Supporting Information

1T MoS_2/CoS_2 Heterostructures Enabling Enhanced Resistive Switching Behavior in Sodium Alginate-based Flexible Memristors

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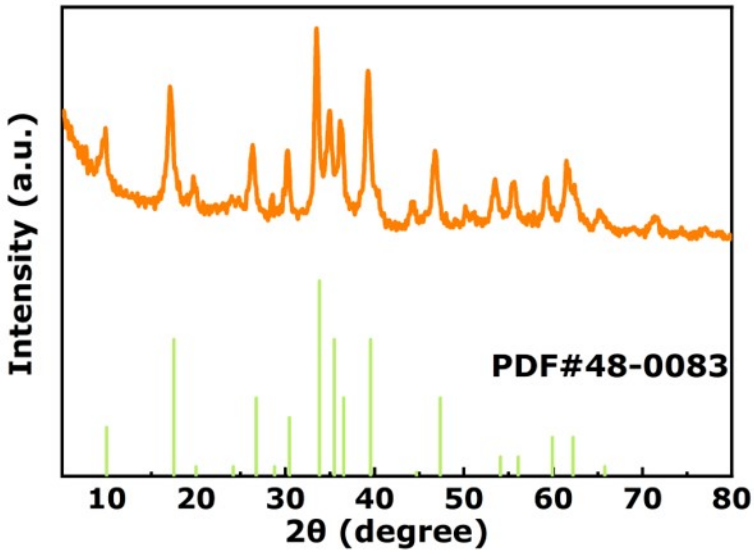

Fig. S1 XRD pattern of Co precursor.

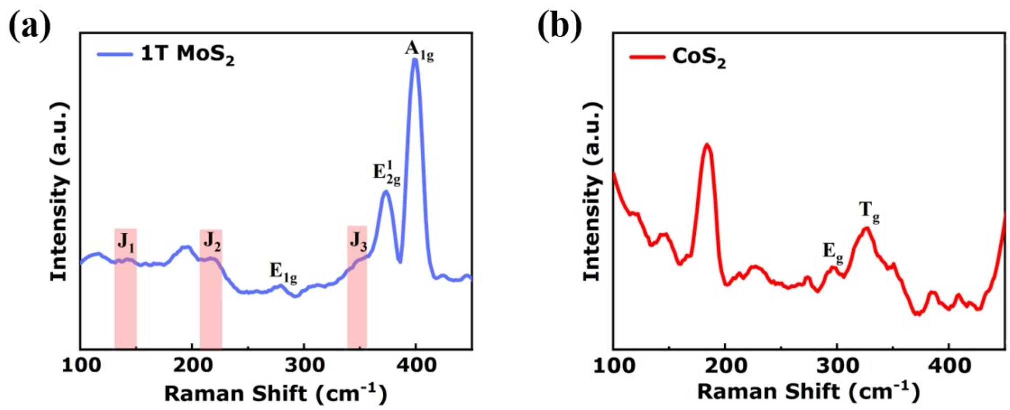

Fig. S2 (a) 1T MoS_2 nanosheets and (b) CoS_2 nanowires Raman spectra.

