Solar Absorber Based Water Purification System

LUX PHOTONICS CONSORTIUM SINGAPORE

Technology Overview

§ Full-solar-spectrum solar absorber absorbs 96% solar energy with thermal emittance of ~ 4% at 100 oC
§ Solar energy collected by the absorber is used to purify seawater or contaminated water containing heavy metal ions, chemicals etc.
§ Able to produce directly drinkable water

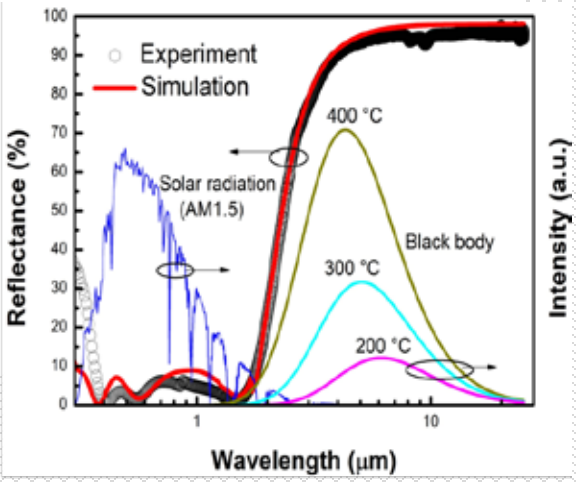

Figure 1. Simulated and experimental reflectance of the solar absorber in the wavelength range of 0.28 – 25 μm.

Technology Features

§ Conversion efficiency of about 90% (vs conventional solar cell of about 20%)
§ Materials used are biocompatible and safe to human

Figure 2. Demonstration of heating performance of our solar absorber under sun light. ~ 160 °C is reached after exposure to sun light for 15 min.

Benefits

§ Thermal energy collected can be easily stored at low cost
§ Uses unlimited solar energy, unlike reverse osmosis technology, which consumes a lot of electrical energy

Potential Applications

§ Purification of seawater
§ Purification of contaminated water (e.g. industrial waste water containing heavy metal ions, chemicals, etc.)

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