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Dismantling of Printed Circuit Boards by Bioleaching Solution

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Electronic waste is a very complex matrix containing valuables and toxic metals. Some very specific metals like Gallium are mainly used for electronic components while also considered a “critical raw element” by the European Commission. Since those metals are used in small quantities, recovery after grinding is impossible. Consequently, those metals must be recovered by separating the components before the milling process. This separation is called dismantling and is usually done pyrometallurgically. Here we present dismantling by means of bioleaching for the very first time.

Dismantling by bioleaching was compared with solutions containing either ferric or ferrous iron for 20 days. Although bioleaching resulted in a separation of approximately 70 %, the ferric solution reached 100 %; separation by ferrous iron was negligible.

After dismantling, the concentration of critical metals increased by a factor of 3, which can be further increased by discriminating between different components e.g. Integrated circuits resistors, capacitors.