Californium | Bihar | 22 Aug 2024

Why in News?

Recently, police in Gopalganj, Bihar, seized **50 grams** of a substance believed to be **Californium,** a highly radioactive metal worth **Rs 850 crore.**

- However, **initial tests by the** Department of Atomic Energy (DAE) and Bhabha Atomic Research Centre (BARC) **revealed no** radioactivity.

Key Points

- **About Californium:**
  - Californium is named after the American state of California and the university.
  - It was first synthesized in 1950 by researchers at the University of California, Berkeley.
  - Californium is a **silvery-white synthetic radioactive metal** with the **atomic number 98** on the periodic table.
  - It is not found **naturally** and is produced through nuclear reactions, specifically by **bombarding curium** with helium ions.
    - **Curium** is a **hard metal** having an **atomic number** of **96** and symbol **Cm.** This metal is artificially produced in the nuclear reactors.
    - A **helium ion** is a **positively charged atom of helium**, typically denoted as **He+.** It is formed when a helium atom loses one or more of its electrons.
  - **Properties:**
    - Californium is **highly radioactive** and is both valuable and hazardous.
    - It belongs to the **actinide series** on the periodic table.
    - Notable isotopes include **Cf-251,** which is the most stable with a **half-life of 898 years,** as well as **Cf-249** and **Cf-250,** which have shorter half-lives.

- **Radioactivity:**
  - It is the property of some unstable atoms (radionuclides) to spontaneously emit nuclear radiation, usually **alpha particles** or **beta particles** often accompanied by **gamma-rays.**
- **Department of Atomic Energy:**
  - The **Department of Atomic Energy (DAE)** was set up under the direct charge of the **Prime Minister** through a **Presidential Order** on **August 3, 1954.**
  - As per this order, all businesses of the Government of India, related to **Atomic Energy** and to the functions of the Central Government under the **Atomic Energy Act, 1948** were directed to be transacted in the **Department of Atomic Energy.**
- **Bhabha Atomic Research Centre (BARC):**
  - **BARC** is **India's leading nuclear research facility that** operates under the **Department of Atomic Energy.**
  - As a **multi-disciplinary research center,** BARC is equipped with extensive infrastructure for advanced R&D, spanning the full range of nuclear science, engineering, and related fields.
  - It also serves as the primary research support for the **Nuclear Power Corporation of India (NPCIL)**, which manages all of India's nuclear reactors.