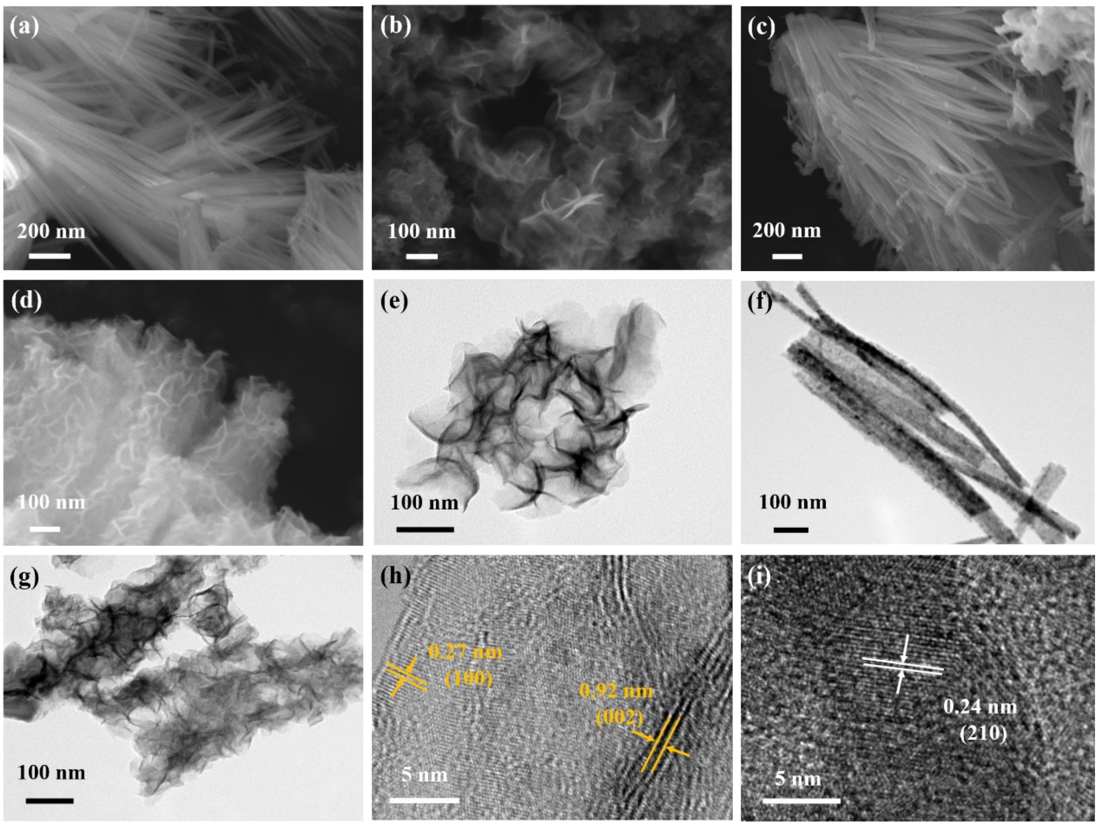

Fig. S3 (a-d) SEM images of Co precursor, 1T MoS_2 nanosheets, CoS_2 nanowires and 1T MoS_2/CoS_2 nanorods; (e-g) TEM images of 1T MoS_2 nanosheets, CoS_2 nanowires and 1T MoS_2/CoS_2 nanorods; (h-i) HRTEM images of 1T MoS_2 nanosheets and CoS_2 nanowires.

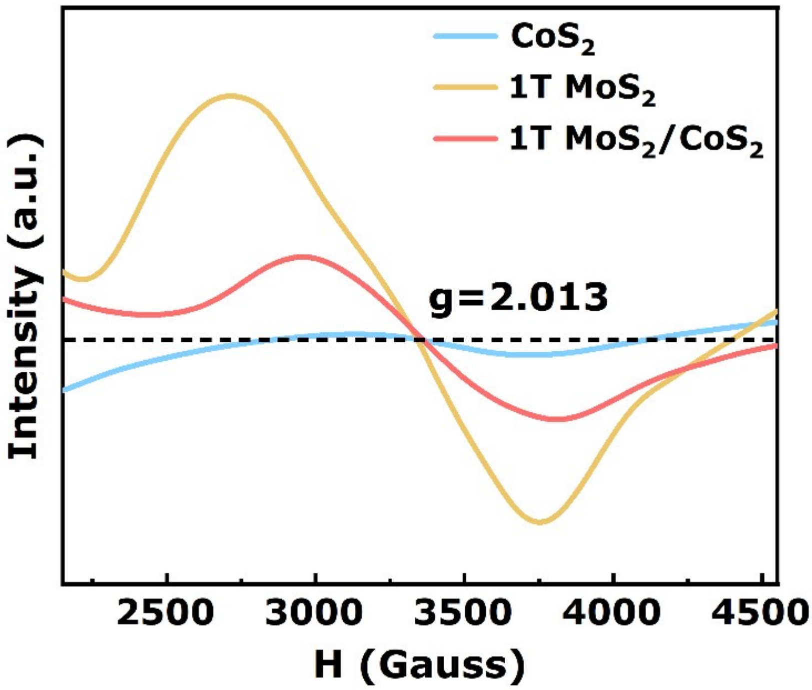

Fig. S4 EPR spectra of CoS_2 nanowires, 1T MoS_2 nanosheets and 1T MoS_2/CoS_2 nanorods.

