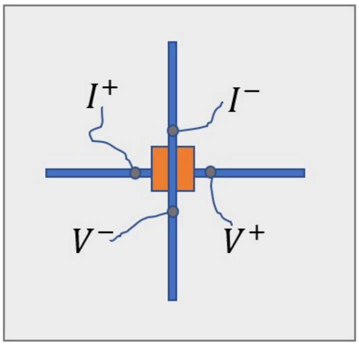

Fig. S1 Schematic of CrO_2-based MTJ with electrodes width of 100 μm and the interlayer size of 1 mmx1 mm

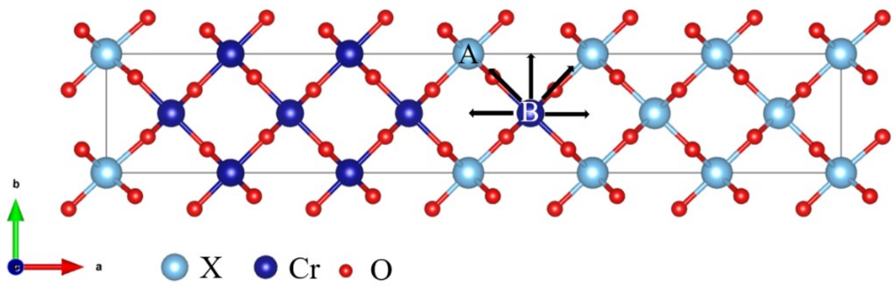

Fig. S2 Model structure of $CrO_2/XO_2/CrO_2$ (X=Ru, Ti, Sn) MJs with mixed interface for theoretical calculations of spin-polarized quantum transport properties. The arrows indicate magnetic moment orientations of diffused Cr^{4+}.

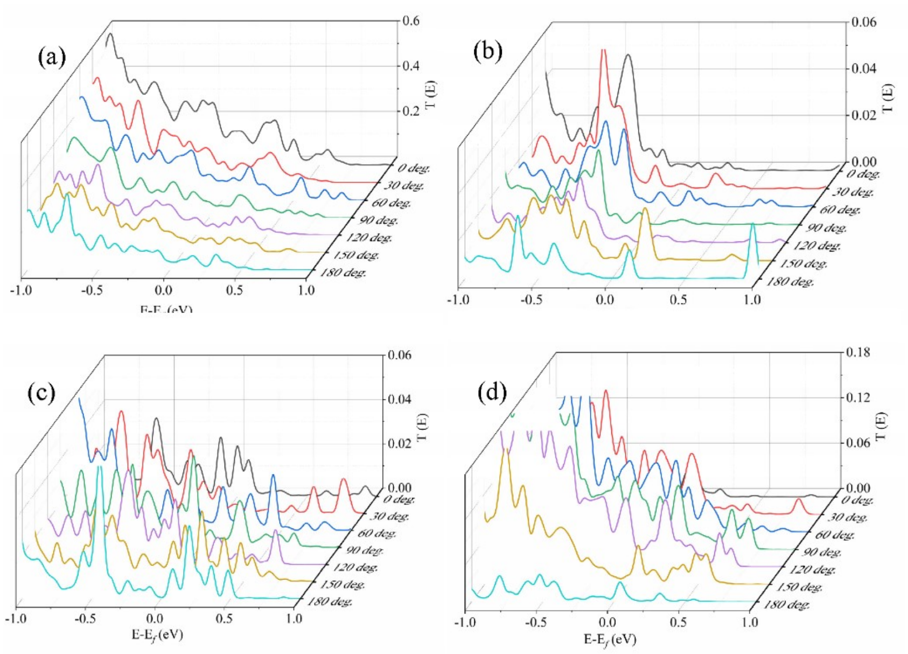

Fig. S3 The transmission coefficients of (a) (c)spin-up and (b) (d) spin-down electrons for $CrO_2/RuO_2/CrO_2$ MJ dependent on magnetic moment orientation of diffused Cr^{4+} for parallel and antiparallel magnetic configures respectively.

