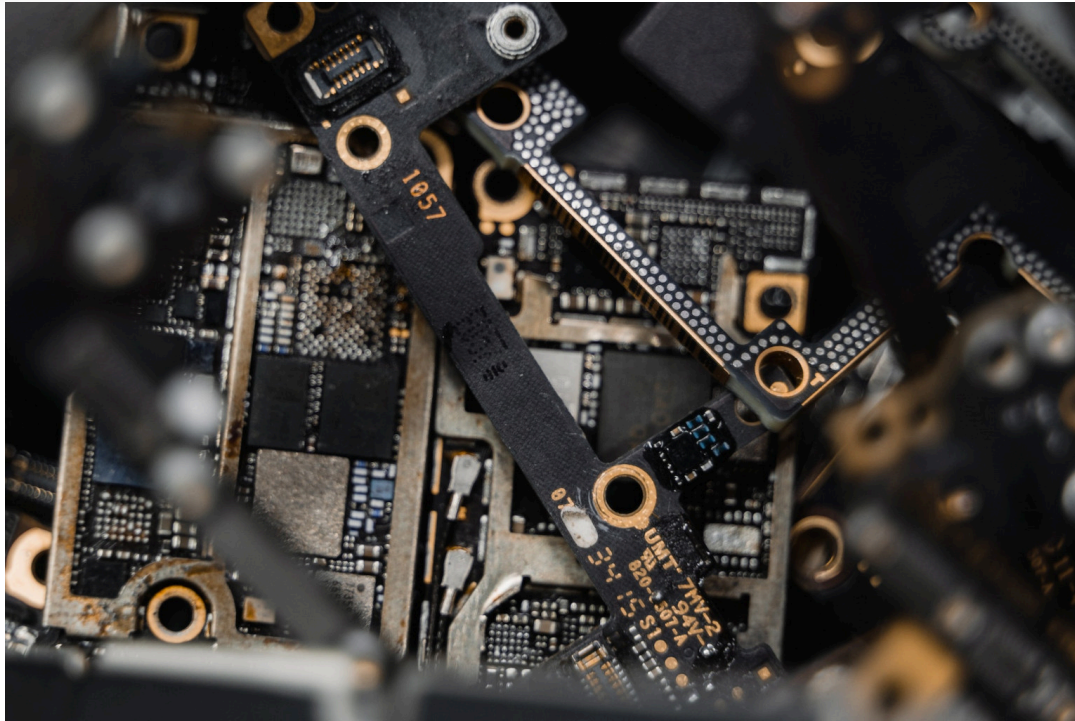


END-OF-LIFE PRINTED CIRCUIT BOARDS RECOVERY THROUGH A BIOLEACHING PROCESS



The invention concerns a new biotechnological method for recovering copper from end-of-life printed circuit boards. The process can be performed as one or a combination of two procedures, one with multi-step leaching and one with column leaching, allowing high leaching yields to be achieved with increasing concentrations of printed circuit boards (PCBs) in solution.

The invention is applicable for the recovery of valuable metals from electronic waste recycling residues and from a circular economy perspective.



PRIORITY NUMBER

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KEYWORDS:

Bioleaching, Copper, Electronic waste, printed circuit boards, Valuable materials recovery.



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DESCRIPTION

The object of the present invention is the sustainable alternative to technologies based on hydrometallurgical processes, characterized by the use of expensive chemical reagents with a high impact on the environment and on the safety of workers. Compared to other patented bioleaching-based technologies, there is no need for any adaptation stage and of engineered bacteria. This aspect implies significant advantages for the commercial availability of the microbial species used. Furthermore, no energy is required to keep the systems in agitation, but only that to circulate the solutions in the plant, with important further advantages in terms of economic and environmental sustainability. The recovery of the copper is carried out through a simple cementation reaction with zinc (in part deriving from the recovery of the treated PCBs); moreover, considering that neither electricity nor solvents are used, the process is therefore absolutely solvent free. The solid residue is still rich in precious metals (gold, silver). Actual TRL is 4.



APPLICATIONS

- Copper recovery from the metallic fraction of ground printed circuit boards
- Copper recovery from similar matrices

ADVANTAGES

- Economic sustainability
- Zero environmental impact

