Optimization Ace
COMPANY LIMITED

JALON

Shaping the Future of PX Separation with Zeolite Molecular Sieves

JALON

PART 1: Who We Are

PART 2: What We Make

PART 3: Jalon Difference

PART 4: Why JALON

Who We Are

Luoyang Jalon Micro-nano New Materials Co., Ltd.

Founded: 1998 **Listed: ShangHai Exchange**

Expertise: R&D, Production, Zeolite Molecular Sieve

Administration Building

R&D center

Warehouse

Manufacturing plant

JALON

ISO 9001 | 14001 | 45001

JALON (THAILAND) CO., LTD.

the 1st Molecular Sieve Manufacturer in Thailand

2025

Development

2020

Groundbreaking Ceremony
of Jalon (Thailand) Co., Ltd.

2021

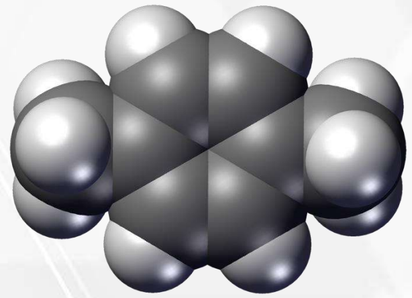
Jalon Thailand Started Operation
T1&T2 Automatic Production Line

2024

Expansion Project Completed
T3&T4 Automatic Production Line
Activated Zeolite Power Production Line

2025

Molecular Sieve
for
P-Xylene Separation



LOCATION

WHA Eastern Seaboard Industrial Estate 2

100 KM

1 h 30 min.

40 KM

40 min.

No. 890/68 Mu 3, Khao Khan Song,
Si Racha, Chon Buri, Thailand, 20110.

Production Capacity	**Molecular Sieve: 24,000 tons** **Activated Zeolite Powder: 3,000 tons**

JALON AUTOMATED WAREHOUSE

Aerial View

Land area: 52.25K M^2 Investment: 1.368 B THB

4 Warehouses, 5 production lines, 100 Employees

leading molecular sieve manufacturer in the world

Certificate of Registration

This certificate has been awarded to

JALON (THAILAND) CO., LTD.

890/68, Mu 3, Khao Khan Song, Si Racha, Chonburi, 20110, Thailand

In recognition of the organization's Quality Management System which complies with

ISO 9001:2015

The scope of activities covered by this certificate is defined below

Manufacturing of Zeolite Molecular Sieves.
(Excludes Product Design under Clause 8.3)
- [USI LWFKWG]

CERTIFICATE

The Governing Board of
ARES International Certification Co., Ltd.
Hereby Grants To:

Jalon（Thailand）Co., Ltd.

NO. 890/68 M.3, KHAOKANSONG SUB-DISTRICT, SRIRACHA DISTRICT, CHONBURI PROVINCE, THAILAND, 20110.

Has been assessed and found to be in accordance with the requirements of standard detailed below

ISO 45001:2018

Scope

Manufacturing of Zeolite Molecular Sieve

Certificate No.: ARES/TW/I22050135
Certificate Issue Date: 2022-05-05
Registration Expiration Date: 2025-05-04

The time interval between each surveillance audit and the last on-site audit shall not exceed 12 months, and the organization must obtain "surveillance audit approval notification" issued by ARES to ensure the validity of the certificate.

Authorized by :

ARES International Certification Co., Ltd.
No.12-2, Ln. 187, Wenping Rd., Anping Dist., Tainan City 708, Taiwan
TEL/ 06-295 9696 (Rep. Line) FAX / 06-295 9667
www.ares-registration.com

CERTIFICATE

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NO. 890/68 M.3, KHAOKANSONG SUB-DISTRICT, SRIRACHA DISTRICT, CHONBURI PROVINCE, THAILAND, 20110.

Has been assessed and found to be in accordance with the requirements of standard detailed below

ISO 14001:2015

Scope

Manufacturing of Zeolite Molecular Sieve

Certificate No.: ARES/TW/I2205013E
Certificate Issue Date: 2025-05-05
Registration Expiration Date: 2028-05-04

The time interval between each surveillance audit and the last on-site audit shall not exceed 12 months, and the organization must obtain "surveillance audit approval notification" issued by ARES to ensure the validity of the certificate.

Authorized by :

ARES International Certification Co., Ltd.
No.12-2, Ln. 187, Wenping Rd., Anping Dist., Tainan City 708, Taiwan
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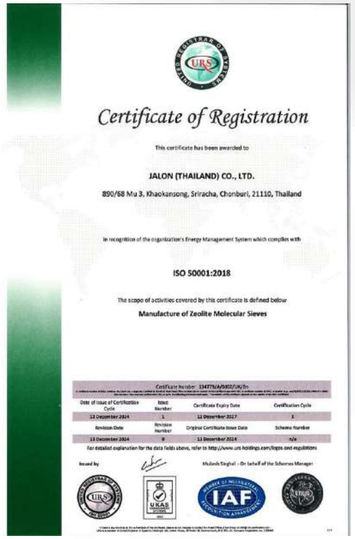


Certificate of Registration

This certificate has been awarded to

JALON (THAILAND) CO., LTD.

