

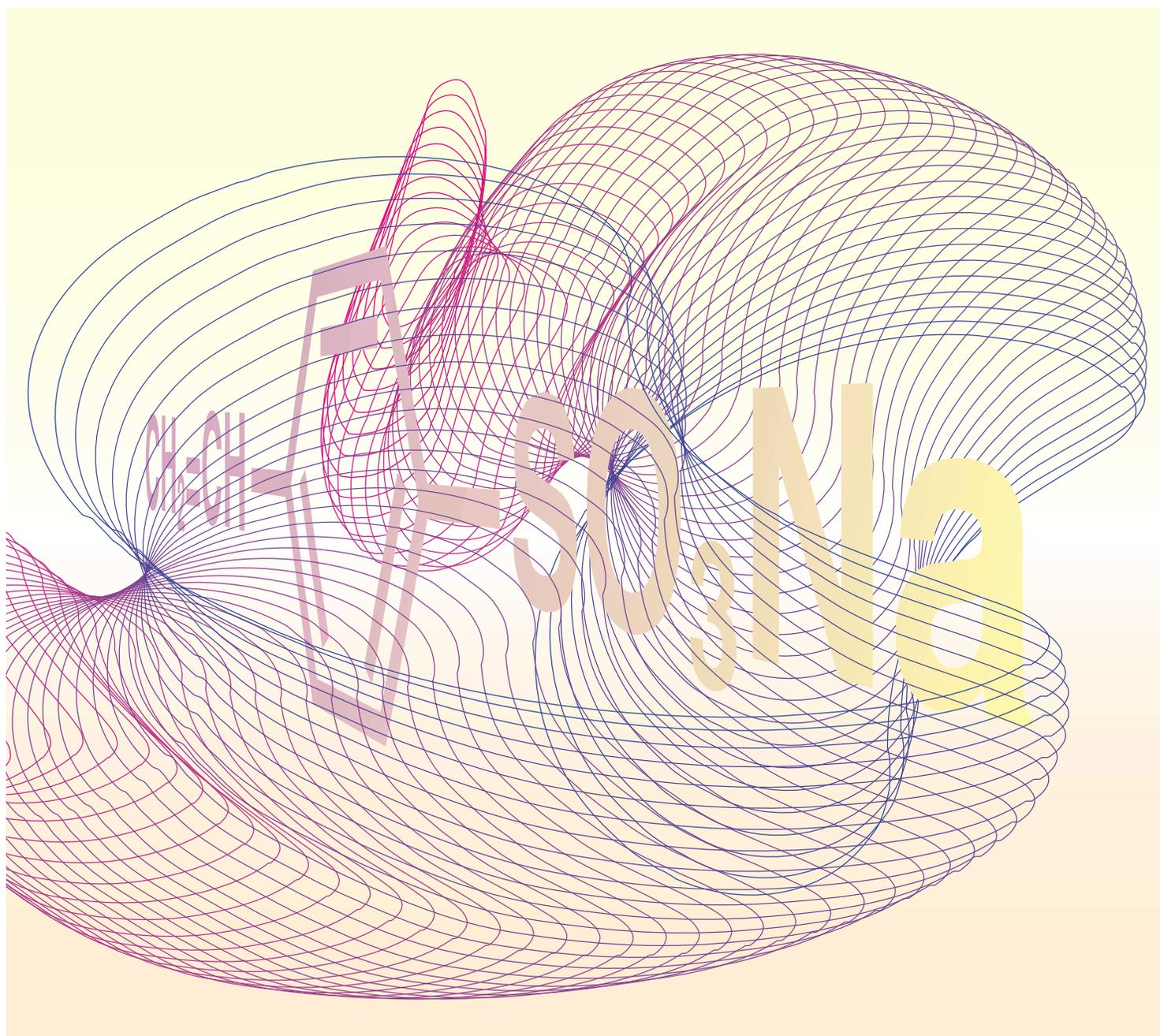


TOSOH CORPORATION

TOSOH

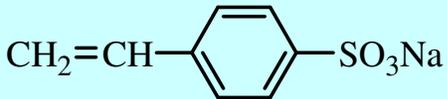
# ***SPINOMAR<sup>®</sup> NaSS***

**(Sodium p-Styrenesulfonate)**



## 1. General Properties

### Properties

Product Name	<i>SPINOMAR</i> <sup>®</sup> NaSS
Generic name	Sodium p-Styrenesulfonate
Chemical formula/Diagram	$\text{CH}_2=\text{CH}-\text{C}_6\text{H}_4-\text{SO}_3\text{Na}$ 
Appearance	White wet powder
Molecular Weight	206.20
Specific gravity	Approximately 0.5
Melting point	330 °C (decomp.)
Flash point	-
Odor	Nil
Toxicity data	LD50 16g/kg(mouse- oral)

### Resistration

CAS No.	2695-37-6
MITI	(3)-1903
TSCA	Listed
EINECS	220-266-3
ECL	KE-13273

## 2. Quality (Specification / Representative value)

Item	Specification	Representative Value
Purity (%)	84-92	88.2
NaBr (%)	<4	2.0
NaOH(%)	<1	0.1
Na <sub>2</sub> SO <sub>4</sub> (%)	<1	0.4

### 3. Chemical Properties

With the inductive effect of sulfo radical on the para position against vinyl group, *SPINOMAR*<sup>®</sup> NaSS possesses the highest reactivity (polymerization activity) among all sulfonated vinyl monomers. It performs radical polymerization in such polar solvents as DMF, DMSO and water using common or redox polymerization initiators.

