

Electrolyte Distillation Purification And Formulation Educational Pilot Plant

Item Number: LPK-CSOCL2



Introduction

Integrated bench-to-pilot scale educational pilot plant for electrolyte distillation, purification, and formulation with borosilicate glass construction, PLC automation, touchscreen HMI, and advanced industrial safety features for hands-on chemical process training, ideal for chemical engineering and materials science curricula.

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Unit Operation / Module	Technical Features & Key Components	Target Experimental Learning Outcomes	Corresponding Curriculum Concepts
Distillation Unit	High-borosilicate glass column, corrosion-resistant packing, heating mantle, and condenser.	Study of fractional distillation, reflux ratio control, vapor-liquid equilibrium (VLE) evaluation, and column efficiency calculations.	Distillation, Mass Transfer Operations, Phase Equilibrium
Dehydration & Crystallization Unit	Temperature-controlled crystallization vessel, wall-scraping stirrer, and vacuum dehydration assembly.	Removal of crystalline water, investigation of crystallization kinetics, and heat transfer analysis in agitated vessels.	Crystallization, Heat Transfer, Drying Processes
Formulation & Blending Unit	Agitated formulation vessel, chemical dosing systems, and product storage receivers.	Precision blending, liquid-liquid mixing dynamics, viscosity verification, and process mass balance.	Agitation and Mixing, Fluid Mechanics, Mass Balances
System Control & Safety Interface	Touchscreen HMI, PLC data acquisition, three-color warning light, and corrosion-resistant valve manifolds.	Real-time process monitoring, sensor calibration, automation loop analysis, and emergency shutdown procedures.	Process Dynamics and Control, Industrial Chemical Safety