

## AXIONIT «LI-SORB» ADSORBENT FOR SELECTIVE RECOVERY OF LITHIUM FROM BRINES. DLE TECHNOLOGY.

By

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### ABSTRACT

Increasing lithium production, including solar evaporation, cannot currently be achieved solely by the traditional method, because it has a number of limitations such as dependence on weather conditions, high time costs, limited space and huge footprint of facilities as well as low efficiency with high Mg / Li ratio and environmental impact. Also, in places where lithium is extracted from geothermal waters, clays as well as formation waters of oil fields, traditional technologies do not fit.

Axion – Rare and Noble Metals is an innovative company engaged in the development and production of new ion-exchange resins and adsorbents under the AXIONIT™ trademark for the selective extraction of rare, rare-earth and precious metals. To meet the needs of the worldwide Lithium producers, Axion developed ion-exchange resin AXIONIT™ Li-Sorb as well as sorption technologies for direct lithium extraction. Our technology allows extract lithium from brines, geothermal waters, clays and formation waters of oil fields in wide ranges of temperatures and pH.

Our technology of lithium recovery consists of the following stages Lithium Raw Materials - Filtration from mechanical debris – Sorption/Stripping - Reverse Osmosis – Evaporation - Recovery Impurities-Precipitation, Sorption is a key stage at this process. Our sorbent is showing high sorption capacity up to 10 g/l, high purity of eluate up to 95% as well as excellent performance stability. Also, AXIONIT™ Li-Sorb increases lithium concentration in solution.

We produced several pilot facilities and currently are starting to design industrial plants.

The results of one of the pilot tests are presented below.

	Li, mg/L	Ca, mg/L	Mg, mg/L	Na, mg/L	SO <sub>4</sub> , mg/L	B, mg/L
Raw brine	402	950	4080	107500	6220	325
Eluate	489	15	146	268	7	90

Li Recovery total, % (on base depleted brine)	95% (average)
Sorption capacity g/liter of sorbent	5

According to the results one of our pilot projects in South America and client research, AXIONIT™ Li-Sorb has shown the best results among the sorbents tested by the client and can rightfully be considered the best on the market.

*Keywords: Lithium, Direct Lithium Extraction, Sorbent, Ion-Exchange Resin, Lithium Carbonate*