#### Monomer reactivity

M1	r1	M2	r2	Solvent	Temp.(°C)
<i>SPINOMAR</i> <sup>®</sup> NaSS	0.55±0.03	Acrylonitrile	0.15±0.02	DMSO	45
	1.5±0.2		0.05±0.02	H <sub>2</sub> O	40
	1.20±0.10		0.10±0.02	H <sub>2</sub> O(pH3)	45
	1.40±0.4		0.05±0.01	H <sub>2</sub> O(pH7)	45
	1.0±0.02	Acrylic acid	0.10±0.02	H <sub>2</sub> O	70
	2.3±1.2	Sodium acrylate	0.34±0.23	H <sub>2</sub> O	70
Sodium allyl sulfonate	0.18±0.05	Acrylonitrile	0.69±0.05	DMSO	60
	0.07±0.06		4.94±0.06	H <sub>2</sub> O	30
Sodium methallyl sulfonate	0		3.1	H <sub>2</sub> O	60

#### Q-e Value of *SPINOMAR* NaSS<sup>®</sup> by Alfrey-Price's equation

Monomer	Solvent	Q	e
<i>SPINOMAR</i> <sup>®</sup> NaSS	H <sub>2</sub> O	2.49	-0.59
	DMSO	0.44	-0.38
Sodium vinylsulfonate		0.064	0.41
Sodium allylsulfonate		0.15	-0.24
Sodium methallylsulfonate	H <sub>2</sub> O(pH7)	0.23	0.28
	H <sub>2</sub> O(pH1.5)	0.27	0.69

Generally, acidic aqueous *SPINOMAR*<sup>®</sup> NaSS is subjected to natural slow polymerization. In powder form, *SPINOMAR*<sup>®</sup> NaSS is subject to slow oxidation and/or polymerization when dried.

## 4. Uses of *SPINOMAR*<sup>®</sup> NaSS

*SPINOMAR*<sup>®</sup> NaSS is used in various fields such as:

- |                    |                      |                |
|--------------------|----------------------|----------------|
| 1. Dyeing          | 2. Water Treatment   | 3. Emulsifiers |
| 4. Scale Inhibitor | 5. Antistatics Agent | 6. Others      |

## 5. Shipping and Storage

*SPINOMAR*<sup>®</sup> NaSS is supplied in 25kg net, polyethylene-lined paper bags, and in 500kg net, PVC flexible containers.

We recommend that *SPINOMAR*<sup>®</sup> NaSS be stored airtight in a dark place like other industrial monomers in order to avoid drying.

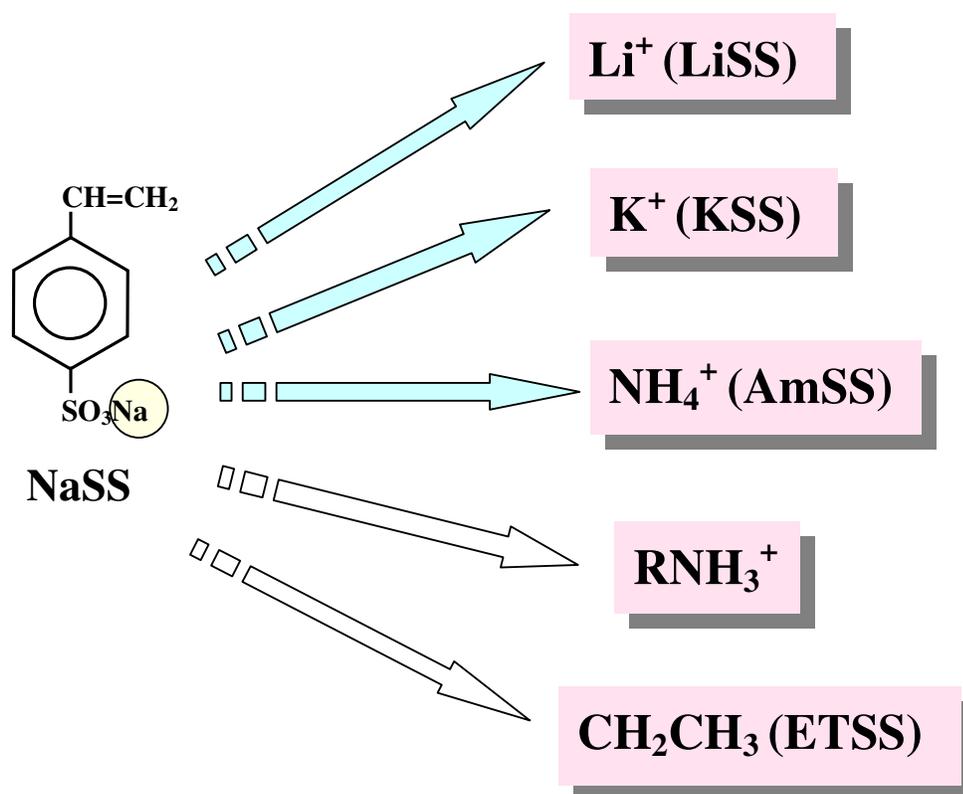
*SPINOMAR*<sup>®</sup> NaSS is subject to slow-oxidation and/or polymerization, when dried.

