

Supporting Information

Switchable Photocurrent Generation in an Ultra-thin Resonant Cavity Solar Cell

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Supporting information 1: Refractive Index data

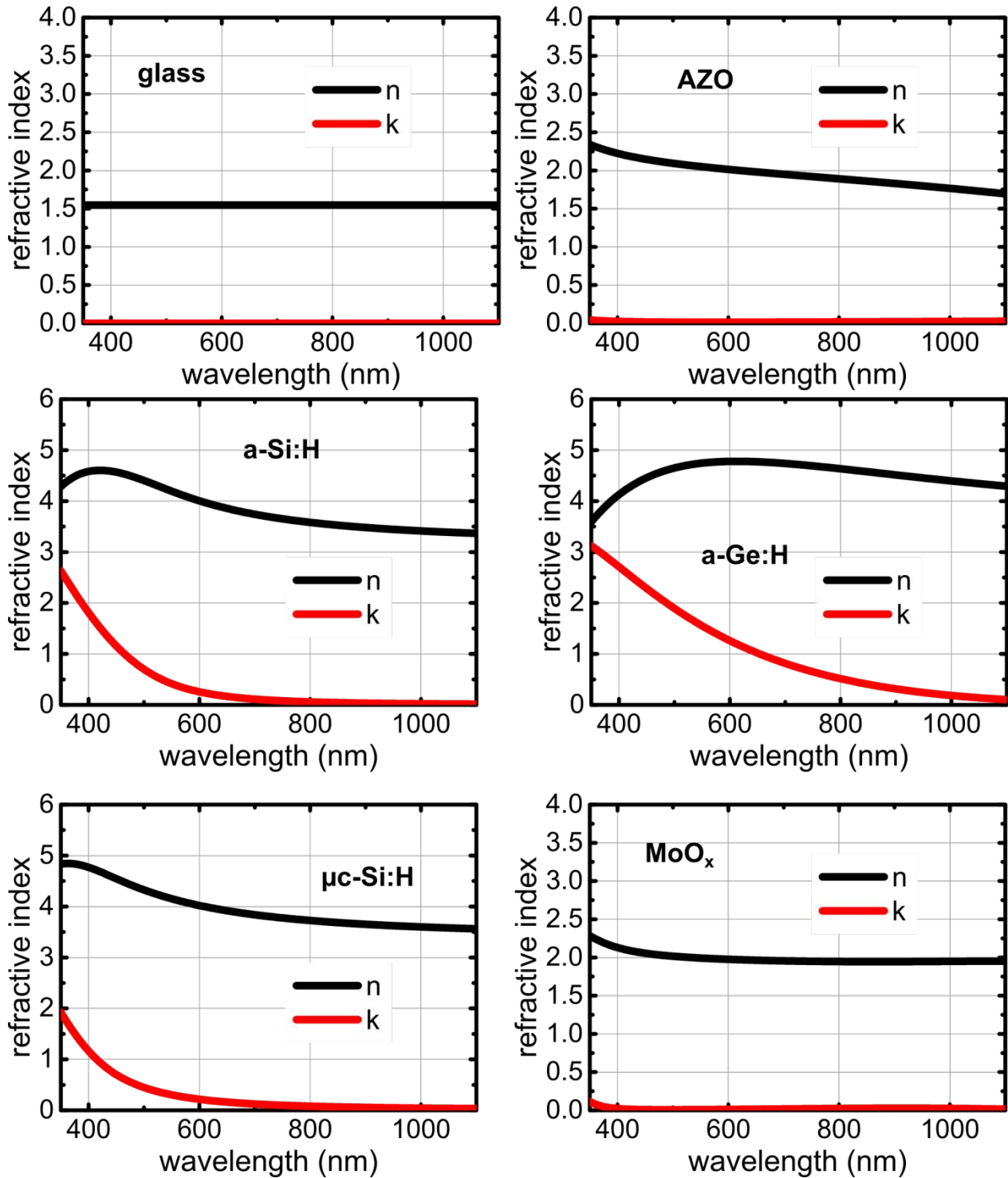


Figure S2-1

Refractive index data for each single layer of the device is shown in these graphs. The data was obtained by fitting optical models to reflection and transmission data of single layers on glass as well as fitting to the optical data of the complete layer stack.

