

# Dubnium

**Db**

## ***General Information***

### **Discovery**

Dubnium was discovered in 1970 by various parties at both Berkeley, California and Dubna, Moscow.

### **Appearance**

Unknown, but probably metallic grey in appearance.

### **Source**

A transuranium element created by bombarding  $^{249}\text{Cf}$  with  $^{15}\text{N}$  nuclei.

### **Uses**

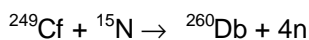
Unknown.

### **Biological Role**

None.

## **General Information**

Two separate groups have claimed to be the discoverers of the element, due to two differing isotopes. Credit has been shared between both. Dubnium is a synthetic element created via nuclear bombardment, few atoms have ever been made and the properties of dubnium are very poorly understood. It is a radioactive metal and is of research interest only. Interestingly, it is unlikely that any of the transuranium elements will ever be synthesised in large quantities due to the danger from their high radioactivity.



## Physical Information

Atomic Number	105
Relative Atomic Mass ( $^{12}\text{C}=12.000$ )	262.11
Melting Point/K	Not available
Boiling Point/K	Not available
Density/kg m <sup>-3</sup>	29,000
Ground State Electron Configuration	[Rn]5f <sup>14</sup> 6d <sup>3</sup> 7s <sup>2</sup>
Electron Affinity (M-M <sup>-</sup> )/kJ mol <sup>-1</sup>	Not available

## Key Isotopes

Nuclide	<sup>255</sup> Db	<sup>257</sup> Db	<sup>258</sup> Db	<sup>259</sup> Db	<sup>260</sup> Db	<sup>261</sup> Db
Atomic mass		257.11	258.11	259.11	260.11	261.11
Natural abundance	0%	0%	0%	0%	0%	0%
Half-life	approx 1.5 secs	1.3 secs	4.4 secs	approx 1.2 secs	1.5 secs	1.8 secs
Nuclide	<sup>262</sup> Db	<sup>263</sup> Db				
Atomic mass	262.11					
Natural abundance	0%	0%				
Half-life	34 secs	27 secs				

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

M - M <sup>+</sup>	640 (est)
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

### Oxidation States

Db<sup>+5</sup> suggested as most stable.