Electronic Supplementary Information

Decrease of the required dopant concentration for δ-Bi₂O₃ crystal stabilization through thermal quenching during single-step flame spray pyrolysis

Jochen A.H. Dreyer, a Suman Pokhrel, b Johannes Birkenstock, c Miguel G. Hevia, d Marco Schowalter, e Andreas Rosenauer, e Atsushi Urakawa, d Wey Yang Teoh a and Lutz Mädler b,*

a Clean Energy and Nanotechnology (CLEAN) Laboratory, School of Energy and Environment, City University of Hong Kong, Hong Kong SAR.

b Foundation Institute of Materials Science (IWT), Department of Production Engineering, University of Bremen, Germany. E-mail: lmaedler@iwt.uni-bremen.de

c Central Laboratory for Crystallography and Applied Materials, University of Bremen, Germany.

d Institute of Chemical Research of Catalonia (ICIQ), Tarragona, Spain.

e Institute of Solid State Physics, University of Bremen, Germany.
Fig. S1 EELS spectrum of L\textsubscript{2,3} edge of Mn or Ti containing Bi\textsubscript{2}O\textsubscript{3}. (a) Mn L\textsubscript{2,3} edge spectra of 2.5%Mn-2.5%Ti-Bi\textsubscript{2}O\textsubscript{3} (b) Mn L\textsubscript{2,3} edge spectra of 5%Mn-5%Ti-Bi\textsubscript{2}O\textsubscript{3} (c) Ti L\textsubscript{2,3} edge spectra of 8%Ti-Bi\textsubscript{2}O\textsubscript{3} (d) Ti L\textsubscript{2,3} edge spectra of 5%Mn-5%Ti-Bi\textsubscript{2}O\textsubscript{3}. The EELS data confirm the oxidation states of Mn to be +2.
**Fig. S2** Ion current (IC) for m/z=44 (CO$_2$) during H$_2$-TPRs of the as-prepared samples synthesized by FSP indicate small CO$_2$ desorption, which was amplified during H$_2$-TPRs conducted with 50 mg of sample (dotted line).