TECHNICAL DATA SHEET

Titanium Silicalite-1 (TS-1)

Microporous Ti-Si molecular sieve · H^+ form · SiO_2/TiO_2 molar ratio ≥25 · BET 360–420 m^2/g · calcined, ready to use · Type B: 50 g / 200 g / 1 kg



ACS Material Titanium Silicalite-1 (TS-1) — Representative Packaging

ACS Material Ti-Si Molecular Sieve TS-1 (Cation: H), 50 g. Image shown for reference.

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Revision Date **10/29/2026**

SECTION I

Product Overview

Titanium Silicalite-1 (TS-1) was the first framework-substituted redox molecular sieve to be identified. Redox molecular sieves offer a significant advantage over standard heterogeneous catalysts: a redox sieve makes it possible to get a significantly higher selectivity to primary oxidation products. TS-1 has unique properties as a heterogeneous catalyst when H_2O_2 is used as the oxidant, and H_2O_2 is attractive for industrial applications because of its relatively low cost and because it is clean.

ACS Material TS-1 is a microporous Ti-Si molecular sieve supplied as a powder in the H^+ form. It is calcined and ready to use directly. Powder (Type B), 20–50 µm, is currently available; Powder (Type A), 0.3–0.5 µm, has been discontinued, and its data are retained in this data sheet for reference. Typical SEM and XRD data for Type B are included.

SECTION II

Core Advantages

- **Redox molecular sieve** — framework-substituted titanium.
- **High surface area** — BET 360–420 m^2/g.
- **Low sodium** — Na_2O <0.1%.
- **H_2O_2 oxidation** — selective partial oxidation catalyst.
- **High crystallinity** — comparative crystallinity >95%.
- **Ready to use** — calcined; H^+ form.

SECTION III

Specifications

Technical data

Specifications	
Product name	Titanium Silicalite-1 (TS-1); Microporous Ti-Si Molecular Sieve TS-1
Brand	ACS Material
Preparation method (Type B)	Hydrothermal Method
Cation	H^+
Supplied	Calcined, ready to use directly

Characterizations by type

Characterizations	Powder (Type A) — Discontinued	Powder (Type B)
Form	Powder	Powder
SiO_2/TiO_2 molar ratio	≥25	≥25
Particle size (µm)	0.3–0.5	20–50
Pore diameter (nm)	~0.5	~0.5
BET surface area (m^2/g)	360–420	360–420
Comparative crystallinity (%)	>95	>95
Na_2O (%)	<0.1	<0.1
Cation	H^+	H^+

Pore volume (Type B): ~0.2 cm^3/g.

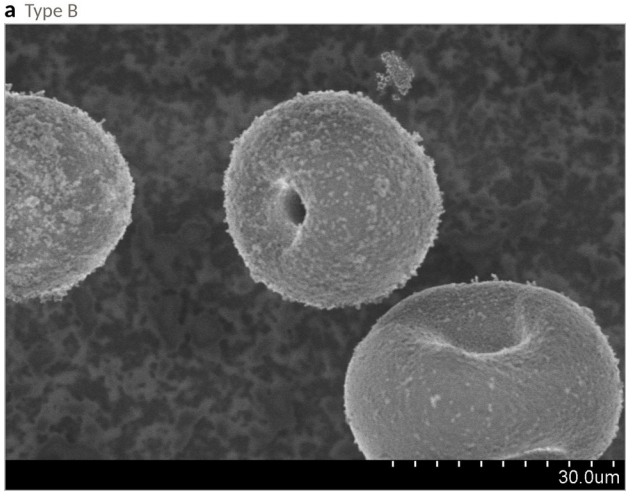
Type A has been discontinued; its specifications are retained for reference.

Ordering information

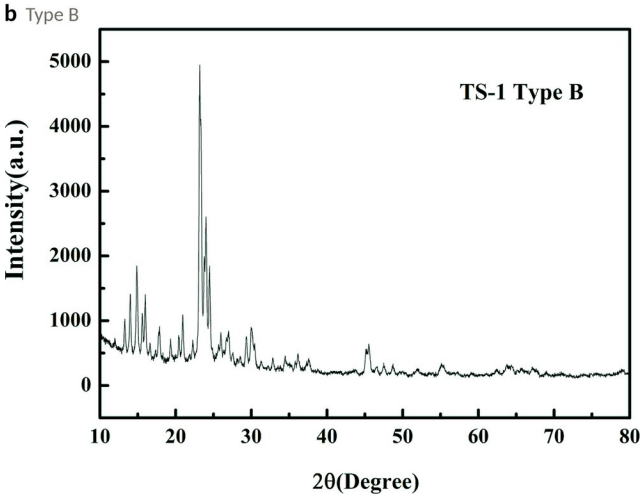
Type	Package	Product No.
Powder (Type B)	50 g	MSTS1B51
Powder (Type B)	200 g	MSTS2022
Powder (Type B)	1 kg	MSTS1B31

Typical data

a Type B



b Type B



a SEM image of ACS Material TS-1, Type B, ×1.50k (scale bar 30.0 µm). **b** XRD pattern (2θ 10–80°).

SECTION IV

Applications

1) Alkene epoxidation.

2) Cyclohexanone ammoxidation.

3) Alcohol oxidation.

4) Oxidation of saturated hydrocarbons.

5) Hydroxylation of aromatic hydrocarbons.

Revision Date: 10/29/2026

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