

Understanding the Thermal Transformation of Random Access Memory Cards: A Pathway to Their Efficient Recycling

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Abstract : Globally, electronic waste (e-waste) continues to grow at an alarming rate. Several technologies have been developed to recover valuable materials from e-waste, however, their efficiency can be increased with a better knowledge of the e-waste components. Random access memory cards (RAMs) are considered as high value scrap for the e-waste recyclers. Despite their high precious metal content, RAMs are still recycled in a conventional manner resulting in huge loss of resources. Our research work highlights the precious metal rich components of a RAM. Inductively coupled plasma (ICP) analysis of RAMs of six different generations have been carried out and the trends in their metal content have been investigated. Over the past decade, the copper content of RAMs has halved and their tin content has increased by 70 %. The stricter environmental laws have facilitated ~96 % drop in the lead content of RAMs. To comprehend the fundamentals of thermal transformation of RAMs, our research provides their detailed kinetic study. This can assist the e-waste recyclers in optimising their metal recovery processes. Thus, understanding the chemical and thermal behaviour of RAMs can open new avenues for efficient e-waste recycling.

Keywords : electronic waste, kinetic study, recycling, thermal transformation

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