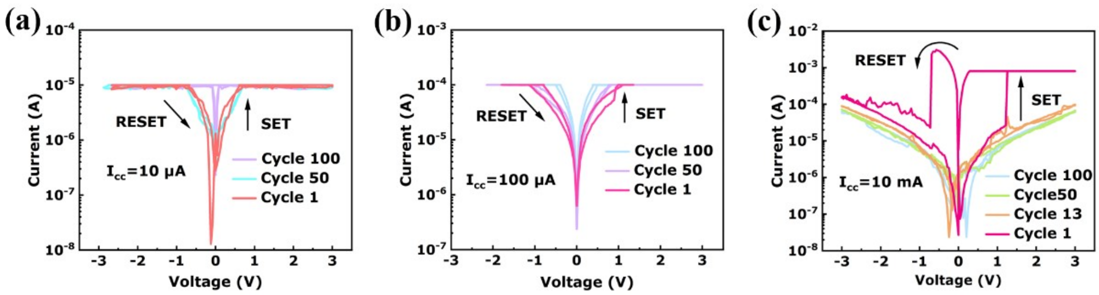

Fig. S5 The I-V curves of Al/1T MoS_2/CoS_2-SA/ITO/PET device with the compliance current is a) 10 μA; (b) 100 μA; c) 10 mA.

