Electronic Supplementary Material (ESI) for CrystEngComm.

Supplementary Information

Hydrothermally stable transition alumina by condensation-enhanced self-assembly and pyrolysis crystallization. Application in the steam reforming of methane.

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1. Additional results

Table S-1. Textural properties of the materials after the steaming tests.

Material	Steaming	S_{BET} ($m^2.g^{-1}$)	V_T ($cm^3.g^{-1}$)	Φ_{BJH} (nm)
TAN-1	none	64	0.176	13.6
TAN-1 ST900.4	900 °C, 4h	61	0.166	13.6
TAN-1 ST900.24	900 °C, 24h	56	0.133	14.1
δ-alumina [a]	none	94	0.272	10.0
δ-alumina ST900.4	900 °C, 4h	55	0.253	25.0
δ-alumina ST900.24	900 °C, 24h	48	0.241	30.0

a. Obtained by thermally treating a commercial γ-alumina (Merck) at 900 °C for 6 h following the protocol reported by Rane *et al.* [59]

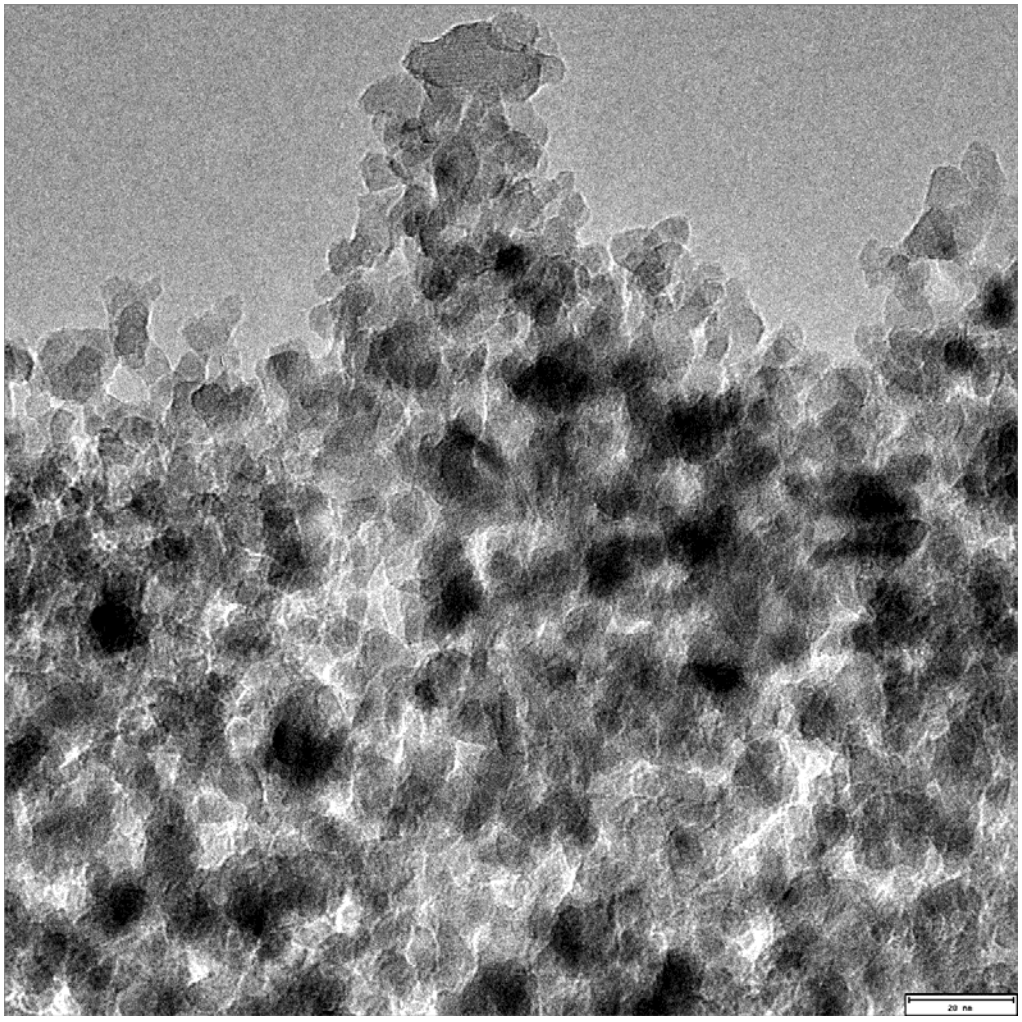

Figure S-1. High-resolution TEM image of TAN-1. Scale-bar corresponds to 20 nm.

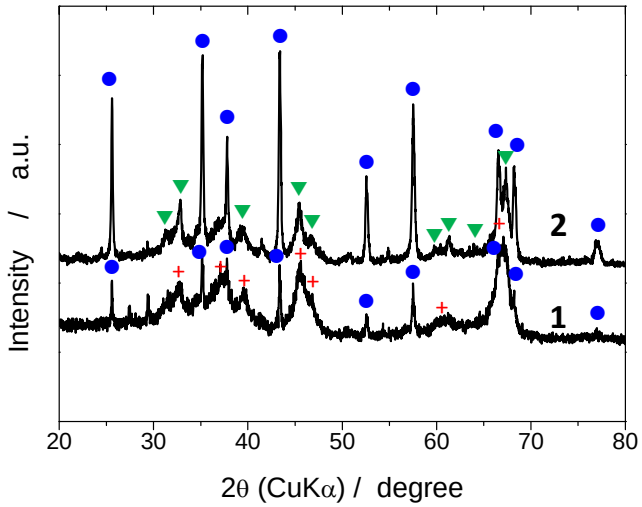

Figure S-2. Indexed XRD patterns for the pyrolyzed materials: **1)** TAN-1 and **2)** TAN-4. Phase notation: Alpha (●)[56], theta (▼)[57] and delta (+)[58]. The patterns are offset in Y-axis. Sample codes can be found in Table 1.

