



>>Entry Name: Terbium

CAS Registry Number: 7440-27-9

Related CAS Registry Numbers(s): 22541-20-4

Tb

Molecular Formula: Tb

Molecular Weight: 158.925

Accurate Mass: 158.925342

Percentage Composition: Tb 100.00%

Abundance: 1.2 ppm (earth's crust). Discovered in 1843 by C.G. Mosander (Stockholm). Stable α -form (hcp) converts into rhombic form at -50° , and into β -form (bcc) at 1320° .

Source/Synthesis: Natural ores include xenotime, euxemite, cerite, gadolinite and also monazite from which it is extracted. Metal obt. by redn. of TbCl_3 or TbF_3 with Ca

Use/Importance: Dopant in solid state devices; used as sodium terbium borate in lasers

Physical Description: Silvery grey, soft, ductile metal; fairly air-stable. Reacts with H_2O slowly and dil. acid

Melting Point: Mp 1365° (1356°)

Boiling Point: Bp 3230° (3041° , 2800°)

Aldrich: 26321-4

Fluka: 86380

>>Variant: Terbium 149

CAS Registry Number: 15065-93-7

Source/Synthesis: Prod. from Pr ($\text{C}, 4\text{n}$), ^{151}Eu ($\alpha, 6\text{n}$), or by proton bombardment of Ta

Other Data: $I = +1/2$; $\mu < 0.9 \mu_{\text{N}}$. Decays by orbital electron capture or $\beta^{(+)}$ emission (83.3%) to ^{149}Gd , also by α emission (17%) to ^{145}Eu

>>Variant: Terbium 149m

Source/Synthesis: Prod. from La ($\text{O}, 6\text{n}$), or ^{141}Pr ($^{12}\text{C}, 4\text{n}$)

Other Data: $I = -11/2$. Decays by orbital electron capture or $\beta^{(+)}$ emission (99.98%) to ^{149}Gd , also by α emission (0.02%) to ^{145}Eu

>>Variant: Terbium 151

CAS Registry Number: 14998-51-7

Source/Synthesis: Prod. from Eu ($\alpha, 4\text{n}$), or by proton bombardment of Gd

Other Data: $I = +1/2$. Decays by orbital electron capture (*ca.* 99%) or $\beta^{(+)}$ emission (*ca.* 1%) to ^{151}Gd , also by α emission (0.01%) to ^{147}Gd

>>Variant: Terbium 151m

Source/Synthesis: Prod. from Eu ($\alpha, 4\text{n}$), or ^{151}Eu ($^3\text{He}, 3\text{n}$)

Other Data: $I = -11/2$. Decays by isomeric transition (93.4%) to ^{151}Tb , also by orbital electron capture or $\beta^{(+)}$ emission (6.6%) to ^{151}Gd

>>Variant: Terbium 153

CAS Registry Number: 14981-98-7

Source/Synthesis: Prod. from Eu ($\alpha, 4\text{n}$), ^{151}Eu ($\alpha, 2\text{n}$), or by proton bombardment of Gd

Other Data: $I = -5/2$; $\mu = 3.5 \mu_{\text{N}}$. Decays by orbital electron capture to ^{153}Gd

>>Variant: Terbium 155

CAS Registry Number: 14391-17-4

Source/Synthesis: Prod. from Eu (He, n), ^{153}Eu ($\alpha, 2\text{n}$), also by proton bombardment of Gd or Ta. Daughter of ^{155}Dy

Other Data: $I = -3/2$; $\mu = 2.0 \mu_{\text{N}}$. Decays by orbital electron capture to ^{155}Gd