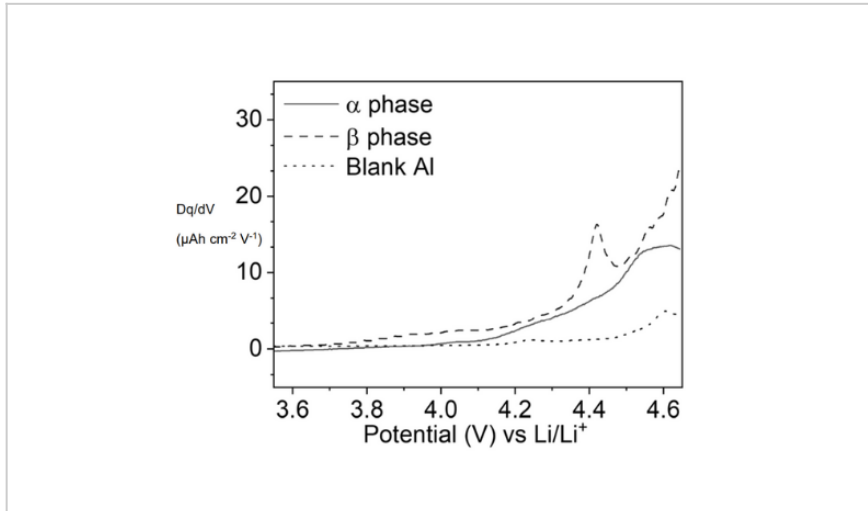


Direct Electrochemical Extraction of Lithium from Spodumene Ores

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PennState



TECHNOLOGY READINESS LEVEL

4

Seeking

Licensing |

Keywords

- Electric Vehicle
- Li-ion Batteries
- Electronic Devices
- Lithium
- Spodumene Ores
- Electrochemical Leaching

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Technology Summary

Penn State researchers are developing an electrochemical leaching method that directly extracts lithium from α phase spodumene without the need for phase transformation, offering a more energy-efficient and environmentally friendly approach to lithium extraction. The system consists of a current collector with lithium-bearing materials, carbon or metal-based electrodes, and an electrolyte. Applying an oxidation voltage to the current collector allows for the electrochemical leaching of lithium ions into the liquid phase. To improve the leaching process, a promoter such as O_2 , O_3 , H_2O_2 , and others, can be added. Additionally, a multi-functional current collector with a large surface area and hydrogen peroxide production capability is introduced for scale-up leaching. The method also enables efficient extraction of lithium from various sources other than ores, including from waste streams and recycled materials.

Application & Market Utility

This innovation can be widely used in industries that are producing lithium for use in Li-ion batteries for electronic devices and electronic vehicles as well as for other applications that consume lithium such as aluminum alloys for airplanes and air-cooling systems.

Next Steps

Seeking collaboration and/or licensing opportunities to further develop and establish commercial testing.



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