高性能膜分离材料装备供应商

High performance membrane separation material & equipment supplier



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高性能膜分离材料装备供应商

上海三及均相膜产品及技术介绍

SMax Homogeneous Membrane Products & Technology

上海三及新材料科技有限公司

Shanghai Sanji New Materials Technology Co.,Ltd

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COMPANY OVERVIEW
公司概况 _

上海三及新材料科技有限公司	
研发能力 R&D Capability	战略合作：华东理工大学国家盐湖中心 联合研发：上海三及–浙江工业大学（化工学院）联合研发中心 Strategic Cooperation: National Salt Lake Center Of East China University Of Science And Technology Joint R&D: Shanghai Sanji Zhejiang University Of Technology (College Of Chemical Engineering) Joint R&D Center
经营场地 Locations	公司地址：上海市徐汇区　　膜生产车间：烟台莱州市 青海办事处：格尔木市 Headquarters: Shanghai　　Membrane Production Workshop: Yantai, Shandong Other Office: Golmud, Qinghai
公司资质 Qualifications	高新技术企业 High-Tech Enterprise　创新型中小企业 Innovative SME 专精特新中小企业 SRDI SME ("Specialized, Refined, Differential & Innovative")
知识产权 Intellectual Property	膜、隔板等核心材料**均为完全自主知识产权**； 成熟的膜研发团队，扎实的**膜产品迭代能力**； **产学研模式**开展基础性、中远期研发工作。 The Core Materials Such As Membranes And Separators Are Completely Independent Intellectual Property Rights; Mature Membrane Research And Development Team, Solid Membrane Product Iteration Ability; The Industry University Research Model Carries Out Fundamental And Long-Term Research And Development Work.
供应链 Supply Chain	上游全部原材料均实现国产化； 原材料均有多家合格供应商，供应链可控 **100% Localization** Of All Upstream Raw Materials; Multiple Qualified Suppliers For Each Material, Ensuring Controllable Supply Chain.
产品性能 Product Performance	ED常规膜性能达到国际先进水平； 耐碱阳膜、一二价选择性阴阳膜国内领先。 Standard IEM Meet Internationally Advanced Standards; Specialized IEM Lead Domestic Performance
生产能力 Production Capacity	**膜产能：25 万㎡ /年；** 生产全过程标准化（SOP），产品稳定； 膜产品自主研发，可提供定制化产品。 Membrane Capacity: 250,000 M^2/Year ； Full-Process SOP For Consistent Quality; Independently Developed Membranes With Customization Available.
服务能力 Service Capabilities	技术/工程/售后团队拥有**10年+离子膜技术服务实战经验；** 累计投入运行的设备近**300台**； ED应用涵盖零排浓缩减量、有机物脱盐、盐湖提锂、杂盐分盐、废盐复分解等领域 Technical/Engineering/After-Sales Teams With **10 + Years Hands-On IEM Service Experience**; **300 + Units** Of Equipment In Operation ED Applications Cover Fields Such As Zero Emission Concentration And Reduction, Organic Matter Desalination, Salt Lake Lithium Extraction, Miscellaneous Salt Salts, And Waste Salt Decomposition

核心团队20年以上均相膜从业经验

The Core Team Has Over 20 Years Of Experience In The Homogeneous Membrane Industry



COMPANY MILESTONES
发展历程 _

2020年

①6万㎡/年膜产线投产；
②DD膜及设备投入使用；
③ED浓缩膜及设备投入使用。

①60,000 M^2/Year Membrane Production Line Launched;
②DD Membranes And Equipment Put Into Operation;
③ED Concentration Membranes And Equipment Put Into Operation.

2021年

①DD在铝型材阳极氧化、腐蚀箔行业得到快速推广；
②ED浓缩膜在火电厂脱硫废水、化工废水零排项目落地。

①DD Rapidly Adopted In Aluminum Profile Anodizing And Etched Foil Industries;
②ED Applied In Thermal Power Plant Desulfurization Wastewater And Chemical Wastewater Zero-Liquid Discharge (ZLD) Projects.

2022年

①第二条6万㎡/年膜产线投产；
②ED脱盐膜物料脱盐项目落地；
③DD磷酸回收项目落地；
④ED气田采出水提锂项目落地；
⑤硫酸铜资源化项目落地。

①Second 60,000 M^2/Year Membrane Production Line Launched;
②ED Applied In Material Desalination;
③DD Applied In Phosphoric Acid Recovery;
④ED Applied In Lithium Extraction From Gas Field Produced Water;
⑤Copper Sulfate Resource Recovery Project Implemented.

2023年

①一二价选择性阴膜项目落地；
②ED盐湖提锂项目落地（膜堆）；
③12万㎡/年宽幅膜产线投产；
④电池生产废水资源化项目落地；
⑤DD产品市场份额快速增长；
⑥获高新技术、创新型企业称号。

①Monovalent/Bivalent Selective Anion Membrane Project ;
②ED Salt Lake Lithium Extraction Project
③120,000 M^2/Year Wide-Width Membrane Production Line Launched;
④Battery Production Wastewater Resource Recovery Project Implemented;
⑤Rapid Growth In Market Share Of DD Products ;
⑥Awarded Titles Of High-Tech Enterprise And Innovative SME.

2024年

①耐碱阳膜项目落地；
②一二价阴膜脱硫废水项目落地；
③肉碱脱盐项目落地；
④完整ED工艺盐湖提锂项目落地；
⑤双置换ED中试项目落地；
⑥获“专精特新”中小企业称号。

①Alkali-Resistant Cation Membrane Project Launched;
②Monovalent/Bivalent Anion Membranes Applied In Desulfurization Wastewater Projects;
③Carnitine Desalination Project Implemented;
④ED Salt Lake Lithium Extraction Project;
⑤Double-Displacement ED Pilot Project ;
⑥Awarded The Title Of "Specialized, Refined, Differential & Innovative (SRDI)" SME.。

2025年

①一二价选择性阳膜投产；
②钛白粉废硫酸项目中试落地；
③酱油脱盐项目落地；
④乳清脱盐中试项目落地；
⑤获得上海创新创业大赛优胜奖 。

①Monovalent/Bivalent Selective Cation Membrane Launched;
②Pilot Project For Waste Sulfuric Acid Treatment In Titanium Dioxide Production;
③Soy Sauce Desalination Project;
④Whey Desalination Pilot Project Implemented;
⑤ Awarded The Excellence Prize In The Shanghai Innovation And Entrepreneurship Competition

2026年

①与韩国头部环保公司战略合作，进军韩国市场；
②阴膜迭代，性能进一步提升；
③建立上海三及–浙江工业大学联合研发中心

① Strategic Cooperation With Leading Environmental Protection Companies In South Korea To Enter The Korean Market;
② Anion Exchange Membrane Iteration Further Improves Performance;
③ Establish A Joint R&D Center Between Shanghai Sanji And Zhejiang University Of Technology

COMPANY BASES
公司场地 _

上海总部
Shanghai Headquarters









材料研发平台
Material Research And Development Platform

生产基地
PRODUCTION BASE

膜生产基地
Membrane production base







装备化生产基地
Equipment manufacturing base





COMPANY CERTIFICATIONS
公司资质 _























“上海市高新技术企业”
“Shanghai High tech Enterprise”

“上海市专精特新中小企业”
Shanghai Specialized, Sophisticated, Distinctive, and Innovative SMEs

“上海市创新型中小企业”
“Innovative Small and Medium sized Enterprises in Shanghai”

“上海创新大赛优胜奖”
“Shanghai Innovation Competition Excellence Award”

PRODUCT OVERVIEW
核心产品介绍 _

现有离子交换膜产品
EXISTING ION-EXCHANGE MEMBRANE PRODUCTS

扩散渗析膜	电渗析膜	双极膜	特种膜
Diffusion Dialysis Membranes	Electrodialysis Membranes	Bipolar Membranes	Specialized Membranes
常规酸回收膜	浓缩阴阳膜	耐碱阳膜	一二价阴膜
Conventional Acid Recovery Membranes	Concentration Cation & Anion Membranes	Alkali-Resistant Cation Membranes	Monovalent/Bivalent Anion Membranes
磷酸回收膜	脱盐阴阳膜	阻氢阴膜	一二价阳膜
Phosphoric Acid Recovery Membranes	Desalination Cation & Anion Membranes	Hydrogen-Blocking Anion Membranes	Monovalent/Bivalent Cation Membranes
一价酸回收膜			阴极膜
Monovalent Acid Recovery Membranes			Cathode Membranes
			阳极膜
			Anode Membranes

应用领域 Application Fields

电渗析：新能源盐湖提锂、硫酸铜资源化；废水零排浓缩减量；有机物脱盐； 杂盐分盐；（有机/无机）盐制酸碱
扩散渗析：酸回收（盐酸、硫酸、磷酸、氢氟酸、硝酸等）与杂质分离

