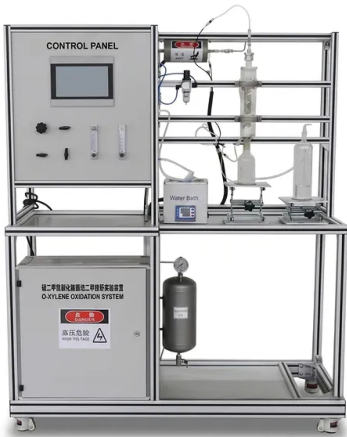


O-Xylene Oxidation To Phthalic Anhydride Educational Unit Operations Pilot Plant

Item Number: LPK-COPA



Introduction

Explore our bench-scale educational pilot plant for o-xylene oxidation to phthalic anhydride, featuring a fixed-bed tubular reactor with visual observation, precise temperature control, and safety systems, ideal for chemical engineering hands-on training and industrial simulation, designed for university unit operations.

[Learn More](#)

Parameter	Specification
Reactor Type	Fixed-bed tubular reactor
Reactor Material	High-temperature resistant glass (up to 500°C)
Reactor Dimensions	Inner Diameter: 20 mm
Operating Pressure	Atmospheric pressure
Temperature Control	Integrated modular program control with ±1°C accuracy
Safety Systems	Thermocouple sensors, pressure gauges, over-temperature alarm, 5L buffer tank
Auxiliary Equipment	Preheater, air filtration system, product trapping device
Frame Material	Industrial-grade aluminum alloy
Dimensions	1480 mm × 580 mm × 1800 mm

Educational Module	Key Concepts & Transport Phenomena	Relevant Textbook Concepts
Heterogeneous Catalysis & Kinetics	Catalyst bed activation, gas-solid reaction kinetics, space velocity, conversion rate, and product selectivity.	Solid-catalyzed reactions, rate equations, and catalyst deactivation in <i>Elements of Chemical Reaction Engineering</i> .
Fixed-Bed Reactor Heat Transfer	Radial and axial temperature profiles, heat dissipation in exothermic packed beds, and prevention of thermal runaway.	Heat transfer in packed beds and heat exchangers in <i>Unit Operations of Chemical Engineering</i> and <i>Transport Processes and Unit Operations</i> .
Process Control & Instrumentation	Feedback loop configuration, PID temperature control, flow rate monitoring, and safety interlock systems.	Instrumentation, process control loops, and safety systems in <i>Chemical Engineering Design</i> .
Mass Transfer & Phase Separation	Gas-phase reactant distribution, product condensation, trapping efficiency, and mass balance calculations.	Gas-solid mass transfer and condensation processes in <i>Unit Operations of Chemical Engineering</i> .