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作品編號	200022
參展科別	環境工程科
作品名稱	Extracting Water from Humid Air Using Solar Energy in Humid Areas
得獎獎項	二等獎
國 家	Saudi Arabia
就讀學校	Almoatasim School
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Abstract

The study aims to evaluate the technique of extracting water from humid air using solar energy through greenhouses in local areas. This technique is believed to provide limited amount of water in areas where potable water is not accessible or abundant. To solve this problem a pyramid-shaped device was designed, it is made of glass panels and equipped with glass doors, fans operated by solar energy, and multiple shelves covered with fabric to act as Absorbent Calcium Chloride (CaCl_2) with a 30% concentration. The doors are open during the night for absorption and closed during the day for energy-generating. Humidity, temperature, and atmospheric pressure are measured every two hours. The amount of water extracted in this area in one full day was around 3.0 liters a day for every square meter. Perhaps the limited amount of water is due to low level of humidity in the area: an average of 50% and temperature of 10 Celsius at night. However, the device itself is independent, does not need power sources, water sources, or infrastructure, can be installed in various places depending on humidity level as well as having the possibility of increasing number or size of device. This makes the device a promising, alternative and environmental friendly solution to produce water. Cost-effective and lighter material can be used to make the device, which will produce an easy-to-use and affordable devices. It is an area in need for further research to improve and further develop it.

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This study uses CaCl_2 desiccant as the moisture absorption materials. By combined with solar energy as the power source for the driving fan, the water generation device can be used without addition electricity device and can produce ~30L water per day. This is a good and valuable invention for people living in the area where water resource is a problem.