

Ground Breaking Invention on Battery Recycling

Vasudevan Subramanyan*

Senior Principal Scientist, Central Electrochemical Research Institute, India

Researchers have developed a new method to recycle electric vehicle batteries using a ground-breaking new approach that many will have experienced in the dentist's chair.

The project on the recycling of lithium-ion batteries (ReLiB) led by researcher used a new method, involving ultrasonic waves, to solve a critical challenge: how to separate out valuable materials from electrodes so that the materials can be fully recovered from batteries at the end of their life.

Current recycling methods for lithium-ion battery recycling typically feed end-of-life batteries into a shredder or high-temperature reactor. A complex set of physical and chemical processes are subsequently needed to produce useable materials. These recycling routes are energy intensive and inefficient.

If an alternate approach is taken and end-of-life batteries are disassembled rather than shredded, there is the potential to recover more material, in a purer state. The disassembly of lithium-ion batteries has been shown to recover a high yield (around 80% of the original material) in a purer state than was possible using shredded material.

The stumbling block ~ of how to remove and separate critical materials (such as lithium, nickel, manganese and cobalt) from used batteries in a fast, economical and environmentally-friendly way ~ can now be avoided thanks to the new approach which adapts technology currently in widespread use in the food preparation industry.

The ultrasonic delamination technique effectively blasts the active materials required from the electrodes leaving virgin aluminium or copper. The process proved highly effective in removing graphite and lithium nickel manganese cobalt oxides, commonly known as NMC.

The research has been published in Green Chemistry and the research team led by researcher have applied for a patent for the technique. Researcher said: "This novel procedure is 100 times quicker and greener than conventional battery recycling techniques and leads to a higher purity of recovered materials. "It essentially works in the same way as a dentist's ultrasonic descaler, breaking down adhesive bonds between the coating layer and the substrate. "It is likely that the initial use of this technology will feed recycled materials straight back into the battery production line. This is a real step change moment in battery recycling."

Other Researchers Commented: "For the full value of battery technologies to be captured for the UK, we must focus on the entire life cycle ~ from the mining of critical materials to battery manufacture to recycling ~ to create a circular economy that is both sustainable for the planet and profitable for industry."

Researchers have been focused on the life cycle of the battery ~ from their first production to their re-use in secondary applications to their eventual recycling, to ensure that the environmental and economic benefits from Electric Vehicle batteries are fully realised.

The research team are in initial discussions with several battery manufacturers and recycling companies to place a technology demonstrator at an industrial site in 2021, with a longer-term aim to license the technology.

The research team has further tested the technology on the four most common battery types and found that it performs with the same efficiency in each case.

*Corresponding to: S Vasudevan, Senior Principal Scientist, Central Electrochemical Research Institute, India, E-mail: svasudevan@cecri.res.in

Received: June 21, 2021; Accepted: June 24, 2021; Published: June 28, 2021

Citation: Subramanyan V (2021) Ground breaking invention on battery recycling. Int J Waste Resour 11: e400.

Copyright: 2021 © Subramanyan V. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.