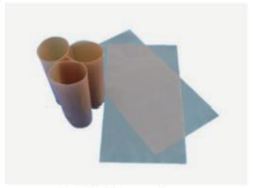
Electrodialysis (ED): New energy salt lake lithium extraction; copper sulfate resource recovery; wastewater zero-liquid discharge (ZLD) concentration & volume reduction; organic desalination; mixed salt separation; acid/alkali production from (organic/inorganic) salts.
Diffusion Dialysis (DD): Acid recovery (hydrochloric acid, sulfuric acid, phosphoric acid, hydrofluoric acid, nitric acid, etc.) and impurity separation

产品特点
PRODUCT FEATURES

离子交换膜 （核心）
Ion Exchange Membrane (Core)

- 均相离子交换膜，**自主开发专利产品**。
- **常规脱盐浓缩膜**性能优越，浓缩浓度可达18%以上，满足高脱盐率、高浓缩倍率等客户要求；
- **专用物料分离膜**可实现中性有机物截留率达95%以上；
- **专用酸回收膜**可实现游离酸回收率达80%–90%，金属截留率95%以上；
- 针对特殊行业需求，**可定制化生产行业专用特种膜**；
- **上游原材料均实现国产化**，均有超3家合格供应商，**供应链可控**。

- Homogeneous ion exchange membrane, a patented product developed independently.
- The conventional desalination and concentration membrane exhibits superior performance, achieving a concentration level exceeding 18%, meeting customer requirements such as high desalination rate and high concentration ratio;
- The dedicated material separation membrane can achieve a retention rate of over 95% for neutral organic compounds;
- The dedicated acid recovery membrane can achieve a free acid recovery rate of 80%–90% and a metal retention rate of over 95%;
- For the needs of special industries, we can produce customized industry-specific specialty membranes;
- All upstream raw materials are domestically sourced, with more than three qualified suppliers for each, ensuring controllable supply chains.


desalination membrane


Concentrated membrane


Desalination membrane


Conventional acid recovery membrane

ELECTRODIALYSIS
电渗析产品介绍 _

电渗析技术原理
PRINCIPLE OF ELECTRODIALYSIS TECHNOLOGY

常规电渗析工作原理 Working principle of conventional electrodialysis

核心组成 Core Components

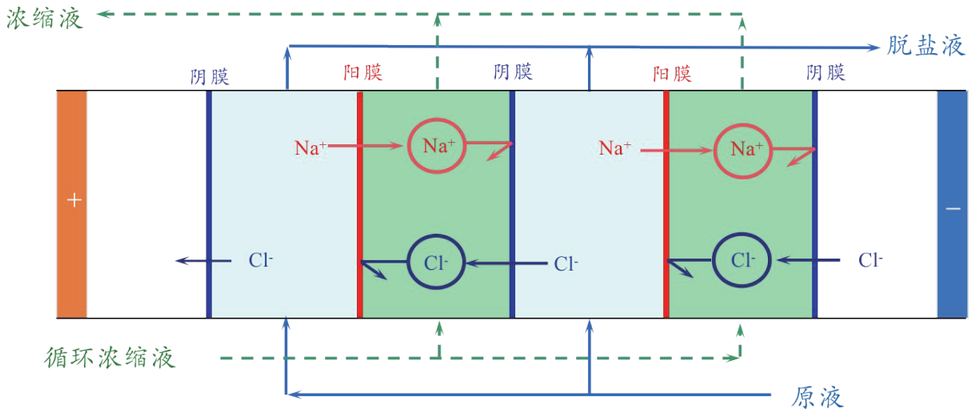
两侧配置阳极板和阴极板，中间阳离子交换膜和阴离子交换膜交替排列，形成脱盐室和浓缩室。

On both sides, anode plate and cathode plate are arranged, and cation exchange membranes and anion exchange membranes are alternately arranged in the middle to form desalination and concentration chambers.

主要原理 Main Principles

在电场力作用下，离子从脱盐室穿过膜进入浓缩室，从而实现脱盐、浓缩。

Under the action of electric field force, ions pass through the membrane from the desalination chamber and enter the concentration chamber, thereby achieving desalination and concentration.



有机物料脱盐电渗析 Working principle of conventional electrodialysis

有机物料脱盐主要原理
Main Principles Of Desalination Of Organic Materials

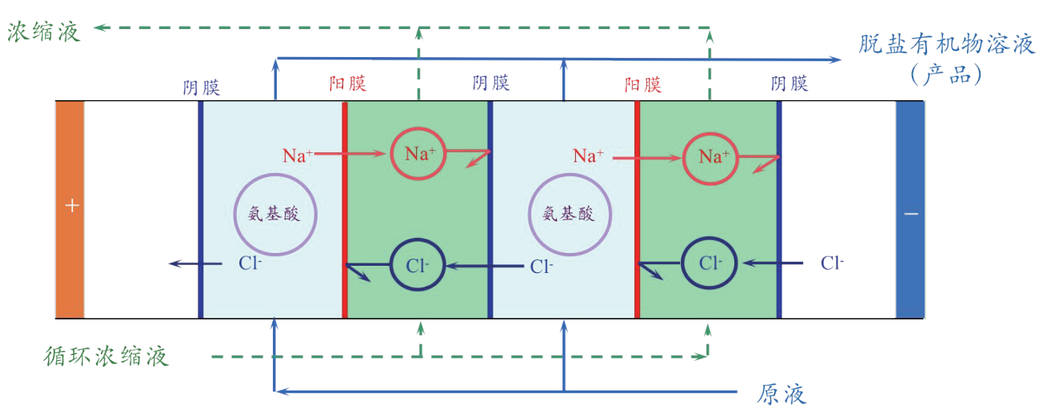
当非离子形态的有机物与有机盐共存时，有机物不带电荷，不能透过离子交换膜，实现有机物与无机盐的分离。

When non-ionic organic compounds coexist with organic salts, the organic compounds do not carry charges and cannot pass through ion exchange membranes, achieving separation between organic compounds and inorganic salts.

举个例子 For example

氨基酸在不同PH下呈现不同的带电性，可以通过调整电荷平衡（等电点）来控制氨基酸迁移。

Amino acids exhibit different charges at different pH values, and their migration can be controlled by adjusting the charge balance (isoelectric point).



双极膜电渗析工作原理 Working principle of bipolar membrane electrodialysis

双极膜主要原理 Main principles of bipolar membrane

在直流电场作用下，阴、阳膜复合层间H2O解离成H+ 和OH–，定向迁移下分别通过阳离子交换膜层和阴离子交换膜层，作为系统H+和OH–离子供应源。

Under the action of a direct current electric field, H2O dissociates into H+and OH - ions between the cation and anion membrane composite layers, which migrate directionally through the cation exchange membrane layer and the anion exchange membrane layer, respectively, serving as the system's H+and OH - ion supply sources.

双极膜电渗析的组装方式 Assembly method of bipolar membrane electrodialysis

将双极膜与不同的阳离子交换膜、阴离子交换膜及其他配件组合，得到不同形式的双极膜电渗析(二隔室、三隔室、四隔室、五隔室等）。

Combining bipolar membranes with different cation exchange membranes, anion exchange membranes, and other accessories to obtain different forms of bipolar membrane electrodialysis (two compartments, three compartments, four compartments, five compartments, etc.).

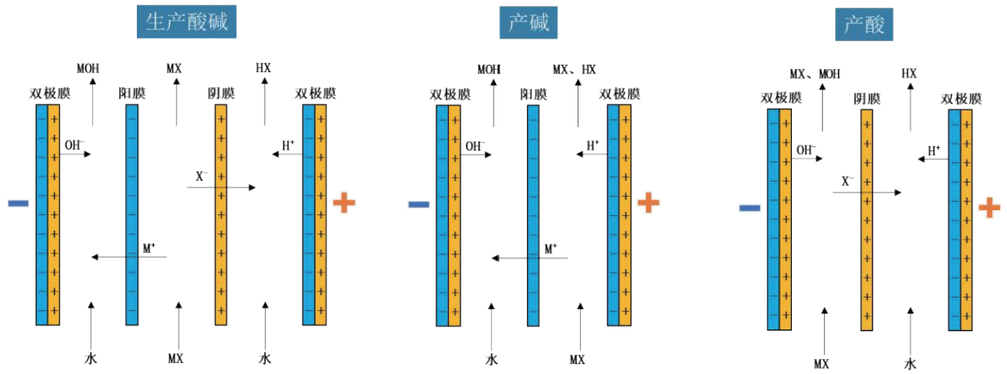
应用场景 Application Scenarios

①（无机系统）无机盐制备对应的酸和碱：硫酸钠、氯化钠 、硫酸锂、硝酸钠、氯化铵等；

②（有机系统）有机酸盐制备对应的有机酸和碱（有机碱盐与之类似）：酒石酸、葡萄糖酸、柠檬酸、维生素C、四甲基氢氧化铵、四丙基氢氧化铵等。

① (Inorganic system) Preparation of corresponding acids and bases for inorganic salts: sodium sulfate, sodium chloride, lithium sulfate, sodium nitrate, ammonium chloride, etc;

② Preparation of corresponding organic acids and bases (similar to organic base salts): tartaric acid, gluconic acid, citric acid, vitamin C, tetramethylammonium hydroxide, tetrapropylammonium hydroxide, etc.