890/68 Mu 3, Khaokansong, Sriracha, Chonburi, 21110, Thailand

In recognition of the organization's Energy Management System which complies with

ISO 50001:2018

The scope of activities covered by this certificate is defined below

Manufacture of Zeolite Molecular Sieves

Certificate of Registration

This certificate has been awarded to

JALON (THAILAND) CO., LTD.

890/68, Mu 3, Khao Khan Song, Si Racha, Chonburi, 20110, Thailand

In recognition of the organization's Quality Management System which complies with

IATF 16949:2016

The scope of activities covered by this certificate is defined below

Manufacturing of Zeolite Molecular Sieves.
(Excludes Product Design under Clause 8.3)
- [USI LWFKWG]

dun & bradstreet

This Certificate is presented to

JALON (THAILAND) COMPANY LIMITED
No. 890/68 Mu3, Khao Khan Song Sub-District, Si Racha District, Chon Buri Province, Thailand 20110

D-U-N-S REGISTERED

D&B D-U-N-S Number 66-294-2474

In recognition of their direction towards global business excellence with their company's operational records verified by Dun & Bradstreet. The D&B Data Universal Numbering System. Number granted here is a global business identifier to authenticate the existence of the company for better enhancement of trust and to facilitate global business transactions.

Miss Mina Intanate
D&B (Thailand) Co., Ltd.
Chief Operating Officer

Date of Issue : 09 January 2025
Valid Until : 08 January 2026

COMMITTED

ecovadis

Sustainability Rating

JUL 2024


أدنوك
ADNOC


中国石化
SINOPEC


PetroChina


Axens
Powering integrated solutions


Linde


AIR
PRODUCTS


MESSER
Gases for Life


Air Liquide


Atlas Copco

What We Make

Molecular Sieve

Industry	Applications	Recommended Product
Petrochemical	Separate P-xylene from Xylenes	JLPS-100
Industrial Gas Purification	CO Removal VOCs Removal CO_2 Capture	JLCOS ZSM-5 JLCO-1

Industry	Applications	Product
Petrochemical	Cracked Gas Dehydration	3A
	Catalyst Protection	13X, 4A
Natural Gas	Dehydration	3A, 4A
Refinery	Desulfurization	4A, 13X
Hydrogen	Hydrogen Purification	5A, JLWN5, JLOX-200
Alcohol	Ethanol Dehydration	3A
Solvent	Alcohol and Solvent	3A, 4A
Industrial Gas	Air Pre-Purification_PPU	13X, JLOX-300, JLPM
Oxygen Generation	PSA / VPSA	JLOX-500, JLOX-103A,
	Medical Oxygen	JLOX-101A, JLOX-501A

Jalon Difference

CUSTOMIZATION

Master the CORE technology of the whole industrial chain of molecular sieve production:

- Possess the **CORE** technology of complete chain of molecular sieve, from zeolite powder synthesis, ion exchange modification, to molecular sieve production.
- Crystal type (LTA, FAU, CHA, MFI, HEU, etc.), silicon-aluminum ratio (2-∞), crystal size (D50=0.5-10μm), cation type (Na+, K+, Ca2+, Li+, Ag+, Ba2+, etc.), and pH are all controllable.
- Products can be customized and developed according to customer needs to meet the individual needs of different customers and different application.

JALON RESEARCH AND DEVELOPMENT

Advanced Analytical Instruments

X-ray diffractometer
(XRD)

X-ray Fluorescence
(XRF)

Scanning Electron Microscope
(SEM)

Laser particle size analyzer

Physical adsorption
instrument BET

Chemical adsorption
instrument

It has a total of 332 sets of various analytical testing instruments and equipment, with a total value of 20.465 million yuan.

Crystal structure;
crystal size;
crystal morphology;
Elemental composition;
Skeleton acidity;
water adsorption capacity;
BET adsorption;
Specific surface area, pore volume, pore size distribution;
Various gas adsorption isotherms;
compressive strength;
Bulk density;
wear rate;
trace water analysis;
…

It can meet the analysis and testing of various raw materials, process control, and final product physical and chemical indicators in the molecular sieve development process and daily production process.

Advanced Evaluation Platforms

Kinetic TSA

TSA Breakthrough

PSA oxygen generator
30Nm^3/h

VPSA oxygen generator
30Nm^3/h

Evaluation device of Diesel vehicle exhaust denitrification catalyst

Carbon monoxide purification, hydrogen purification, carbon dioxide purification, methane purification evaluation equipment

Provide product performance optimization and technical support

Molecular Sieve

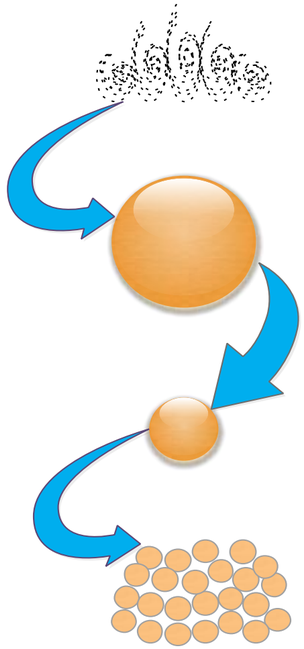
JLPS

P-Xylene Separation

Molecular Sieve for P-Xylene Separation

Innovative multi-stage technology for high mechanical strength and low-wear sphere shaping, integrated with fully automated equipment, ensures consistent and stable quality across batches while significantly boosting adsorbent production capacity.

