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# lithium-mining-from-brine-faq

Infinity Turbine  
LLC

## Lithium Mining from Brine FAQ



This webpage QR code

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Lithium Mining from Brine FAQ

PDF Version of the webpage (first pages)

<https://infinityturbine.com/lithium/lithium-mining-from-brine-faq.html>

## How much lithium is mined from brine versus the ground

Lithium brine deposits represent about 66 percent of global lithium resources and are found mainly in the salt flats of Chile, Argentina, China and Tibet.

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## Where is lithium mined

Lithium deposits are traditionally mined from rock and brine, which is lithium-rich water. Another mining method is using water that is a byproduct of geothermal heat plants. This can solve two problems at once by creating emissions-free geothermal energy and utilizing lithium at the same time. Lithium is prolific.

## **Is there lithium in seawater**

With lithium in short supply on land and concentrated in just a handful of countries, researchers are looking for ways to mine the element from the oceans, which collectively hold 5,000 times as much lithium as that found on land. Today's commercial methods for mining lithium include extracting the metal from briny lakes and underground sources of concentrated salt water. Producers pump subsurface brine into large evaporation ponds and let it sit for a year or two, as sunlight slowly evaporates the water and concentrates the salts. They eventually treat the brine chemically to precipitate lithium carbonate, then filter and dry the mineral. That method is less expensive than the other common industrial method—extracting the metal from lithium-bearing mineral ores.

## **Is there lithium in the oceans**

Seawater could come to the rescue. The world's oceans contain an estimated 180 billion tons of lithium. But it's dilute, present at roughly 0.2 parts per million. Researchers have devised numerous filters and membranes to try to selectively extract lithium from seawater. But those efforts rely on evaporating away much of the water to concentrate the lithium, which requires extensive land use and time. To date such efforts have not proved economical.

## Can we harvest lithium from seawater

Enriching the lithium content in seawater via an electrochemical cell. The research team from KAUST developed an electrochemical cell containing a ceramic membrane composed of lithium lanthanum titanium oxide (LLTO), whose crystal structure possesses holes wide enough to allow lithium ions to move through, while also blocking the larger metal ions. The cell is comprised of three compartments: First, seawater flows into the central feed chamber, and then positive lithium ions move through the LLTO membrane, and into an adjacent compartment equipped with a buffer solution, in addition to a copper cathode coated in ruthenium and platinum. The researchers then alter the pH of the solution, creating a solid lithium phosphate that only contains traces of other metal ions. In other words, the final product is pure enough to fall within all-electric vehicle battery manufacturers' standards to build. This process would require only five dollars of electricity to extract 2.2 lbs (1 kg) of lithium from seawater. Five dollars. And, the value of chlorine and hydrogen produced from the cell would more than pay for the cost, leaving residual seawater to be used in desalination plants to offer freshwater.



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