TECHNICAL DATA SHEET

ZSM-5 Series Zeolite (MFI) Powder

MFI framework · hydrothermal method · SiO_2/Al_2O_3 from 18–25 to >1500 · H^+ / Na^+ forms (laboratory grades) · 100 g / 200 g / 1 kg



ACS Material ZSM-5 Series Zeolite (MFI) Powder — Representative Packaging

Representative packaging shown: ZSM-5 powder, P-38, 200 g (MSZ5P001). Label and packaging may vary.

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Revision Date **10/29/2026**

SECTION I

Product Overview

ZSM-5 Series Zeolite (MFI) Powder is a shape-selective catalyst distinguished by its unique channel structure. ZSM-5 (zeolite socony mobil-5) is a pentasil aluminosilicate zeolite: each pentasil unit is made up of eight 5-membered rings, and the units are joined by oxygen bridges into regular corrugated sheets with 10-ring holes. The channel structure and acidity of ZSM-5 suit it to acid-catalyzed reactions and to use as a support material for catalysis.

The series is prepared by the hydrothermal method. ACS Material offers laboratory grades (P-25, P-38, P-38-Na, P-117 and P-360; SiO_2/Al_2O_3 ~25 to 360, H^+ or Na^+ form) and industrial grades (SiO_2/Al_2O_3 18–25 up to >1500, single crystals or aggregates of nanocrystals). Package options for the listed store variants are 100 g, 200 g and 1 kg.

SECTION II

Core Advantages

— **Shape-selective MFI framework** — pentasil units joined by oxygen bridges form corrugated sheets with 10-ring holes; pore size ~5 Å.

— **H^+ and Na^+ forms** — laboratory grade P-38 is offered in the H^+ form and in the Na^+ form (P-38-Na).

— **Low sodium, high crystallinity** — industrial grades: Na_2O <0.1 wt% and relative crystallinity >90%.

— **Wide SiO_2/Al_2O_3 choice** — 5 laboratory and 17 industrial grades (5 marked Discontinued), from 18–25 (P-20n) to >1500 (P-1500s / P-1500p).

— **High surface area** — BET >380 m^2/g for P-38, P-38-Na, P-117 and P-360; >350 m^2/g for all industrial grades.

— **Ready-to-use laboratory grades** — calcined on delivery; reactivate at 550 °C in air when needed.

SECTION III

Specifications

Technical data — all grades

Specifications	
Product name	ZSM-5 Series Zeolite (MFI) Powder
Brand	ACS Material
CAS No.	1318-02-1
Framework	MFI
Structure	Pentasil aluminosilicate zeolite, 10-ring channels
Pore size	~5 Å
Linear formula	$(SiO_2)x(Al_2O_3)y$
Preparation method	Hydrothermal method
Laboratory grade forms	H^+; Na^+ (P-38-Na)
SiO_2/Al_2O_3 range	~25 to 360 (laboratory); 18–25 to >1500 (industrial)
Grades	5 laboratory grades and 17 industrial grades, including 5 industrial grades marked (Discontinued)
Package options (store variants)	100 g / 200 g / 1 kg

Laboratory grades — calcined, ready to use

Type	Form	SiO_2/Al_2O_3 molar ratio	Avg. particle size (µm)	BET surface area (m^2/g)	Na_2O (%)	Adsorption (wt%)
P-25	H^+	~25	2–5	≥340	–	–
P-38	H^+	~38	2	>380	<0.2	≥9.5
P-38-Na	Na^+	~38	2	>380	–	≥9.5
P-117	H^+	~117	2	>380	<0.2	≥9.5
P-360	H^+	360	2	>380	<0.1	≥9.5

Laboratory grades are calcined and ready to use directly. They can be reactivated by calcination at 550 °C in air: increase the temperature in steps of 10 °C per minute and heat at 550 °C for about 5–6 hours.

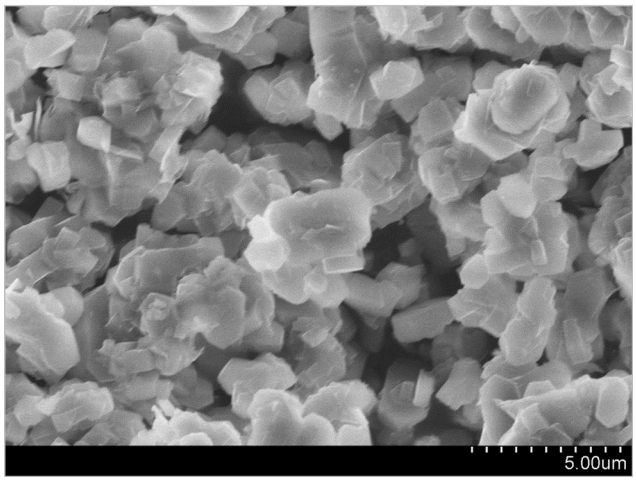
Industrial grades — Na_2O <0.1 wt%, BET surface area >350 m^2/g, relative crystallinity >90% (all grades)

