

Description of Additional Supplementary Files

File Name: Supplementary Movie 1.

Description: Oscillating bending actuation of the vertically placed porous PP film. The original size of the actuator was $9\text{ mm} \times 3\text{ mm} \times 100\text{ }\mu\text{m}$. The actuator was supplied with ethanol and under vertically irradiated 800 mW cm^{-2} NIR light. The maximum bending curvature and oscillating displacement are 7.3 cm^{-1} and 15.7 mm , respectively.

File Name: Supplementary Movie 2.

Description: Oscillating bending actuation of the vertically placed porous PP film carrying a load 6-times its own mass. The original size of the actuator was $9.5\text{ mm} \times 5\text{ mm} \times 100\text{ }\mu\text{m}$. The actuator was supplied with ethanol and under vertically irradiated 800 mW cm^{-2} NIR light. The maximum specific work and specific power are $12.02 \times 10^{-5}\text{ J g}^{-1}$ and $2 \times 10^{-4}\text{ W g}^{-1}$, respectively.