

Extraction of REEs from Spent NdFeB Magnets

– A Hybrid Electrochemistry and Hydrometallurgy Approach

Problem / Opportunity

- Magnets essential for consumer electronics and clean tech
- NdFeB magnet enriched with a select group of REEs
- REE mining and refining predominantly in China.
- Only 17% e-scrap recycled globally¹.

Value Proposition

Low-cost, safe, and environmentally benign separation enables *decentralized* magnet recycling.

Existing Recycling Technologies

Direct recycling
Pyrometallurgy

not for mixed waste
energy intensive
capital costs

Hydrometallurgy

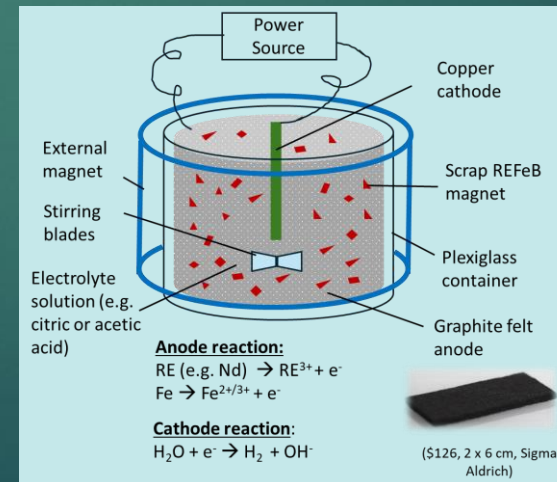
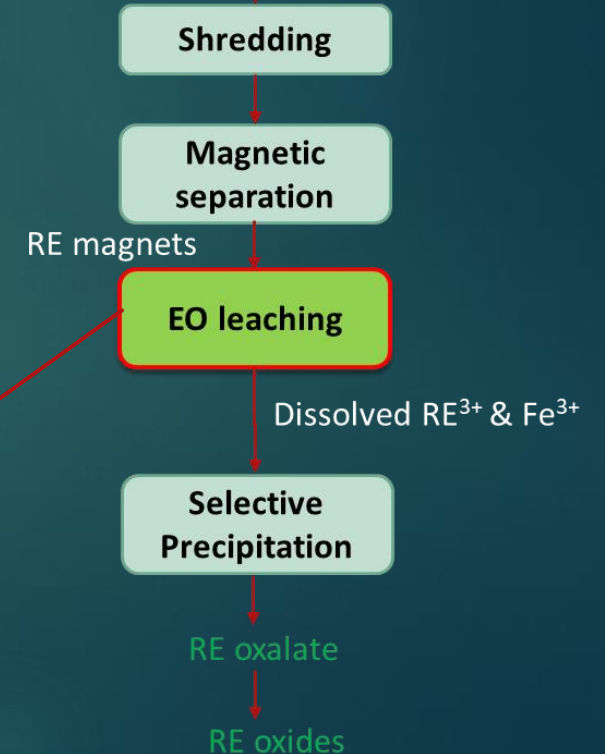
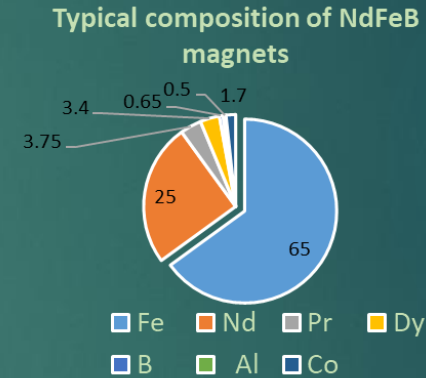
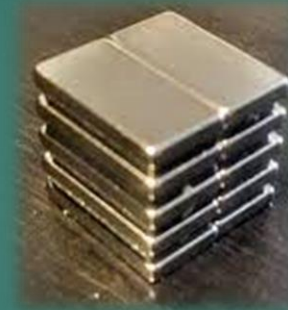
waste emission
corrosive chemicals
operation costs

Solvent extraction

proprietary solvents
eco-toxicity

Electro-oxidation

\$\$\$ electrodes
difficult to scale



¹World Economic Forum, 2019.