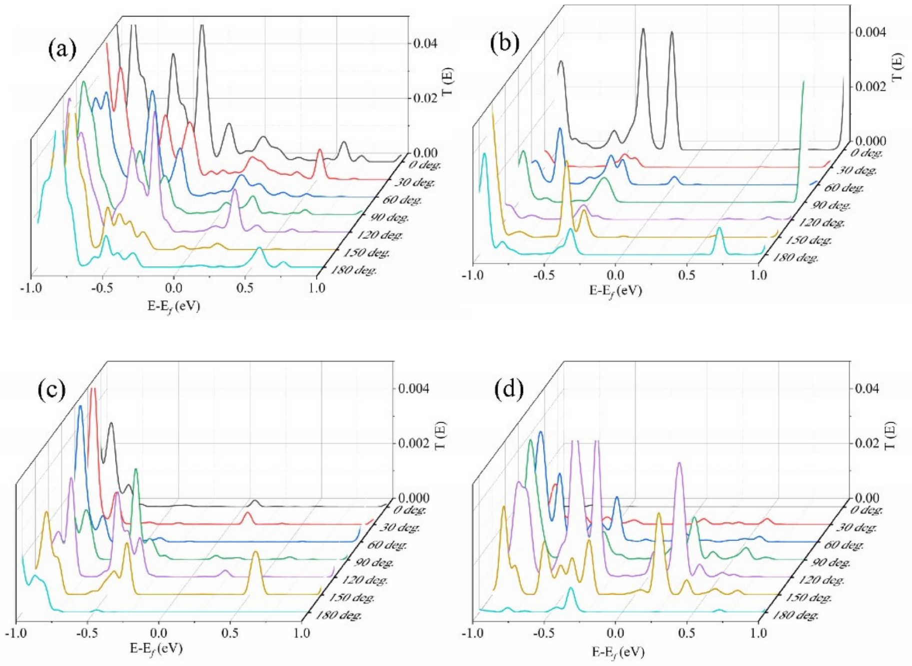

Fig. S4 The transmission coefficients of (a) (c)spin-up and (b) (d) spin-down electrons for $CrO_2/TiO_2/CrO_2$ MTJ dependent on magnetic moment orientation of diffused Cr^{4+} for parallel and antiparallel magnetic configures respectively.

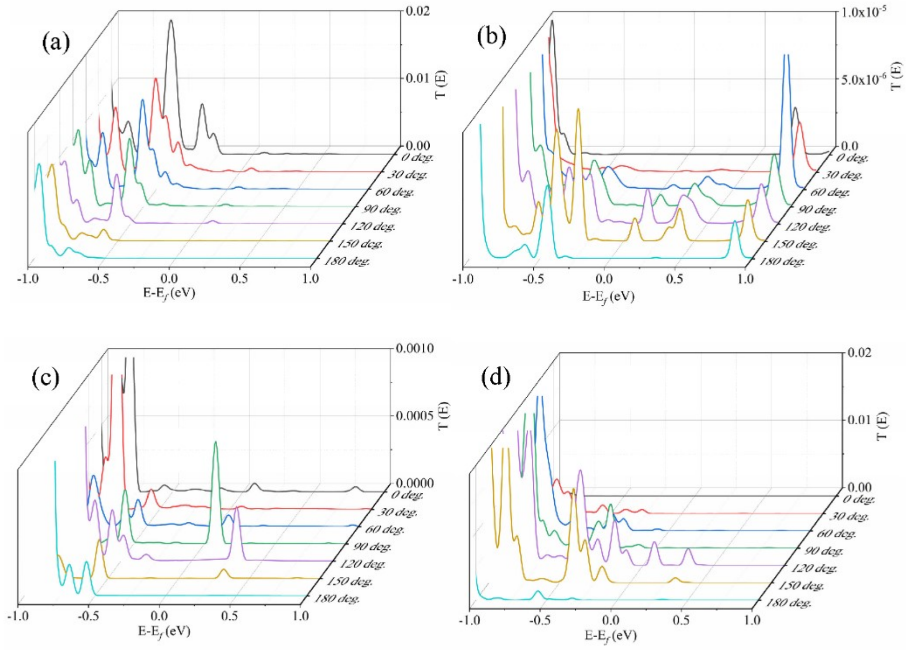

Fig. S5 The transmission coefficients of (a) (c)spin-up and (b) (d) spin-down electrons for $CrO_2/SnO_2/CrO_2$ MTJ dependent on magnetic moment orientation of diffused Cr^{4+} for parallel and antiparallel magnetic configures respectively.

