

Recycling Precious metals from E-waste

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SOURCES OF PRECIOUS METALS IN E-WASTE



Printed circuit boards



Mobile phones



Hard drives



LEDs and screens

RECYCLING METHODS



Mechanical/
Physical
Processing



Hydrometallur-
gical Processing



Pyrometallurgical
Processing



Biological
Methods

ADVANTAGES OF RECYCLING PRECIOUS METALS



Reduces the need for mining



Lowers toxic waste release



Creates economic value

SDG CONNECTIONS



Background

- ❖ E-waste contains valuable metals like Au, Ag, Pt, Pd.
- ❖ Improper disposal causes environmental contamination.
- ❖ Recycling supports SDGs: 9, 12, 13.
- ❖ Encourages circular economy and reduces mining impacts.

Methodology

- ❖ Mechanical Processing: Dismantling, shredding, material separation
- ❖ Hydrometallurgy: Leaching + purification
- ❖ Pyrometallurgy: High-temp smelting for large-scale recovery
- ❖ Biological Methods:
Microbial metal leaching

Results

- ❖ Successful recovery of high-value metals from e-waste parts.
- ❖ Hydrometallurgy provides high efficiency with lower emissions
- ❖ Bioleaching is promising for low-grade materials.
- ❖ Reduced toxic waste release and resource loss.

Discussion

- ❖ Recycling creates environmental + economic benefits
- ❖ Challenges: collection, hazardous materials, mixed components.
- ❖ Future: safe chemistry, circular design, formal recycling systems.
- ❖ Expands green industry and job opportunities.