Tantalum

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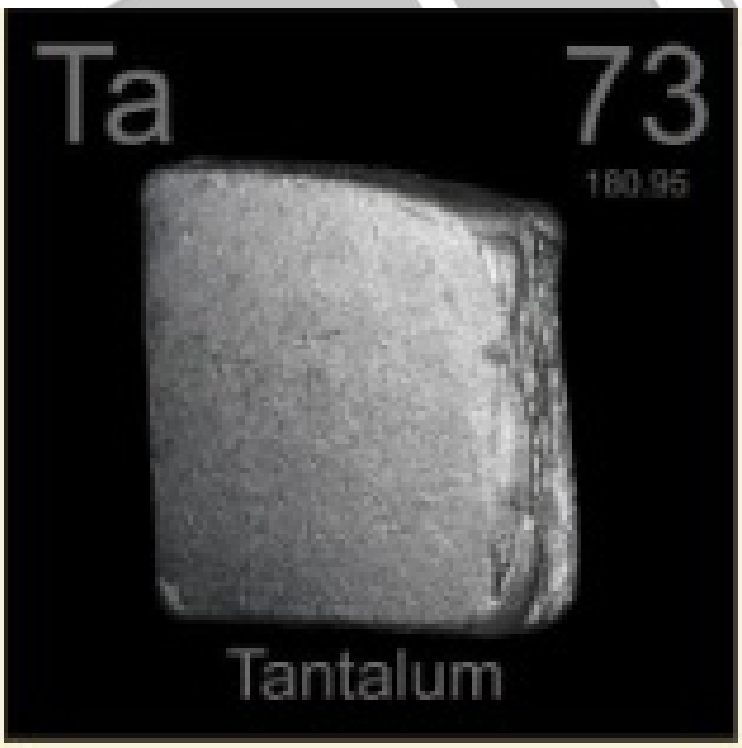
Why in News?

Tantalum, a rare metal with remarkable properties, has been discovered in the sands of the **Sutlej River in Punjab** by a team of researchers from the Indian Institute of Technology (IIT), Ropar.

What are the Key Facts About Tantalum?

- **Discovery:**
  - Tantalum is a rare metal with the **atomic number 73**. It was first discovered in 1802 by Swedish chemist **Anders Gustaf Ekenberg.**



- **Properties:**
  - It is **grey, heavy, and highly corrosion-resistant,** forming an oxide layer when exposed to air.
  - **Pure tantalum is ductile,** allowing it to be stretched int**o thin wires without breaking.**
  - Extremely **resistant to chemical attack** at temperatures below 150°C, it is affected only by hydrofluoric acid, acidic solutions with fluoride ions, and free sulphur trioxide.
  - Tantalum also has an **extremely high melting point.**
- **Uses of Tantalum:**
  - **Electronic Sector:**
    - **Capacitors** made from tantalum are vital for storing more electricity in smaller sizes, ideal for portable electronic devices.
    - A committee of experts within the Ministry of Mines has recognized a collection of 30 **critical minerals for India, with Tantalum** being among them.
    - It is also used to make components for chemical plants, nuclear power plants, aeroplanes and missiles.
  - **Substitute for Platinum:**
    - It has a high melting point, and is frequently used as a **substitute for platinum,** which is more expensive.
  - **Medical Applications:**
    - Tantalum **does not react with bodily fluids** and is used to make surgical equipment and implants, like artificial joints, according to the US Department of Energy.
  - **Cutting-Edge Material:**
    - Composite with **tantalum carbide (TaC) and graphite** is one of the hardest materials, used in high-speed machine tool cutting edges.

What is the Significance of the Discovery of Tantalum in Sutlej?

- The discovery of tantalum in the Sutlej River sand indicates that there may be a potential source of tantalum in India, which could **reduce the dependence on imports and increase the domestic supply.**
  - India imports most of its Tantalum metal from the United States, United Kingdom and Germany.
- The discovery of tantalum can help in enhancing **India's electronics and semiconductor Industry.**