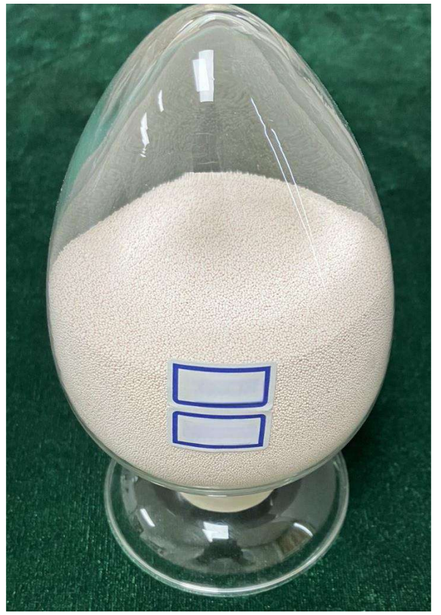
Multi-Stage Sphere Forming Technology



Automated Production

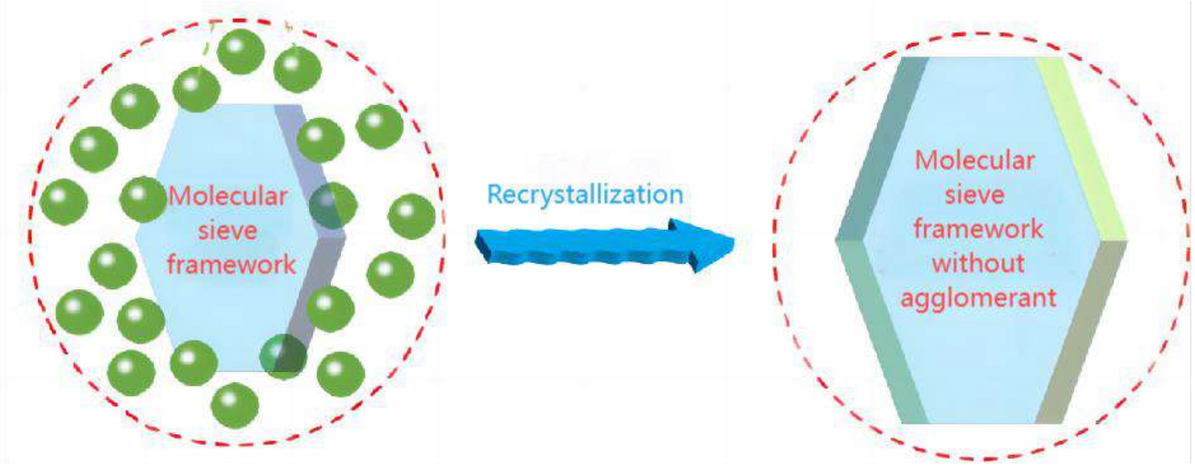
*This machine is in Thailand

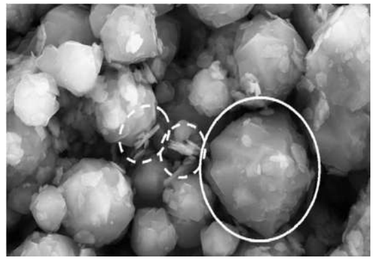
High-Strength, Low-Attition

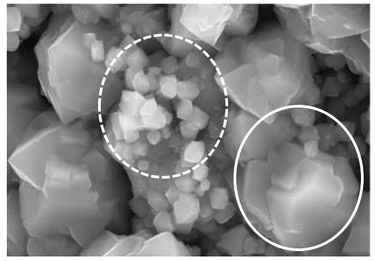


Highly Crystalline & Binder-free

By optimizing the shaping formula and crystallization process parameters and using a proprietary crystallization solution, the full crystallization technology for NaX matrix spheres has been developed. This process transforms non-adsorptive binder impurities into effective FAU crystals, enhancing the performance of the adsorbent while ensuring its mechanical strength.