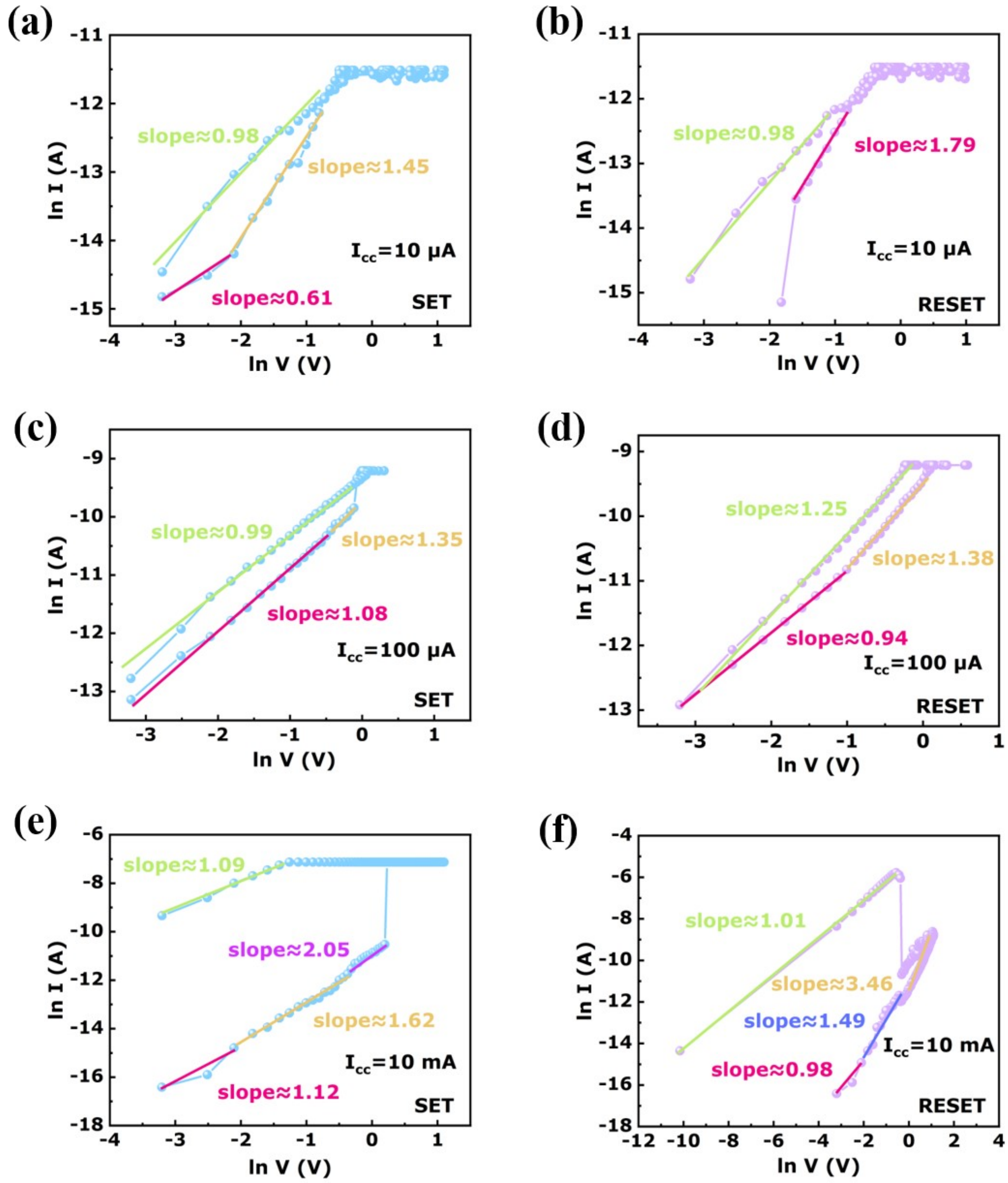

Fig. S6 The Double logarithmic plots of current and voltage for I-V curves of Al/1T MoS_2/CoS_2-SA/ITO/PET device with the compliance current is (a-b) 10 μA; (c-d) 100 μA; (e-f) 10 mA.

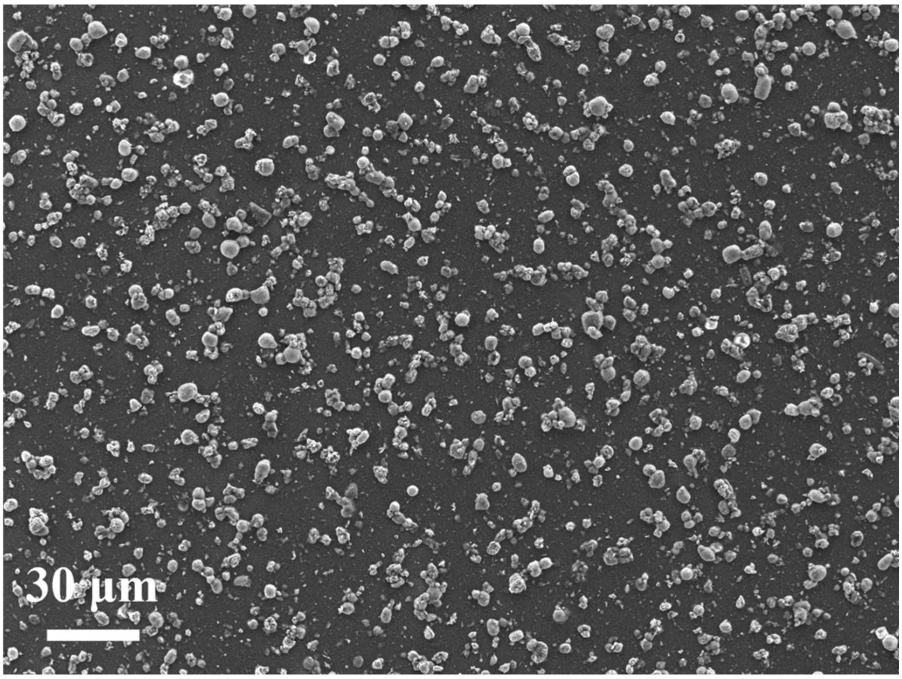

Fig. 7 The SEM image of Al/1T MoS_2/CoS_2-SA/ITO/PET device surface.

