Supporting Information:

High Performance Transient Organic Solar Cells on Biodegradable Polyvinyl Alcohol Composite Substrates

He Xi,‡*[a] Dazheng Chen,‡[b] Ling Lv,[a] Peng Zhong,[a] Zhenhua Lin,[b] Jingjing Chang,[b] Hong Wang,[a] Bin Wang,[a,c] Xiaohua Ma*[a] and Chunfu Zhang*[b]

[a]School of Advanced Materials and Nanotechnology, State Key Laboratory of Wide Band Gap Semiconductor Technology, Xidian University, 266 Xinglong Section of Xifeng Road, Xi'an, 710126, China. Email: hxi@xidian.edu.cn, xhma@xidian.edu.cn

[b]State Key Laboratory of Wide Band Gap Semiconductor Technology, School of Microelectronics, Xidian University, 2 South Taibai Road, Xi'an, 710071, China. Email: cfzhang@xidian.edu.cn

[c]Key Laboratory of Microelectronic Devices & Integrated Technology, Institute of Microelectronics, Chinese Academy of Sciences, Beijing, 100029, China

Table of Contents

Table S1. Denotations for each polymer with varying chemical compositions.

Polymer composite	PVA / g	Sucrose / g	Gelatin / g	PVA-to-filler ratios
PVA	1	0	0	1:0
PS10	1	0.1	0	10:1
PS2	1	0.5	0	2:1
PS1	1	1	0	1:1
PS0.5	1	2	0	1:2
PG10	1	0	0.1	10:1
PG2	1	0	0.5	2:1
PG1	1	0	1	1:1
PG0.5	1	0	2	1:2

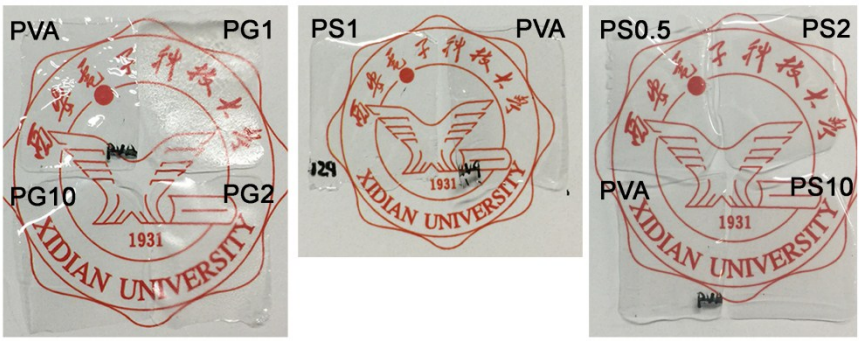

Figure S1. Optical images of the PVA/sucrose and PVA/gelatin films with close contact to the logo of Xidian University to exhibit their transparency.

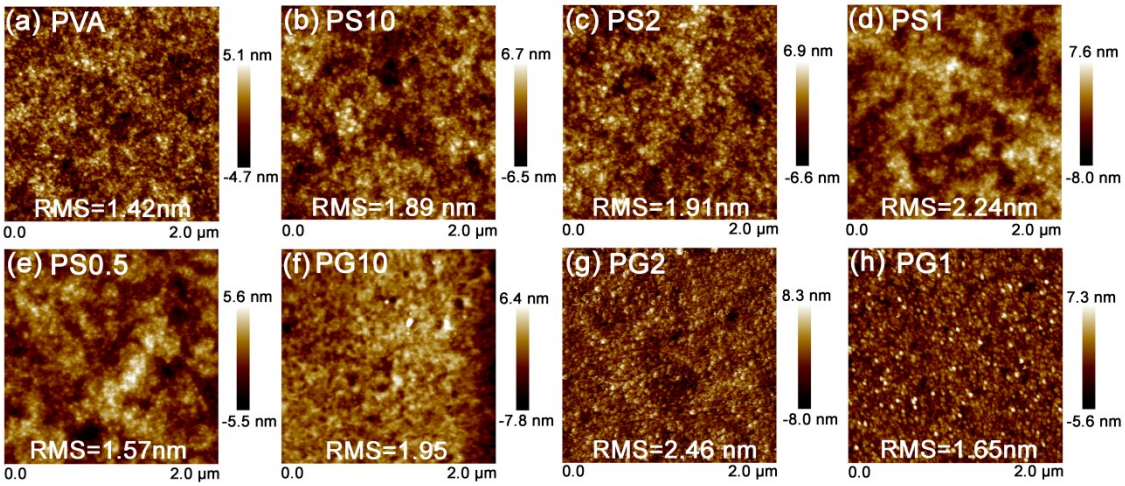

Figure S2. Surface AFM images (2×2 μm) of the PVA thin films without (a), and with sucrose (b-e) or gelatin (f-h) doping in different concentrations on glass substrates. It is notable that for all polymer samples, the surface close to the glass substrate was used for AFM measurement.