## 6. Safety and Handling

Typical precautions should be taken when handling *SPINOMAR*<sup>®</sup> NaSS to avoid ingestion or contact with the eyes or skin. Please refer to the Material Safety Data Sheet for more information. This product is recommended for industrial use only.

## 7. Various salts of the Styrenesulfonate Monomer

- Tosoh can supply various salts of the styrenesulfonate monomer. In addition to sodium styrenesulfonate, the lithium salt, the potassium salt, the ammonium salt, the amine salt, and etc. are available to meet customer's specific needs.
- Sodium styrenesulfonate, lithium salt, potassium salt and ammonium salt are soluble into water well. They are not soluble into hydrocarbon solvents.
- Ethyl styrenesulfonate is soluble into common organic solvents.



Product	NaSS	LiSS	AmSS	ETSS
Appearance	white powder	white powder	white powder	yellow liquid
Solubility (wt%) at 25°C				
H <sub>2</sub> O	19.6	41.5	24.5	insol
DMF	8.7	32.3	27.0	miscible
DMSO	19.7	31.2	30.0	miscible
Ethanol	0.3	16.5	3.6	miscible
Toluene	insol	insol	insol	miscible

## 8. Poly-NaSS (Polystyrenesulfonate Homo-Polymer)

Poly-NaSS is homo/co-polymer produced by TOSOH CORPORATION.

### Specification, Packing (Homo-polymer)

Specification	PS-1	PS-5	PS-50	PS-100
Appearance	Red clear liquid	Light yellow clear liquid	Light yellow clear liquid	Light yellow clear liquid
Active Solid (%)	20-22	20-22	20-22	20-22
Viscosity (mPa.s, 25 °C)	5-10	20-50	200-500	800-1600
pH(25°C)	7-9	7-9	7-9	8-11
Molecular weight (x10 <sup>4</sup> )	1-3	5-10	40-60	80-120

All specifications in this publication are subject to change without notice.

### Packing

- 20kg Can
- 200kg Drum

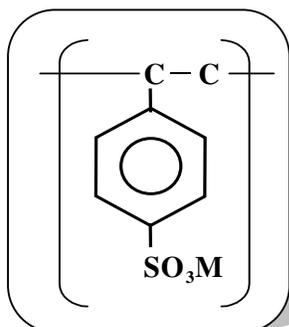
### Applications

- Antistatic Agent
- Dispersant
- Anchor Coat Agent

## 9. Poly-NaSS (Polystyrenesulfonate Co-Polymer)

Based on Tosoh's polymerization technology, we can provide you with homopolymers of various salts of styrenesulfonate that have wide range of molecular weight.

PS Series ( 20% aqueous solution )

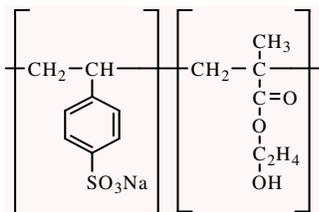


M = Na, Li, K, NH<sub>4</sub>

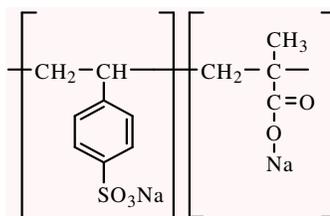
M<sub>w</sub> = 10,000 ~ 1,000,000

Copolymers of Styrenesulfonate with other monomers are available.

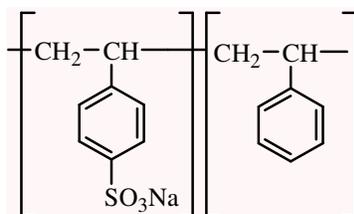
HM Series ( 20% aqueous solution )



MA Series ( 20% aqueous solution )



ST Series ( 20% aqueous solution )





TOSOH

For more information, please contact your nearest representative

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