Technical Data

D001 Macroporous Strong Acid Cation-Exchange Resin

PRODUCT DESCRIPTION

D001 is a macroporous poly(styrene sulphonate) cation-exchange resin with excellent resistance to both osmotic and thermal shock. Its special sponge-like structure permits higher rates of diffusion of most cations including those of heavy metals and amines and also positively charged organics of higher molecular weight, and facilitates their removal on regeneration. These properties of physical robustness, good regenerability, and fast kinetics of exchange make it ideal for a range of applications. In such cases, it is the general rule that a specially graded particle size is required.

D001 of specially tailored particle sizes find applications in mixed beds, for make-up and condensate polishing, for hydrometallurgy, for sugar treatment, and demineralisation of numerous organic solutions to name but a few. With the macroporous **D001**, continuous softening of sugar solutions by the Asahi process is feasible. Here, no gel resin is normally recommended because of the extra osmotic and mechanical stresses imposed by the external regeneration of the resin and its subsequent return to service.

CHEMICAL STABILITY

D001 is insoluble in acids, alkalies, and all common solvents. However, exposure to significant amounts of free chlorine or other strong oxidising agents over long periods of time will eventually break down the crosslinking. This will tend to increase the moisture content of the resin, decreasing its mechanical strength, and should be avoided.

Typical Physical & Chemical Characteristics

Polymer Matrix Structure	Macroporous polystyrene crosslinked with divinylbenzene
Physical Form and Appearance	Spherical grey to brown beads
Whole Bead Count	95% min.
Functional Groups	Sulphonic acid （$R\text{-}SO_3$）
Ionic Form, as shipped	Na^+
Shipping Weight	770-850 g/l
Particle Size Range	0.315mm-1.25 mm≥95%
Moisture Retention, Na^+ form	45– 55%
Swelling $Na^+ \rightarrow H^+$	9% max.
$Ca^{2+} \rightarrow Na^+$	6% max.
Specific Gravity, moist Na^+ Form	1.25-1.28
Total Exchange Capacity, Na^+ form, wet, volumetric dry, weight	 1.80eq/l min. 4.35 eq/kg min.
Operating Temperature, Na^+ Form.	150ºC max
pH Range, Stability pH Range Operating, Na^+ cycle	None

Standard Operating Conditions

Operation	Rate	Solution	Minutes	Amount
Service	12- 45 BV/h	Influent water	per design	per design
Backwash	5-12 m/h	Influent water 5ºC- 30ºC	5 - 20	1.5 - 4 BV
Regeneration	4 - 8 BV/h	8-20% NaOH	15-60	60-320 g/l
Rinse, (slow)	3-8BV/h	Influent water	30 approx.	2-4 BV
Rinse, (fast)	8-40 BV/h	Influent water	30 approx.	3-10BV
Backwash Expansion 50% to 75% Design Rising Space 100%				

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

D001 Macroporous Strong Acid Cation-Exchange Resin

Supplier

Shengdong Technology Co., LTD.
No. 88 Zhuhu Road, Tianchang, Anhui Province, China 239300

For non-emergency information contact: 0086-550-7322555

Emergency telephone number

Spill Emergency	0086-550-7322555
Health Emergency	0086-550-7322555

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	**CAS-No.**	**Concentration**
Sulfonated divinylbenzene/styrene copolymer, Na^+ ion form	63182-08-1	45.0 - 55.0%
Water	7732-18-5	45.0 - 55.0%

3. HAZARDS IDENTIFICATION

Emergency Overview
Appearance

Form	Beads
Colour	grey to brown
Hazard Summary	**CAUTION!** MAY CAUSE EYE/SKIN IRRITATION

Potential Health Effects

Primary Routes of Entry:	Skin contact Eye contact

Eyes: Direct contact with material can cause the following:
slight irritation
Skin: Prolonged or repeated skin contact can cause the following:
slight irritation

4. FIRST AID MEASURES

Skin contact: Wash off with soap and water. If skin irritation persists, call a physician.
Eye contact: Rinse with plenty of water. If eye irritation persists, consult a specialist.

5. FIRE-FIGHTING MEASURES

Flash point not applicable
Ignition temperature 500.0 °C
Lower explosion limit not applicable
Upper explosion limit not applicable
Suitable extinguishing media:
Use the following extinguishing media when fighting fires involving this material:
water spray
carbon dioxide (CO_2)
foam
dry chemical
Specific hazards during fire fighting: Toxic fumes are generated when material is exposed to fire or fire conditions. Cool closed containers exposed to fire with water spray.
Special protective equipment for fire-fighters: In the event of fire, wear self-contained breathing apparatus.
Further information: Remain upwind.
Avoid breathing smoke.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Appropriate protective equipment must be worn when handling a spill of this material. See SECTION 8, Exposure Controls/Personal Protection, for recommendations.
If exposed to material during clean-up operations, see SECTION 4, First Aid Measures, for actions to follow.
Methods for cleaning up
Keep spectators away.
Floor may be slippery; use care to avoid falling.
Transfer spilled material to suitable containers for recovery or disposal.

