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>>Entry Name: Lead

Synonym(s): Plumbum (L.)

CAS Registry Number: 7439-92-1

Related CAS Registry Numbers(s): 12596-92-8 14280-50-3 14701-27-0 18466-73-4

Pb

Molecular Formula: Pb

Molecular Weight: 207.2

Accurate Mass: 207.976627

Percentage Composition: Pb 100.00%

plumbing. 29 Isotopes have been reported of which 4 are natural ( $^{207}\text{Pb}$  used in nmr spectroscopy). Abundance: 13 ppm (earth's crust), 0.003 ppm (seawater). No biological role. Has ccp struct. which becomes hcp at high pressure

**Source/Synthesis:** End product of each of the three series of naturally occurring radioactive decay schemes. Main ore is sulfide (galena), but also occurs as sulfate (anglesite), carbonate (cerrusite) and as chloride-phosphate (pyromorphite). Metal obt. by roasting sulfide to oxide followed by redn. (C or CO)

**Use/Importance:** Not attacked by conc.  $\text{H}_2\text{SO}_4$  and so used in plant for synth. of this acid. Also used extensively in batteries, anti-knock petrol additives ( $\text{PbEt}_4$ ), alloys, ammunition, pigments. Radiation shield around X-ray equipment and nuclear reactors

**Physical Description:** Bluish-grey, soft, weak, ductile metal which tarnishes in moist air. Otherwise stable to  $\text{O}_2$  and  $\text{H}_2\text{O}$  at ord. temp. Dissolves in dil.  $\text{HNO}_3$ ,  $\text{AcOH}$ ,  $\text{HCl}$  (slowly). Sol. alkali solns. Attacked at r.t. by  $\text{F}_2$ ,  $\text{Cl}_2$

**Melting Point:** Mp  $327^\circ$

**Boiling Point:** Bp  $1770^\circ$  ( $1774^\circ$ ,  $1751^\circ$ )

**Hazard & Toxicity:** Cumulative poison. May be pyrophoric when finely divided.  $\text{LD}_{50}$  (rat, orl) 1100 mg/kg

Aldrich: 26586-1

Fluka: 15301

Sigma: L8898

Other: Gelest PBL6180

>>Variant: Lead 194

CAS Registry Number: 35105-27-2

**Source/Synthesis:** Prod. by proton bombardment of Tl

**Other Data:**  $I = +0$ . Decays by orbital electron capture or  $\beta^{(+)}$  emission to  $^{194}\text{Tl}$

>>Variant: Lead 196

CAS Registry Number: 29136-24-1

**Source/Synthesis:** Prod. from Tl (p,8n)

**Other Data:**  $I = +0$ . Decays by orbital electron capture or  $\beta^{(+)}$  emission to  $^{196}\text{Tl}$

>>Variant: Lead 198

CAS Registry Number: 16646-00-7

**Source/Synthesis:** Prod. from Tl (p,6n)

**Other Data:**  $I = +0$ . Decays by orbital electron capture to  $^{198}\text{Tl}$

>>Variant: Lead 200

CAS Registry Number: 16645-99-1

**Source/Synthesis:** Prod. from Tl (p,4n), or  $^{202}\text{Hg}$  ( $^3\text{He}$ ,5n)

**Other Data:**  $I = +0$ . Decays by orbital electron capture to  $^{200}\text{Tl}$

>>Variant: Lead 201

CAS Registry Number: 17239-87-1

**Source/Synthesis:** Prod. from Tl (p,3n), or  $^{203}\text{Tl}$  (d,4n)

**Other Data:**  $I = -5/2$ ;  $\mu = +0.675 \mu_N$ . Decays by orbital electron capture to  $^{201}\text{Tl}$ . There is also an isomer  $^{201m}\text{Pb}$ ,  $t_{1/2}$  1.02 min.

>>Variant: Lead 202