

Isotopes of Actinium

| Isotope | Atomic Mass | Half-life | Mode of Decay | Nuclear Spin | Nuclear Magnetic Moment |
|---------|-------------|-------------|---|--------------|-------------------------|
| Ac-224 | 224.021708 | 2.7 hours | β^- to Th-224; α to Fr-220; EC to Ra-224 | 0 | No data available |
| Ac-225 | 225.02322 | 10.0 days | α to Fr-221 | 3/2 | No data available |
| Ac-226 | 226.026089 | 1.224 days | β^- to Th-226; α to Fr-222; EC to Ra-226 | 1 | No data available |
| Ac-227 | 227.027750 | 21.77 years | β^- to Th-228; α to Fr-224 | 3/2 | 1.1 |
| Ac-228 | 228.031104 | 6.15 hours | β^- to Th-229 | 3 | No data available |
| Ac-229 | 229.03293 | 1.04 hours | No data available | 3/2 | No data available |

89

Ac

Actinium was discovered in 1899 by André-Louis Debierne. Its name derives from the Greek word *aktinos*, meaning "ray."

Actinium is a silvery metal with a cubic crystal form. It behaves like lanthanum, forming mostly the trivalent salts of the metal. It is strongly electropositive, the first ionization potential being 5.17 eV. It reacts with HCl, forming AcCl_3 , and also reacts with organic acids, forming their corresponding salts. Combustion in air can produce oxide and nitride. It is also susceptible to react with CO_2 , forming carbonate. It is used in nuclear reactors as a source of neutrons. Exposure to its radiation can cause cancer.

Properties of Actinium

| | |
|---------------------------------|-------------------------------------|
| Name | Actinium |
| Symbol | Ac |
| Atomic number | 89 |
| Atomic weight | 227 |
| Standard state | Solid at 298 °K |
| CAS Registry ID | 7440-34-8 |
| Group in periodic table | N/A |
| Group name | Actinoids |
| Period in periodic table | 7 (Actinoid) |
| Block in periodic table | f-block |
| Color | Silvery |
| Classification | Metallic |
| Melting point | 1050 °C |
| Boiling point | 3300 °C |
| Vaporization point | 3198 °C |
| Thermal conductivity | 12 (estimate) W/(m·K) |
| Electronegativity | 1.1 |
| Heat of vaporization | 400.00 kJ·mol ⁻¹ |
| Heat of fusion | 14.00 kJ·mol ⁻¹ |
| Density of solid | 10.07 g/cm ³ |
| Electron configuration | [Rn]6d ¹ 7s ² |
| Oxidation state | +3 |