Contribution ID: **300** Type: **Poster**

Condensation of water from the atmosphere with a Peltier cell through nanostructured materials

The amount of fresh water on the planet is decreasing, however, in the atmosphere that amount is approximately 1.4 x 10^19 liters, which makes the atmosphere an almost inexhaustible source. This project, uses the dew point temperature to condense water on different nanostructured surfaces and configurations, to increase the condensation area. The study was developed using a Peltier cell, which had a water-cooling system and was supplied with energy through a voltage source. The temperature of the cold face was measured with a type J thermocouple. The entire system was controlled with ARDUINO, to ensure a constant temperature close to the dew temperature of the cold face in real-time. The materials used were copper and porous copper (50 ⊠m pore size), porous carbon, deposited by the magnetron sputtering technique, and aluminum and porous aluminum. The results indicate that the amount of condensed water is a function s of the temperature and humidity values of the environment. Contact angle values of said surfaces are also shown. Moreover, there was a variation in water condensation between pristine materials and those that are porous. Regarding the contact angle, there were minor variations between one material and another.

Keywords

water condensation, nanostructured surfaces, Cu surfaces, Al surfaces

Reference

Ankit Nagar, et al., ACS Nano 2020 14 (6), 6420-6435

This work was supported by

PAPIIT-IG101123 project

Author approval

I confirm

Author will attend

I confirm

Author: Dr CRUZ CARDENAS, Julio Cesar (UNAM)

Co-authors: Ms VAZQUEZ, Veronica (UNAM); Dr MUHL, Stephen (UNAM); Dr CAMPS, Ivan (ITESM)

Presenter: Dr CRUZ CARDENAS, Julio Cesar (UNAM)

Session Classification: NANOSTRUCTURES

Track Classification: Nanostructures