Off-grid solar container for agricultural irrigation

Can a solar absorber revolutionize irrigation?
The off-grid and low-maintenance extraction of atmospheric water that can be supplied directly to plants can revolutionize irrigationin remote,water-scarce regions. The solar absorber was fabricated by loading partially oxidized CNTs onto the GFM with a controlled loading percentage ~10 wt.%.

Can solar energy extract moisture from air for drinking & irrigation?
This passive SAWE system,harnessing solar energy to continuously extract moisture from air for drinking and irrigation,offers a promising solution to address the intertwined challenges of energy,water,and food supply,particularly for remote and water-scarce regions.

How is the microstructure of a solar absorber characterized?
The microstructure was characterized by SEM(Teneo VS,FEI). The light absorption spectrum of the solar absorber was measured by UV/Vis/NIR spectrometer (Lambda 950,PerkinElmer). The water capture and release isotherms of saturated LiCl solution were evaluated by a dynamic vapor sorption analyzer (IGAsorp,Hiden Isochema).

How was the off-grid Irrigation Experiment performed?
The off-grid irrigation experiment was performed on the balcony in KAUST. A custom-built acrylic tray with ten individual compartments was used for plant growth. Chinese cabbage seed (Quality Cabbage,Longda Seed) was selected for demonstration and standard potting soil (Basissubstrat 2,Stender) was used for plant growth.

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Abstract and Figures This study explores the design and adaptation of a shipping container into a portable irrigation control station for agricultural operations.

This study explores the design and adaptation of a shipping container into a portable irrigation control station for agricultural operations. The project leverages the ...

Intriguingly, we demonstrate the system's potential for off-grid irrigation by successfully growing cabbage plants using atmospheric water.

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