

Chemists find new way to create lithium metal electrodes for batteries

May 15 2018, by Jim Shelton



This image shows the schematic structure of a new battery cell with lithium metal electrodes developed at Yale and Donghua University. Credit: Yale University

Researchers at Yale and Donghua University in China have developed a new process for creating lithium metal that may boost the energy and capacity of rechargeable batteries.



Lithium metal is considered the best option as a material for anodes in high-energy batteries, the researchers said, because of the metal's high potential for providing large amounts of energy and capacity in a given mass. Yet existing <u>lithium metal</u> electrodes, limited by low capacity and utilization efficiency, have not come close to reaching that potential.

In a new study May 14 in the journal *Proceedings of the National Academy of Sciences*, a team led by Yale's Hailiang Wang describes a new approach to creating more efficient <u>lithium metal electrodes</u>. The process yields a protective layer that enables lithium <u>metal</u> anodes to be efficiently discharged and charged at high capacities.

Based on the new process, the researchers constructed a battery cell that outperforms other laboratory-scale battery cells, as well as state-of-the-art <u>lithium</u>-ion batteries on the market.

Hailiang Wang is an assistant professor of chemistry and a member of the Energy Sciences Institute at Yale's West Campus. The first author of the study is Qiuwei Shi, a graduate student at Donghua and visiting student at Yale. Additional authors are Yiren Zhong and Min Wu from Yale and Hongzhi Wang from Donghua.

More information: Qiuwei Shi et al. High-capacity rechargeable batteries based on deeply cyclable lithium metal anodes, *Proceedings of the National Academy of Sciences* (2018). DOI: 10.1073/pnas.1803634115

Provided by Yale University

Citation: Chemists find new way to create lithium metal electrodes for batteries (2018, May 15) retrieved 27 April 2024 from



https://phys.org/news/2018-05-chemists-lithium-metal-electrodes-batteries.html

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