



Rutherfordium

Discovery and Origin

Rutherfordium is named after scientist Ernest Rutherford. It was first reported by a team of scientists in Dubna, Russia, in 1964. They identified and isotope, ^{260}Rf , with a reported half-life of 0.3 seconds.

Properties

ATOMIC NO.: 104

PERIOD: 7

ATOMIC MASS: 260.9 g.mol^{-1}

GROUP: 4

TYPE: Highly Radioactive

MELTING POINT: 2100°C / 3800°F / 2400 K

BOILING POINT: 5500°C / 9900°F / 5800 K

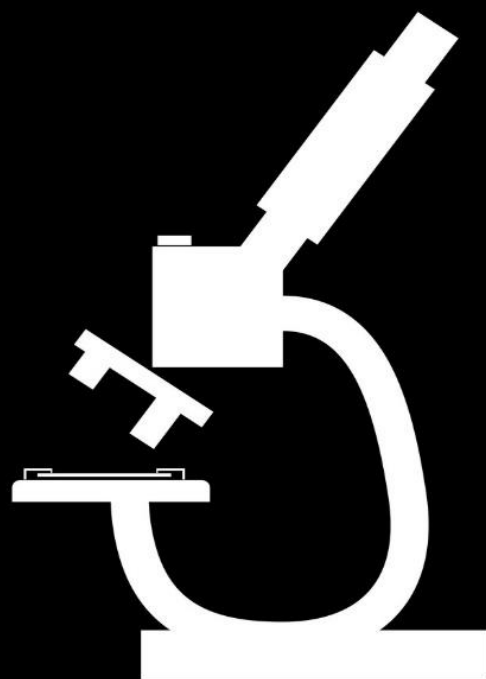
DENSITY: 23 g/cm^3 BLOCK: D-Block {TRANSITION METALS}

PHASE: Solid

ELECTRONIC CONFURIGATION: $5f^{14}6d^{27}s^2$



RUTHERFORDIUM
UNDER MICROSCOPE



--By Ayan Das, XJ-A

Isotopes

Isotopes	Discovery Year
^{253}Rf	1994
^{254}Rf	1994
^{255}Rf	1974
^{256}Rf	1974
^{257}Rf	1969
$^{257\text{m}}\text{Rf}$	1969
^{258}Rf	1969
^{259}Rf	1969
$^{259\text{m}}\text{Rf}$	1969
^{260}Rf	1969
^{261}Rf	1970
$^{261\text{m}}\text{Rf}$	2001
^{262}Rf	1996
^{263}Rf	1999
$^{263\text{m}}\text{Rf}$	1999
^{265}Rf	2010
^{266}Rf	2007
^{267}Rf	2004
^{268}Rf	2004
^{270}Rf	2010

Facts Time

- ❖ As a synthetic element, rutherfordium can be synthesized in a lab, but is not naturally occurring on Earth.
- ❖ There are no known commercial uses for rutherfordium, as it cannot be mined, and its sample sizes are so small.
- ❖ There are no stable or naturally occurring isotope of rutherfordium, although several radioactive isotopes have been created. The synthesis of these radioactive isotopes occurs from the fusing of two atoms or by decay of other elements. Twenty radioactive isotopes have been isolated.
- ❖ Rutherfordium is believed to have a very stable, high melting point oxide state.

HISTORY

Rutherfordium was reportedly first detected in 1964 at the Joint Institute of Nuclear Research at Dubna (then in the Soviet Union). Researchers there bombarded a plutonium-242 target with neon-22 ions and separated the reaction products by gradient thermochromatography after conversion to chlorides by interaction with ZrCl_4 . The team identified spontaneous fission activity contained within a volatile chloride portraying eka-hafnium properties. Although a half-life was not accurately determined, later calculations indicated that the product was most likely rutherfordium-259

--BY Ayan Das, XI-A