

# Studies on Solar Desalting Stills

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## Summary

Following three subjects have been studied.

1. Liquid flow along an inclined groove was theoretically analyzed in connection with designing the roof type solar still. The momentum and heat transfer equations were established and finite element method was used to calculate the shape of meniscus, the velocity distribution, the convectional flow vector and the temperature distribution with respect to a cross section of the flow. The result qualitatively indicated the effect of convection on the average temperature rise and enhancement of the evaporation rate.
2. Selection of the materials was discussed and following are pointed out.
  - 1) Concrete slab is suitable to roofing a green house at hot arid area.
  - 2) Plastic sheet would be favorably used as a temporary purpose in resort or emergency.
  - 3) The hybrid system of the roof type solar still connected with photoelectric cell is worthy to evaluate.
3. The "Inland Marine Oasis Solartopia: IMOS System" is proposed to evaluate roof type solar stills and the conceptual design revealed as follows.
  - 1) A module of IMOS System with solar photovoltaic cell having total capacity of 2,000 MW can afforest desert of about 1,000 km<sup>2</sup>.
  - 2) The hybrid solar stills produce about 120,000 m<sup>3</sup> fresh water per day which is quite sufficient for maintenance of the site and the remaining can irrigate around the site.