Electronic Supplementary Material (ESI) for Nanoscale.

An ultrasonic atomization assisted synthesis of self-assembled manganese oxide octahedral molecular sieve nanostructures and their application in catalysis and water treatment.

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Supporting information

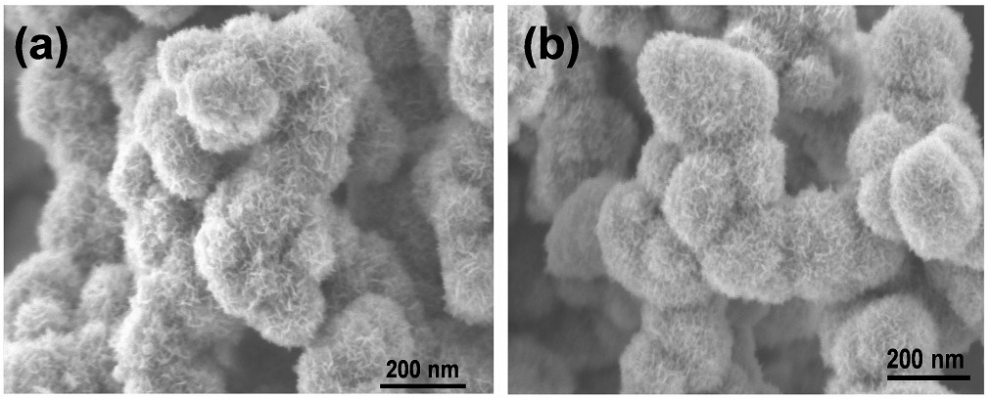

Figure S1. SEM images of materials prepared without atomizing the $KMnO_4$ solution. (a) No nozzle_No aging (b) No nozzle_24h aging.

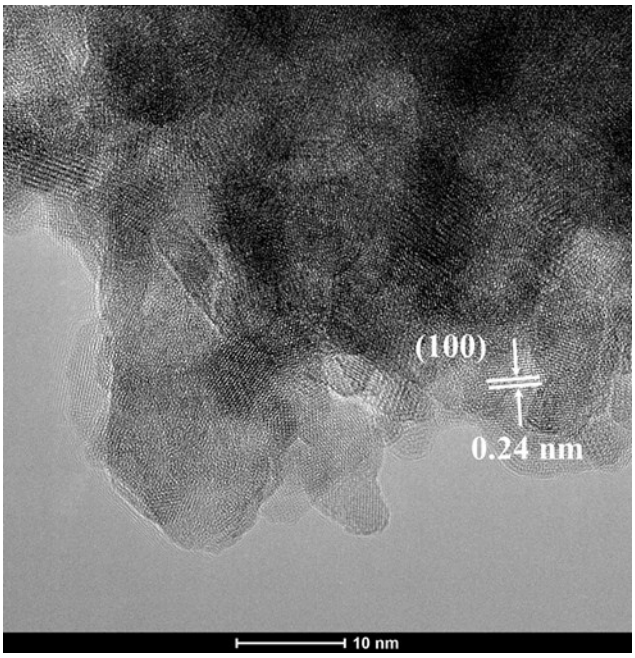

Figure S2. TEM image of materials prepared without atomizing the $KMnO_4$ solution. Sample: No nozzle_24h aging. The d spacing of 0.24 nm corresponds to the (100) plane of manganese oxide octahedral layered material (OL-1).