7. Handling and storage

Handling
NOTE: This product as supplied is a whole bead resin and may produce slight eye irritation. However, the ground form of this resin should be treated as a severe eye irritant. Worker exposure to ground resins can be controlled with local exhaust ventilation at the point of dust generation, or use of suitable personal protective equipment (dust/mist air-purifying respirator and safety goggles). Avoid repeated freeze-thaw cycles; beads may fracture. If frozen, thaw at room temperature.
Storage
Further information:
CAUTION: Do not pack column with dry ion exchange resins. Dry beads expand when wetted; this expansion can cause glass column to shatter.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limit(s)
Exposure limits are listed below, if they exist.
Eye protection: Use safety glasses with side shields (ANSI Z87.1or approved equivalent).

Hand protection: Cotton or canvas gloves.

Respiratory protection: No personal respiratory protective equipment normally required.
Protective measures: Facilities storing or utilizing this material should be equipped with an eyewash facility.
Engineering measures: None required under normal operating conditions.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	Beads
Colour	grey to brown
pH	7.0 - 9.0Aqueous slurry
Boiling point/range	100 °C Water
Melting point/range	0 °C Water
Flash point	not applicable
Ignition temperature	500 °C
Lower explosion limit	not applicable
Upper explosion limit	not applicable
Vapour pressure	17.0 mmHg at20 °C Water
Relative vapour density	<1.0water
Water solubility	insoluble
Relative density	1.25 - 1.29
Viscosity, dynamic	not applicable
Evaporation rate	<1.00Water
Percent volatility	45 - 55 %

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Hazardous reactions	Stable under normal conditions.
Materials to avoid	Avoid contact with the following: Strong Oxidizers
Hazardous decomposition products	Thermal decomposition may yield the following:, monomer vapors,

11. TOXICOLOGICAL INFORMATION

No data are available for this material. The information shown is based on profiles of compositionally similar materials.

Acute oral toxicity	LD50rat >5,000 mg/kg
Acute dermal toxicity	LD50rabbit >5,000 mg/kg

12. ECOLOGICAL INFORMATION

Limited effects are expected from exposure of the environmental compartments by insoluble plastic beads of large diameter (200 to 1300 microns).

13. DISPOSAL CONSIDERATIONS

Disposal
Waste Classification: When a decision is made to discard this material as supplied, it does not meet RCRA's characteristic definition of ignitability, corrosivity, or reactivity, and is not listed in 40 CFR 261.33. The toxicity characteristic (TC), however, has not been evaluated by the Toxicity Characteristic Leaching Procedure (TCLP).
Unused material may be incinerated or landfilled in facilities meeting local, state, and federal regulations.
Contaminated packaging: Empty containers should be taken to local recyclers for disposal. Refer to applicable federal, state, and local regulations.

14. TRANSPORT INFORMATION

DOT

Not regulated for transport

IMO/IMDG

Not regulated (Not dangerous for transport)

Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations

15. REGULATORY INFORMATION

Workplace Classification
This product is considered non-hazardous under the OSHA Hazard Communication Standard (29CFR1910.1200).
This product is not a'controlled product' under the Canadian Workplace Hazardous Materials Information System (WHMIS).
SARA TITLE III: Section 311/312 Categorizations (40CFR370): This product is not a hazardous chemical under 29CFR 1910.1200, and therefore is not covered by Title III of SARA.
SARA TITLE III: Section 313 Information (40CFR372)
This product does not contain a chemical which is listed in Section 313 at or above de minimis concentrations.
CERCLA Information(40CFR302.4)

Releases of this material to air, land, or water are not reportable to the National Response Center under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or to state and local emergency planning committees under the Superfund Amendments and Reauthorization Act (SARA) Title III Section 304.

US. Toxic Substances Control Act (TSCA) All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

Pennsylvania

Any material listed as "Not Hazardous" in the CAS REG NO. column of SECTION 2, Composition/Information On Ingredients, of this MSDS is a trade secret under the provisions of the Pennsylvania Worker and Community Right-to-Know Act.

16. OTHER INFORMATION

Hazard Rating

	Health	**Fire**	**Reactivity**
HMIS	1	1	0

Legend

ACGIH	American Conference of Governmental Industrial Hygienists
BAc	Butyl acetate
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
STEL	Short Term Exposure Limit (STEL):
TLV	Threshold Limit Value
TWA	Time Weighted Average (TWA):
|	Bar denotes a revision from prior MSDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.