

# Selective extraction of cobalt from spent lithium-ion batteries

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## **Abstract**

Lithium-ion battery (LIB) are widely used in electronic products and electric vehicles largely due to the advantages of low price, low memory effect, high power efficiency, and long life cycle. In recent years, an increasing amount of end-of-life LIBs are to be recycled. Extraction of spent LIB has been carried out for recycling of valuable metals such as cobalt. Environmental friendly organic acids such as citric acid was used to selectively extract cobalt. For a better understanding of the cobalt speciation during extraction, in situ synchrotron extended X-ray absorption fine structure (EXAFS) spectra at 323-363 K. Specifically, H<sub>2</sub>O<sub>2</sub> (0-1%) was added during the extraction to obtain desired Co<sup>3+</sup>/Co<sup>2+</sup> ratios that also facilitate the extraction efficiency.

**Keywords:** lithium ion battery, cobalt, extraction, citric acid, EXAFS