



## >>Entry Name: Indium

**CAS Registry Number:** 7440-74-6

**Related CAS Registry Numbers(s):** 14133-75-6 14391-66-3 14864-11-0 15756-53-3 22537-23-1 22537-49-1 61178-97-0

In

**Molecular Formula:** In

**Molecular Weight:** 114.82

**Accurate Mass:** 114.90388

**Percentage Composition:** In 100.00%

In and  $^{113}\text{In}$  are stable and useful in nmr spectroscopy. Abundance: 0.24 ppm (earth's crust). 0.02 ppm (sea water). Possesses no biological role. Has fcc struct.

**Source/Synthesis:** By-product from Zn/Pb extraction processes: obt. from the dusts, slags and fumes. Metal obt. by two-stage electrolysis via In/Hg alloy

**Use/Importance:** Used as coating for metals to protect against wear and corrosion. In alloys (Pb, Cu, Al, Zn, Au, Ag, Pd) to increase hardness, corrosion resistance.

Component of low melting alloys and solders (e.g. with Sn, Pb, Bi, Cd). In control bars in nuclear reactors. In semiconductor industry. Catalyst in synth. of cyclopropanes and allylic alcohols

**Physical Description:** Soft silvery white malleable and ductile metal: liq. wets glass. Stable in dry air at 25°. Slowly oxidised in moist air. Reacts with halogens, S, Se, Te, As, P on heating. Dissolves in Hg. Not affected by alkalis. Has plastic props. at cryogenic temps.

**Melting Point:** Mp 156.2°

**Boiling Point:** Bp 2070°

**Solubility:** Insol. H<sub>2</sub>O in bulk form; sol. most acids

**Aldrich:** 26404-0

**Fluka:** 57078

## >>Variant: Indium 107

**CAS Registry Number:** 15756-53-3

**Source/Synthesis:** Prod. from Cd (d,n), Cd (p, $\gamma$ ),  $^{108}\text{Cd}$  (p,2n),  $^{110}\text{Cd}$  (p,4n), or  $^{107}\text{Ag}$  ( $^3\text{He}$ ,3n)

**Other Data:**  $I = +9/2$ ;  $\mu = +5.59 \mu_{\text{N}}$ . Decays by orbital electron capture or  $\beta^{(+)}$  emission to  $^{107}\text{Cd}$ . There is also  $^{107\text{m}}\text{In}$ ,  $t_{1/2}$  50 s

## >>Variant: Indium 108

**CAS Registry Number:** 26842-21-7

**Source/Synthesis:** Prod. from Ag ( $\alpha$ ,3n), Cd (p,n),  $^{107}\text{Ag}$  ( $^3\text{He}$ ,2n), or  $^{94}\text{Mo}$  ( $^{16}\text{O}$ ,np)

**Other Data:**  $I = +3$ ;  $\mu = +4.56 \mu_{\text{N}}$ . Decays by orbital electron capture or  $\beta^{(+)}$  emission to  $^{108}\text{Cd}$

## >>Variant: Indium 108m

**Source/Synthesis:** Prod. from Ag ( $\alpha$ ,3n), Cd (p,n),  $^{107}\text{Ag}$  ( $^3\text{He}$ ,2n), or  $^{94}\text{Mo}$  ( $^{16}\text{O}$ ,np)

**Other Data:**  $I = +6$ . Decays by orbital electron capture or  $\beta^{(+)}$  emission to  $^{108}\text{Cd}$

## >>Variant: Indium 109

**CAS Registry Number:** 14833-35-3

**Source/Synthesis:** Prod. from Ag ( $\alpha$ ,2n). Daughter of  $^{109}\text{Sn}$

**Other Data:**  $I = +9/2$ ;  $\mu = +5.54 \mu_{\text{N}}$ . Decays by orbital electron capture or  $\beta^{(+)}$  emission to  $^{109}\text{Cd}$ . There are also  $^{109\text{m}1}\text{In}$ ,  $t_{1/2}$  1.34 min. and  $^{109\text{m}2}\text{In}$ ,  $t_{1/2}$  0.210 s

## >>Variant: Indium 111

**CAS Registry Number:** 15750-15-9

**Source/Synthesis:** Prod. from Ag ( $\alpha$ ,2n)

**Use/Importance:** Used in diagnostic nuclear medicine

**Other Data:**  $I = +9/2$ ;  $\mu = +5.50 \mu_{\text{N}}$ . Decays by orbital electron capture to  $^{111}\text{Cd}$

## >>Variant: Indium 113

**CAS Registry Number:** 14885-78-0

**Other Data:**  $I = +9/2$ ;  $\mu = +5.5289 \mu_{\text{N}}$ . Nmr relative sensitivity ( $^1\text{H}=1.00$ ) 0.345; receptivity ( $^{13}\text{C}=1.00$ ) 83.8