

4f-5d Splitting of Free Rare Earth Ions

Activator ion	Electron configuration of excited state	Energy [cm ⁻¹]	Energy [nm]
Ce ³⁺	[Xe]4f ⁰ 5d ¹	49340	203
Pr ³⁺	[Xe]4f ¹ 5d ¹	61580	162
Nd ³⁺	[Xe]4f ² 5d ¹	72100	139
Sm ³⁺	[Xe]4f ⁴ 5d ¹	75800	132
Eu ³⁺	[Xe]4f ⁵ 5d ¹	85300	117
Eu ²⁺	[Xe]4f ⁶ 5d ¹	34000	295
Gd ³⁺	[Xe]4f ⁶ 5d ¹	95200	105
Tb ³⁺	[Xe]4f ⁷ 5d ¹	62500	160
Dy ³⁺	[Xe]4f ⁸ 5d ¹	74400	134
Ho ³⁺	[Xe]4f ⁹ 5d ¹	81100	123
Er ³⁺	[Xe]4f ¹⁰ 5d ¹	79300	126
Tm ³⁺	[Xe]4f ¹¹ 5d ¹	78600	127
Yb ³⁺	[Xe]4f ¹² 5d ¹	87300	115

Ref.: P. Dorenbos, The 4f n↔4f n-15d transitions of the trivalent lanthanides in haloenides and chalcogenides, Journal of Luminescence 91 (2000) 91