Supplementary Information

Design and Characterization of Multi-Component Lamellar Materials Based on MWW-Type Zeolitic Layers and Metal Oxide Sub-domains

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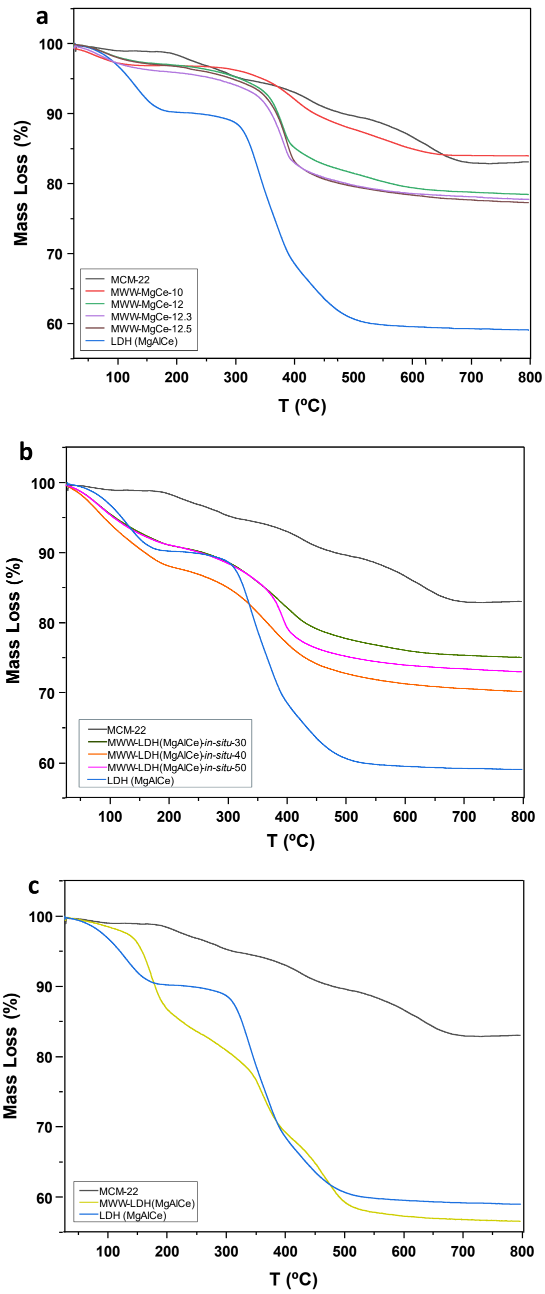

Figure S1. Thermogravimetric analysis (TGA). (a) As-synthesized multi-component MWW-MgCe materials obtained through method (I) at different pHs for the formation of metallic oxide sub-domains. (b) As-synthesized multi-component MWW-LHD-*in-situ* materials obtained following synthesis method (II). (c) As-synthesized multi-component MWW-LHD materials obtained following synthesis method (III).

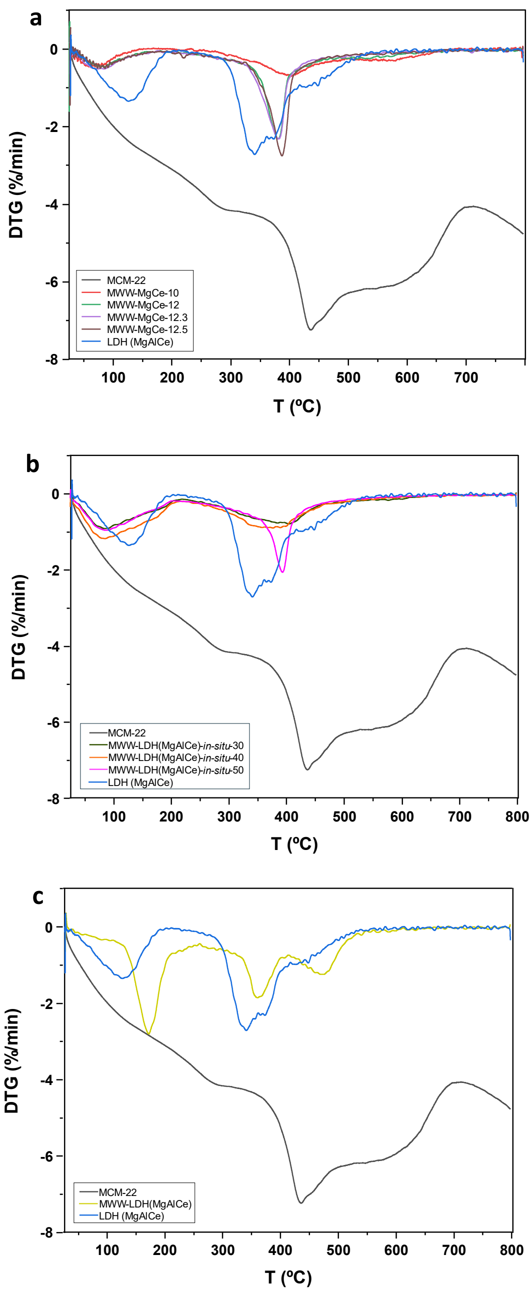

Figure S2. Derivative curves (DTA) from thermogravimetric analysis (TGA). (a) As-synthesized multi-component MWW-MgCe materials obtained through method (I) at different pHs for the formation of metallic oxide sub-domains. (b) As-synthesized multi-component MWW-LHD-*in-situ* materials obtained following synthesis method (II) with different LDH content. (c) As-synthesized multi-component MWW-LHD materials obtained following synthesis method (III).