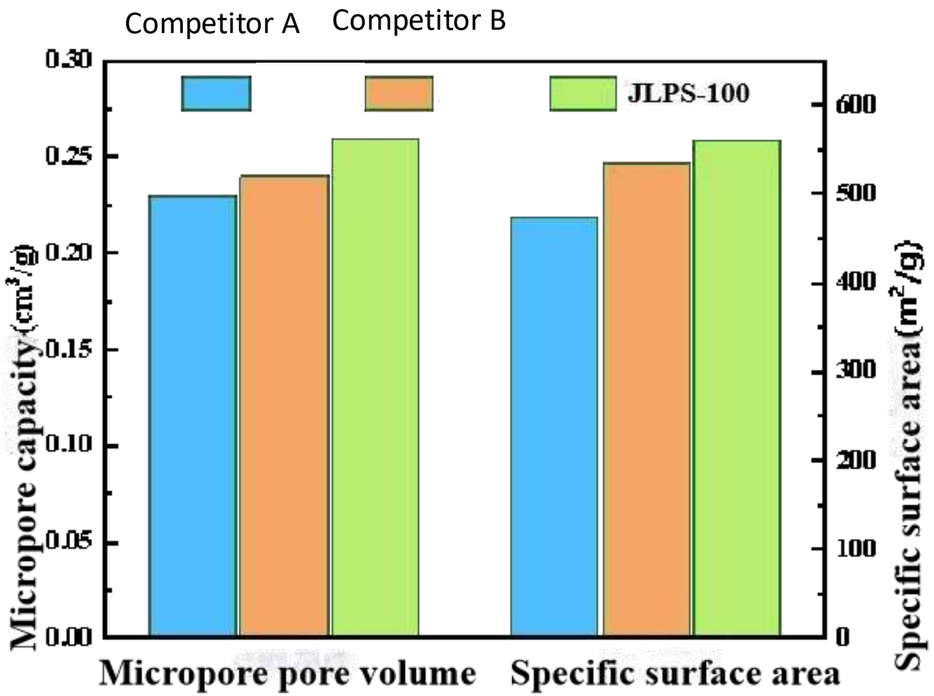


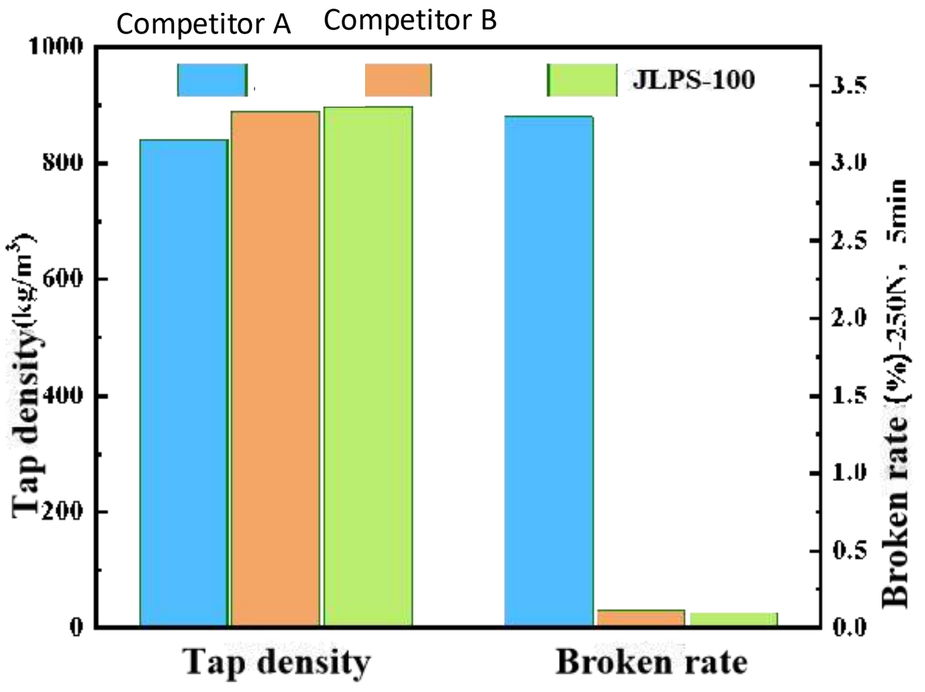


Project	Unit	Detection Index	
		Precrystallization	After Crystallization
Static Toluene Adsorption	mg/g	205	230
Micropore Specific Surface Area	m^2/g	501.13	543.29
Microporous Pore Volume	m^3/g	0.263	0.280
Crystal Size	μm	< 1	< 1

