Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C. This journal is © The Royal Society of Chemistry 2019

Evidence for dynamic relaxation behavior of oxygen vacancy in Aurivillius Bi₂MoO₆ from dielectric spectroscopy during resistance switching

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Figure S1. a) EDS spectrum of the Bi₂MoO₆ film. XPS spectra of the Bi₂MoO₆ film: b) survey spectrum. c) Bi 4f spectrum. d) Mo 3d spectrum.



Figure S2. HRS and LRS of 30 different cells.



Figure S3. *I-V* characteristics for five different devices at random points in each device.



Figure S4. Electronic density of state (DOS) of Bi_2MoO_6 : (a) perfect Bi_2MoO_6 , (b) Bi_2MoO_6 with oxygen vacancy.



Figure S5. a) Schematic illustration of an oxygen vacancy chain in the Bi_2MoO_6 supercell with the corresponding band-decomposed charge-density of the oxygen defect state with its isosurface value. The isosurface of the charge density corresponds to 0.0019 e/A°. b) The crystal structure with oxygen vacancy. The red represents Bi, the blue respresents Mo, the silver represents oxygen, and the black represents the oxygen vacancy.



Figure S6. Impedance spectrum of a $Pt/Bi_2MoO_6/FTO$ cell in the initial states. The corresponding equivalent circuit is depicted in the inset.