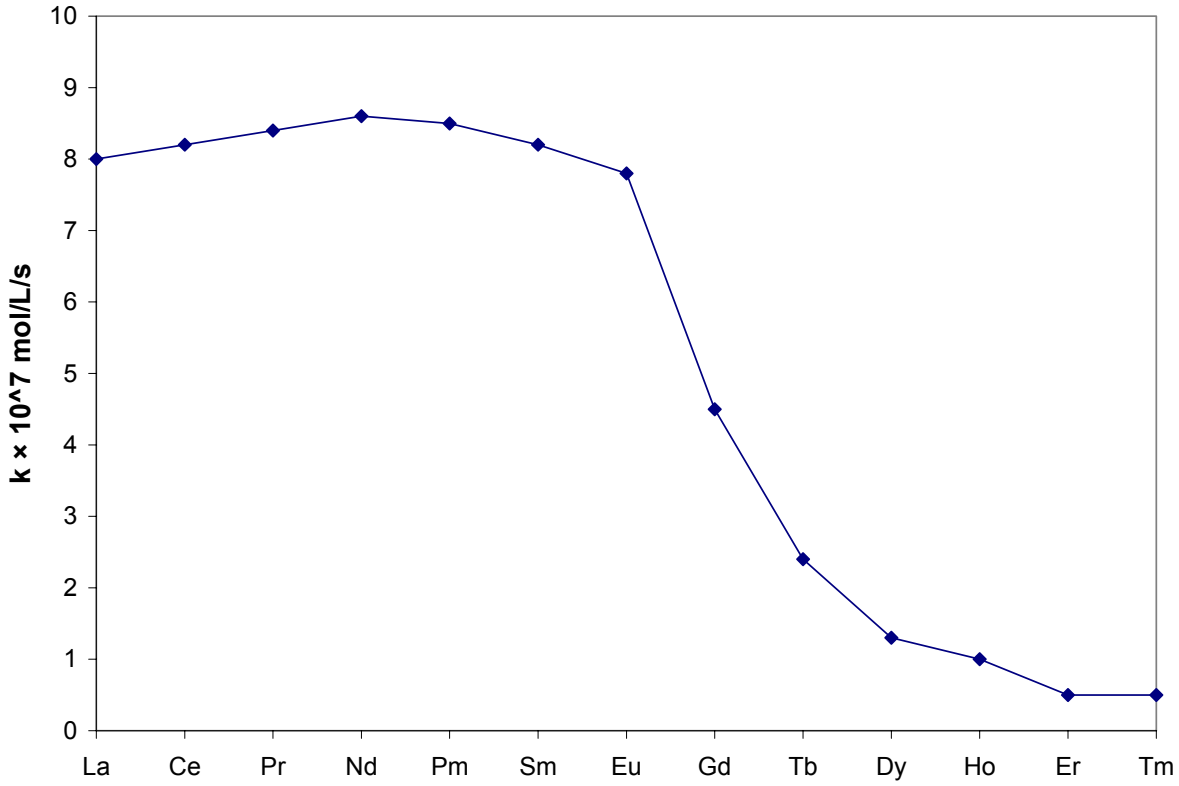

Figure L.4 Rate constants for the formation of 1:1 Ln^{3+}/oxalate complexes at 25°C.

