Electronic Supporting Information

Influence of Mg/CTAB Ratio on the Structural, Physicochemical Properties and Catalytic Activity of Amorphous Mesoporous Magnesium Silicate Catalysts

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Figure S1. Mg 1s XPS spectrum of (a) 0.25, (b) 0.50, (c) 0.75 and (d) 1.00MgMST.



Figure S2. Si 2p XPS spectrum of (a) 0.25, (b) 0.50, (c) 0.75 and (d) 1.00MgMST.



Figure S3. O 1s XPS spectrum of (a) 0.25, (b) 0.50, (c) 0.75 and (d) 1.00MgMST.



Figure S4. C 1s XPS spectrum of adventitious carbon in (a) 0.25, (b) 0.50, (c) 0.75 and (d) 1.00MgMST as calibration reference. Signal at 284.8 eV is attributed to C-C group while peaks at \sim 286 eV and \sim 288 eV are assigned to C-O and O=C-O, respectively.



Figure S5. Arrhenius plot for styrene epoxidation with hydrogen peroxide in the presence of 1.00MgMST at various temperature.

Factors	Styrene Conversion		StO Selectivity		BZ Selectivity		PA Selectivity	
	p-value	Significance	p-value	Significance	p-value	Significance	p-value	Significance
Time	0.0004	Yes	0.0086	Yes	0.6935	No	0.3454	No
Mg/CTAB ratio	0.0226	Yes	0.0028	Yes	0.5142	No	0.3864	No
Styrene/H ₂ O ₂ ratio	0.0101	Yes	0.0016	Yes	0.0003	Yes	0.0025	Yes
Catalyst Loading	0.0030	Yes	0.0376	Yes	0.2473	No	0.2579	No
Temperature	0.0184	Yes	0.0127	Yes	0.0049	Yes	0.0247	Yes

Table S1. ANOVA results for the catalytic testing with different factors.

Table S2. The rate constant and adjusted R-square of each kinetic model at 333 K, 353 K and 373 K.

	Temperature (K)									
Kinetic Model	333		353		373					
_	k	R ²	k	R ²	k	R ²				
Zero Order	9.8665×10 ⁻⁸	0.8222	1.3215×10 ⁻⁷	0.7406	2.3839×10 ⁻⁷	0.7612				
First Order	7.8043×10 ⁻⁵	0.9977	1.3364×10 ⁻⁴	0.9982	2.2807×10-4	0.9978				
Second Order	6.4750×10 ⁻²	0.9448	1.6471×10 ⁻¹	0.9831	2.4918×10 ⁻¹	0.9782				
Pseudo-First-Order	7.8073×10 ⁻⁵	0.9977	1.3367×10-4	0.9982	2.2811×10-4	0.9978				
Pseudo-Second-Order	2.9744×10^{0}	0.9959	5.8863×10 ⁻¹	0.9709	1.9617×10^{0}	0.9885				