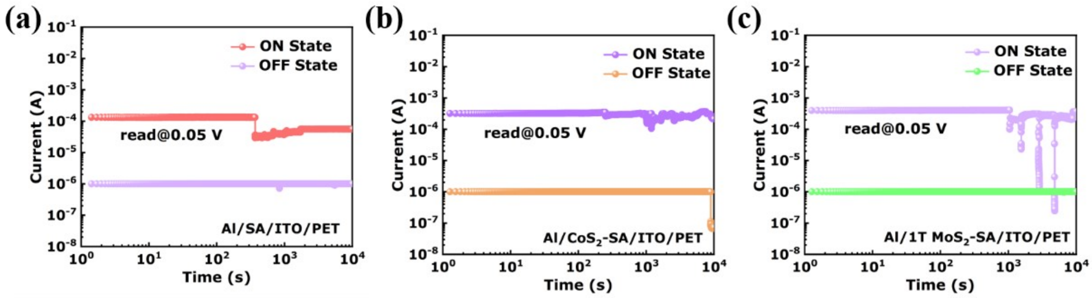

Fig. S8 The I-t diagram of (a) Al/SA/ITO/PET, (b) Al/CoS_2-SA/ITO/PET and (c) Al/1T MoS_2-SA/ITO/PET device at a read voltage of 0.05 V.

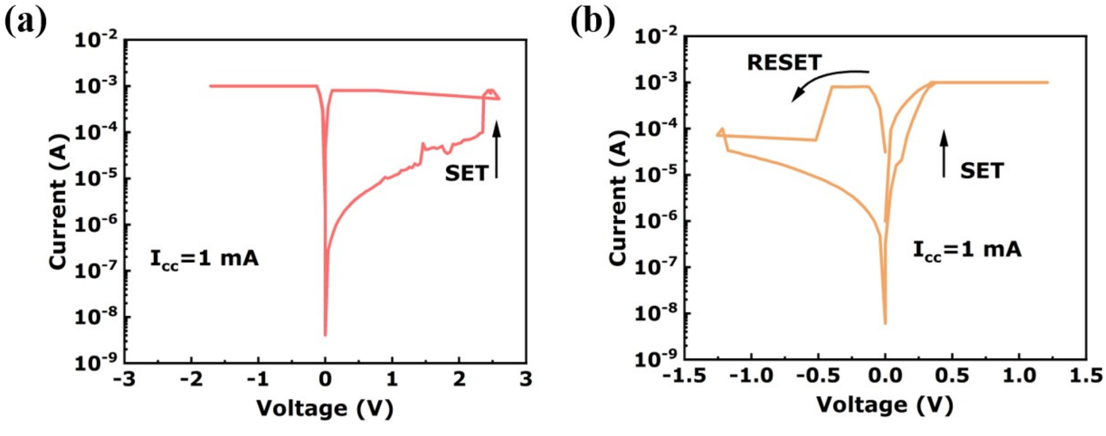

Fig. S9 I-V diagram of Al/1T MoS_2/CoS_2-SA/ITO/PET device coated with two layers.

