

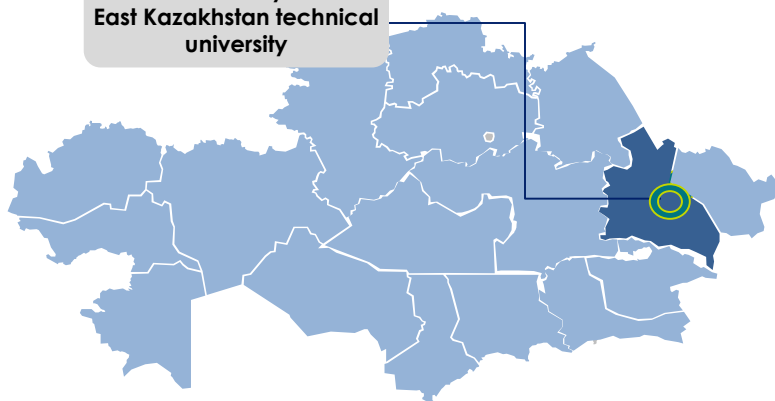


PRODUCTION OF BATTERY GRADE LITHIUM COMPOUNDS IN EAST KAZAKHSTAN



LOCATION

D. Serikbayev
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university



PRODUCT

ANNUAL PRODUCTION CAPACITY **lithium carbonate with a productivity of 5 kg / day**

GLOBAL DEMAND **25 THOUSAND TONS OF SPODUMENE CONCENTRATE**

Valuation Metrics

REQUIRED INVESTMENT **US\$3,6 MILLION**

PROJECT IMPLEMENTATION PERIOD **2 YEARS**



THE PROJECT

Production of lithium compounds from technogenic mineral formations (TMF) of East Kazakhstan includes: exploration and extraction works at lithium-containing tailings and deposits; hydrometallurgical production of battery grade lithium compounds by processing lithium-containing technogenic mineral formations (TMF) and ores to produce lithium carbonate with a productivity of 5 kg / day. Full research to establish exact lithium reserves in Kazakhstan has not yet been performed. Significant lithium reserves are concentrated in tailings from rare-metal fields in East Kazakhstan. There are studies confirming the possibility of obtaining lithium carbonate and hydrocarbonate from Kazakhstan's technogenic mineral formations (TMF), suitable for further production of lithium batteries.



RESERVES

In order to develop a feasibility study on costs and benefits of organizing this type of production, it is necessary to estimate reserves of technogenic mineral formations (TMF) of the Belogorskiy mining complex. In total, Belogorskiy mining complex has six sections, the total waste volume of which is 1,166,033 cubic meters. According to the available author's reports, in addition to previously mined tantalum, niobium and tin, technogenic mineral formations (TMF) of Belogorskiy mining complex contain lithium, rubidium, and cesium. Also, there are mica and ceramic raw materials. In the dump fields of Belogorskiy mining complex, the recovered resources are as following (in tons) : lithium – 13466, beryllium – 14672, tantalum – 1888, niobium – 2259, tin – 15246. Ak-Kezen tailing is one of the most promising one. Reserves of tailing1 is 700 thousand tons and tailing2 is 642.9 thousand tons. Reserves were last estimated in 1997. Lithium content in technogenic mineral formations (TMF) of the Ak-Kezen tailing is 0,14%.



TECHNOLOGICAL ASPECTS

A reactor variant of sulfation of spodumene with sulfuric acid at 110 ° C was developed. The resulting lithium carbonate contained 97% of the basic substance. The classical bicarbonate refining of technical lithium carbonate was tested with the production of lithium carbonate with a basic substance content of 99%. When creating a process flow diagram (PFD) for lithium hydrometallurgy, a PFD for the hydrometallurgical production of beryllium hydroxide and its processing into ammonium fluoroberyllate used at Ulba Metallurgical Plant JSC can be taken as a basis. In the 1990s this PFD was successfully tested for processing 23 tons of spodumene concentrate of Belogorskiy mining complex, which gave 115 kg of lithium carbonate and 65 kg of lithium fluoride.



INVESTMENT OPPORTUNITY

The team of D. Serikbayev East Kazakhstan technical university conducted several studies and has been working on attracting partners for the project implementation.