Performance Comparison

JLPS-100 Adsorbent Lab-Scale Evaluation

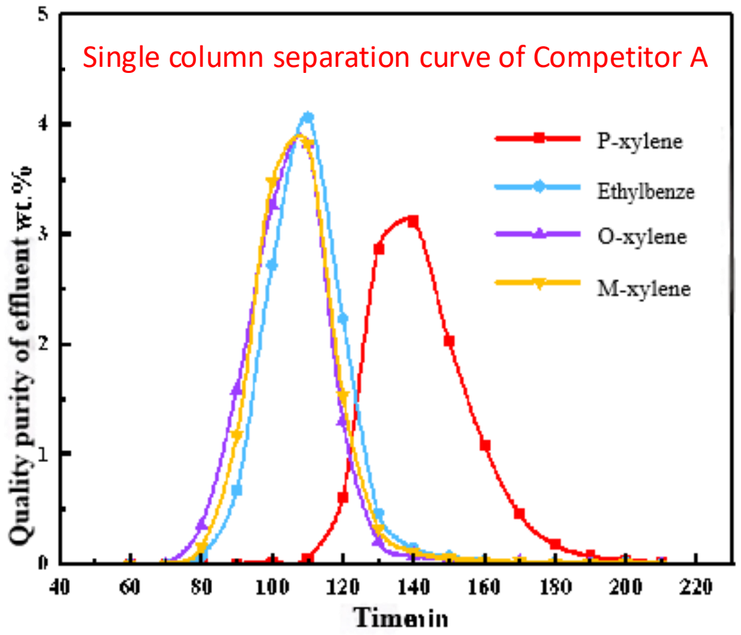


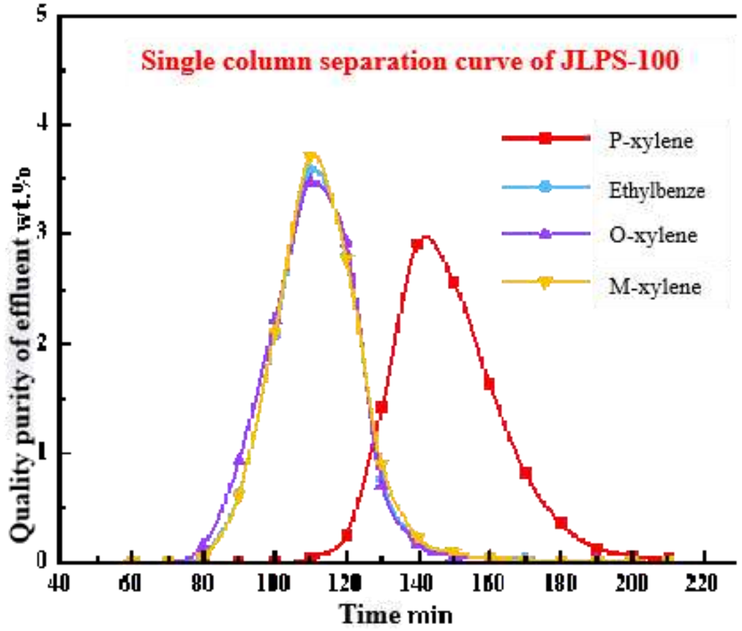


Compared with the competitor's PX adsorbents, the new generation JLPS-100 series features a higher specific surface area and micropore volume, as well as enhanced strength, reaching an advanced industry level.

Performance Comparison

JLPS-100 Adsorbent Lab-Scale Evaluation





Sorbent	Aeparate Rate	Saturated Adsorption Capacity of Aromatic Hydrocarbons mg/g
Competitor A	1.1	182
Competitor B	1.2	189
JLPS-100	1.2	190

- A fixed bed was used for the bench-scale evaluation of the JLPS-100 adsorbent, where the separation performance was comparable to that of the competitor's adsorbent.
- Further measurements showed that the aromatic hydrocarbon saturation adsorption capacity of the JLPS-100 adsorbent was 190 mg/g, also comparable to that of the competitor's adsorbent.

Performance Comparison

JLPS-100 Adsorbent Pilot-Scale Evaluation

A full-process pilot test using simulated moving bed (SMB) technology was conducted with real PX feedstock from a partner. Following adsorption separation, the extract and raffinate components underwent continuous distillation to recover the desorbent, producing the final product while enabling desorbent recycling.

Component	Content wt.%
P-xylene	18.39
Ethylbenzene	6.33
M-xylene	41.97
O-xylene	33.21
Non-aromatic Hydrocarbon	0.09
Carbonyl ppm	＜1
S ppm	＜1
N ppm	＜1
Total	100

PX Sample

Project	Value
Experimental facility	SMB with 24 columns
Loading volume of adsorbent	3L
Xoning of bed	7(I) - 9(II) - 5(III) -3(IV)
Desorption agent	P-diethylbenzene
Temperature	177℃
Pressure	0.8MPa

SMB Experimental Conditions

Performance Comparison

JLPS-100 Adsorbent Pilot-Scale Evaluation

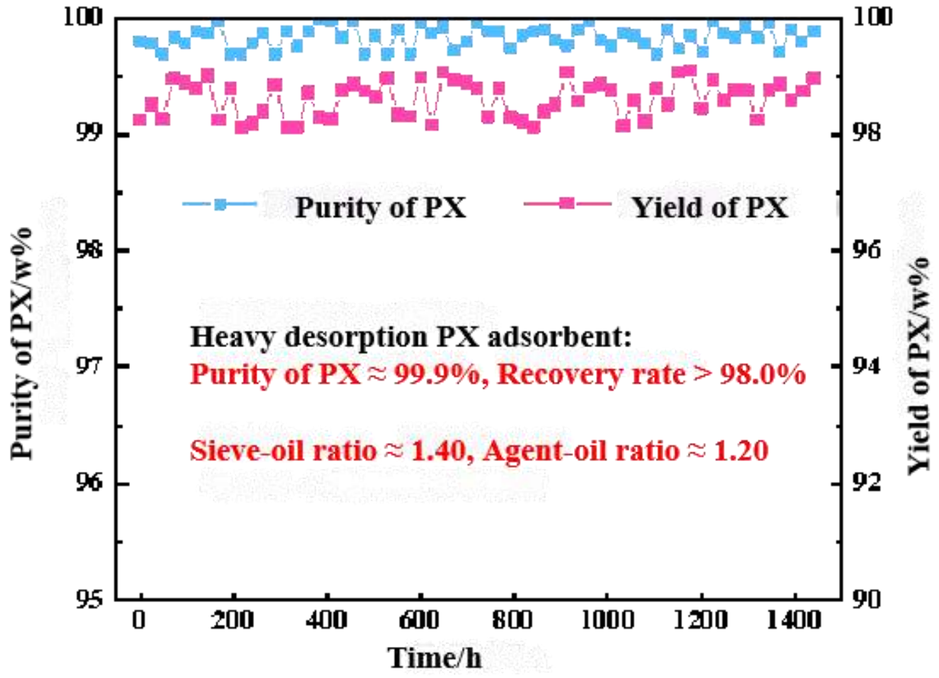
Product Separation Performance of JLPS-100 under Different Adsorbent-feed and Desorbent-Feed Ratio Conditions

