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## Recycling based comprehensive characterization of waste printed circuit boards of various brown and white goods

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Comprehensive characterization of printed circuit board (PCB) of end-of-life electrical and electronic equipment (EEEs) is a critical attribute in determination of resource content of e-waste for recycling. Though PCBs in e-waste are documented as valuable secondary metals reservoir, precise information related to their physical and chemical characteristics including metals content encompassing various brands of waste EEEs is sparse in the existing literature. Thus, the main objective of this research is to comprehensively characterize two brands of PCBs from each of 16 end-of-life EEEs classified as brown and white goods for general and precious metals along with moisture content, volatile matter and pH for recycling purpose. Results revealed that large percent share of waste PCBs of brown goods are occupied by general elements such as Cu (highest: 23 wt. % in laptop), Al (highest: 6 wt. % in computer), Pb (highest: 15 wt. % in DVD player) and Ba (highest: 7 wt. % in TV), which make them rich secondary resource. Precious metals, Au and Ag were found to be prevalent in brown goods PCBs with highest content of Au in mobile phone (316 g/ton) and Ag in laptop (636 g/ton). It can be inferred from the study that brown goods PCBs will serve as potential resource reservoir than white goods for the purpose of metals recycling owing to their higher content of general and precious metals. Comprehensive characterization of waste PCBs of brown and white goods thus helps to develop analogy between metals content and prioritization of metals for recycling to ensure efficient resource circulation.

### Biography

Anshu Priya is a PhD Scholar at the Department of Civil and Environmental Engineering, Indian Institute of Technology Patna, India. She has earned her BSc in Industrial Microbiology and MSc in Biotechnology. She is working on characterization, management and recovery of metals from electronic waste with special emphasis on bioleaching of metals from end-of-life electrical and electronic equipments. Her research interest includes areas of bio hydrometallurgy, environmental biotechnology, microbiology, molecular biology and metal-microbe interactions.

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