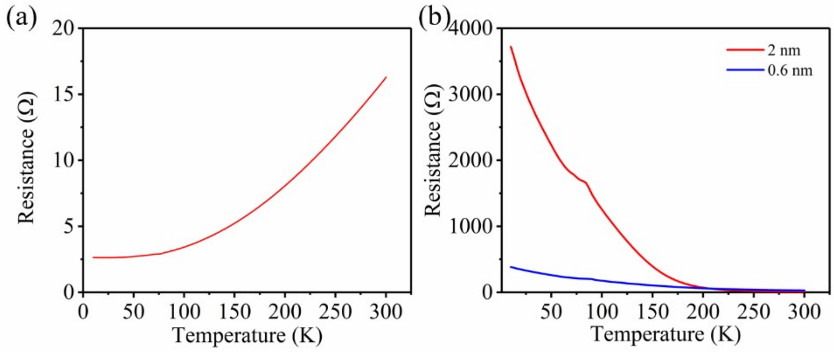

Fig. S6 The temperature dependence of resistance for (a) monolayer CrO_2 film and (b) $CrO_2/TiO_2/CrO_2$ MTJs with TiO_2 tunnel barrier thickness of 0.6 nm and 2 nm.

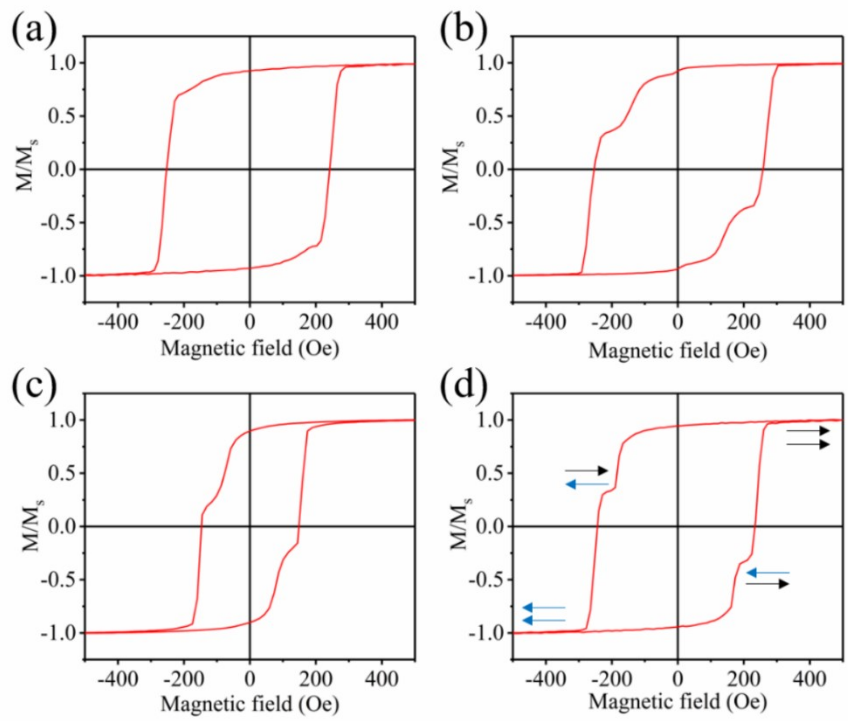

Fig. S7 The normalized hysteresis loops of TiO_2 (100) substrate / CrO_2 (40 nm) /TiO_2 (t) /CrO_2 (12 nm) MTJs with TiO_2 tunnel barrier thickness (t) of (a) 0.6 nm, (b) 1.0 nm, (c) 1.6 nm, (d) 2.0 nm with the external field along TiO_2 [001] crystal orientation. The arrows in (d) represent the magnetization directions of bottom and top CrO_2 electrodes.