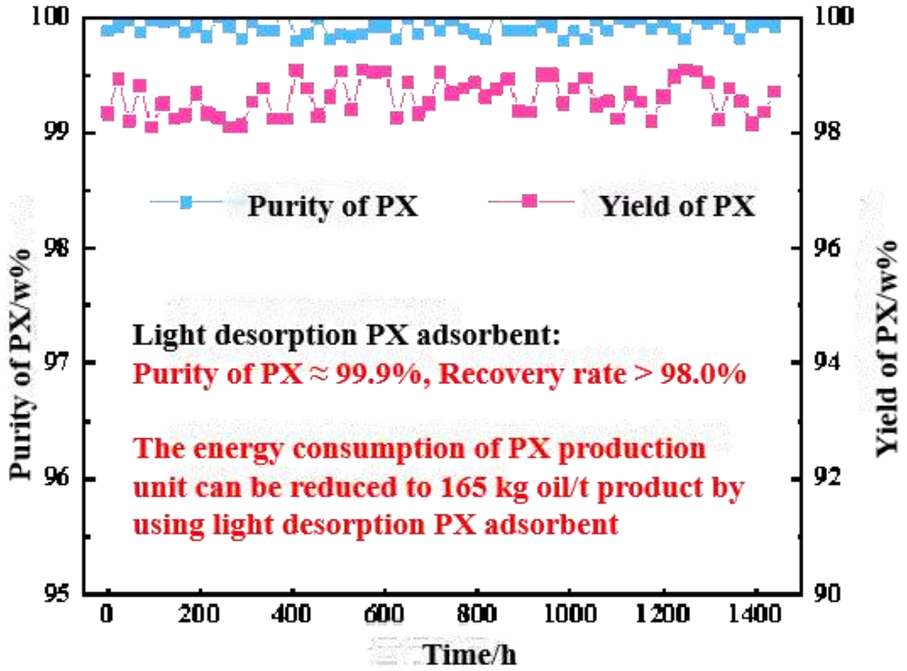
Adorbent-feed Ratio	Desorbent-feed Ratio D/F	Purity of PX Product	Recovery Rate of PX	Technical Benchmarking / competitor's PX Adsorbents
2.5	1.35	99.95%	98.91%	~
2.2	1.34	99.94%	99.38%	~
1.9	1.35	99.87%	98.02%	~
1.7	1.29	99.84%	98.25%	~
1.6	1.25	99.85%	98.20%	~
1.4	1.21	99.80%	98.50%	~

Evaluating PX purity and yield under different adsorbent-to-feed and desorbent-to-feed ratios showed that the performance of the JLPS-100 adsorbent is comparable to competitor's PX adsorbent.