双重置换电渗析工作原理 Working principle of double displacement electrodialysis

双重置换电渗析主要原理 Main principle of double displacement electrodialysis

在通直流电的情况下，实现硫酸钠或氯化钠与碳酸铵或碳酸氢铵的阴阳离子互换，产生碳酸钠或者碳酸氢钠及相应的有一定经济价值的铵盐。

Under the condition of direct current, the exchange of cations and anions between sodium sulfate or sodium chloride and ammonium carbonate or ammonium bicarbonate is achieved, producing sodium carbonate or sodium bicarbonate and corresponding ammonium salts with certain economic value.

双置换电渗析的组装方式 Assembly method of double displacement electrodialysis

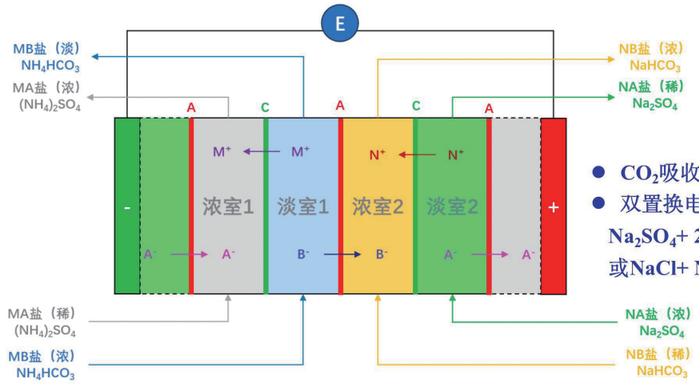
将专用的阳离子交换膜、阴离子交换膜及其他配件组合，设计特殊结构的四隔室电渗析。

Design a special structure of four-compartment electrodialysis by combining specialized cation exchange membranes, anion exchange membranes, and other accessories.

应用场景 Application Scenarios

将“废盐+二氧化碳+氨水”变为具有相应经济价值的副产品。相比于热法复分解结晶，膜法不消耗高热量，不产生废气、废水。

Transform 'waste salt+carbon dioxide+aqueous ammonia into by-products with corresponding economic value. Compared to thermal decomposition crystallization, the membrane method does not consume high heat and does not produce waste gas or wastewater.



- CO_2吸收：$NH_3+H_2O+CO_2= NH_4HCO_3$
- 双置换电渗析制备副产盐：

$Na_2SO_4+ 2NH_4HCO_3 =2NaHCO_3+(NH_4)_2SO_4$

或$NaCl+ NH_4HCO_3 =NaHCO_3+NH_4Cl$

电渗析产品介绍
INTRODUCTION TO ELECTRODIALYSIS PRODUCTS

电渗析膜产品主要性能 Main performance of electrodialysis membrane products

型号 Model	类型 Type	选择透过率% Selective permeability	pH
CD	脱盐阳膜 Desalination cation membrane	≥90	1–9
AD	脱盐阴膜 Desalination anion membrane	≥96	1–9
CC	浓缩阳膜 Concentrated cation membrane	≥90	1–9
AC	浓缩阴膜 Concentrated anion membrane	≥96	1–9
CBS	耐碱阳膜 Alkali resistant cation membrane	≥90	1–14
CCS	一二价阳膜 Monovalent /divalent cation membrane	≥96	1–9
AAS	一二价阴膜 Bivalent anion membrane	≥96	1–9

脱盐膜 ① 电耗低 ② 脱盐程度高 ③ 适用于终点脱盐浓度低的系统
① Low power consumption
② High degree of desalination
③ Suitable for systems with low endpoint desalination concentration

浓缩膜 ① 浓缩浓度可达18%以上 ② 有机物截留率高 ③ 适用于浓缩浓度要求高的系统
① The concentration can reach over 18%
② High organic matter retention rate
③ Suitable for systems with high concentration requirements

拥有丰富的型号对应客户不同的需求！
Having a wide range of models to meet different customer needs!

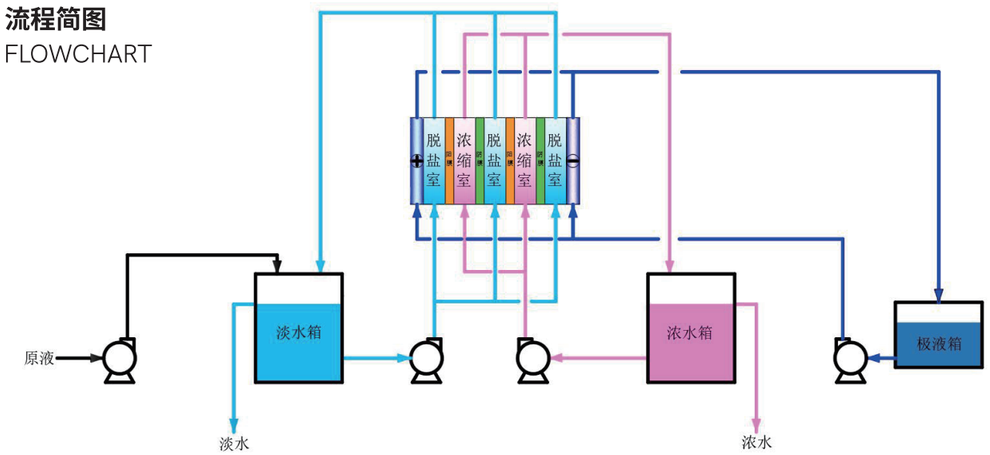
电渗析装备型号 Electrodialysis equipment model

型号 Model	SED–30	SED–55	SED–110S	SED–138H	SEDW–138H
规模 scale	小试设备 Small scale testing equipment	中试设备 Pilot equipment	中型工业化设备 Medium sized industrial equipment	大型工业化设备 Large scale industrial equipment	大型工业化设备 Large scale industrial equipment
膜尺寸 cm Membrane size	16*28cm	18*55cm	55*112cm	55*138cm	112*138cm
最大装入膜对数/台 Maximum number of loaded membranes per unit	20对 (pairs)	200对 (pairs)	220对 (pairs)	1200对 (pairs)	1200对 (pairs)
膜堆尺寸 mm Membrane stack size	200*130*350 (W*D*H)	240*390*685 (W*D*H)	970*950*1750 (W*D*H)	1000*4500*2000 (W*D*H)	1600*4500*2000 (W*D*H)
重量（空载）kg Unloaded weight	10	20	1000	4000	5500
处理量 (NaCl 3%→1%) L/h Treatment capacity	10	250	2100	15200	32450
使用上限温度 Use upper limit temperature	40℃	40℃	40℃	40℃	40℃
设备照片 Equipment photo					

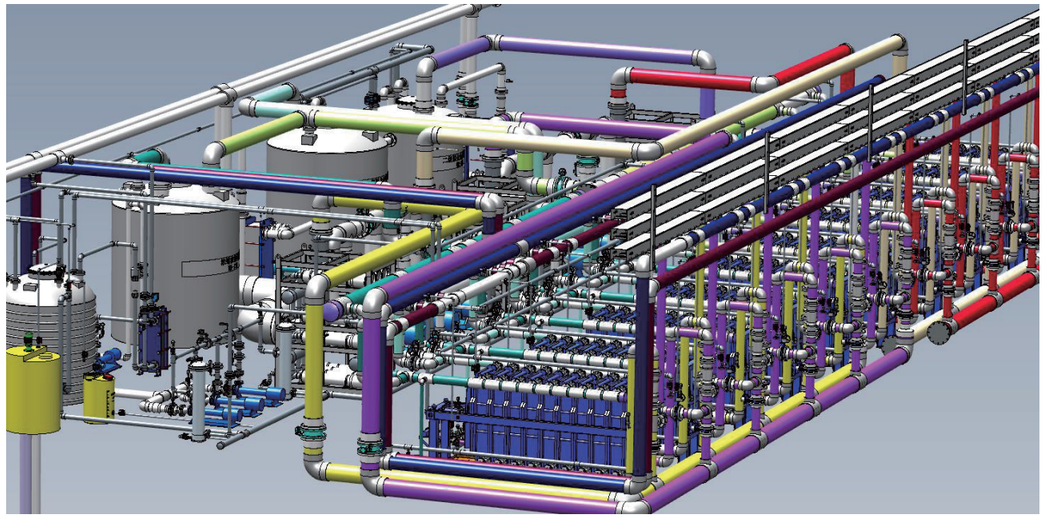
*可根据项目的实际需求进行定制设计。如三隔室、四隔室、隔断室等特殊结构电渗析
*Customized design can be carried out according to the actual needs of the project. Special structures such as three compartments, four compartments, and partition compartments for electrodialysis

电渗析标准工艺 Standard process of electrodialysis

流程简图
FLOWCHART



三维配管图
3D PIPING DIAGRAM



代表性大型（液压）设备 Representative large-scale (hydraulic) equipment

单台组处理能力大
Large processing capacity per unit group

结构科学，流体、电流分布均匀
Structural science, uniform distribution of fluids and currents

结构紧凑，占地面积小
Compact structure and small footprint

匠心制造，现代工业风，高品位质感
Crafted with ingenuity, modern industrial style, high-quality texture



