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Supporting information for article:

Comparative analysis of XANES and EXAFS for local structural characterization of disordered metal oxides

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Table S1 Fabrication parameters for TiGDC20 samples

	Sputtering process	Deposition pressure	Gas flow	Power	Deposition time
Sample 1	Co-sputtered from Ti and 20 mol% Gd in CeO_2 stoichiometric target.	20 mTorr	30 sccm Ar	100 Watt GDC 150 Watt Ti	4 h
Sample 2	Reactive co-sputtered from Ti and 20 mol% Gd in Ce alloy target.	15 mTorr	35 sccm Ar 3 sccm O_2	100 Watt GDC 150 Watt Ti	3 h

Table S2 Fabrication parameters for the VGDC20 sample

	Sputtering process	Deposition pressure	Gas flow	Power	Deposition time
VGDC20	Co-sputtered from V and 20 mol% Gd in CeO_2 stoichiometric target.	20 mTorr	30 sccm Ar	100 Watt GDC 100 Watt V	4 h

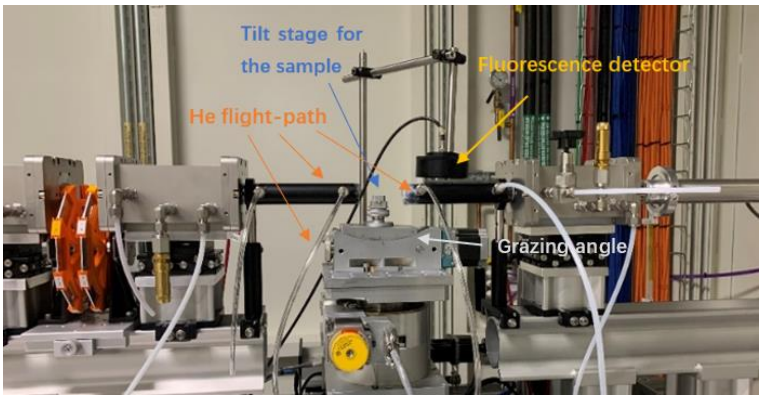

Figure S1 Ex-situ experimental setup at the QAS beamline. The data were collected at grazing incidence. The grazing angle is 2 degrees. The blue arrow shows the sample stage. The fluorescence detector was positioned at the top of the sample stage (indicated by the yellow arrow). Helium gas was flown in a flight tube/path to reduce the X-ray absorption by air.

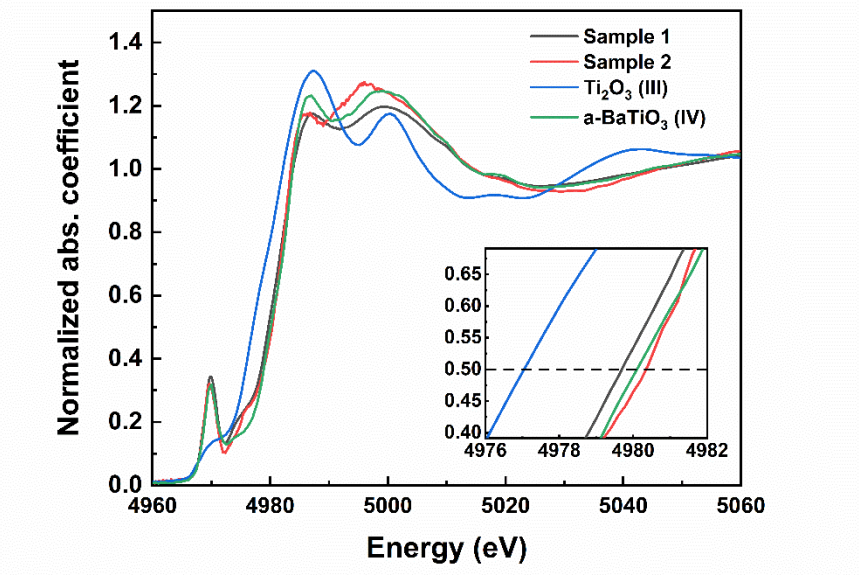

Figure S2 Ti K-edge XANES spectra of sample 1, sample 2, Ti_2O_3, and amorphous $BaTiO_3$. The inset shows the region near the 0.5 edge step (McKeown, 2002) used to qualitatively estimated the changes in the charge state between the samples and reference compounds, with states (III) and (IV).

S1. Pre-edge fitting processes

The pre-edge peak fitting processes were performed by Athena software. The error function was used to model the main edge step. Pseudo-Voigt and Gaussian functions were used to model the main pre-edge peak and the high energy pre-edge feature, respectively.

References

McKeown, D. A., Muller, I. S., Matlack, K. S., & Pegg, I. L. (2002). *J. Non-Cryst. Solids*, **298**, 160-175.