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## A Review Study on Lithium Extraction from Geothermal Brine Reservoirs

Alkali metal lithium is recognized as one of the most important and highly valuable metals, utilized extensively in energy production and industry. Among the various sources for lithium extraction, such as seawater, hydrothermal clays, and pegmatites, geothermal brine reservoirs hold significant potential for lithium recovery. However, several challenges impede the development of lithium extraction methods from geothermal reservoirs. These challenges include sustainable production over time, environmental concerns, cost, and appropriate separation techniques. This study briefly addresses the economic challenges of lithium production from geothermal wells, highlighting its potential for long-term, environmentally friendly co-production of geothermal energy and lithium. The findings indicate that at lithium concentrations above 1 gr/L, the extraction efficiency from geothermal brine exceeds 90%. Moreover, lithium extraction using adsorbents demonstrates high efficiency and environmental compatibility.

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