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عنوان مقاله:

THERMODYNAMIC OPTIMIZATION OF THE SOLAR PARABOLIC COOKERS AND COMPARISON WITH ENERGY ANALYSIS

محل انتشار:

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خلاصه مقاله:

In this paper, an exergetic optimization of the solar parabolic cookers is developed. For this means, an integrated mathematical model of thermal and optical performance of the solar cooker is derived. In this analysis, the most geometric parameters and operating conditions are considered as variables. Some correlations for exergy efficiency of solar cooker components are used. Then, exergy efficiency of solar cooker is derived by using these correlations. In the process of deriving an equation for the exergy efficiency, while the overall thermal loss coefficient and other heat transfer coefficients of solar cooker assumed to be variable, the common error of using the Petela efficiency is corrected to reach the improved equation of solar radiation exergy. Finally, through MATLAB optimization toolbox the exergy efficiency equation is maximized. Results show the exergy and energy analysis of the solar cooker doesn't have same behavior. Also, the benefits of the exergy method for the design of solar cookers were obtained.

کلمات کلیدی:

Exergy; Solar Parabolic Cooker; Optimization

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