



RECYCLING OF VALUABLE MATERIALS FROM MOBILE PHONES

Task

Mobile phones, like other modern electronics, contain a variety of chemical components that are considered to be valuable or vital raw materials in Europe. At the end of the equipment's life cycle, however, these raw materials are only partly recovered by current recycling processes.

Method

Fraunhofer ILT is coordinating the European network project »ADIR«, in which technological solutions are developed in order to recover the individual substances in an automated process chain. For this purpose, the valuable electronic elements shall be identified and removed selectively so that they can be recycled into separated fractions. The project is testing methods for the processing of mobile phones and of commercially used electronic circuit boards from network technology.

Results

There are two decisive factors needed to selectively recover the raw materials: first, exact knowledge of where and in which components the individual substances are located, and, second, a process for their targeted removal. Laser-based processes can be used for both points. The material identification by means of laser-induced breakdown spectroscopy (LIBS) allows a very precise elemental analysis of the contents

of electronic components. Subsequently, processing lasers are used as a non-contacting tool in order to selectively separate the high-quality components and feed them in pure fractions into the metallurgical processes.

Applications

The »ADIR« project is initially targeted at electronics from the telecommunications sector. By providing a technology for the improved recovery of raw materials, »ADIR« aims to strengthen economically and ecologically attractive recycling of old electronic devices.

The Fraunhofer-Gesellschaft has launched »i-Recycle« as a model project. It will feed all of its discarded business mobile phones from all Fraunhofer institutes into the new recycling processes.

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- 3 Discarded, disassembled mobile phones.
4 Laser-based material analysis of electronic components.