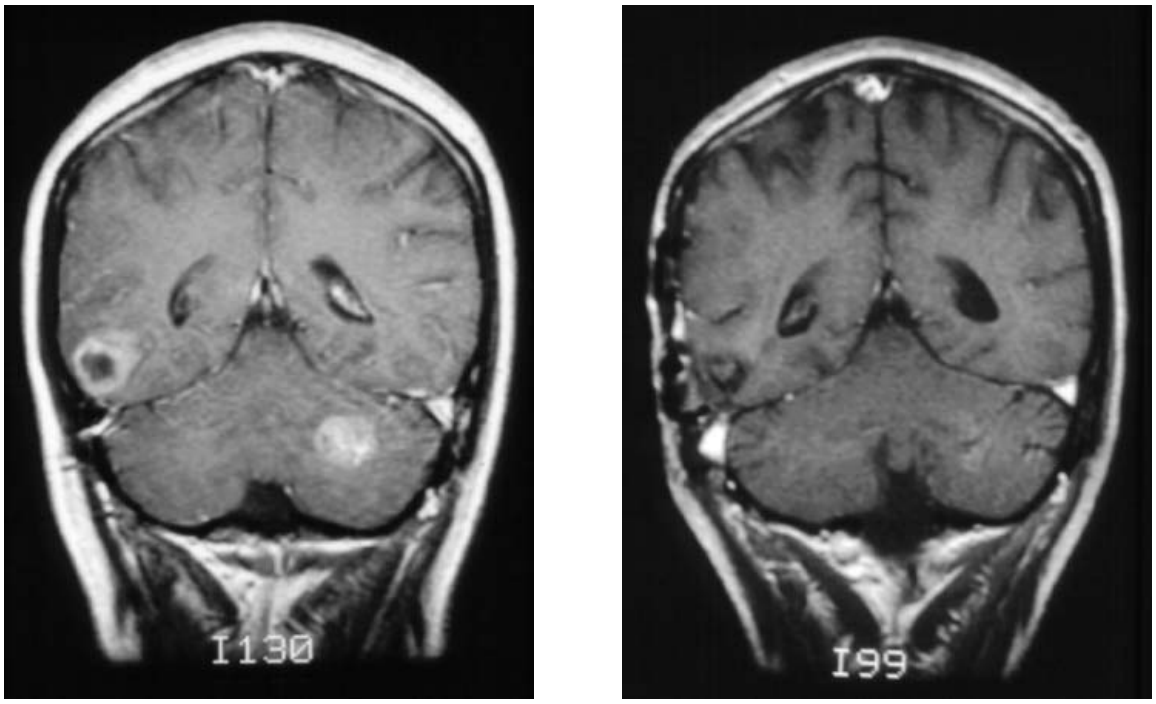

Figure L.5. MRI scans with Gd enhancement before and after surgery and radiotherapy. The follow-up study shows only minimal enhancement in the left cerebellar region, consistent with almost complete disappearance of the tumor mass.

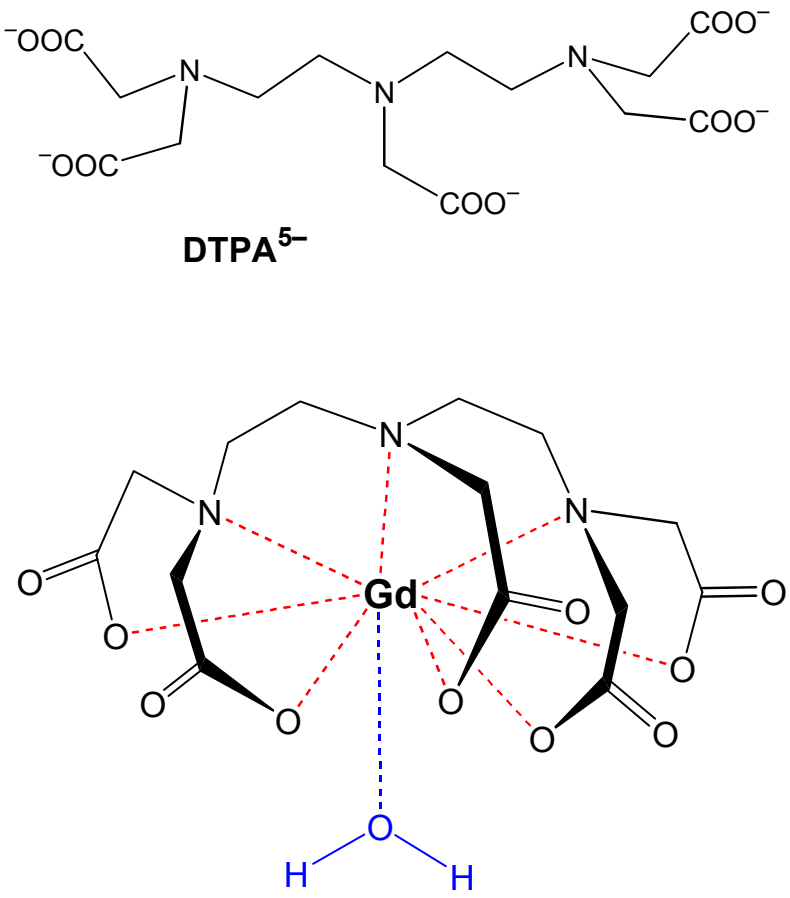

Figure L.6. The free $DTPA^{5-}$ ligand, and its gadolinium complex. Note the additional coordination site available for water to bind to.

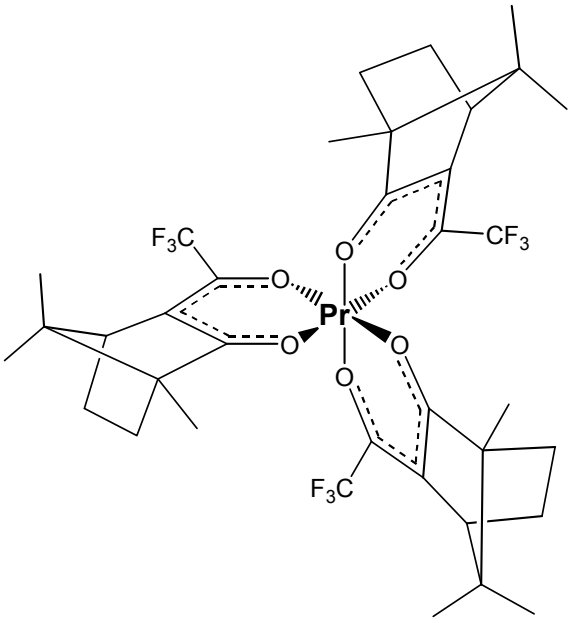

Figure L.7. Chiral praseodymium complex with three β-diketonate ligands. Eu^{3+} and Pr^{3+} complexes are often used because their electronic relaxation times are very short, reducing line-broadening for the nucleus under study (usually ^{1}H).