Supporting Information

Biodegradable Resistive Switching Memory Based on Magnesium Difluoride

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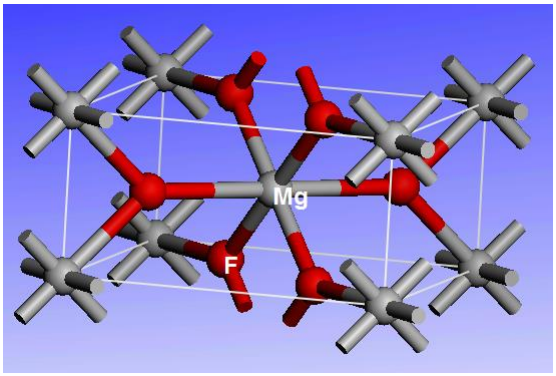

Figure S1. Atomic structure of magnesium difluoride (MgF_2). The gray balls represent Mg atoms and the red balls represent F atoms.

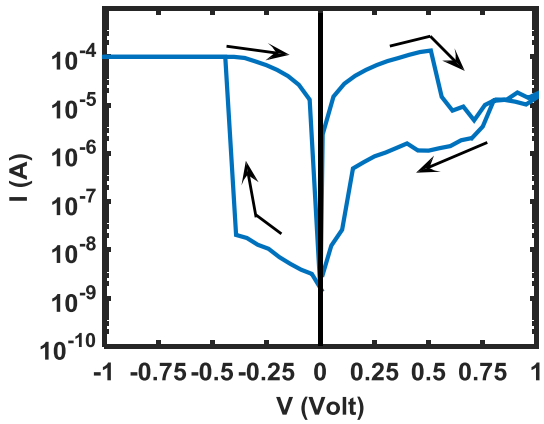

Figure S2. I-V curves of one switching cycle of the device measured in DI water.

switching materials	**electrode materials**	**all bio-degradable**	**peak voltage**	**peak current**	**device size(s)**	**on/off ratio**	**retention**	**reference**
Ag-chitosan	Mg/Mg	yes	3 V	1-2 mA	>1 mm	>100	10^4 sec	[14]
Albumen	ITO/Al	no	4 V	100 mA	1 mm	>100	10^4 sec	[15]
Ag-CNP	Al/Pt/Ag	no	5 V	1 mA	50-500 μm	10^6	10^5 sec	[16]
sericin	ITO/Au/Ag	no	2.5 V	varied	120 μm	10^6	10^3 sec	[17]
silk fibroin	ITO/Al	no	14 V	40 mA	160 um	10	800 sec	[18]
MgF_2	Mg/Fe	yes	1.5 V	0.1 mA	20-200 μm	>100	10^5 sec	this work

Table S1. A representative list of biodegradable material based ReRAM device characteristics and performance metrics.

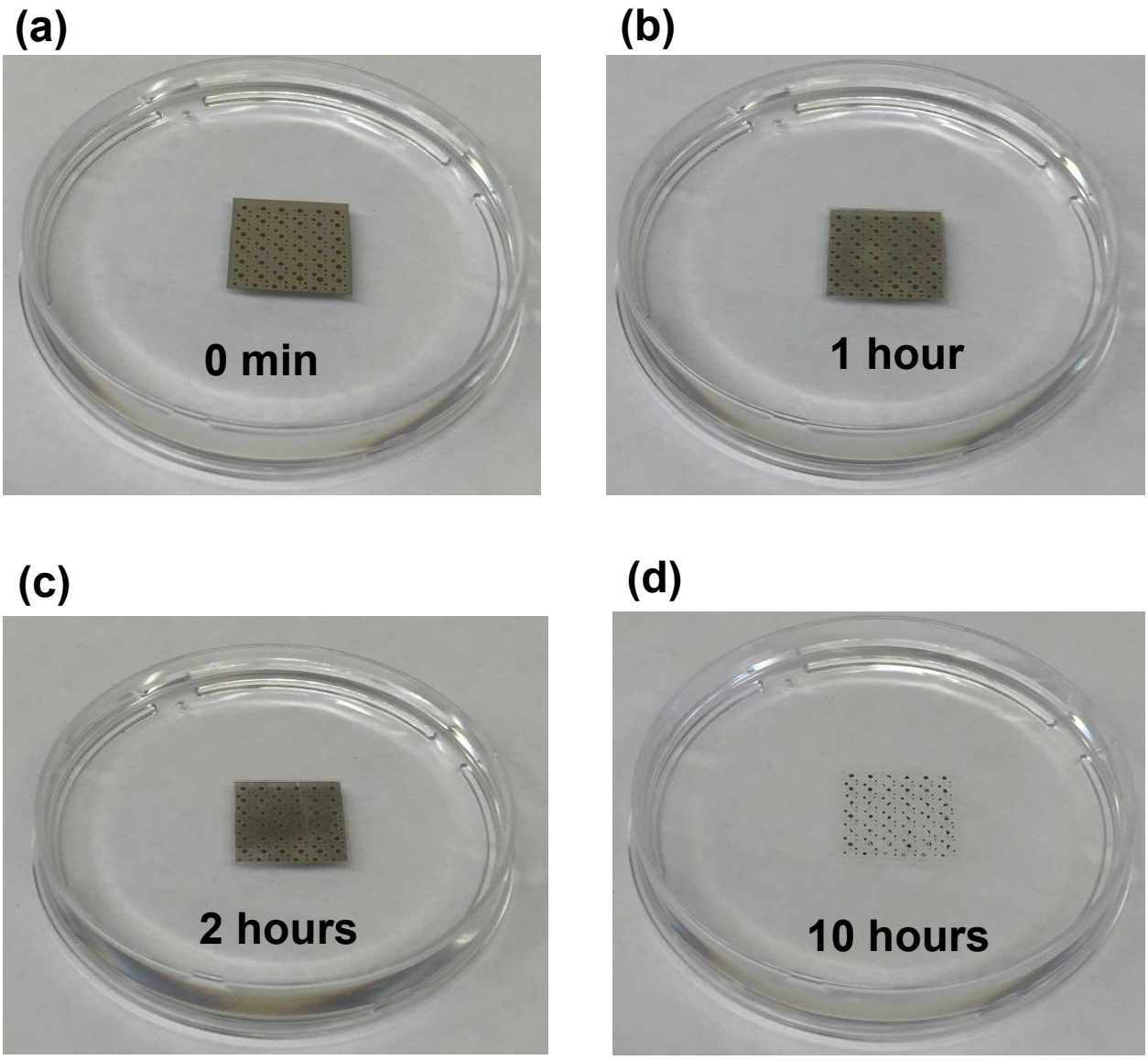

Figure S3. Dissolution behaviors of the PET-supported devices coated with additional 20-nm MgF_2 on the front and back surfaces of the sample. Devices at **(a)** 0 min, **(b)** 1 hour, **(c)** 2 hours, and **(d)** 10 hours after immersion in DI water.