

Separation of Al, SUS and Resin from Waste Printed Circuit Boards



Fig. 1. Waste Printed Circuit Boards (WPCBs).

Waste printed circuit boards (WPCBs) are valuable secondary raw material for critical and precious metal industries. WPCBs also contain Al, stainless steel (SUS), and resin. When WPCBs is melted in a furnace, the viscosity of slag is increased due to the presence of Al and SUS, in particular. In addition, heat generated by the combustion of resin shortens the life of furnace. The aim of this project was to develop a pretreatment process that can effectively sort or separate Al, SUS, resin, and copper from WPCBs.

The first step in designing an effective and cost-efficient process was to perform a qualitative and quantitative analysis of WPCBs. It was found that WPCBs sample was composed of 37.1 ± 4.52 % of cables and wires (including the PVC insulated copper wires); 27.6 ± 2.67 % of plastics (from computer key-boards, the external part of electronic devices and others waste materials); 19.8 ± 1.15 % of printed circuit boards (with or without capacitors, resistors, transformers etc.); 7.4 ± 1.98 % of ferric compound; 6.1 ± 1.40 % of fine copper wire, and 1.9 ± 0.80 % of capacitors, resistors, transformers etc. (see Figure).

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Due to the complexity of the WPCBs, the first objective was to find an appropriate size-reduction technique, followed by a separation process in order to sort using physical separation technics.

RESEARCHERS

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