电渗析产品应用案例
APPLICATION CASES OF ELECTRODIALYSIS PRODUCT

01

废水零排及资源化
Zero Discharge And Resource Utilization Of Wastewater

化工废水
Chemical wastewater

石化废水
Petrochemical wastewater

火电厂脱硫废水
Thermal power plant desulfurization wastewater

矿井水
Mine water

园区盐综合利用
Comprehensive utilization of salt in the park

酸碱回收及浓缩
Acid alkali recovery and concentration

工业（废）盐制酸碱
Industrial (waste) salt to acid and alkali production

02

有机物料脱盐
Organic Material Desalination

复合/单一氨基酸脱盐
Composite/single amino acid desalination

甜菜碱/左旋肉碱等生物碱脱盐
Desalination of alkaloids such as betaine/L-carnitine

酱油脱盐
Soy sauce desalination

醇类（季戊四醇等一）脱盐
Desalination of alcohols (such as pentaerythritol)

水合肼脱盐
Hydrazine hydrate desalination

其他有机物脱盐
Desalination of other organic compounds



03

新能源领域
New Energy Sector

盐湖提锂
Lithium extraction from salt lakes

制氢氧化锂
Lithium hydroxide production

三元前驱体废水资源化
Resource utilization of ternary precursor wastewater

04

工业清洁生产
Industrial Clean Production

有机胺液净化
Organic amine liquid purification

电镀液净化
Purification of electroplating solution

湿法制磷酸萃余酸净化
Purification of wet-process phosphoric acide raffinate

05

海水/苦咸水资源化
Utilization Of Seawater/Brackish Water Resources

海淡浓水制盐
Salt production from seawater diluted and concentrated water

苦咸水脱盐
Brackish water desalination

深海水资源化
Deep seawater resource utilization

06

特殊分离需求
Special Separation Requirements

盐复分解制高附加值盐
Salt decomposition to produce high value-added salt

特定有机酸盐制有机酸
Organic acid production from specific organic acid salts

山东某氯化铵浓缩项目

A ammonium chloride concentration project in shandong

电渗析规模 Scale of electrodialysis
63 m^3/h（2024年）

水质特征 Water quality characteristics
氯化铵 72g/L
Ammonium chloride 72g/L

项目目标 Project Objective
氯化铵脱盐及浓缩
Ammonium chloride desalination and concentration

主要成果 Main achievements
电渗析浓缩液的氯化铵浓度高于17%，实现废水的零排放

The concentration of ammonium chloride in electrodialysis concentrate is higher than 17%, achieving zero discharge of wastewater

洗液 Washing Liguid

加氨水反应沉淀 — Add aqueous ammonia for reaction precipitation

过滤除杂 — Filtration for impurity removed

ED+RO → **脱盐液** Desalted liquid

蒸发结晶 → **氯化铵副产** Ammonium chloride byproduct
Evaporative crystallization



安徽某电厂脱硫废水（一二价分盐）项目

Desulfurization wastewater project of a power plant in Anhui (monovalent and divalent salt separation) project

电渗析规模 Scale of electrodialysis
140 m^3/h（2024年）

水质特征 Water quality characteristics
氯离子约10g/L，硫酸根约0.5-1 g/L，钙离子约3.5 g/L
Chloride ions are about 10g/L, sulfate ions are about 0.5-1g/L, and calcium ions are about 3.5g/L

项目目标 Processing Requirements
脱硫废水中的氯离子小于4000 mg/L
Chloride ions in desulfurization wastewater are less than 4000 mg/L

主要成果 Main achievements
硫酸根截留率大于72%，浓缩液氯化钠浓度高于16%，氯离子可脱至4000mg/L以下，系统稳定运行。

The retention rate of sulfate ions is greater than 72%, the concentration of sodium chloride in the concentrated solution is higher than 16%, and the chloride ions can be removed to below 4000mg/L, indicating stable operation of the system.

脱盐液
Desalted liquid

脱硫废水 Desulfurization wastewater → 预处理除杂 Pretreatment and impurity removal → 选择性ED Selective ED → **富钙浓缩液** concentrate



青海氯化锂浓缩除硼项目

Qinghai Lithium Chloride Concentration and Boron Removal Project

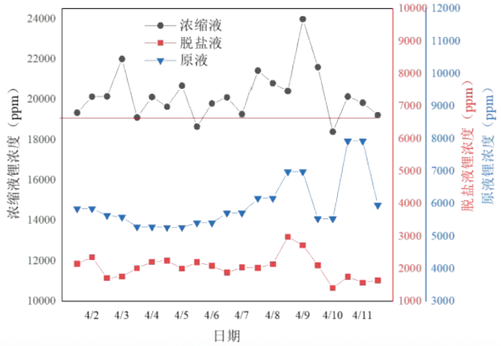
电渗析处理规模 Scale of electrodialysis treatment

10 m^3/h（2024年）

水质特征 Water quality characteristics

脱附液纳滤浓水，锂离子约5g/L，硼约0.5g/L

Desorption solution nanofiltration concentrated water, lithium ion about 5g/L, boron about 0.5g/L



项目效果 Project Results

本项目2023年7月开始运行，系统稳定

锂回收率：＞99%

锂浓缩浓度：4~6.0g/L → 20g/L

硼去除率：稳定在88%~91%

This project was commissioned in July 2023 and the system is stable

Lithium recovery rate:>99%

Lithium concentration: 4-6.0g/L → 20g/L

Boron removal rate: stable at 88%~91%

运行日期 Running Date	原液 Feed Liquid		浓水产水 Concentrate		淡水产水 Desalted Liquid	
	锂(lithium)g/L	硼(boron)g/L	锂(lithium)g/L	硼(boron)g/L	锂(lithium)g/L	硼(boron)g/L
2024.07.09	5.227	0.43	20.512	0.26	0.066	0.48
2024.07.16	4.772	0.35	20.197	0.20	0.020	0.40
2024.07.23	4.609	0.39	19.364	0.23	0.052	0.42
2024.07.30	5.156	0.41	20.531	0.23	0.053	0.50
2024.08.06	4.506	0.43	20.219	0.27	0.047	0.49







氨基酸脱盐项目

Amino acid desalination project

项目时间 Project Timeline

2022、2023、2024年三期

Three phases in 2022, 2023, and 2024

处理量 processing capacity

400 m^3/d

地点 Location

湖北公安

Gong an, Hubei

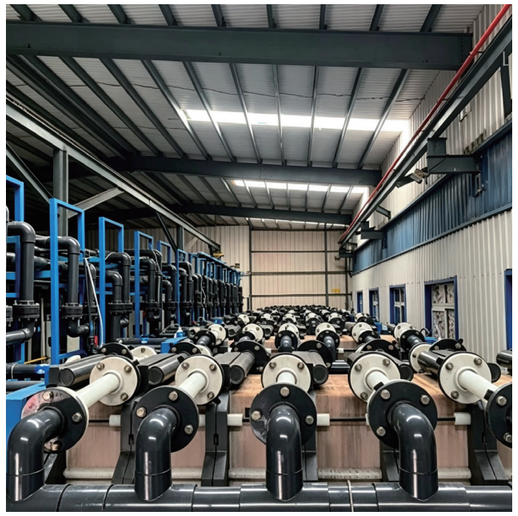
处理效果 Processing effect

氨基酸收率＞90%　氯化铵浓水浓度＞15%

Amino acid yield>90%

Ammonium chloride concentrated water concentration>15%

物料名称 Material Name		电导率（mS/cm） Conductivity
氨基酸物料	Amino acid material	80~100
脱盐物料	Desalted material	25~30
浓缩液	concentrate	190~200





左旋肉碱脱盐项目

L-carnitine desalination project

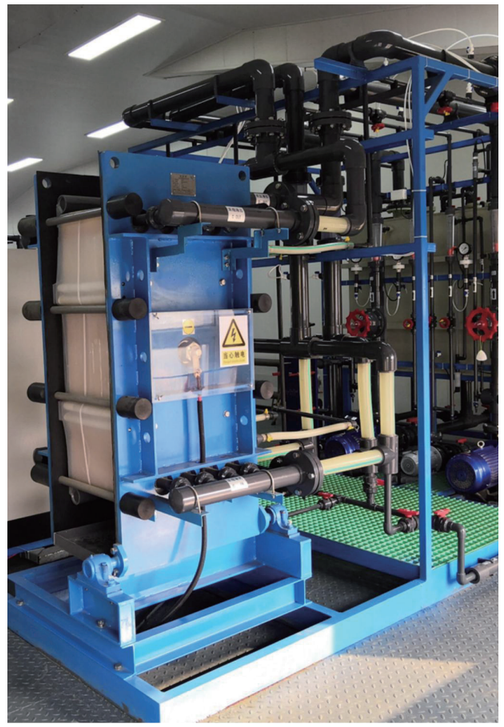
项目时间 Project Timeline
2020年

地点 Location
浙江嘉兴
Jiaxing, Zhejiang

处理量 processing capacity
10 m^3/h

处理效果 Processing performance
一段左旋肉碱回收率＞99%
总左旋肉碱回收率＞95%
The recovery rate of L-carnitine is greater than 99%
Total L-carnitine recovery rate>95%

