



SysCAD

Design | Operate | Optimise

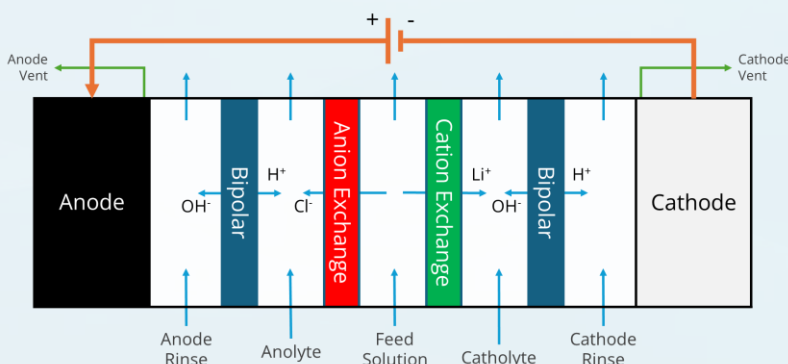
Power Up Your Lithium Processing Models

- SysCAD is a powerful, industry-proven platform for design, optimisation, and operational support of lithium plants.
- Supporting advanced purification methods from ore and brine sources, SysCAD enables steady-state and dynamic simulation of the entire lithium extraction and processing lifecycle.
- A quality SysCAD model provides a robust framework to leverage your process expertise and decades of industry research to improve product quality and reduce costs.

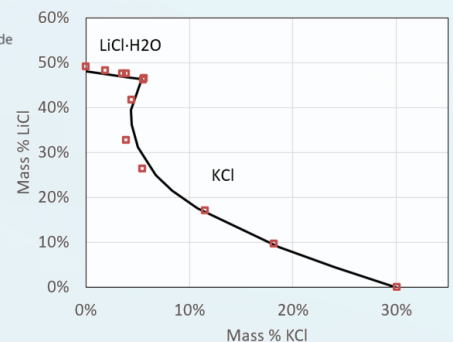


Integrated Thermodynamic Calculation Engines (TCEs)

- Seamless integration with leading thermodynamic packages, including PHREEQC, AQSol, OLI, and ChemApp, enabling accurate prediction of solution properties such as phase equilibria, pH, and scaling potential.
- Flexible and TCE-enabled unit models for detailed simulation of:
 - Ponds & Evaporators
 - Ion Exchange / DLE
 - Resin Regeneration
 - Reverse Osmosis
 - Nanofiltration
 - Electrodialysis
 - Crystallisation



Bipolar electrodialysis for recovery of LiOH and HCl from LiCl



— LiCl-KCl-H₂O solubility isotherm at 50°C (AQSol)
 ■ Experimental data (Plyushchev et al., 1959)

Smarter Lithium Processing

Backed by comprehensive documentation, practical lithium example projects, and our team’s technical expertise in thermodynamics, extractive metallurgy and process simulation.



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Key Applications

Direct Lithium Extraction (DLE)	Simulate ion exchange and adsorption using integrated TCEs, including custom isotherms, competitive sorption models, and kinetics. Model loading, washing, elution, and regeneration cycles to optimise lithium recovery and resin usage.
Membrane-Based Separation	Model nanofiltration, electrodialysis, and reverse osmosis, assessing ionic permeance, osmotic pressure, and stack configuration. Evaluate effects of applied pressure, current density, and impurities on recovery, energy use, and scaling risk.
High-Temperature Ore Conversion	Detailed thermochemistry and free energy minimisation for spodumene calcination, acid roasting, and leaching. Analyse energy consumption, reaction extents, and impacts on downstream lithium recovery and impurity control.
Evaporation & Crystallisation	Simulate evaporation ponds with real environmental data (rainfall, temperature, humidity). Predict volume changes, brine concentration, and salt precipitation. Model crystalliser performance, product purity, and the impact of recycle streams.
Dynamic Process Modelling	Use SysCAD dynamic solver to test control logic, level management, and equipment interaction. Model buffer tanks, flow balancing, and plant response to process upsets. Applications in process tuning, commissioning and operator training.

