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New Efficient Technique for Extracting Polymetallic Nodules

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Context

Despite concerns over deep-sea biodiversity, countries continue to explore mining of **polymetallic nodules**. A new study reports a **more efficient and cleaner extraction process** for metals found in these nodules.

What Are Polymetallic Nodules?

- Potato-sized deposits found on deep ocean floors.
- Rich in **nickel, cobalt, copper, manganese** — critical for batteries, electronics, and clean-energy technologies.

New Extraction Technique

Hydrogen-Based Smelting Process

- Researchers developed a **single-step smelting method** that:
- **Melts the nodules**
- Uses **hydrogen instead of carbon** to remove oxygen from metal oxides
- Produces a mixed alloy rich in **nickel, copper, and cobalt**
- Generates **manganese-rich byproducts** usable in **battery production**

Advantages

- **Significant reduction in CO₂ emissions** compared to conventional carbon-based extraction.
- **More energy-efficient** and environmentally cleaner.
- Converts a greater share of metal content into usable form.