Supporting information

SI: Collections of all the biological organisms

The *O. Sinesis* and *C. Barometz* spores were obtained from Mountain Huading (Zhejiang, China) and they were cultivated in Fern Artificial Cultivation Laboratory of Harbin Normal University (HANU, 126°42’E, 45°24’N). When harvest began, the mature microsporangia were plucked and washed in distilled water for three times. Then the cleaned microsporangia were transferred to a super-cleaned table and the walls of microsporangia were carefully dilacerated. The fallen spores were collected, purified and stored at 5~10 °C.
S-2: Calculation of the specific capacity for iodine/C composite.

The specific capacity of iodine/C composite is calculated based on the following equation,

\[ C_{\text{iodine}} = \frac{Q_{\text{iodine/C}} - Q_C}{m_{\text{iodine}}} \]  \hspace{1cm} (2)

Where \( C_{\text{iodine}} \) is specific capacity of pure iodine in the iodine/C electrode; \( Q_{\text{iodine/C}} \) is the capacity of the iodine/C electrode; \( Q_C \) is the capacitance capacity of carbon host; \( m_{\text{iodine}} \) is the mass of iodine."