

ERAMET Lithium direct extraction process

F. Burdet¹, D. Beltrami², A. Charlot³, G. Martin⁴ and A. Vascon⁵

1. Head of Hydrometallurgy Department, ERAMET Ideas, 1 avenue Albert Einstein, 78190 Trappes, FRANCE, fabien.burdet@eramet.com

2. Hydrometallurgy Senior Research Engineer, ERAMET Ideas, 1 avenue Albert Einstein, 78190 Trappes, FRANCE, denis.beltrami@eramet.com

3. Process & Operation Engineer, ERAMINE Sudamerica, Av. Luis Maria Campos 46 – Piso 10 Palermo, C 1425 Ciudad de Buenos Aires, ARGENTINA, alexandre.charlot@eramet.com

4. Hydrometallurgy Expert, ERAMET Ideas, 1 avenue Albert Einstein, 78190 Trappes, FRANCE, guillaume.martin@eramet.com

5. Hydrometallurgy Research Engineer, ERAMET Ideas, 1 avenue Albert Einstein, 78190 Trappes, FRANCE, alessio.vascon@eramet.com

ABSTRACT

The ERAMET group, specialized in nickel, manganese, high-performance alloys and mineralized sands, is currently developing a lithium project to diversify its metals portfolio.

Exploration campaigns carried out by ERAMINE Sudamerica (a 100% Argentinian subsidiary of ERAMET) have highlighted the potential of the Centenario-Ratones salar located in the province of Salta in northwest Argentina. This deposit, located at an altitude of 3800 metres and extending 60 km long and 6 km wide, contains a lithium-rich brine that can support a major industrial project.

ERAMET first studied the “conventional” process based on natural evaporation. Although the technical feasibility of such a process has been validated, the contrasting economics of this option and its high environmental impact have led ERAMET to choose a more efficient and environmentally friendly solution: the direct extraction of lithium.

ERAMET then partnered with Institut Français du Pétrole Energies Nouvelles (IFPEN) to develop an active material that can selectively extract lithium directly from the natural brine pumped from the salar aquifer. This material produces a lithium rich solution that is pre-purified and pre-concentrated thanks to membrane separation technics. After a final concentration and further purifications this solution is converted to battery grade lithium carbonate.

This process allows ERAMET to benefit from a more competitive and environmentally friendly lithium carbonate production pathway compared to the “conventional” process:

- High overall extraction efficiency, more than 85% compared to 40-60% for the conventional process
- No waiting time due to natural evaporation
- Better hydric balance of the salar thanks to the higher lithium recovery yield of this process
- Simplified downstream part of the process due to the selectivity of the active solid
- Less solid residues produced
- Reduced footprint

Keywords : lithium extraction material, solid-liquid extraction, membrane separation technics, lithium carbonate