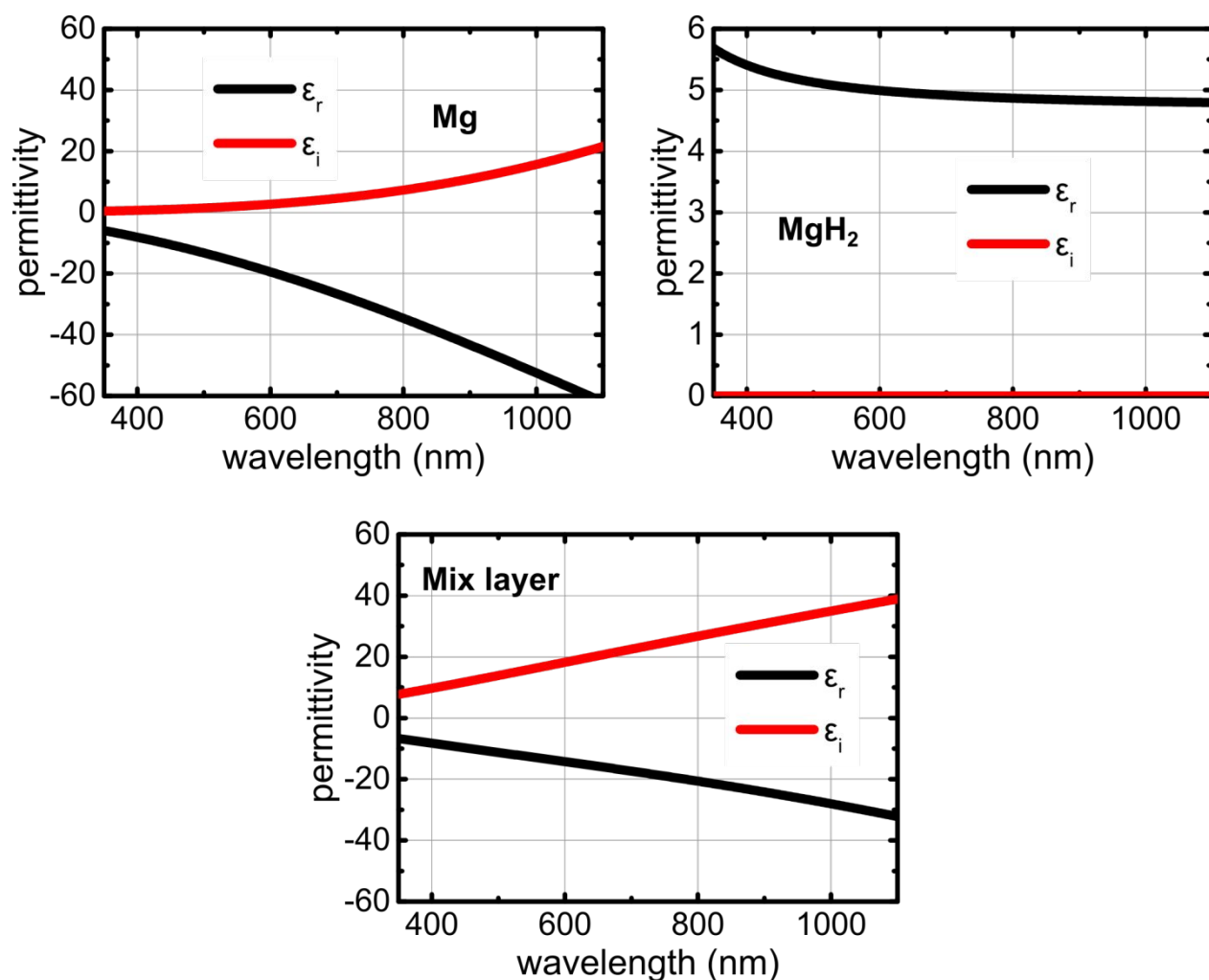


Figure S3-1

The dielectric functions of Mg, MgH₂ and the mix layer of Pd, Mg and hydrogen as well as oxygen were obtained by fitting of an optical model to the respective R and T data before and after hydrogenation. The R and T data for MgH₂ and the intermix layer were obtained from the layer stack with glass/Mg/Pd after hydrogen absorption for 15 minutes at 20 °C. The mix layer is necessary to include additional optical absorption, alloying between Mg and Pd, and non-hydrogenated parts in the model.