Type	SAR (SiO_2/Al_2O_3)	Morphology	Particle size D50 (µm)	Applications	Supplied
P-1500s	>1500	Single crystals	<15	Adsorbent, catalyst, VOC, isomer separation	Not calcined
P-1500p	>1500	Single crystals	<15	Hydrophobic adsorbent, catalyst, isomer separation	Calcined
P-1200s	900–1500	Single crystals	<15	Catalyst, adsorbent, VOC	Calcined
P-800s	700–900	Single crystals	<15	Catalyst, adsorbent, VOC	Not calcined
P-600s	500–700	Single crystals	<10	Catalyst, adsorbent, VOC	Not calcined
P-400s	350–450	Single crystals	<10	Catalyst, adsorbent, VOC, MTP/MTPG	Not calcined
P-300s	250–350	Single crystals	<10	Catalyst, adsorbent, VOC, FCC ZSM-5 additive for octane enhancement	Not calcined
P-200s	160–230	Single crystals	<10	Catalyst, catalyst carrier, methanol and toluene alkylation	Not calcined
P-150s	140–160	Single crystals	<10	Catalyst, catalyst carrier	Not calcined
P-120s	110–130	Single crystals	<10	Catalyst, catalyst carrier	Not calcined
P-100s (Discontinued)	90–110	Single crystals	<10	Catalyst, catalyst carrier	Not calcined
P-80s (Discontinued)	70–90	Single crystals	<10	Catalyst, catalyst carrier	Not calcined
P-60n (Discontinued)	50–70	Aggregates of nanocrystals	<10	Catalyst, catalyst carrier, MTG	Not calcined
P-30n	25–35	Aggregates of nanocrystals	<5	Catalyst, catalyst carrier, MTA/FCC ZSM-5 additive for C_3=, dewaxing, alkylation, dealkylation, oligomerization	Not calcined
P-30s (Discontinued)	25–35	Single crystals	<5	Catalyst, catalyst carrier, MTA/FCC ZSM-5 additive for C_3=, dewaxing, alkylation, dealkylation, oligomerization	Not calcined
P-20n	18–25	Aggregates of nanocrystals	<5	Catalyst, catalyst carrier, MTA	Not calcined
P-20s (Discontinued)	18–25	Single crystals	<5	Catalyst, catalyst carrier, MTA	Not calcined

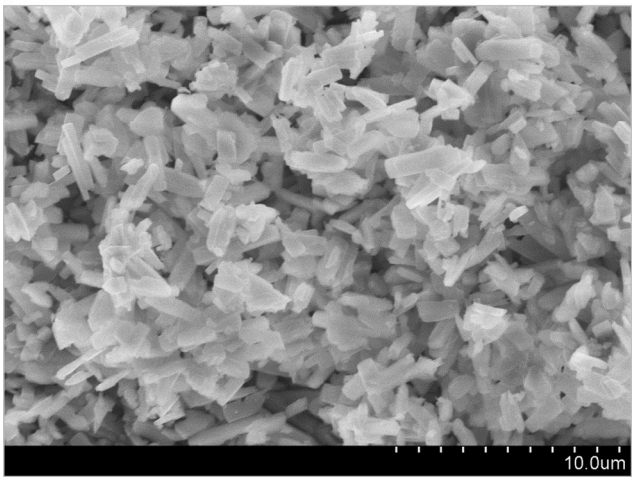
For grades supplied not calcined, heat at 500–530 °C for at least 3 hours; adjust the time to the total quantity of product. Please contact us for calcination services, bulk quantities and lead time.

Typical data

a P-38



b P-360



a SEM image of ACS Material ZSM-5 Series Zeolite Powder, P-38, ×6.00k (scale bar 5.00 µm). **b** SEM image, P-360, ×4.50k (scale bar 10.0 µm).

SECTION IV

Applications

ZSM-5 Series Zeolite Powder is used as a catalyst and as an adsorbent. Its channel structure and acidity suit it to acid-catalyzed reactions and to use as a support material for catalysis.

Application fields named for individual grades include VOC adsorption, isomer separation, hydrophobic adsorption (P-1500p), catalyst carriers, MTP/MTPG, FCC ZSM-5 additives for octane enhancement and for C_3=, methanol and toluene alkylation, MTA, dewaxing, alkylation, dealkylation and oligomerization; see the industrial grades table for the fields listed per grade.

Revision Date: 10/29/2026

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