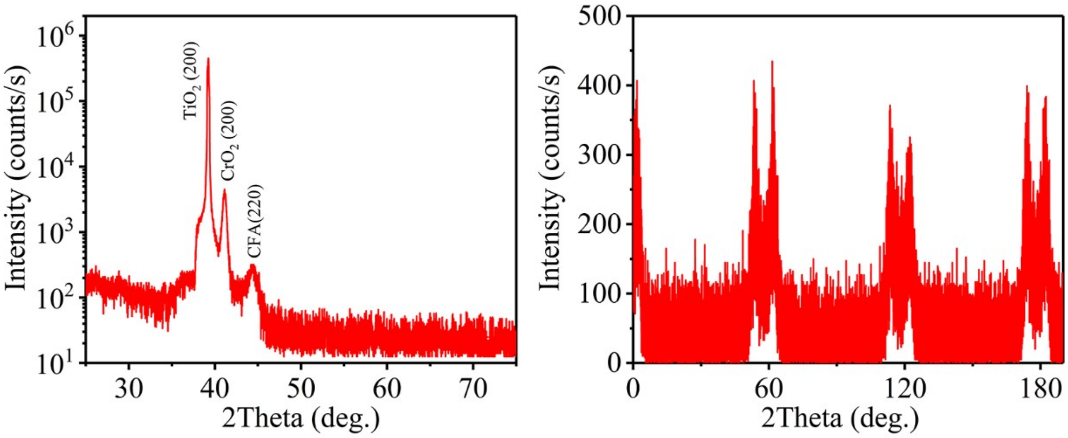

Fig. S8 (a) X-ray diffraction patterns and (b) ϕ-scan of (200) crystal plane of CFA film. XRD pattern and ϕ- scan results verify the epitaxial growth of CFA film.

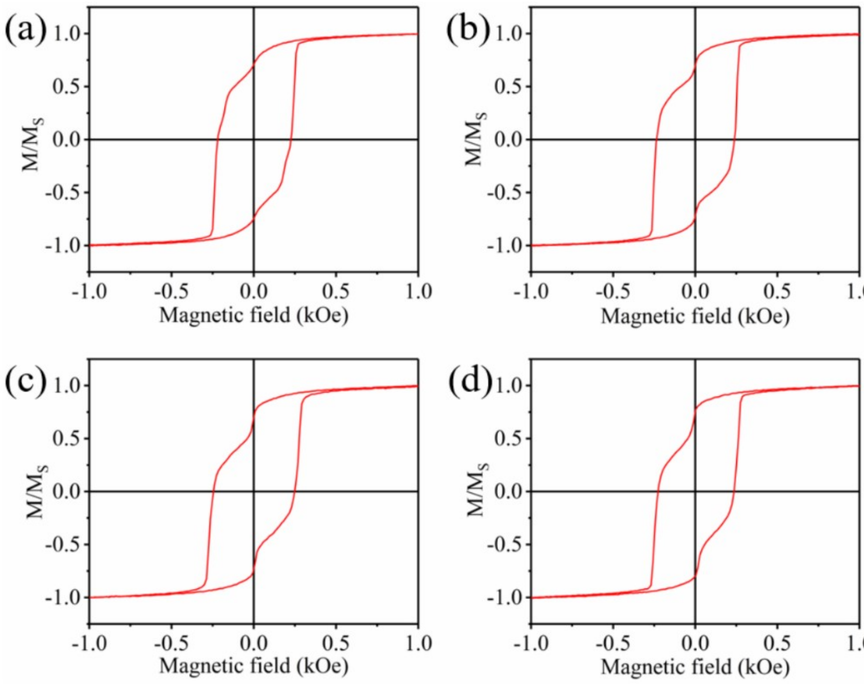

Fig. S9 The normalized hysteresis loops of TiO_2 (100) substrate/ CrO_2 (20 nm) /TiO_2 (t) /CFA (5 nm) MTJ with TiO_2 tunnel barrier thickness (t) of (a) 0.6 nm, (b) 1.0 nm, (c) 1.6 nm, (d) 2.0 nm with the external field along TiO_2 [001] crystal orientation.

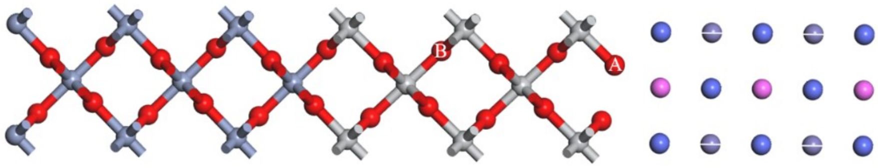

Fig. S10 Model structure of CrO_2/TiO_2/CFA MTJ for theoretical calculations of spin-polarized quantum transport properties. The positions labeled as A and B represents the oxygen vacancies located on TiO_2/CFA interface and inside TiO_2 tunnel barrier respectively.