OPEN ACCESS Freely available online

ISSN: 2090-4568
Journal of Advanced Chemical Engineering

Commentary

Extraction of Precious Metals from E-Waste

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DESCRIPTION

When electronic products like computers, cell phones, televisions, VCRs, stereos, copiers, fax machines, internal chips and other relating materials or devices, reach the end of their existence, they will be considered as electronic waste, else known as "e-waste." E-waste can frequently comprise of several dangerous factors which can include heavy metals like mercury and lead. Despite this reality, gold, as well as other precious metals, also make up a significant quantum of e-waste, and its extraction could have profitable properties for the gold industry.

E-Waste statistics

It is noted that 20-50 million metric tons of e-waste is disposed in around the world every year. Thrown e-waste is estimated to contain over$ 60 million in gold and silver every time. In the United States alone, e-waste accounts for 2 of all trash that is thrown in landfills. E-waste also accounts for 70 of all overall poisonous waste in the United States. Nearly 12.5 of e-waste is found being recycled.

For every 1 million cell phones that are recycled, the following huge amount of precious metals can be recovered.

- 16,000 kg of copper
- 350 kg of silver
- 34 kg of gold
- 15 kg of palladium

Gold extraction by cyanide operation

Since its preface into the mining industry during the 1870s, the use of cyanide in gold filtering or extracting has been a useful technique, but dangerous process of metal extraction. This extraction process involves the chemical reaction between the pulverized-waste and sodium cyanide, which produces a soluble gold cyanide solution that allows for easier extraction of the precious metals. While useful, golden cyanidation remains a controversial methodology that's banned in several countries around the world. Several mining extraction procedures throughout history that have employed this methodology have affected in disastrous cyanide falls that have oppressively affected the environs.

Other Traditional methodologies of Gold Extraction from E-Waste

Acid treatment

The combination of hydrochloric acid and nitric acid has been found to be useful chemicals in the extraction of gold from e-waste. Other mild acids have also been successful in their extraction of gold, as these acids can successfully dissolve gold while limiting their eventuality to affect adverse effects to the environs.

Bioleaching

Microbiological processes have been proposed over the last decade as possible different alternatives to extract the precious metals such as copper, gold, palladium and silver from e-waste. Bacteria's like Thiobacillus ferrooxidans and T. Thio-oxidans, as well as fungi including *Aspergillus Niger* and *Penicillin simplicissimum* have been proved to successfully extract copper, aluminum, lead and zinc from e-waste. *Aspergillus Niger* and *Chromo bacterium biolaceum* are two microorganisms that have been found as suitable and sustainable methodologies of extracting gold from gold plated electronic devices.

Advantages of gold extraction from E-Waste

Not only does the extraction of gold from e-waste greatly reduce the quantity of waste that's carelessly deposited into landfills around the world, but it also provides a new recycling opportunity in an surroundings that desperately needs new sustainable options. The innovative design proposed by the common trouble between EnviroLeac and JabilInc. will reduce up to 50 million tons of e-waste that is thrown into surroundings each year. However, Experimenters believe a significant reduction in both carbon emigrations and other harsh environmental consequences that affect from gold mining will also occur, If similar extraction procedures can reduce the quantum of gold that is mined around the world each time. The eventuality for the recovery of gold and other useful metals from e-waste to profit both the global economy and society at large is unconceivable.

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Received: 05-Jan-2022, Manuscript No. ACE-22-209; **Editor assigned:** 07-Jan-2022, PreQC No. ACE-22-209(PQ); **Reviewed:** 21-Jan-2022, QC No ACE-22-209; **Revised:** 24-Jan-2022, Manuscript No. ACE-22-209(R); **Published:** 01-Feb-2022, DOI:10.35248/2090-4568.22.12.209.

Citation: Chen X (2022) Extraction of Precious Metals from E-waste. J Adv Chem. 12:209