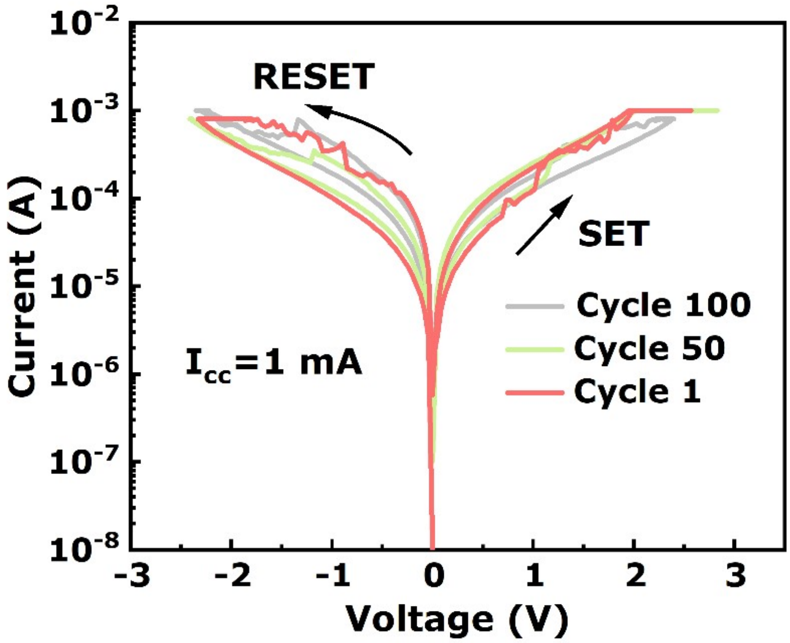

Fig. S10 I-V diagram of Al/1T MoS_2/CoS_2-SA/ITO/PET device coated with three layers.

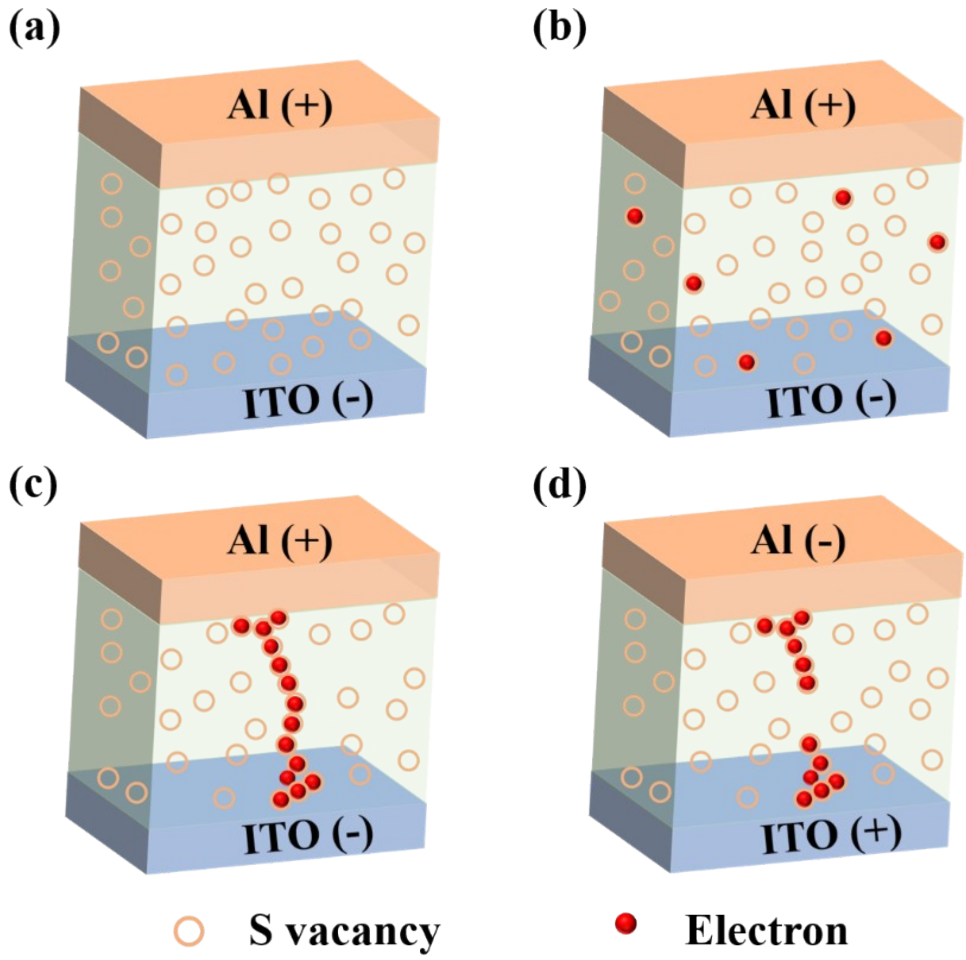

Fig. S11 Schematic diagram of switching mechanism in Al/CoS_2-SA/ITO/PET device.

