

Insight into ETS-10 synthesis for the preparation of mixed matrix membranes for CO₂/CH₄ gas separation

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Table S1. Synthesis conditions, crystal size and final product of different ETS-10 syntheses. Ti1 and Ti2 correspond to anatase with particle sizes of 200-300 nm and 25 nm, respectively. The nomenclature used is “Ti source_ temperature_ time”, i. e., the first sample is labeled Ti1_230 °C_ 9h.

Synthesis	Temperature	Ti source	Time (h)	Product ^a	Crystal size (μm) ^b
230_ti source_time	230 °C	Ti1	9	ETS-10, anatase, quartz	0.6 ± 0.1 0.34 ± 0.06
			15	ETS-10, anatase	0.5 ± 0.1 0.33 ± 0.07
			24	ETS-10	0.7 ± 0.1 0.39 ± 0.07
		Ti2	9-24	--	--
		TiCl ₃ (with ETS-10 seeds)	5	ETS-10, amorphous	1.7 ± 0.3 2.0 ± 0.3
			24	ETS-10	1.9 ± 0.2 2.3 ± 0.3
			48	ETS-10	2.9 ± 0.4 3.2 ± 0.4
195_ti source_time	195 °C	Ti1	15	Anatase	--
		Ti2	15	ETS-10	0.5 ± 0.1 0.29 ± 0.06
			36	ETS-10, quartz	0.37 ± 0.06 0.24 ± 0.06
			48	Q, ETS-10	--
		TiCl ₃ (with ETS-10 seeds)	24	ETS-10, amorphous	1.8 ± 0.2 1.9 ± 0.2
			48	ETS-10	2.2 ± 0.3 2.3 ± 0.4
180_ti source_time	180 °C	Ti1	15-24	Anatase	--
		Ti2	15	Anatase, ETS-10	0.31 ± 0.04
			24	ETS-10, anatase	0.49 ± 0.07 0.28 ± 0.06
			48	ETS-10, ETS-4, anatase	0.44±0.07 0.21±0.04
		TiCl ₃ (with ETS-10 seeds)	48	ETS-10, amorphous	0.08 ± 0.02
			62	ETS-10, AM-3, ETS-4	--

^a From XRD data; the major product appears at the first place.

^b First value corresponds to crystal size in direction c, and second value corresponds to crystal size in directions a=b. Values correspond to the average of 20 particles measured by IMAQ Vision Builder program and errors correspond to standard deviation.

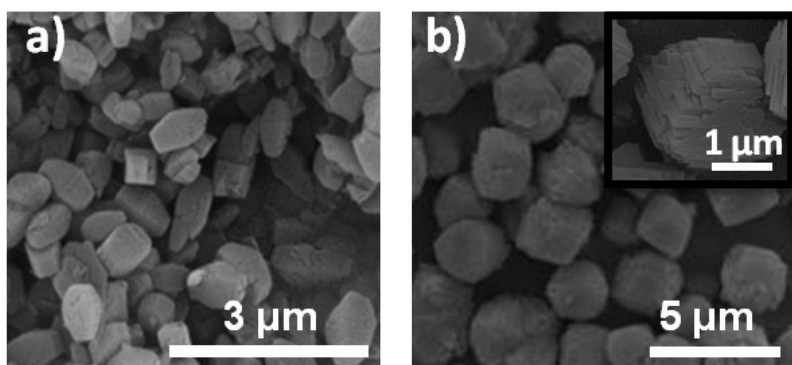


Figure S1. SEM images of ETS-10 crystals a) Ti1_230_24h, b) TiCl₃_230_24h.