Performance Comparison

JLPS-100 Adsorbent Long-Term Evaluation

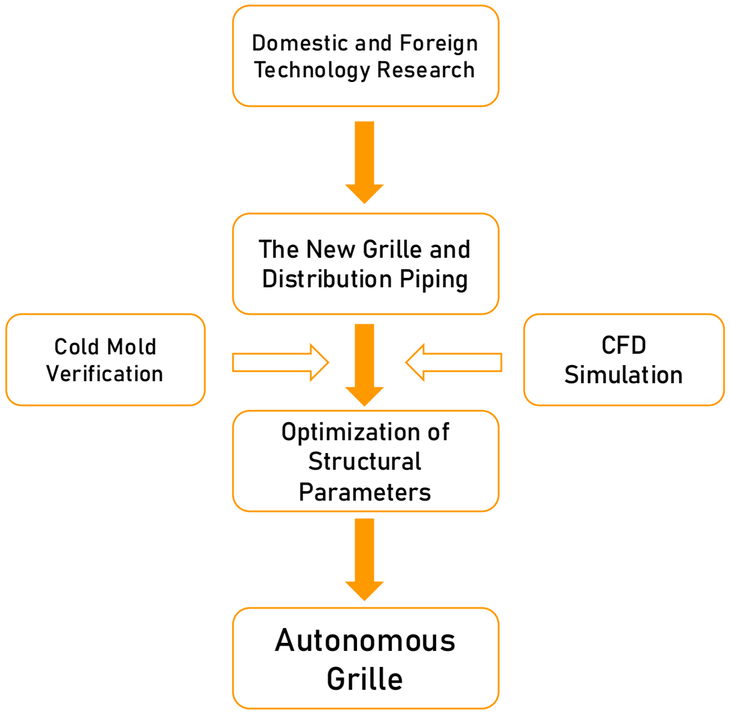


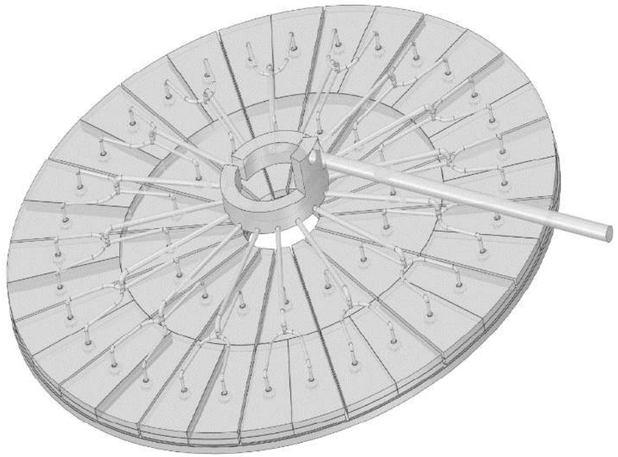


According to the results of the long-term stability experiment on PX adsorption and separation, the PX product purity reached 99.9%, the PX product yield remained stable at over 98%, and the adsorbent performance was consistent.

P-xylene Separation Technical Solution

Internal Grid of the Adsorption Unit

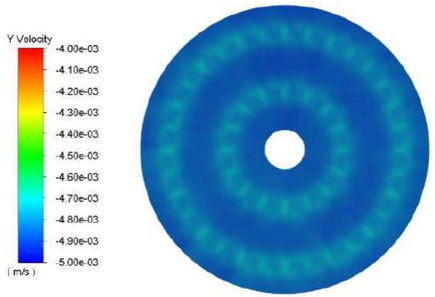




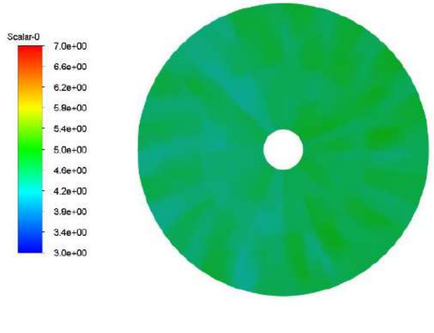
- The adsorption tower grid is a core component in the simulated moving bed adsorption-separation process. It effectively prevents the adsorbent from moving with the material flow, avoiding penetration through the grid surface and escape from the adsorption tower, which could damage valves and equipment.
- By achieving "zoned modularity" with the grid, the equipment can be scaled up, ensuring uniform fluid distribution within the simulated moving bed and reducing engineering complexity.

P-xylene Separation Technical Solution

Internal Grid of the Adsorption Unit



Uniformity of flow velocity



Mixing uniformity

Grille type	Contrast Grid 1	Contrast Grid 2	Our Grid
Fluid Mixing Uniformity Deviation	0.18	0.09	0.04
Deviation in Fluid Distribution Uniformity	0.24	0.08	0.08
Pressure Drop under Typical Conditions/kPa	1.2	1.45	0.7

- Upgraded adsorption tower grid material to 304 stainless steel.
- Enhanced fluid mixing through a combined labyrinth structure, including flow guidance, swirling and jetting, to achieve uniform mixing and distribution.
- Achieved uniform flow distribution into the grid piping through a non-closed micro-gradient distribution structure in the distribution system.
- Optimized the material inlet with a socket sleeve structure for stress-free welding in the distribution system.
- Used a non-closed micro-gradient distribution structure in the distribution system to ensure uniform distribution of flow into the grid piping.