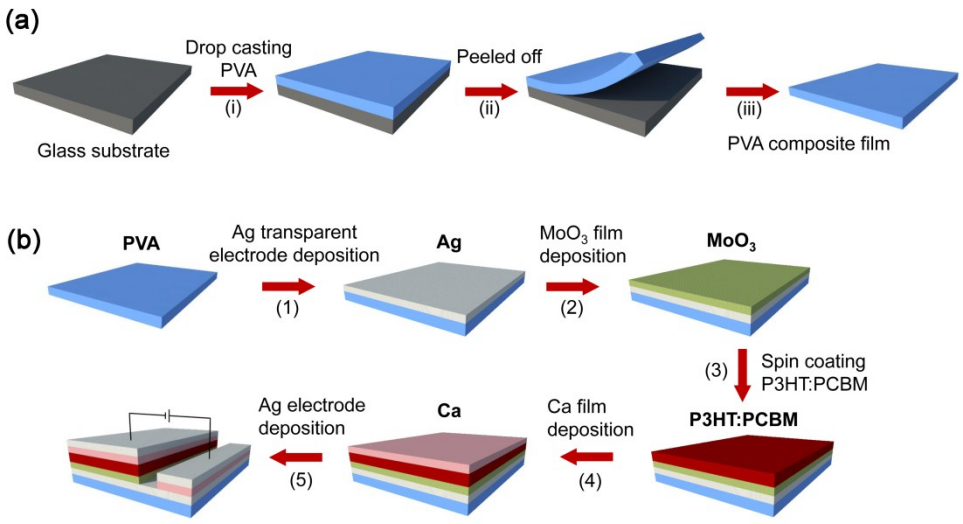

Figure S3. Schematic diagram of fabrication process for (a) PVA-based substrates and (b) the transient OSCs.

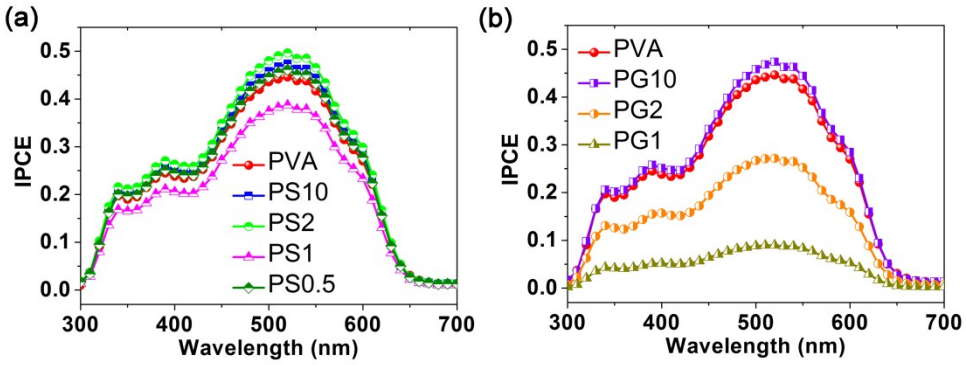

Figure S4. IPCE spectra of the transient OSCs fabricated on (a) PVA/sucrose and (b) PVA/gelatin substrates.

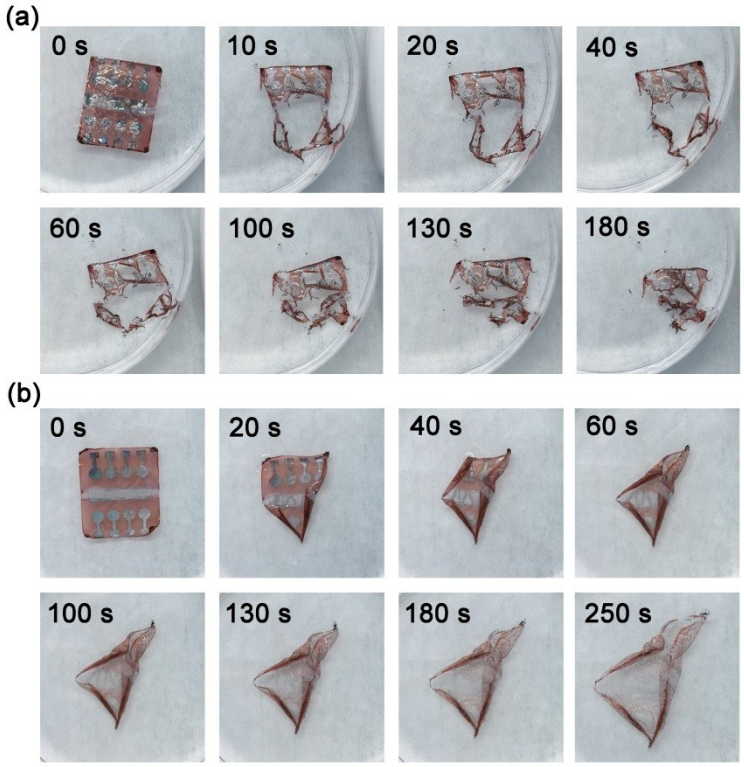

Figure S5. Optical pictures illustrating time sequence of the dissolution of transient OSCs on PS2 substrate (a) and PG2 substrate (b) in DI water at room temperature.