

Closed-loop cobalt recycling from spent lithium-ion batteries based on a deep eutectic solvent

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The recycling of LCO is realized in a closed-loop protocol, where the dissolution/extraction of the cobalt element involves no additional precipitates, thus enabling the reusability of the leaching solution. Credit: Journal of Energy Chemistry

Taibai Li, Xiang Ge, and their colleagues from School of Materials and Metallurgy, Guizhou University have reported the efficient closed-loop recycling of the cathode material lithium cobalt oxide (LCO) of lithium-

ion batteries employing ChCl:OA type deep eutectic solvent. The ultrafast leaching process can be achieved in 10 s at 180 °C, and a nearly 100% leaching rate can be achieved in 2 h at 90 °C, which meets the requirements of mild and efficient reaction process design.

Furthermore, DIW is added or evaporated into the leaching solution to achieve direct precipitation of cobalt ions and reversible recovery of the leaching solvent. The cobalt ions may be precipitated as cobalt oxalate phase, annealed, and calcined into LCO material with good crystallinity, and its electrochemical performance is comparable with the commercialized sample. The work was published as a manuscript entitled "Closed-loop cobalt recycling from spent [lithium-ion batteries](#) based on a deep eutectic solvent (DES) with easy solvent recovery" in the *Journal of Energy Chemistry*.

More information: Taibai Li et al, Closed-loop cobalt recycling from spent lithium-ion batteries based on a deep eutectic solvent (DES) with easy solvent recovery, *Journal of Energy Chemistry* (2022). [DOI: 10.1016/j.jechem.2022.05.008](#)

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