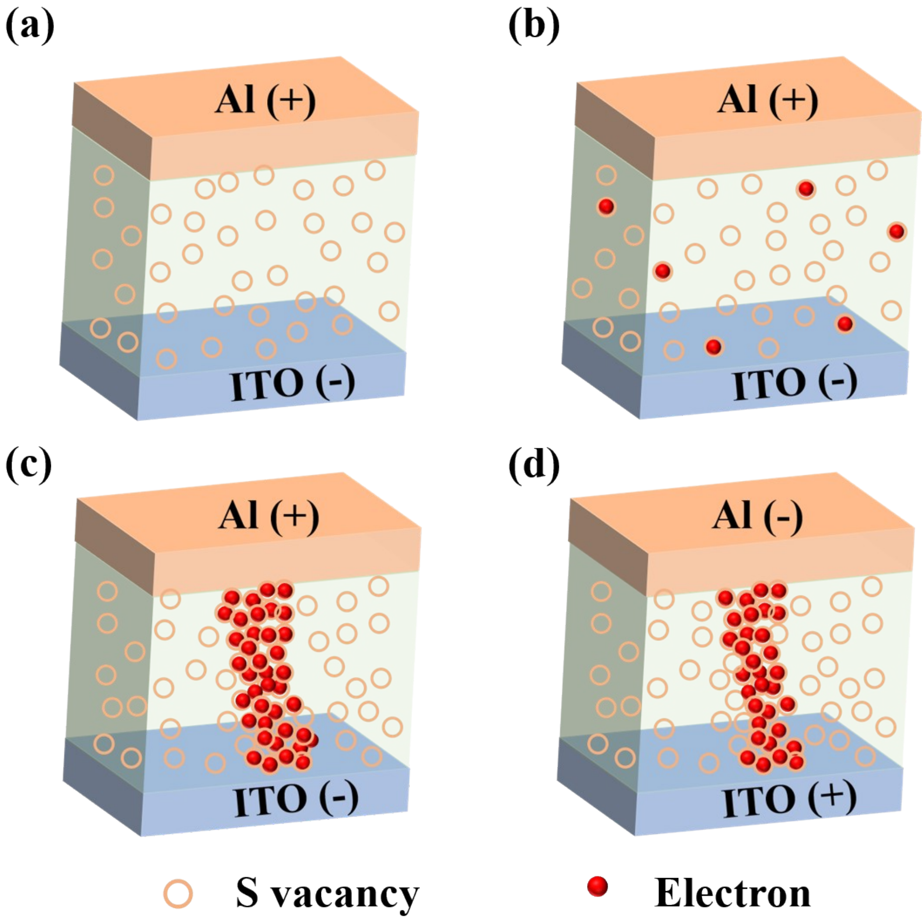

Fig. S12 Schematic diagram of switching mechanism in Al/1T MoS_2-SA/ITO/PET device.

Table S1. Comparison of the key performance parameters of MoS_2-based flexible RRAM devices.

Structures	V_{reset}/V_{set} (V)	Endurance cycles	Retention time (s)	Reference
Al/1T MoS_2/CoS_2-SA/ITO/PET	-1.73/1.7	100	10^4	This work
Au/MoS_2/Au	-0.9/2.7	20	10^4	[1]
Ag/MoS_2/Ti/Au	-0.4/0.3	350	10^4	[2]
Ag/PVP: MoS_2/HfO_x/ITO	-1.18/2.1	500	10^4	[3]
Ag/MoS_2/polymer/Cr/Au	-0.7/0.5	300	10^3	[4]
Ti/Au/MoS_2/PDMS	-15/15	100	10^3	[5]
Al/MoS_2-PDA-PFMMA/ITO	-0.9/1.1	60	10^4	[6]
ITO/(MoS_2:PS)/Al	-2.5/2.7	25	400	[7]
Cu/gMoS_2-PMMA/ITO	1.3/-1.2	100	10^4	[8]
Ti/MoS_2–rGO/ITO	-0.48/0.5	200	10^4	[9]
Ag/MoS_2/Au/Ti/PET	-0.8/1.1	90	10^4	[10]

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