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Performance evaluation of an acrylic mirror booster solar still for neera concentration in jaggery-making industry

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Abstract

A single-basin solar still was constructed from locally available materials to concentrate palm tree juice (*neera*) for *jaggery*-making application. The performance of the still was tested with and without an acrylic mirror booster on both partially cloudy and clear sunshine days. About 73% of water content from *neera* was evaporated within 2 days by using the mirror booster technique in clear sunshine days. Distilled water of about 7.26 l was extracted from 10 l of *neera* with the mirror booster condition. Wind velocity showed a considerable effect on *neera* juice temperature and water vapour temperature during partially cloudy conditions. The calculated efficiency of the still with the mirror booster technique was 36.53% in clear sunshine conditions. The calculated energy conservation for the *neera* concentration process by using the mirror booster solar still was about 16408 kJ.

Keywords

- neera concentration,
- energy conservation,
- booster mirror,
- solar distillation

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