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Urban mining of precious metals and copper from mobile motherboards: Recovery studies

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Globalization of information and communication has not only revolutionized our lives, economies and industries but also led to hazardous wastes generated from electronics. E waste or Electronic waste is a term for electrical and electronic equipment's that have become discarded or obsolete. Almost all E waste contains some or other form of recyclable material including plastic, glass and metal. The need of recycling the e waste is increasing day by day with the increase in production of electronic devices and discarding them after usage. The economics of E-waste recycling lies with the recovery of precious metals. A mobile mother board contains many valuable metals like gold, silver, palladium and copper. Recovery of precious metals and valuable metals is a big challenge as it also contains hazardous substances such as cadmium, bromine, mercury, dioxins, furans etc.

Thermo Gravimetric Analysis (TGA) has performed to study the thermal degradation characteristics of Mobile Mother Board (MMB). MMBs were calcined at 8000°C about two hours in a gas fired furnace for complete combustion of MMB. The flue

gases were treated at 1200°C for removing the organic toxins using a gas cleaning system.

Calcined MMBs are made into fine powder and elemental analysis made for the MMBs. Based on the composition of the elements present in MMBs different types of fluxes were added with different composition to concentrate the precious elements in Black copper during smelting process at temperature of 13000°C where the gangue can be separated as slag. The chemical composition of the smelted copper is presented and discussed. This study reveals that mobile mother boards are rich source of copper and precious metals.

Speaker Biography

K Pavan Kumar Reddy has completed his bachelor degree in Mechanical Engineering at the age of 21 years from JNTU Hyderabad University, INDIA. He is pursuing his masters in Metallurgical Engineering in JNTU Hyderabad University. He has participated in International conference on Semiconductors and workshop on E waste Management organized by C-MET Hyderabad. He has given oral presentation in All INDIA seminar on "Advances in Metallurgy and Manufacturing Process" organized by The Institute of Engineers – INDIA.

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