Low-Cost and Sustainable Carbonized Sawdust Based Solar Absorber for Solar Vapor Generation Towards Seawater Desalination

ABSTRACT

Solar vapor generation is a promising clean water generation as it utilizes clean and renewable solar energy as the energy source, along with the use of low-cost and sustainable carbonized sawdust (CSD). In this work, CSD coated cotton towel was used as the solar absorber (SA) for seawater desalination by solar vapor generation. A series of different weight percentage solar absorber was fabricated for the determination of the optimal photothermal conversion material content. The experiment was conducted by outdoors solar vapor generation using deionized water. The best performed 60 wt% CSD coated cotton towel solar absorber (SA60) was chosen for the seawater desalination towards clean water generation. Outdoors solar vapor generation was conducted for about 2 h with seawater gathered from the beach coast of Universiti Malaysia Sabah. Average efficiency of SA60 was calculated at 63.41 ± 1.31% with the average evaporation rate at about 1.15 kg/m2 h. Salinity (120 ppm) and pH (7.22) of the collected clean water was within the World Health Organization safe water limit standard.