Supporting information 2: Sample Design

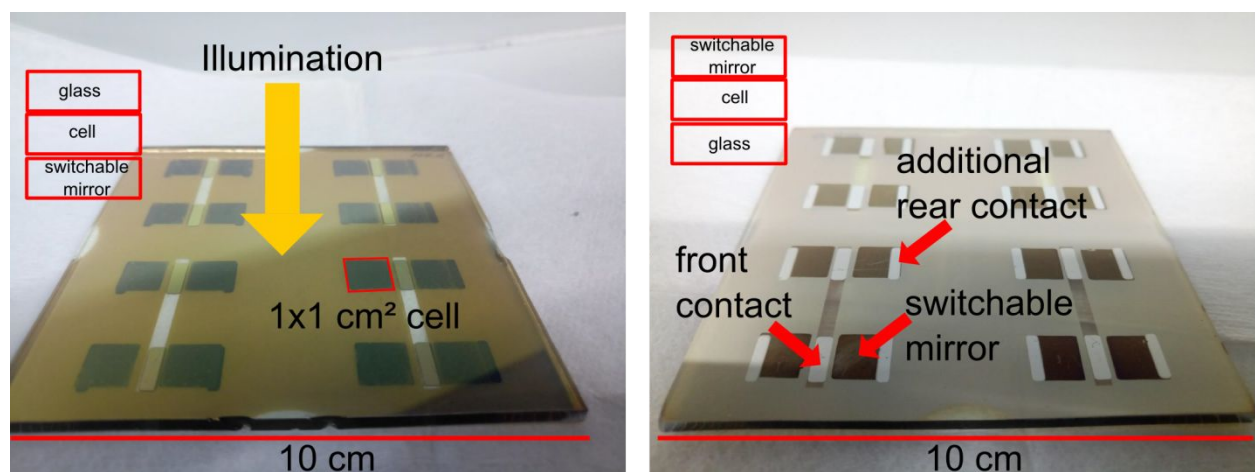


Figure S4-1

The device is shown in from both sides. The complete glass is covered with the AZO layer and the n-i-p layer stack. The 1x1 cm² cells are created by deposition of the switchable mirror on the layers.

Supporting information 3: IV curves during degradation testing

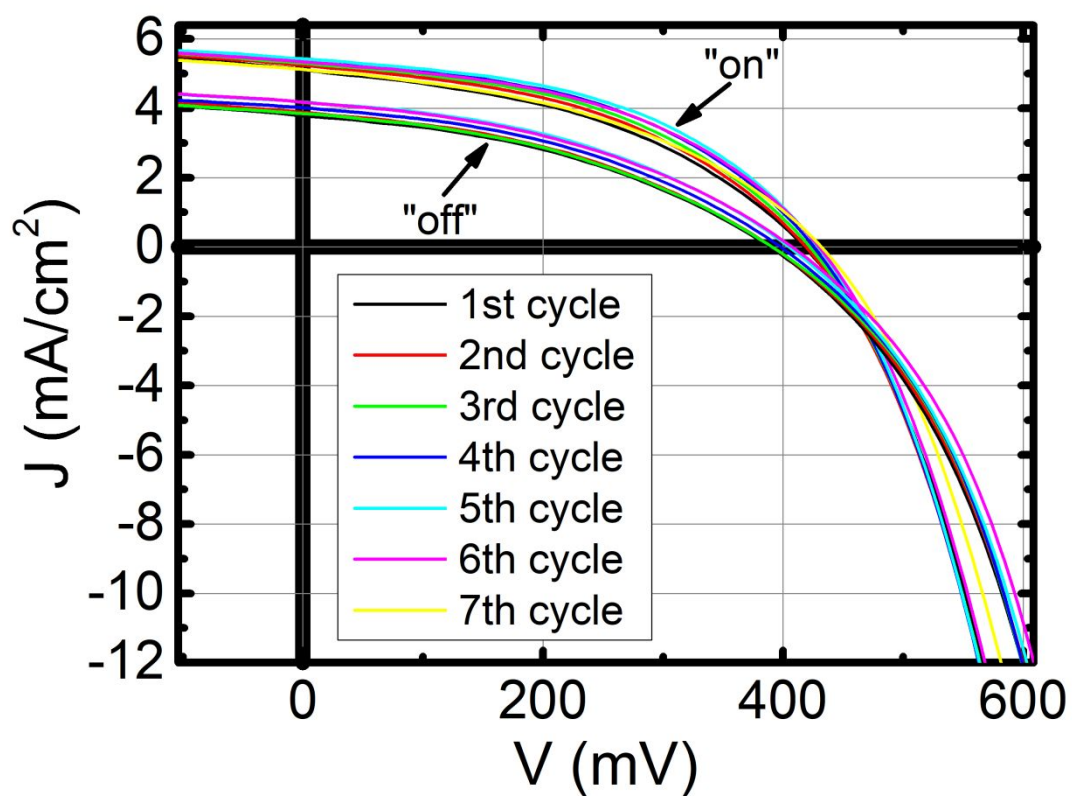


Figure S5-1

All IV curves of the degradation measurements: The graphs presented here are the IV curves of the parameters in Figure 5 (c).

