Peptides for Metal Recovery

Imagine transforming e-waste from an environmental threat into a valuable resource – efficiently, selectively, and sustainably. acib's metal-binding peptides make it possible!

BACKGROUND

The exponential growth of electronic waste (e-waste), currently nearing 62 million tonnes annually, represents both an environmental crisis and a strategic economic opportunity. E-waste contains valuable critical metals such as cobalt, nickel, and rare-earth elements, crucial for emerging technologies like electric vehicles, batteries, and wind turbines. Current recycling methods, relying on energy-intensive and chemically aggressive processes, are inefficient, environmentally harmful, and leave economies vulnerable due to dependency on a few countries controlling metal supplies. Consequently, there is an urgent need for innovative, eco-friendly, and geopolitically strategic technologies that can efficiently recover valuable metals and support a circular economy.

TECHNOLOGY

acib leverages groundbreaking biotechnology by harnessing the power of peptides identified through advanced combinatorial phage-display methods. Our approach utilizes advanced phage display screening to identify peptides with high specificity for nickel and cobalt, achieving up to 20,000-fold increased binding efficiency compared to standard methods. Our peptide sequences demonstrate exceptional selectivity and binding strength, with dissociation constants <8 µM for cobalt and <30 µM for nickel.

Our peptides are ideally suited for:

- **Selective Metal Recovery:** Efficient extraction of nickel and cobalt from complex metal waste streams such as batteries and electronic scrap.
- **Environmental Remediation:** Eco-friendly solutions for removing metals from contaminated waters and waste streams, significantly reducing ecological impact.
- **Circular Economy Integration:** Facilitating closed-loop recycling processes, reducing the need for primary metal extraction, and promoting sustainable resource utilization.

OFFER

Join forces with acib to develop the next generation of metal recovery technology. By integrating our peptide-based solutions, you can achieve higher recovery efficiencies, reduce environmental footprints, and enhance your competitive edge in sustainable resource management.

Let acib help you transform environmental challenges into economic opportunities!

EXPERTS

Dr. Doris Ribitsch
Prof. Dr. Georg Gübitz

DEVELOPMENT STATUS:

Technology Readiness Level 3
(Experimental proof-of-concept)

KEYWORDS

- Metal-binding Peptides
- Phage Display
- Bio-Recovery
- Bio-Sorption
- Nickel
- Cobalt
- Circular Economy
- Sustainable Recycling
- Sustainable Metallurgy
- Industrial Biotechnology

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