

Green approach for Recovery & Reuse of e-waste by Radiation processes.

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Abstract

The printed circuit boards (PCBs) are the platform upon which microelectronic components such as, semiconductor chips and capacitors are mounted. Even though its usage and end-of-life cannot be stopped but could be recycled or reused. The abrupt and non-stop growth in the field of technology, are the reasons for the huge dumping of these E-wastes. For the last few decades the research on recycling of PCBs had been at hike due to its hazardous compositions. The researchers tried to recycle this e-waste PCBs in different methods like chemical methods, thermal or pyrolysis methods, mechanical methods, etc. In the above methods the thermal and chemical methods produce large quantity of harzadous waste products during the separation process. In mechanical methods the separation and securing the purity of the metals used in the printed circuit board is difficult. The recycling of hazardous e-waste printed circuit board (PCB) in green route is discussed. The most two critical problem of removing solder and also the thermoset organic materials are solved in this research work in greener route. Electron beam (EB)/Gamma Radiation plays a pivotal role to degrade the thermoset to different extents and ease the removal of copper foil, glass fiber and recover & reuse of thermoset resin from the circuit board. The degraded materials were characterized by FTIR, DSC, TGA & Rheometer.

Keywords: E-waste, recycling, electron beam, printed circuit board, solder removal, thermoset degradation.

Biography

I have completed Master's & Ph.D in Polymer Engg & Tech from the premier institute in the world for this field, Institute of Chemical Technology, Mumbai. I, **Prof. Mehul Patel working past 3 years as Professor & Scientist at CIPET, Govt. of India.** Moreover past 7 years of experience in chemical laboratories & working on 17 different projects for government and public sectors helps me to endeavor to put wheel into motion. I have published four books worldwide. i) Novel green approach for the recycling of e-waste. ii) Novel foldable mechanism for space application. iii) Blend of HDPE & Reclaimed Rubber. iv) Development of Biobased Polymers for Industrial coating application. I gained experience in recovery & reuse rather than doing recycling and matter of fact, I was the only person to develop & use **Zeolite ZMG-5** as catalyst for hydro-cracking in India (2008) & **Ionic liquid (EMIM+ BF4-)** used to extract e-waste elements.

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