

IIT Delhi scientist develops tech for recycling E-Waste & recover metals

Researchers at Chemical Engineering Department, Indian Institute of Technology Delhi (IIT-Delhi) have developed an integrated method for efficient recycling of e-waste to recover precious metals like Silver and gold.



The technology developed by Professor K. K. Pant of Chemical Engineering Department, IIT Delhi carries out laboratory scale pyrolysis of e-waste followed by recovery of individual metals. It can solve the problem of e-waste disposal as well as generate revenue from e-waste by fuel production and metal recovery. The technology has been developed under the Waste Management program of the Department of Science and Technology (DST).

Pyrolysis converts the e-waste into the liquid, gases, and solid product. The liquid and gaseous product can be used as fuel while metals are recovered from solid residue. The extraction of metals is being carried out by hydrometallurgy using different leaching agents and finally, electro deposition will be used if required for individual metal recovery.

This technology which will be useful for the waste management sector, electrical, electronic industries and metal producing industry, is under pilot scale testing and validation. The team is further targeting design of 50 kg/day capacity e-waste recycler.

The patent for the technology has been filed and the researchers are working on the recovery process of individual metals (Cu, Ag, Au) and technology transfer to industries. The technology holds great market potential owing to its unique feature of integrated approach of complete recycling of e-waste and recovery of precious metals without causing any damage to the environment.

E-waste generated worldwide in 2016 was 44.7 Mt and it is expected to grow to 52.2 Mt by 2021. India is fourth largest e-waste producer country and has generated 2 Mt in 2016. The total value of material that can be recycled from worldwide e-waste generated in 2016 was Rs 4670 billion.

However, there is no viable option for complete recycling of e-waste and therefore there is a need for the development of technology which will be eco-friendly and economical. The risk associated with e-waste recycling is the presence of hazardous substances such as antimony, lead, cadmium, arsenic, brominated flame retardants and so on. Therefore, the developed process can minimize hazardous effects due to these substances.