P-xylene Separation Technical Solution

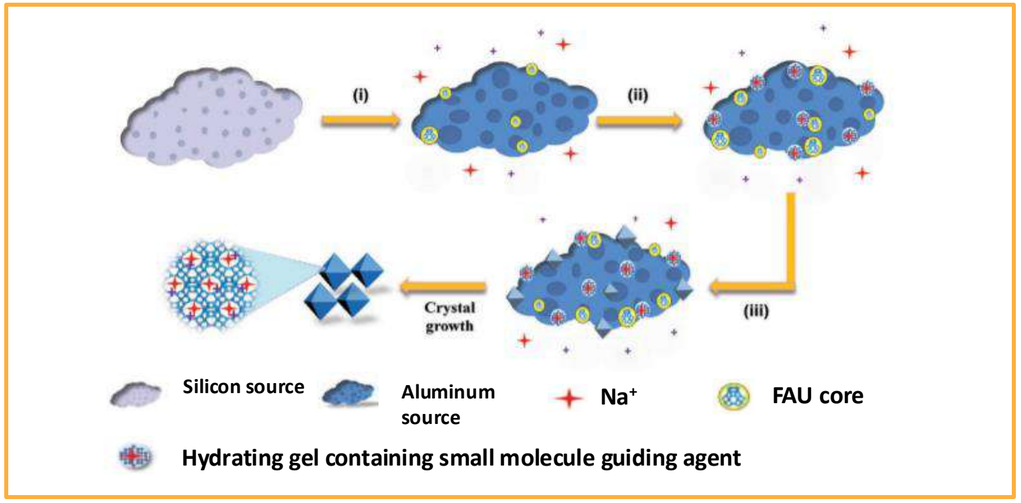
Simulated Moving Bed Control System

Independently developed a dedicated control system (SMIL, Simulated Moving intelligent Logic) separate from the DCS, enabling the control of material flow, pressure, and bed valve sequence logic in adsorption towers, thereby realizing the simulated moving bed process. The system features intelligent control functions such as self-memory, self-learning, and self-diagnosis.

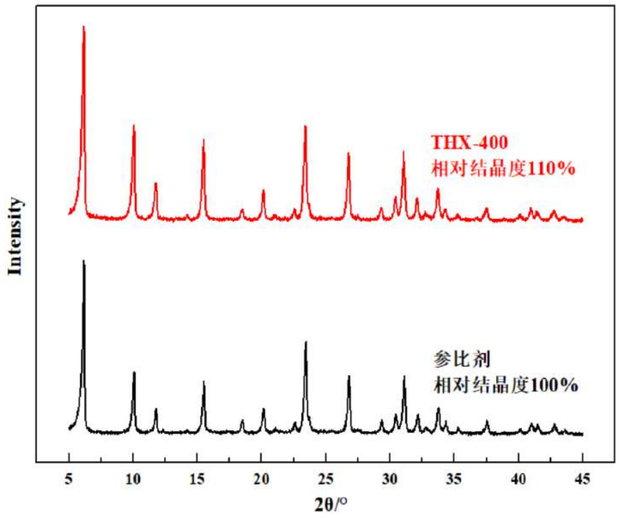
- Online Adjustment
- Operation Optimization
- Master-Slave Switching
- Rapid Regional Switching
- Fault Tolerance
- Fault Diagnosis

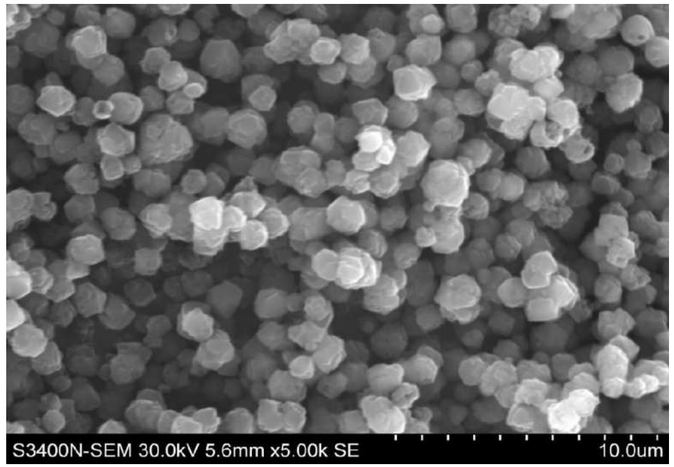
Molecular Sieve for P-xylene Separation

Synthesis Zeolite Powder



Utilizing a high-alkalinity and small-molecule structure-directing gel system, submicron-sized NaX molecular sieves rapidly are synthesized at low temperatures with high yields. These molecular sieves feature an intact framework structure, with the crystal grain size precisely controlled to approximately 1 micron. The silicon-aluminum ratio of the molecular sieve framework is adjustable within the range of 2.3 to 2.5. They exhibit a high specific surface area, high toluene adsorption capacity, and interconnected channels, resulting in faster adsorption and diffusion rates.





THX-400 Product Structure

Project	Unit	Detection index	
		JLPS-100	Typical
Silica-Alumina Ratio		2.3-2.5	2.45
Micropore Specific Surface Area	m^2/g	650-660	659
Microporous Pore Volume	m^3/g	0.33	0.325
Crystal Size	μm	0.8-1.5	1-1.5

Why JALON

Deliver Value To Clients

Global player

- real investment-**DBD 1.368 B THB**
- Since 2020 in Thailand and 1998 in China
- Zeolite Molecular Sieve production & innovation base
- Control the full zeolite value chain end to end

Why JALON

Deliver Value To Clients

R&D Driven

- Control the full zeolite value chain end to end

-Customizable materials, scalable process

-Full control from zeolite synthesis to shaping

-Production & Innovation base

Why JALON

Deliver Value To Clients

LOCAL FACTORY

-Shorter lead time

-Local Support and Lower costs

ต่ออายุการรับรองระบบ ISO14001 & ISO45001

ผู้ตรวจประเมิน จาก ARES INTERNATIONAL CERTIFICATION

Thank you

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