物料名称 Material Name	电导率（mS/cm） Conductivity
原料 raw material	110±10
脱盐物料 Desalination material	10



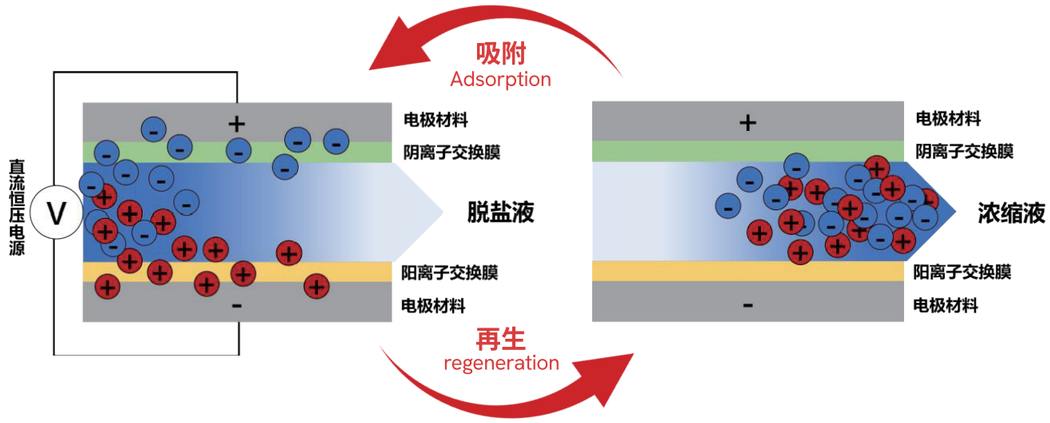
电吸附领域装备化案例

Case study of equipment in the field of electro adsorption

【电吸附技术】

电吸附技术中的膜电容法（MEMBRANE CAPACITIVE DEIONIZATION, MCDI）通过施加低电压形成电场，水中离子经过离子交换膜被两侧电极吸附，实现脱盐；通过断电或反接电压，被吸附的离子脱附释放并随水流排出，实现电极再生。

The membrane capacitive deionization (MCDI) in electro adsorption technology forms an electric field by applying low voltage, and ions in water are adsorbed by the electrodes on both sides through an ion exchange membrane to achieve desalination; By cutting off the power or reversing the voltage, the adsorbed ions are desorbed and released, and discharged with the water flow, achieving electrode regeneration.



离子膜核心价值 Core Value Of Ion Exchange Membrane

提升脱盐效率
Improve Desalination Efficiency

膜选择透过，阻隔同离子干扰，大幅提高脱盐率。

The membrane is selectively permeable to block interference from Co-ions, greatly improving the desalination rate.

保障再生彻底
Ensure Thorough Regeneration

膜单向阻隔，避免二次吸附，脱附完全且不结垢。

Unidirectional membrane barrier, avoiding Re-adsorption, complete desorption and no scaling.

延长电极寿命
Extend Electrode Lifespan

膜物理隔离，缓冲水流冲刷，减少碳颗粒脱落。

Membrane physical isolation, buffering water flow erosion, reducing carbon particle detachment.

电渗析项目 Electrodialysis project

序号 Number	项目名称 Project Name	行业 Industry	地点 Location	膜面积 Membrane Area	投产时间 Commissioning Date
01	青海某盐湖提锂项目 Lithium extraction project from a salt lake in Qinghai	新能源 New Energy	格尔木 Golmud	6560㎡	2024
02	青海某盐湖提锂项目 Lithium extraction project from a salt lake in Qinghai	新能源 New Energy	格尔木 Golmud	1000㎡	2023
03	中石油某气田采出水提锂项目 Lithium Recovery Project from Produced Water in a Certain Gas Field of CNPC	石油石化 Petroleum and Petrochemicals	遂宁 Suining	440㎡	2023
04	西藏某盐湖提锂项目 Lithium extraction project of a salt lake in Xizang	新能源 New Energy	阿里 Ali	1085㎡	2023
05	浙江某药业肉碱脱盐项目 Carnitine desalination project of a pharmaceutical company in Zhejiang	医药 Medicine	嘉兴 Jiaxing	2168㎡	2020
06	浙江某药业左旋脱盐项目二期 Phase II of L-Cornitine Desalination Project of a Pharmaceutical Company in Zhejiang Province	医药 Medicine	嘉兴 Jiaxing	3696㎡	2025
07	江苏某化工废水浓缩项目 Chemical Wastewater Concentration Projectin in Jiangsu	化工 Chemical Industry	苏州 Suzhou	550㎡	2020
08	江苏某赖氨酸脱盐项目 lysine desalination project in Jiangsu	医药 Medicine	苏州 Suzhou	1232㎡	2021
09	江苏某赖氨酸脱盐项目二期 Phase II Lysine Desalination Project in Jiangsu	医药 Medicine	苏州 Suzhou		2023
10	湖北某氨基酸脱盐项目 Desalination project for amino acids in Hubei	医药、食品 Medicine and food	荆州 Jingzhou	9600㎡	2022
11	湖北某氨基酸脱盐项目二期 Phase II of an Amino Acid Desalination Project in Hubei	医药、食品 Medicine and food	荆州 Jingzhou		2023
12	湖北某氨基酸脱盐项目三期 Phase III of an Amino Acid Desalination Project in Hubei	医药、食品 Medicine and food	荆州 Jingzhou		2024
13	青海某铜箔生产废水资源化项目 Copper Foil Production Wastewater Resource Utilization Project in Qinghai	有色金属 Non-Ferrous Metals	西宁 Xining	616㎡	2022
14	江苏铜箔生产废水资源化项目 Copper Foil Production Wastewater Resource Utilization Project in Jiangsu	有色金属 Non-Ferrous Metals	泰州 Taizhou	494㎡	2022
15	山东某化工生产废水零排项目 Zero discharge project of chemical production wastewater in Shandong	化工 Chemical Industry	淄博 zibo	494㎡	2022
16	中石油某气田废水零排项目 Zero discharge project of wastewater from a certain gas field of PetroChina	石油石化 Petroleum and Petrochemicals	重庆 Chongqing	810㎡	2022
17	山东某化工废水零排项目 Chemical wastewater zero discharge project in Shandong	化工 Chemical Industry	烟台 Yantai	810㎡	2022
18	江西某铜箔生产废水资源化项目 Copper Foil Production Wastewater Resource Utilization Project in Jiangxi	有色金属 Non-Ferrous Metals	九江 Jiujiang	494㎡	2022
19	深圳某铜箔生产废水资源化项目 Copper foil production wastewater resource utilization project in Shenzhen	有色金属 Non-Ferrous Metals	深圳 Shenzhen	540㎡	2023
20	福建某铜箔生产废水资源化项目 Copper Foil Production Wastewater Resource Utilization Project in Fujian	有色金属 Non-Ferrous Metals	宁德 Ningde	540㎡	2023
21	海南某海水深度资源化中试项目 Pilot project for deep seawater resource utilization in Hainan	海水淡化 Seawater Desalination	海南 Hainan	135㎡	2023
22	江苏废盐资源化项目 Waste Salt Resource Utilization Project in Jiangsu	化工 Chemical Industry	泰州 Taoizhou	540㎡	2023
23	四川某铜箔生产废水资源化项目 Copper foil production wastewater resource utilization project in Sichuan	有色金属 Non-Ferrous Metals	德阳 Deyang	1232㎡	2023
24	云南某冶金生产废水资源化项目 Metallurgical production wastewater resource utilization project in Yunnan	有色金属 Non-Ferrous Metals	昆明 Kunming	270㎡	2023