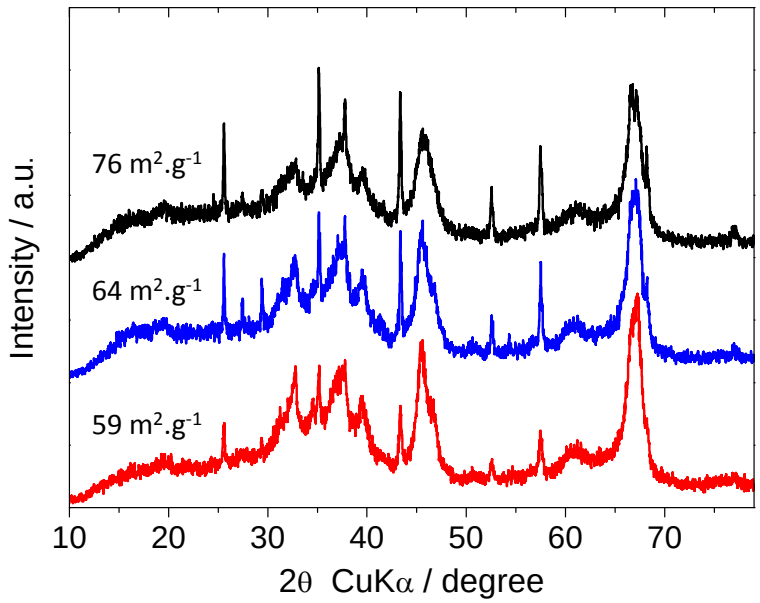

Figure S-3. XRD patterns of several batches for TAN-1 including the corresponding specific surface area. The patterns are offset in Y-axis.

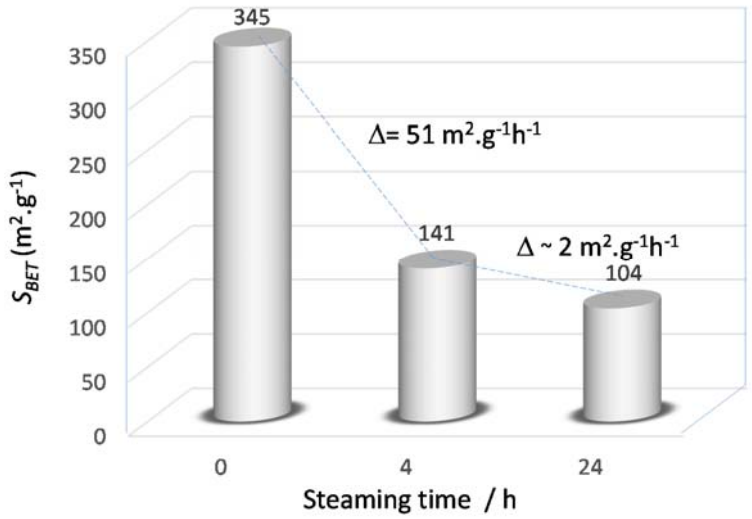

Figure S-4. Stability under steaming (100 *vol.*%, 900 °C) for a commercial mesostructured gamma alumina (MSU-X). Representation of the S_{BET} as a function of the steaming time, in h.

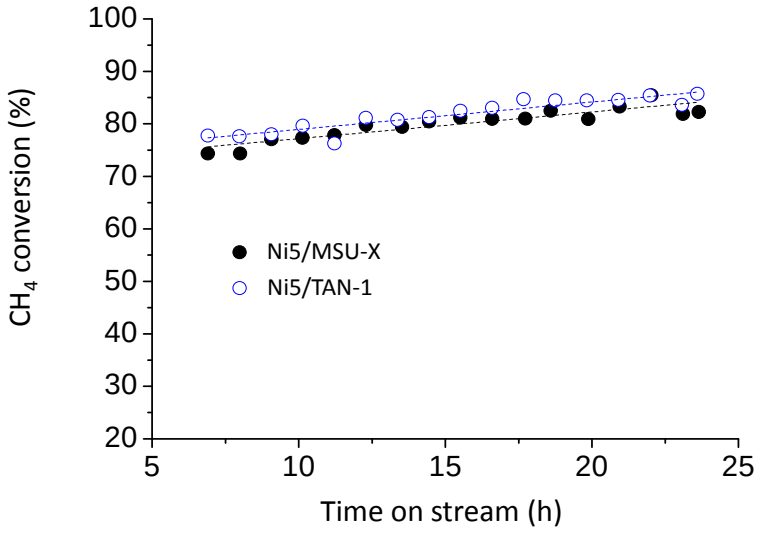

Figure S-5. CH_4 conversion (%) for the SRM reaction as a function of time on stream for Ni5/MSU-X and Ni5/TAN-1 catalysts.