

Answers to problem set 2

1. Complete Table L4 by working out term symbols and magnetic moments.
2. Draw isomers for LnX_6Y and LnX_5Y_2 , assuming a capped octahedral geometry.
3. Give the structure of a lanthanide complex used as an MRI contrast agent (that was NOT mentioned in your notes). What are desirable properties for the ligand? How were they achieved in your example?
4. Comment on the variation of the exothermic enthalpies of the lanthanide trichlorides, MCl_3 , given below (ΔH_f in kJ mol^{-1}).

Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb
1058	1061	1045	----	1030	940	1012	1001	991	1009	1002	990	949