电渗析项目 Electrodialysis project

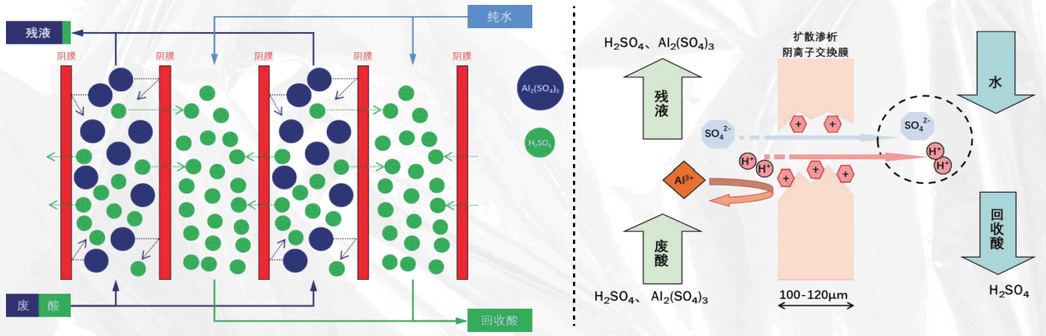
序号 Number	项目名称 Project Name	行业 Industry	地点 Location	膜面积 Membrane Area	投产时间 Commissioning Date
25	湖北某废盐资源化项目 Waste salt resource utilization project in Hubei	化工 Chemical Industry	宜昌 Yichang	120㎡	2023
26	湖北某有机物脱盐项目 Desalination project for organic matter in Hubei	化工 Chemical Industry	宜昌 Yichang	616㎡	2023
27	山东某磷酸铁废水资源化项目 Iron Phosphate Wastewater Resource Utilization Project in Shandong	新能源 New Energy	滨州 Binzhou	16400㎡	2025
28	安徽某电厂脱硫废水零排项目 Power plant desulfurization wastewater zero discharge project in Anhui	火电 Thermal Power	铜陵 Tongling	1120㎡	2024
29	安徽某电厂脱硫废水零排项目 Power plant desulfurization wastewater zero discharge project in Anhui	火电 Thermal Power	安庆 Anqing	2240㎡	2024
30	印度某左旋肉碱脱盐项目 L-carnitine desalination project in India	医药 Medicine	新德里 New Delhi	370㎡	2025
31	印度某左旋肉碱脱盐项目二期 Phase II of a L-carnitine desalination project in India	医药 Medicine	新德里 New Delhi	370㎡	2026
32	黑龙江某乳清脱盐项目 Whey desalination project in Heilongjiang	食品 Food	哈尔滨 Harbin	270㎡	2025
33	内蒙古某废水零排项目 Zero discharge wastewater project in Inner Mongolia	化工 Chemical Industry	鄂尔多斯 Ordos	246㎡	2025
34	安徽某中间体脱盐项目 IntermediateDesalination Project in Anhui	医药 Medicine	池州 chizhou	740㎡	2025

DIFFUSION DIALYSIS
扩散渗析产品 _

扩散渗析技术原理
PRINCIPLE OF DIFFUSION DIALYSIS TECHNOLOGY

扩散渗析工作原理 Working principle of diffusion dialysis

核心载体 Core Vehicle	阴离子交换膜，阴膜表面拥有均匀分布的带有正电荷的高分子官能团。 Anion exchange membrane, with uniformly distributed positively charged polymer functional groups on the surface of the anion exchange membrane
核心原理 Core Principle	在静电作用下，阴离子被阴膜表面的正电荷吸引而透过，为了保持电荷平衡，氢离子由于分子量很小可跟着阴离子一起透过阴膜，而带正电荷、分子量大的金属离子很难透过。 Under the action of static electricity, anions are attracted by the positive charges on the surface of the anion membrane and pass through. In order to maintain charge balance, hydrogen ions can pass through the anion membrane together with anions due to their small molecular weight, while metal ions with positive charges and large molecular weight are difficult to pass through.
扩散渗析驱动力 Driving Force Of Diffusion Dialysis	阴离子交换膜两侧存在浓度差， 酸从废酸侧向纯水侧扩散移动 There is a concentration difference on both sides of the anion exchange membrane, and the acid diffuses and moves from the waste acid side to the pure water side
核心过程 Core Process	金属离子或有机分子无法透过阴膜而被截留， 实现游离酸与其他成分的有效分离。 Metal ions and organic molecules cannot pass through the anion membrane and are intercepted, achieving effective separation of free acids from other components.



扩散渗析技术优势 Advantages of diffusion dialysis technology

扩散渗析技术优势

Advantages of diffusion dialysis technology

高效经济

酸回收率高，减少新酸量
减少中和碱使用
减少废盐量和处置费用

High acid recovery rate, reducing the amount of fresh acid
Reduce the consumption of neutralizing alkali
Reduce the amount of waste salt and disposal costs

高效经济

变废为宝，绿色生产

Recover waste resources for green manufactuning



高效经济

设备以酸浓差为驱动力，
无需提供其他能力

The equipment is driven by acid concentration difference,
No need to provide any other abilities

高效经济

设备结构简单，操作简单
运行稳定，运维方便

The device has a simple structure and easy operation
Stable operation and convenient maintenance

游离酸回收率可达：80-90%
金属阳离子截留率可达：95%
特种用途膜：磷酸回收膜、一价酸回收膜;

Free acid recovery rate can reach 80-90%
The retention rate of metal cations can reach 95%
Specialty:
phosphoric acid recovery membrane, monovalent acid recovery membrane

扩散渗析产品介绍
INTRODUCTION TO DIFFUSION DIALYSIS PRODUCTS

扩散渗析膜产品主要性能 Main performance of diffusion dialysis membrane products

膜类型 Membrane Type

型号 Model	类型 Type	膜厚度（μm） film thickness	膜电阻（Ω·cm2） Membrane resistance	选择透过率% Selective permeability
DD	常规酸回收膜 Conventional acid recovery membrane	100–120	1.0–1.2	≥95%
PD	磷酸回收膜 Phosphoric acid recovery membrane	90–110	0.8–1.0	≥95%
MD	一价酸回收膜 Monovalent acid recovery membrane	100–120	1.1–1.3	≥95%

常规酸回收膜（DD）
Conventional Acid Recovery Membrane (DD)

低电阻，高膜面处理量
Low resistance,
high film processing capacity

高选择性及金属截留率
High selectivity and metal retention rate

适用于硫酸体系
Suitable for sulfuric acid system

磷酸回收膜（PD）
Conventional Acid Recovery Membrane (DD)

低电阻、高酸透过系数
Low resistance
high acid permeability coefficient

抗氧化性强
Strong antioxidant properties

适用于复杂混酸体系
Suitable for complex mixed acid systems

一价酸回收膜（MD）
Monovalent Acid Recovery Membrane (MD)

调控离子通道结构及孔径
拦截”酸–金属”络合物
Regulating ion channel structure and pore size to intercept "acid metal" complexes

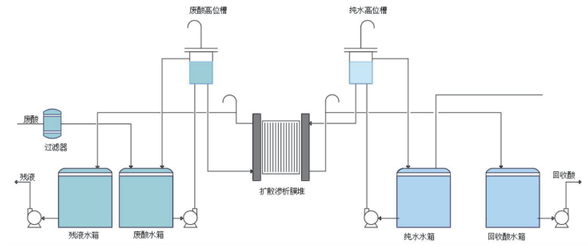
高酸通量和回收率 高金属截留率
High acid flux and recovery rate
High metal retention rate

拥有丰富的型号对应客户不同的需求！
Having a wide range of models to meet different customer needs!

扩散渗析装备型号 Diffusion dialysis equipment model

型号 Model		SDD–30	SDD–55	SDD–110	SDD–160	SDDW–160
规模 scale		小试设备 Small scale testing equipment	中试设备 Pilot equipment	中型工业化设备 Medium sized industrial equipment	大型工业化设备 Large scale industrial equipment	大型工业化设备 Large scale industrial equipment
膜尺寸 cm Membrane size		16*24cm	18*55cm	55*110cm	55*160cm	112*160cm
最大装入膜对数/台 Maximum number of loaded membranes per unit		20张 (sheets)	100张 (sheets)	200张 (sheets)	300张 (sheets)	400张 (sheets)
膜堆尺寸 mm Membrane stack size		200*130*350 (W*D*H)	240*390*685 (W*D*H)	860*980*1665 (W*D*H)	860*1210*2340 (W*D*H)	1200*1300*1900 (W*D*H)
重量（空载）kg Weight (empty load)		10	100	1000	1700	3000
处理量（回收率80%） processing capacity (Recovery rate of 80%)	盐酸HCl	0.77 L/h	22 L/h	190 L/h	440 L/h	1200 L/h
	硫酸H_2SO_4	0.38 L/h	11 L/h	100 L/h	220 L/h	730 L/h
	铝箔废酸 Aluminum foil waste acid	0.55 L/h	16 L/h	140 L/h	320 L/h	1000 L/h
	磷酸H_3PO_4	0.06 L/h	2 L/h	15 L/h	35 L/h	215 L/h
使用上限温度 Use upper limit temperature		40℃	40℃	40℃	40℃	40℃
设备照片 Equipment photo						

扩散渗析工艺流程 Diffusion dialysis process flow



代表性应用行业 Representative application industries

扩散渗析技术可广泛应用于无机酸与金属离子的分离。
Diffusion dialysis technology can be widely used for the separation of inorganic acids and metal ions.