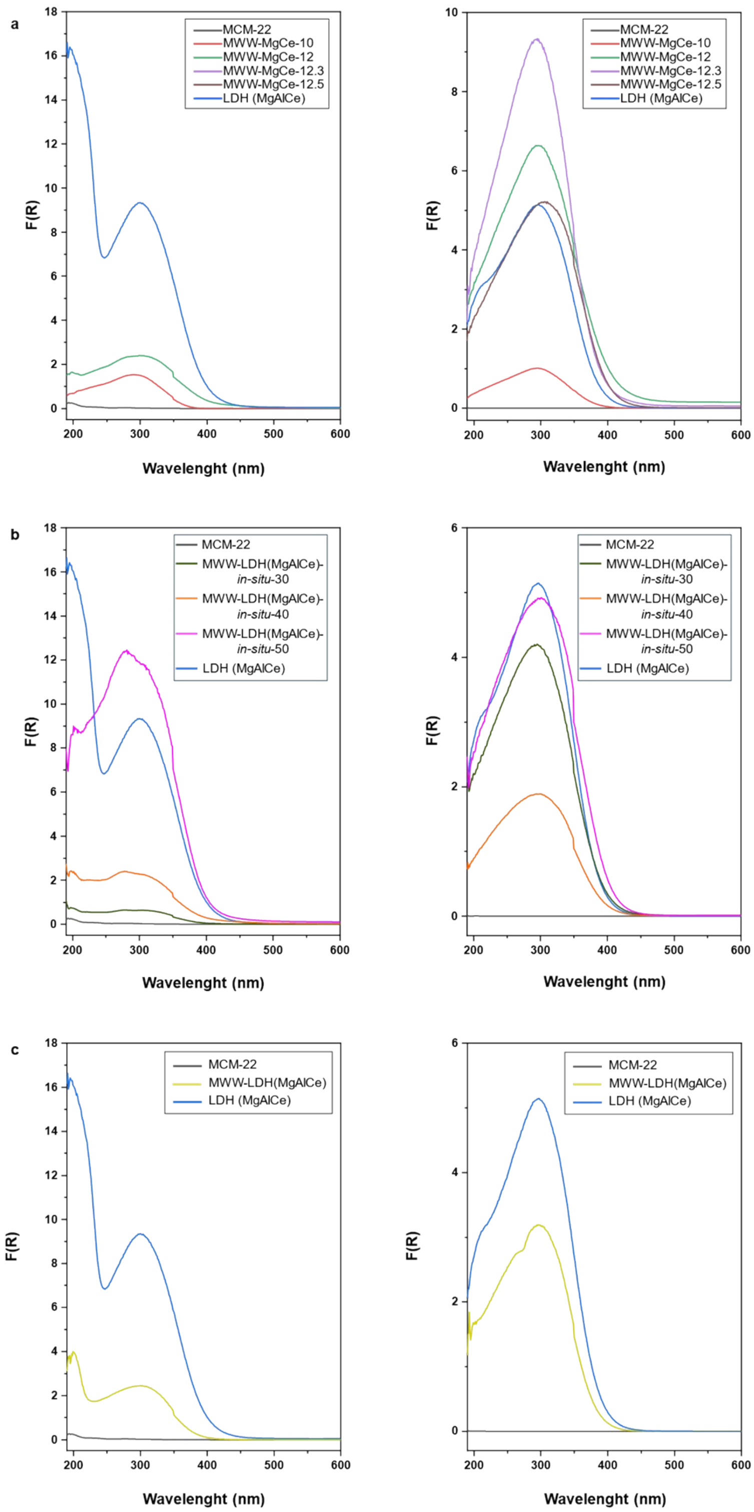

Figure S3. Uv-Visible spectra of as-synthesized (left) and calcined (right) samples. (a) Multi-component MWW-MgCe materials obtained through method (I) at different pHs for the formation of metallic oxide sub-domains. (b) Multi-component MWW-LHD-*in-situ* materials obtained following synthesis method (II) with different LDH content. (c) Multi-component MWW-LHD materials obtained following synthesis method (III).

