Electronic Supplementary Material (ESI) for New Journal of Chemistry. This journal is © The Royal Society of Chemistry and the Centre National de la Recherche Scientifique 2024

## **Supporting Information**

## Synthesis, characterization and properties of indium-doped

## manganese oxide molecular sieve sponges

Zhenxin Liu<sup>1</sup>, Xidong Wang<sup>2</sup>, Xuehui Guo<sup>1</sup>, Depeng Wu<sup>1</sup>, Yu Xing<sup>1,\*</sup>

<sup>1</sup>Henan Provincial Key Laboratory of Surface and Interface Science, School of Materials and Chemical

Engineering, Zhengzhou University of Light Industry, Zhengzhou, 450002, China.

<sup>2</sup> School of Electric and Information, Northeast Agricultural University, Harbin, 150030, China.

\* To whom correspondence should be addressed. E-mail address: yuxing@zzuli.edu.cn (Y. Xing). Tel/Fax:

+86 371 86608700.

	Sample	Macroscopic	Electrical	Electrical	ICP
	code	morphology	resistivity	conductivity	concentration
			/(kΩ·cm)	/(mS·cm <sup>-1</sup> )	of indium
					(wt)
Comparison	M1-powder	powder	0.23	4.34	9.14%
	M2-powder	powder	0.10	10.06	3.03%
	M3-powder	powder	0.05	19.23	5.15%
	M4-powder	powder	0.03	32.26	4.48%
	R-powder	powder	0.72	1.39	0.00%
	M2-sponge	3D foam	0.19	5.19	3.03%
	M3-sponge	3D foam	0.74	1.35	5.15%
	R-sponge	3D foam	0.21	4.72	0.00%
Highlight	Free-standing, macroscopic 3D manganese oxide molecular sieve				
	sponges were prepared.				
	Electrical conductivity of substrates increases by 3-23 times upon				
	indium doping conditions.				
	Indium doping may create two new FT-IR bands at 1090-1092 cm <sup>-1</sup>				
	and 1026-1028 cm <sup>-1</sup> .				
	Indium doping may weaken most Raman bands except the band at				
	ca. 640 cm <sup>-1</sup> .				
	Indium-doped OMS-2 material is electroactive for the catalytic				
	reduction of oxygen.				

Supporting Information Table S1. Comparison and highlight the advantages of this work.