不锈钢 stainless steel


铝型材 Aluminum Profile


电子产品 electronic products


电容器 capacitor


钛白粉 titanium dioxide

应用领域 Application Areas	铝型材 Aluminum Profile	电极箔 Aluminum Profile	不锈钢 stainless steel	钛白粉 titanium dioxide	电子产品 electronic products	食品/药品 Food/Medicine	湿法磷酸 wet-process H_3PO_4
废酸来源 Source of waste acid	阳极氧化 Anodizing	腐蚀工艺 Corrosion process	表面酸洗 Surface acid washing	生产 Production	阳极氧化 Anodizing	生产 Production	生产/萃余酸 Production/extraction of residual acid
处理对象 Processing object	硫酸/铝 Sulfuric acid/aluminum	硫酸/盐酸/铝 Sulfuric acid/hydrochloric acid/aluminum	硝酸/氢氟酸/铁 Nitric acid/hydrofluoric acid/iron	硫酸/铁 Sulfuric acid/iron	磷酸/硝酸/铝 Phosphoric acid/nitric acid/aluminum	盐酸/硫酸/有机物 Hydrochloric acid/sulfuric acid/organic matter	阳极氧化 Anodizing
原酸组份 Original acid components	H_2SO_4 (10%–20%) + AL^{3+}(1–5G/L)	H_2SO_4 (8%–15%) + HCL (3%–5%) + AL^{3+} (2–6G/L)	HNO_3 (15%–25%) + HF (2%–5%) + FE^{3+} (3–8G/L)	H_2SO_4 (15%–24%) + FE^{2+}/FE^{3+} (10–160G/L)	H_3PO_4 (5%–12%) + HNO_3 (3%–8%) + AL^{3+} (1–3G/L)	HCL (6%–18%) /H_2SO_4 (8%–15%) + 少量有机物	H_3PO_4 (20%–50%) + FE^{3+}/CA^{2+}/MG^{2+} (0.3%–4.0%)
酸回收率 Acid recovery rate	80%–85%	80%–88%	68%–70%	88%–90%	75%–82%	70%–78%	40%–45% (有效磷回收率) Effective phosphorus recovery rate
金属截留率 Metal retention rate	AL^{3+}≥90%	AL^{3+}≥90%	FE^{3+}≥97% CR^{3+}≥98% NI^{2+}≥96%	FE^{2+}/FE^{3+}≥99%	AL^{3+}≥90%	(无金属离子) (No metal ions)	FE^{3+}≥86% MG^{2+}≥99% AL^{3+}≥94%

*注：各种无机酸的回收能力大致关系为：盐酸≥硝酸>硫酸≥氢氟酸>>磷酸

*Note: The approximate relationship between the recovery capacity of various inorganic acids is: hydrochloric acid ≥ nitric acid>sulfuric acid ≥ hydrofluoric acid>>phosphoric acid

应用领域：阳极氧化废酸回收
APPLICATION AREAS：ANODIZING WASTE ACID RECOVERY

阳极氧化简介 Introduction to anodizing

阳极氧化是铝型材表面处理的一种方法。在型材表面形成一层保护膜，从而提高型材表面耐磨、耐腐蚀性能。

Anodizing is a method of surface treatment for aluminum profiles. Form a protective film on the surface of the profile to improve its wear and corrosion resistance.

行业现状 Industry status

① 每生产1t型材，用酸量为50kg（98%硫酸）。
② 一般阳极氧化废酸组成：硫酸160–200g/L，Al3+15–20g/L，溶铝量在1.5–2.5kg/t铝型材
③ 随着槽液中Al3+离子量浓度的升高，**直接影响槽液的导电性能和膜层质量**。
④ 传统方式需要停产排槽液，**既影响生产效率，同时也增加用酸量和废液的碱中和费用**。

① For every 1 ton of profile produced, 50kg of acid (98% sulfuric acid) is used.
② The general composition of anodic oxidation waste acid is sulfuric acid 160-200g/L, Al3+15-20g/L, and the amount of dissolved aluminum is 1.5-2.5kg/t aluminum profile
③ As the concentration of Al3+ions in the tank solution increases, it directly affects the conductivity and membrane quality of the tank solution.
④ The traditional method requires stopping production and draining the tank solution, which not only affects production efficiency but also increases the amount of acid used and the cost of alkaline neutralization of waste liquid.

解决方案 Solution

① 采用扩散渗析实现**A13+和酸的分离**，控制槽液中的A13+的平衡；
② 将回收酸与新酸进行调配，**减少新酸使用量**；
③ 将废液的**碱中和量减少**，大大降低环保压力。

① Using diffusion dialysis to separate A13+from acid and control the balance of A13+in the tank solution;
② Mix recycled acid with new acid to reduce the amount of new acid used;
③ Reduce the alkaline neutralization amount of waste liquid, greatly reducing environmental pressure.

预处理 Preprocessing

① 去除悬浮物
② 除油

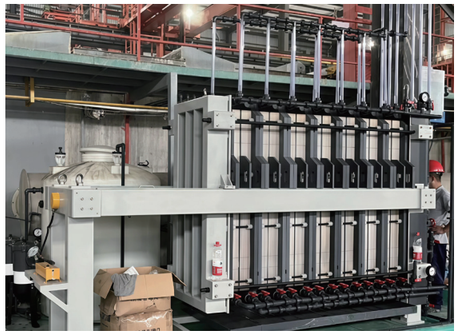
① Remove suspended solids
② Degreasing

铝型材阳极氧化酸回收项目典型案例
Typical case of aluminum profile anodizing acid recovery project



山东某铝型材阳极氧化客户
Shandong aluminum profile anodizing customer

建立年份：2022年	Year of establishment: 2022
酸回收率：80%	Acid recovery rate: 80%
金属拦截率：95%	Metal interception rate: 95%



安徽某铝型材阳极氧化客户
Anhui aluminum profile anodizing customer

建立年份：2022年	Year of establishment: 2022
酸回收率：83%	Acid recovery rate: 83%
金属拦截率：96%	Metal interception rate: 96%
铝离子浓度：18-20g/L	Aluminum ion concentration: 18-20g/L



江西某铝型材阳极氧化客户
Jiangxi aluminum profile anodizing customer

建立年份：2021年	Year of establishment: 2021
酸回收率：82%	Acid recovery rate: 82%
金属拦截率：97%	Metal interception rate: 97%

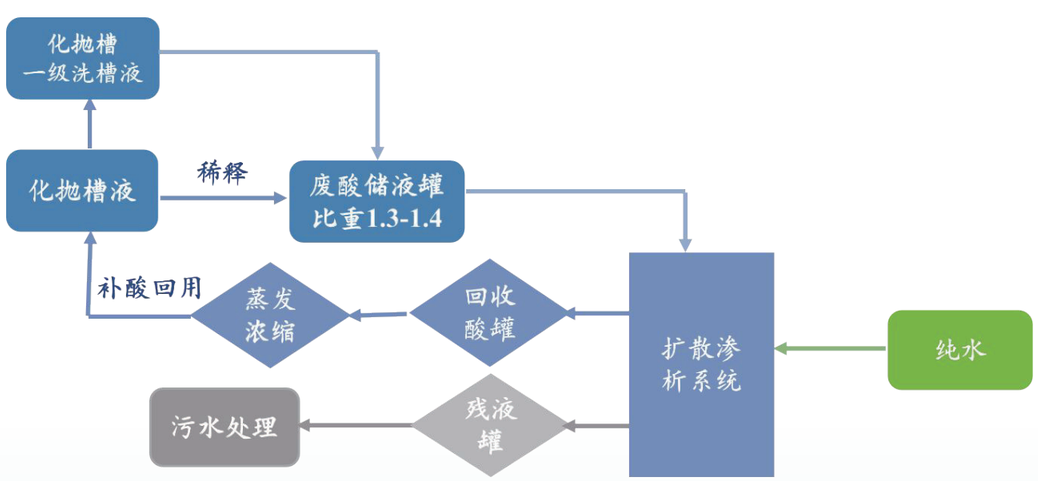
应用领域: 电/化抛液废酸回收
APPLICATION FIELD: RECOVERY OF WASTE ACID FROM ELECTRO/CHEMICAL POLISHING LIQUID

抛光液废酸简介 Introduction to polishing liquid waste acid

抛光工艺一般分为化学抛光液和电化学抛光液，从酸种类上分为两酸抛光（磷酸、硫酸）和三酸抛光（磷酸、硫酸、硝酸），有些会加入有机添加剂。
该领域需要回收的废酸一般指一级水洗液。回收酸作为补充酸进入化抛槽，避免化抛槽铝离子累积。其中，槽液比重为1.4~1.8，水洗液比重为1.1~1.5。

The polishing process is generally divided into chemical polishing solution and electrochemical polishing solution. According to the type of acid, it can be divided into two acid polishing (phosphoric acid, sulfuric acid) and three acid polishing (phosphoric acid, sulfuric acid, nitric acid), and some may add organic additives.

The waste acid that needs to be recycled in this field generally refers to the first-stage rinse water. Recycled acid is fed into the chemical polishing tank as a supplementary acid to avoid the accumulation of aluminum ions in the tank. Among them, the specific gravity of the bath is 1.4-1.8, and the specific gravity of the washing solution is 1.1-1.5.



扩散渗析回收化抛液技术要求
Technical requirements for diffusion dialysis recovery and Chemical Polishing Solution

扩散渗析设备的进料条件 Feed conditions for diffusion dialysis equipment

① 需对物料进行预处理：过滤使料液SDI<5。
② 控制氧化剂的含量（余氯<0.2MG/L，臭氧<0.1MG/L，双氧水<0.1MG/L）。
③ 比重≤1.4。
④ 运行温度：≤40℃；最优运行温度：30–35摄氏度。

① Pre treatment of materials is required: filter to ensure that the SDI of the material solution is less than 5.
② Control the content of oxidants (residual chlorine<0.2mg/L, ozone<0.1mg/L, hydrogen peroxide<0.1mg/L).
③ Specific gravity ≤ 1.4.
④ Operating temperature: ≤ 40 °C; Optimal operating temperature: 30-35 degrees Celsius.