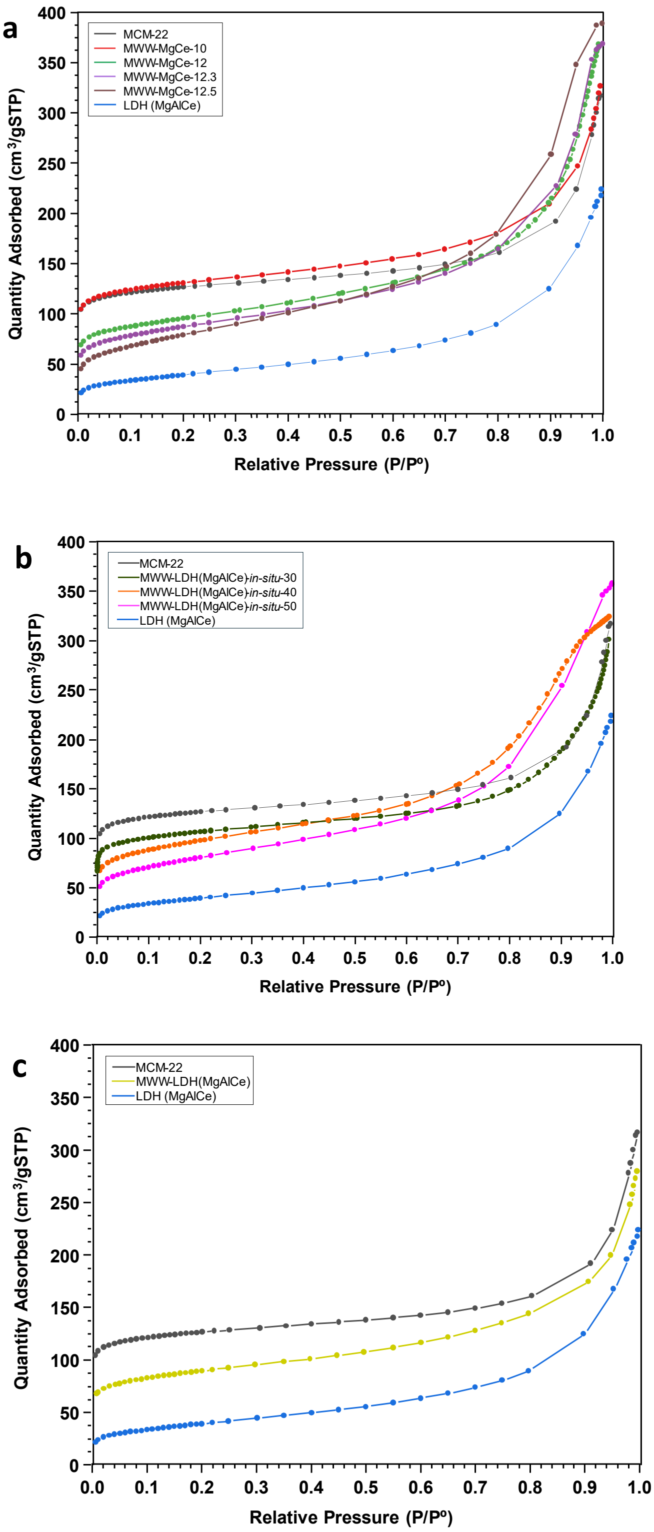

Figure S4. N_2 adsorption isotherms. (a) Multi-component MWW-MgCe materials obtained through method (I) at different pHs for the formation of metallic oxide sub-domains. (b) Multi-component MWW-LHD-*in-situ* materials obtained through method (II) with different LDH contents. (c) Multi-component MWW-LHD materials obtained following synthesis method (III).

Table S1. Ammonia desorbed quantity estimated from thermoprogrammed desorption analyses (TPD) of multi-component MWW-MgCe, MWW-LHD-*in-situ* and MWW-LHD materials, obtained following synthesis methods (I), (II) and (III), respectively.

Material	**Temperature (°C)[1]**	**NH_3 Quantity (cm^3/g)**
MCM-22	361	29.3
LDH (MgAlCe)	315	91.3
	MWW-MgCe materials	
MWW-MgCe-10	204	27.8
MWW-MgCe-12	360	122.4
MWW-MgCe-12.3	399	130.3
MWW-MgCe-12.5	369	136.1
	MWW-in-situ materials	
MWW-LDH(MgAlCe)-*in-situ*-30	336.4	60.8
MWW-LDH(MgAlCe)-*in-situ*-40	287.3	69.4
MWW-LDH(MgAlCe)-*in-situ*-50	328.0	77.9
	MWW-LDH materials	
MWW-LDH	349.6	93.0

[1] Temperature of main desorption peak of the samples.

Table S2. Bandgap (Eg) of the multi-component materials based on MWW layers and LDH (MgAlCe) sub-domains.

Material	**E_g (eV)**[1]
MCM-22	4.57
LDH (MgAlCe)	2.78
MWW-MgCe materials	
MWW-MgCe-12	2.45
MWW-LHD-in-situ materials	
MWW-LDH(MgAlCe)-*in-situ*-30	2.73
MWW-LDH(MgAlCe)-*in-situ*-40	2.65
MWW-LDH(MgAlCe)-*in-situ*-50	2.55
MWW-LHD materials	
MWW-LDH	2.83

[1] Band gap estimated using Tauc method.