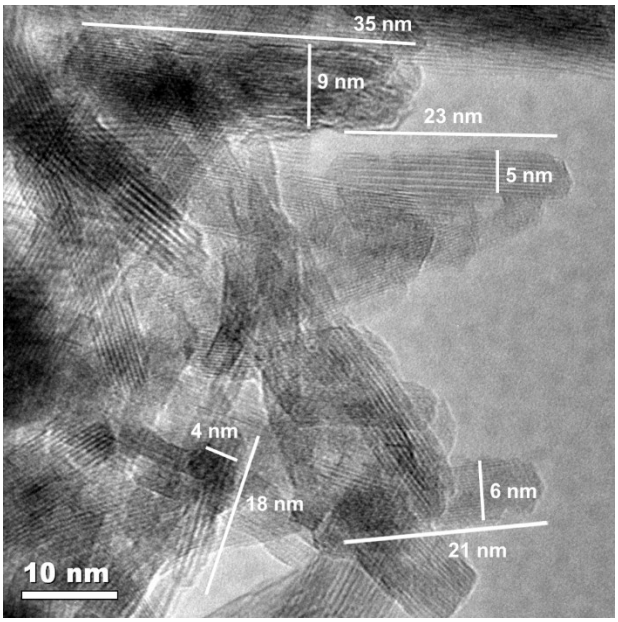

Figure S3. HRTEM image of the OMS-2_{Nz}. $KMnO_4$ feed solutions were prepared using acetone as a co-solvent (20%) and were atomized using the 120 kHz nozzle. Sample: OMS-2_{Nz}_20% Acetone_24h aging.

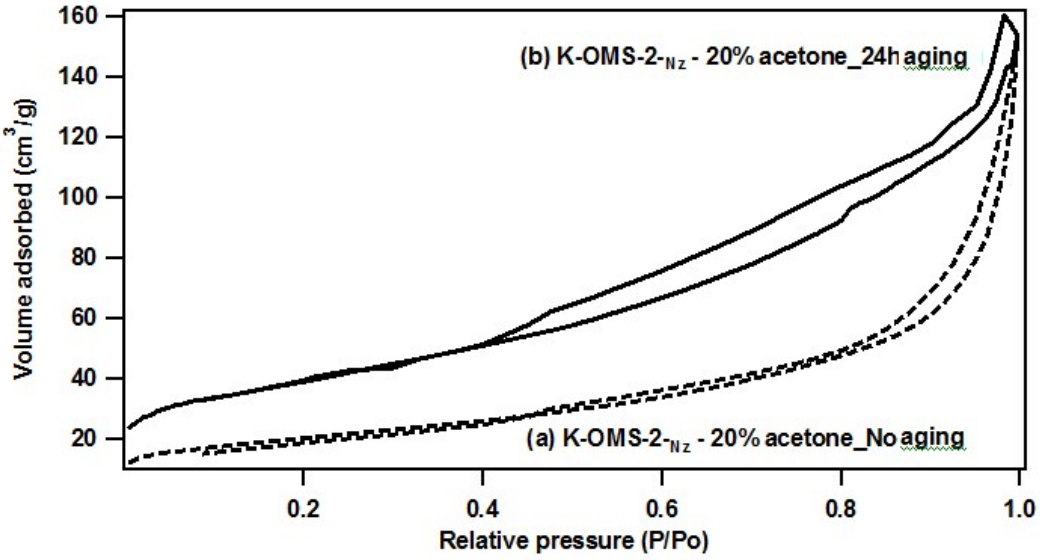

Figure S4. Nitrogen adsorption isotherms of the OMS-2_{Nz} materials prepared using $KMnO_4$ feed solutions containing acetone as a co-solvent (20%) and atomized with the 120 kHz nozzle. (a) 20% Acetone_No aging (b) 20% Acetone_24h aging.

Table S1. Reusability of the OMS-2_{Nz} catalyst[a] in the oxidation of hydroxymethylfurfural (HMF) to 2,5-diformylfuran (DFF).

Cycle	Conversion %	Selectivity (%)
1	40	100
2	37	100
3	27	100

[a] OMS-2_{Nz}_48 kHz catalyst

Table S2. Lead adsorption from aqueous solutions using OMS-2_{Nz} catalysts.

Catalyst	**Pb^{2+} removed (mg/g cat)**	**% of Pb^{2+} removed from 100 ppm solution**
OMS-2_{Nz}_120 kHz	130	70
OMS-2_{Nz}_120 kHz_10% acetone	144	78
OMS-2_{Nz}_120 kHz_20% acetone	136	73
OMS-2_{Ref}	22	12