影响扩散渗析经济价值的化抛液参数
Chemical parameters affecting the economic value of diffusion dialysis

① 磷硫比：**磷硫比越高，可回收的磷酸越多，经济价值越大。**
② 铝离子浓度：**铝离子浓度越低，游离的磷酸越多，经济价值越大。**
③ 比重：**最优比重为1.35–1.4，比重越接近1.4，处理量越少，设备规模越小。**

① Phosphorus sulfur ratio: The higher the phosphorus sulfur ratio, the more phosphoric acid can be recovered, and the greater the economic value.
② Aluminum ion concentration: The lower the aluminum ion concentration, the more free phosphoric acid there is, and the greater the economic value.
③ Proportion: The optimal proportion is 1.35-1.4. The closer the proportion is to 1.4, the less processing capacity and the smaller the equipment footprint.

扩散渗析设备的性能指标 Performance indicators of diffusion dialysis equipment

① 磷酸回收率。
② 铝离子截留率。
③ 残液处理方式：中和、稀释、蒸发、树脂。

① Phosphate recovery rate.
② Aluminum ion rejection rate.
③ Residual liquid treatment methods: neutralization, dilution, evaporation, resin.

铝型材化抛废酸回收项目典型案例
Typical case of aluminum profile chemical waste acid recycling project



浙江化妆品外壳产品（化抛液磷酸回收）
Zhejiang cosmetics shell products (chemical polishing solution phosphoric acid recovery)

建立年份：2022年	Year of establishment: 2022
磷酸回收率：50%	Phosphoric acid recovery rate: 50%
硫酸回收率：80%	Sulfuric acid recovery rate: 80%
金属拦截率：97%	Metal interception rate: 97%



某台资公司/3C产品（化抛液磷酸回收）
A Taiwanese funded company/3C product (chemical polishing solution phosphoric acid recovery)

建立年份：2021年	Year of establishment: 2021
磷酸回收率：50%	Phosphoric acid recovery rate: 50%
硫酸回收率：75%	Sulfuric acid recovery rate: 75%
金属拦截率：94%	Metal interception rate: 94%

扩散渗析项目 Diffusion dialysis project

序号 Number	项目名称 Project Name	行业 Industry	地点 Location	膜面积 Membrane Area	投产时间 Commissioning Date
01	新疆某废酸回收项目 Waste acid recycling project in Xinjiang	铝箔 Aluminum Foil	乌鲁木齐 Urumqi	1760㎡	2021
02	江苏某废酸回收项目 Waste acid recycling project in Jiangsu	铝箔 Aluminum Foil	响水 Xiangshui	5280㎡	2020
03	江苏某废酸回收项目二期 Phase II of a waste acid recycling project in Jiangsu	铝箔 Aluminum Foil	响水 Xiangshui		2023
04	安徽某废酸回收项目 Waste acid recycling project in Anhui	铝箔 Aluminum Foil	淮北 Huaibei	880㎡	2022
05	河南某废酸回收项目 Waste acid recycling project in Henan	铝箔 Aluminum Foil	商丘 Shangqiu	880㎡	2022
06	广西某废酸回收项目 Waste acid recycling project in Guangxi	铝箔 Aluminum Foil	梧州 Wuzhou	5280㎡	2022
07	广西某废酸回收项目二期 Phase II of a waste acid recycling project in Guangxi	铝箔 Aluminum Foil	梧州 Wuzhou		2023
08	湖北某废酸回收项目 Waste acid recycling project in Hubei	铝箔 Aluminum Foil	宜川 Yichuan	1510㎡	2022
09	江苏某废酸回收项目 Waste acid recycling project in Jiangsu	铝箔 Aluminum Foil	扬州 Yangzhou	530㎡	2022
10	江苏某废酸回收项目 Waste acid recycling project in Jiangsu	铝箔 Aluminum Foil	南通 Nantong	1144㎡	2022
11	广西某废酸回收项目 Waste acid recycling project in Guangxi	铝型材 Aluminum Profile	百色 Baise	1500㎡	2022
12	广西某废酸回收项目 Waste acid recycling project in Guangxi	铝箔 Aluminum Foil	梧州 Wuzhou	1760㎡	2023
13	俄罗斯某废酸回收项目 Waste acid recycling project in Russia	铝箔 Aluminum Foil	俄罗斯 Russia	880㎡	2023

扩散渗析项目 Diffusion dialysis project

序号 Number	项目名称 Project Name	行业 Industry	地点 Location	膜面积 Membrane Area	投产时间 Commissioning Date
14	江西某废酸回收项目 Waste acid recycling project in Jiangxi	铝型材 Aluminum Profile	上饶 Shangrao	880㎡	2023
15	安徽某废酸回收项目 Waste acid recycling project in Anhui	铝型材 Aluminum Profile	宣城 Xuancheng	264㎡	2023
16	安徽某废酸回收项目 Waste acid recycling project in Anhui	铝型材 Aluminum Profile	池州 Chizhou	880㎡	2022
17	安徽某废酸回收项目二期 Waste Acid Recycling Project Phase II in Anhui	铝型材 Aluminum Profile	池州 Chizhou		2023
18	山东某废酸回收项目 Waste acid recycling project in Shandong	化抛 Chemical Polishing	临沂 Linyi	880㎡	2023
19	广东某废酸回收项目 Waste acid recycling project in Guangdong	铝型材 Aluminum Profile	清远 Qingyuan	704㎡	2023
20	浙江某废酸回收项目 Waste acid recycling project in Zhejiang	铝型材 Aluminum Profile	宁波 Ningbo	1760㎡	2023
21	广东某废酸回收项目 Waste acid recycling project in Guangdong	铝型材 Aluminum Profile	佛山 Foshan	530㎡	2023
22	马来西亚某废酸回收项目 Waste acid recycling project in Malaysia	铝型材 Aluminum Profile	马来西亚 Malaysia	1060㎡	2023
23	湖北某废酸回收项目 Waste acid recycling project in Hubei	医药、食品 Medicine and food	荆州 Jinzhou	2640㎡	2023
24	江苏某废酸回收项目 Waste acid recycling project in Jiangsu	铝型材 Aluminum Profile	常州 Changzhou	264㎡	2023
25	山东废酸回收项目 Waste Acid Recycling Project in Shandong	铝型材 Aluminum Profile	临沂 Linyi	880㎡	2023
26	安徽某废酸回收项目 Waste acid recycling project in Anhui	医药 Medicine	池州 Chizhou	704㎡	2023

序号 Number	项目名称 Project Name	行业 Industry	地点 Location	膜面积 Membrane Area	投产时间 Commissioning Date
27	江苏某废酸回收项目 Waste acid recycling project in Jiangsu	化工 Chemical Industry	泰州 Taizhou	528㎡	2022
28	江苏某贵金属回收项目 Precious metal recycling project in Jiangsu	电子 Electron	苏州 Suzhou		2022
29	江苏某贵金属回收项目 Precious metal recycling project in Jiangsu	电子 Electron	苏州 Suzhou		2023
30	浙江某废酸回收项目 Waste acid recycling project in Zhejiang	化抛 Chemical polishing	绍兴 Shaoxing	880㎡	2022
31	内蒙古某酸回收项目 Acid recovery project in Inner Mongolia	化工 Chemical Industry	鄂尔多斯 Ordos	880㎡	2024
32	吉林某废酸回收项目 Waste acid recycling project in Jilin	化抛 New Energy	长春 Changchun	2640㎡	2025
33	泰国某废酸回收项目 Waste acid recycling project in Thailand	铝型材 Aluminum Profile	泰国 Thailand	1430㎡	2025
34	老挝某废酸回收项目 Waste acid recycling project in Laos	铝型材 Aluminum Profile	老挝 Laos	1430㎡	2025
35	安徽某废酸回收项目 Waste acid recycling project in Anhui	铝型材 Aluminum Profile	合肥 Hefei	716㎡	2025
36	广东某废酸回收项目 Waste acid recycling project in Guangdong	铝箔 Aluminum Foil	肇庆 Zhaoqing	1430㎡	2025
37	新疆某废酸回收项目 Waste acid recycling project in Xinjiang	铝箔 Aluminum Foil	乌鲁木齐 Urumqi	10240㎡	2025
38	新疆某废酸回收项目 Waste acid recycling project in Xinjiang	铝箔 Aluminum Foil	伊犁 Yili	5728㎡	2025
39	上海某废酸回收项目 Waste acid recycling project in Shanghai	铝型材 Aluminum Profile	上海 Shanghai	716㎡	2025
40	上海某废酸回收项目 Waste acid recycling project in Shanghai	化抛 Chemical polishing	上海 Shanghai	2864㎡	2026