

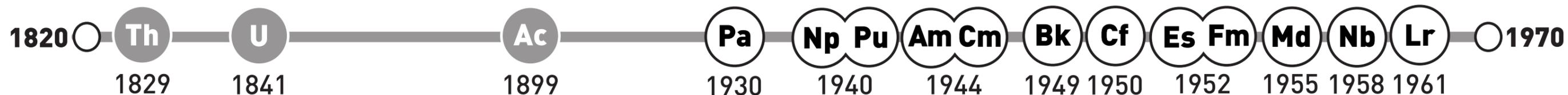
# The Actinides

THE ACTINIDES ARE DENSE, RADIOACTIVE METALS, MANY OF WHICH ARE UNSTABLE, AND THE MAJORITY OF WHICH ARE MADE SYNTHETICALLY

89 Ac Actinium	90 Th Thorium	91 Pa Protactinium	92 U Uranium	93 Np Neptunium	94 Pu Plutonium	95 Am Americium	96 Cm Curium	97 Bk Berkelium	98 Cf Californium	99 Es Einsteinium	100 Fm Fermium	101 Md Mendelevium	102 No Nobelium	103 Lr Lawrencium
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## DATES OF DISCOVERY OF THE ACTINIDES

● NATURALLY ABUNDANT ○ SYNTHETICALLY PRODUCED



THE ACTINIDES ALL FORM  
**STABLE +3 IONS**

**BERKELIUM IS THE RAREST**

**Bk**

NATURALLY OCCURRING  
ELEMENT

(NO MORE THAN A FEW ATOMS AT A TIME IN URANIUM DEPOSITS)

**U<sup>3+</sup>**

**U<sup>4+</sup>**

**U<sup>5+</sup>**

**U<sup>6+</sup>**

SOME ACTINIDES HAVE  
OXIDATION STATES  
OF VARYING COLOURS

**Pu<sup>3+</sup>**

**Pu<sup>4+</sup>**

**Pu<sup>5+</sup>**

**Pu<sup>6+</sup>**

**Pu<sup>7+</sup>**



**URANIUM & PLUTONIUM**  
ARE USED FOR  
NUCLEAR POWER

**THORIUM CAN FORM MORE COVALENT BONDS THAN ANY OTHER ELEMENT**

**14**



**Th**

**THORIUM IS A PYROPHORIC ELEMENT**

(IGNITES SPONTANEOUSLY IN AIR)

**CURIUM IS SO RADIOACTIVE THAT IT GLOWS PURPLE**

**Cm**

ACTINIDES NAMED AFTER FAMOUS SCIENTISTS



**CURIUM**  
**MARIE CURIE**

WON NOBEL PRIZE FOR WORK ON RADIOACTIVITY & ALSO DISCOVERED POLONIUM AND RADIUM



**EINSTEINIUM**  
**ALBERT EINSTEIN**

DEVELOPED GENERAL THEORY OF RELATIVITY & WON NOBEL PRIZE FOR WORK ON PHOTOELECTRIC EFFECT



**FERMIUM**  
**ENRICO FERMI**

WON NOBEL PRIZE FOR WORK ON RADIOACTIVITY & ALSO CONSTRUCTED THE FIRST NUCLEAR REACTOR



**MENDELEVIUM**  
**DMITRI MENDELEEV**

CREATED THE MODERN PERIODIC TABLE & USED IT TO PREDICT PROPERTIES OF UNDISCOVERED ELEMENTS



**NOBELIUM**  
**ALFRED NOBEL**

THE INVENTOR OF DYNAMITE, & LEFT HIS FORTUNE AFTER HIS DEATH TO FOUND THE NOBEL PRIZES



**LAWRENCIUM**  
**ERNEST LAWRENCE**

WON A NOBEL PRIZE FOR THE INVENTION OF THE CYCLOTRON, A TYPE OF PARTICLE ACCELERATOR