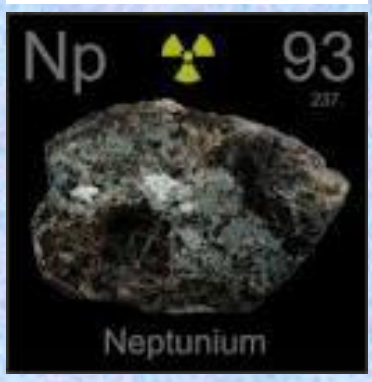
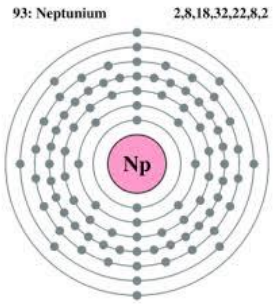
# NEPTUNIUM


## DISCOVERY OF NEPTUNIUM

Neptunium is a chemical element with the symbol Np and atomic number 93. A radioactive actinide metal, neptunium is the first transuranic element. Its position in the periodic table just after uranium, named after the planet Uranus, led to it being named after Neptune, the next planet beyond Uranus

Neptunium was first made in 1940 by Edwin McMillan and Philip Abelson at Berkeley, California. It came from a uranium target that had been bombarded with slow neutrons and which then emitted unusual beta-rays indicating a new isotope.




SYMBOL:Np

Electron configuration: [Rn] $5f^4 6d^1 7s^2$
Atomic number: 93
Atomic mass: 237.0482 u
Discovered: 1940
Isotopes: Neptunium-237
Discoverers; Edwin McMillan, Philip Abelson

# USES FOR NEPTUNIUM

Neptunium has also been used in detectors of high-energy neutrons. The longest-lived isotope of neptunium, neptunium-237, is a by-product of nuclear reactors and plutonium production. It, and the isotope neptunium-239, are also found in trace amounts in uranium ores due to neutron capture reactions and beta decay

Neptunium is used mainly for research purposes. When bombarded with neutrons neptunium-237 is used to produce plutonium-238 which is used for spacecraft generators and terrestrial navigation beacons.

Neptunium is squashed between uranium and plutonium on the periodic table of elements. This gives us some idea of its possible use. Its neighbours both have isotopes that split under neutron bombardment, giving off a great deal of energy. Thus used in explosives.

The main use of neptunium-237 is in devices for detecting high-energy neutrons. Neptunium is dangerous. As well as radioactive, it's also pyrophoric, capable of spontaneously catching fire at room temperature.

# PROPERTIES OF NEPTUNIUM

-Neptunium is a ductile, silvery, radioactive metal.

-Neptunium forms numerous chemical compounds.

- Chemically it is extremely reactive and is attacked by oxygen, steam and acids, but not by alkalis.

-It can exist in many oxidation states, from neptunium (II) to neptunium (VII).

- Neptunium is the first transuranic element.

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|---|---|
| Electrical resistivity | 1.220 μΩ·m (at 22 °C) |
| Magnetic ordering | paramagnetic |