

# Einsteinium

**Es**

## ***General Information***

### **Discovery**

Einsteinium was discovered by G.R. Choppin, S.G. Thompson, A Ghiorso and B.G. Harvey in 1952, in the debris of the thermonuclear explosion in the Pacific at Eniwetok. This involved the examination of tons of radioactive coral from the blast area.

### **Appearance**

Einsteinium is a radioactive, silvery metal.

### **Source**

Einsteinium can be obtained in milligram quantities from the neutron bombardment of plutonium.

### **Uses**

Einsteinium has no uses outside research.

### **Biological Role**

Einsteinium has no known biological role. It is toxic due to its radioactivity.

### **General Information**

Einsteinium is attacked by oxygen, steam and acids but not by alkalis.

## Physical Information

Atomic Number	99
Relative Atomic Mass ( $^{12}\text{C}=12.000$ )	254 (radioactive)
Melting Point/K	Not available
Boiling Point/K	Not available
Density/kg m <sup>-3</sup>	Not available
Ground State Electron Configuration	[Rn]5f <sup>11</sup> 7s <sup>2</sup>
Electron Affinity (M-M <sup>-</sup> )/kJ mol <sup>-1</sup>	-50

## Key Isotopes

Nuclide	<sup>253</sup> ES	<sup>254</sup> Es
Atomic mass		254.09
Natural abundance	0%	0%
Half-life	20.7 days	201 days

## Ionisation Energies/kJ mol<sup>-1</sup>

M - M <sup>+</sup>	619
M <sup>+</sup> - M <sup>2+</sup>	
M <sup>2+</sup> - M <sup>3+</sup>	
M <sup>3+</sup> - M <sup>4+</sup>	
M <sup>4+</sup> - M <sup>5+</sup>	
M <sup>5+</sup> - M <sup>6+</sup>	
M <sup>6+</sup> - M <sup>7+</sup>	
M <sup>7+</sup> - M <sup>8+</sup>	
M <sup>8+</sup> - M <sup>9+</sup>	
M <sup>9+</sup> - M <sup>10+</sup>	

## Other Information

Enthalpy of Fusion/kJ mol <sup>-1</sup>	Not available
Enthalpy of Vaporisation/kJ mol <sup>-1</sup>	Not available
<b>Oxidation States</b>	
Main	Es <sup>+3</sup>
Others	Es <sup>+2</sup>