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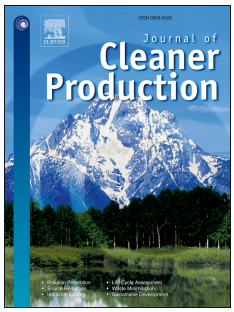

Waste Printed Circuit Boards Recycling: An Extensive Assessment of Current Status

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Waste Printed Circuit Boards Recycling: An Extensive Assessment of Current Status

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Abstract

The rapid proliferation of electronic devices in the last two decades has compelled the researchers to find a remedy for one of the most toxic and hazardous waste materials - the waste Printed Circuit Boards. Numerous articles have been published demonstrating the process routes for recycling of this toxic but otherwise useful waste due to nearly 30% metal content. In this paper, more than 150 related articles mostly published in the last 15 years and covering the broad areas like characterization of waste printed circuit boards, health hazards associated with the processing and the different routes of recycling have been analyzed to provide a comprehensive overview on this topic. Physical separation processes employing electrostatic separator, magnetic separator, froth floatation, etc., has been reviewed for separation of metals and non-metals, along with useful utilizations of the non-metallic materials. The recovery of metals from this waste material through pyrometallurgical, hydrometallurgical or bio-hydrometallurgical routes is also critically discussed.

Keywords: Printed Circuit Boards (PCBs) recycling; Resource utilization; Metal recovery; Metallurgical process; Leaching.