

USE OF E- WASTE AS THERMO PLASTIC AND THERMOSET COMPOSITES

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Abstract :-The aim of this paper was to investigate the feasibility of using glass- Nano metals, a byproduct of recycling waste printed circuit boards (PCBS) , to introduce e waste in the production of thermoset, glass – Nano metals were attained by two step crushing and milling processes . Glass – Nano metals with particle size varying from 100-150 microns used as filler in thermoset compound and all its characteristics were calculated like tensile strength, flexure strength and impact strength. All the results showed that the use of glass – Nano metals as filler in thermosets represented a promising method for resolving the environmental pollutions and reducing the cost of thermoset, thus attaining both environmental and economic benefits.

Keywords- E-Waste, Thermosets, Thermoplastic

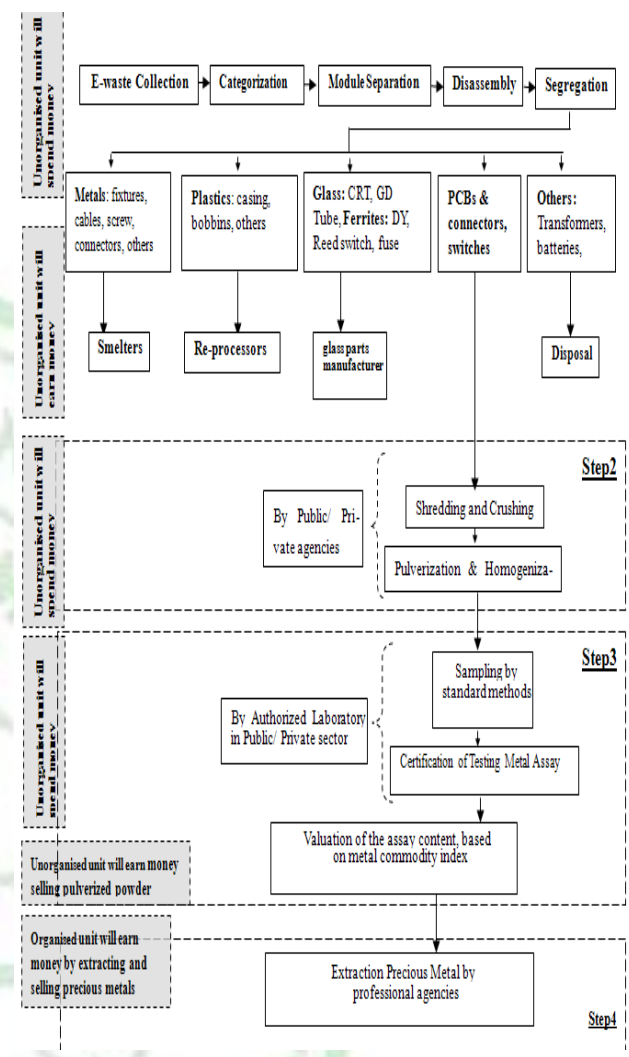
Introduction

E- Waste comprises discarded electronics appliances, of which computers and mobile telephones are disproportionately abundant because of their short lifespan . The current global production of E-Waste is estimated to be 20-25 million tonnes per year , with most E-Waste being produced in Europe , the united states of America and Australia .E-Waste contains valuable metals (Cu, Platinum group) as well as potential environmental contaminants , specially Pb, Sb, Hg, Cd, Ni, polybrominated diphenyl ethers (PBDEs) and polychlorinated biphenyls (PCBs). Burning E-Waste may generate dioxins , furans , polycyclic aromatic hydrocarbons (PAHs) , ply halogenated aromatic

hydrocarbons (PHAHs) and hydrogen chloride.

E Waste Management

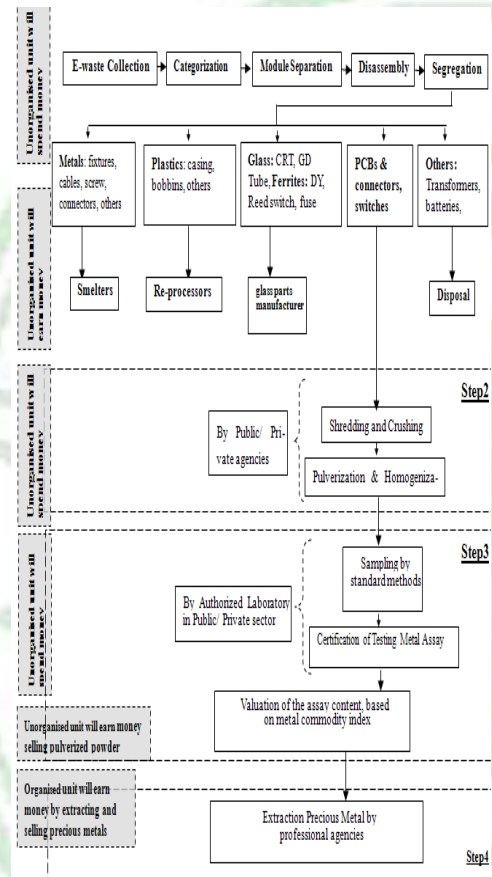
Electronic Waste is becoming a crisis for the society. Huge accumulation of e-waste and their recycling through primitive means for extraction of precious metals is real concern in the developing countries as e-waste contains hazardous materials. Recycling of e-waste through proper technologies is, however, considered to be a profitable business in developed countries like India , China , Brazil etc., where manpower is inexpensive and enforcement of environmental laws is not so stringent. Through this paper we propose to present an outsourcing model where equal participation of the formal and non-formal sector is ensured to make the e-waste business a profitable one .



Recycling of E Waste

The populated PCBs, constituting 3 to 5% by weight of total e-waste, have rich value of metals such as silver, gold, palladium, platinum, tantalum and other metals in traces level. Their recovery requires professional skill and high cost equipments. The lack of knowledge , affordable logistics and greed for

quick money motivates non-formal sector to employ unhygienic and unscientific methods for recovery of valuable metals such as Cu, Ag, and Au etc.



Thermosetting Plastic

A thermosetting plastic, also known as a thermoset, is polymer material that irreversibly cures. The cure may be done through heat (generally above 200 centigrade) through a chemical reaction (two part epoxy for example) or irradiations such as

electron beam processing. Thermoset materials are usually liquid or malleable prior to curing and designed to be moulded into their final form are used as adhesives. Others are solids like that of the moulding compound used in semiconductors and integrated circuits (ICs).

Thermoplastic

A thermoplastic also known as thermo softening plastic is a polymer that turns to a liquid when heated and freezes to a very glassy state when cooled sufficiently. Most thermoplastics are high molecular weight polymers whose chains associate through weak Van Der Waal forces (poly ethylene), stronger dipole-dipole interactions and hydrogen bonding (nylon), or even stacking of aromatic rings (polystyrene). Thermoplastic polymers differ from thermosetting polymers (Bakelite) in that they can be remelted and remoulded. Many thermoplastic materials are addition polymers example vinyl chain growth polymers such as polyethylene and poly propylene.

Conclusion

We have used Taguchi's design of experiment to determine the Mesh Size and percentage composition of crushed e waste. Our aim is to make Thermoplastic and Thermoset

composite by recycling of e waste and its various properties like tensile strength, flexure strength etc., to make a clean environment free of e waste hazards

References:-

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