Supporting information 4: Change of Transmission with linear fit

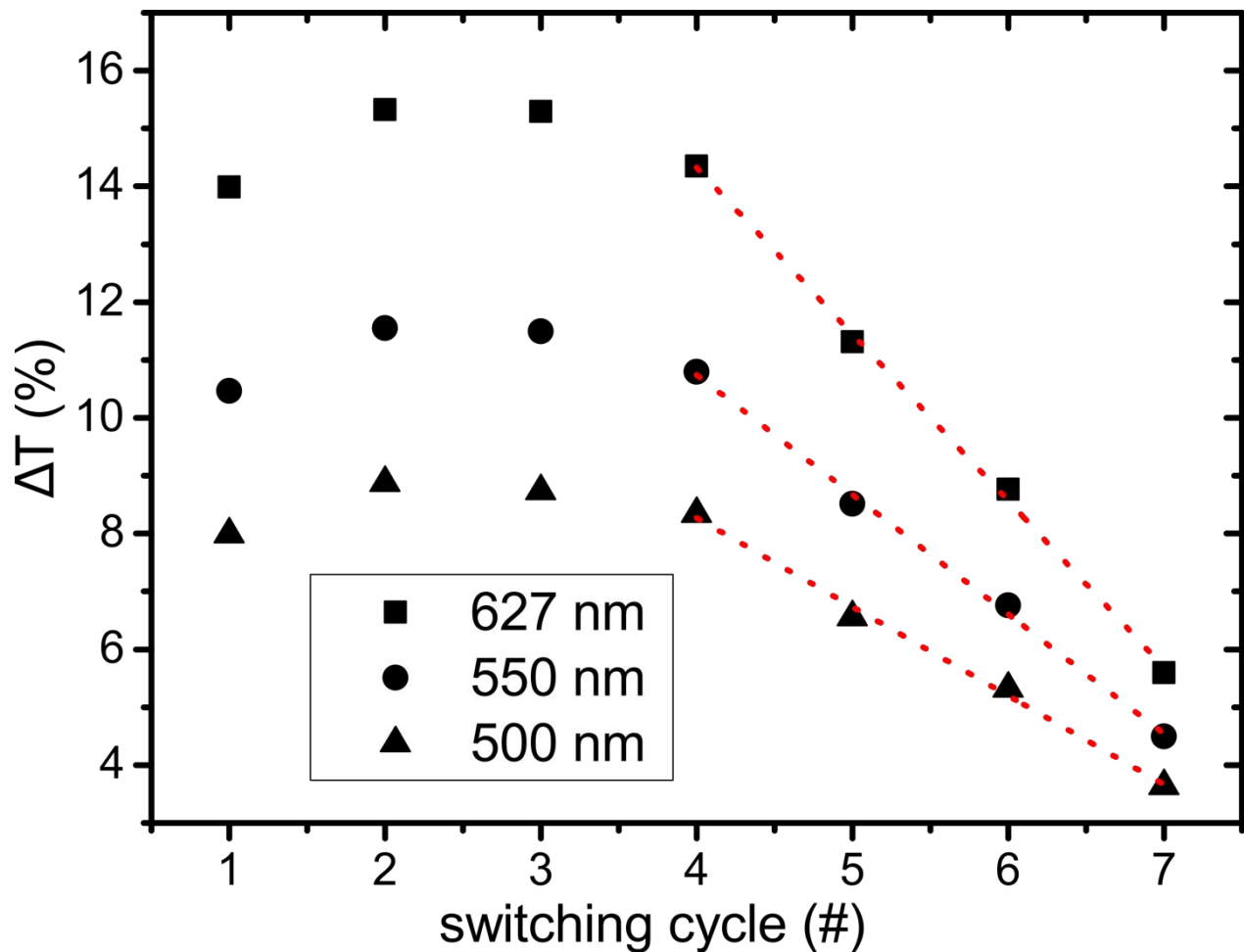


Figure S6-1

The Figure presents the difference between T ("on") and T ("off") for three representative wavelengths. After the fourth switching cycle, the Mg / Ti / Pd multilayer system starts to degrade. The red curves show linear fits of the degradation beginning with the fourth cycle. The results of the fit give a measure of how fast the switching capability will be lost.

- 627 nm : $25.84 - 2.88 * n$ (with $r^2 = 0.997$) -> no switching effect after 10 cycles
- 550 nm : $19.01 - 2.07 * n$ (with $r^2 = 0.996$) -> no switching effect after 9 cycles
- 500 nm : $14.04 - 1.53 * n$ (with $r^2 = 0.993$) -> no switching effect after 9 cycles