

Accepted Manuscript

Title: Strategy to synthesize integrated solar energy coproduction processes with optimal process intensification.
Case study: Efficient solar thermal hydrogen production

Author: Emre Gençer Rakesh Agrawal



PII: S0098-1354(17)30047-9
DOI: <http://dx.doi.org/doi:10.1016/j.compchemeng.2017.01.038>
Reference: CACE 5694

To appear in: *Computers and Chemical Engineering*

Received date: 19-9-2016
Revised date: 18-1-2017
Accepted date: 19-1-2017

Please cite this article as: Emre Gençer, Rakesh Agrawal, Strategy to synthesize integrated solar energy coproduction processes with optimal process intensification. Case study: Efficient solar thermal hydrogen production, *Computers and Chemical Engineering* (2017), <http://dx.doi.org/10.1016/j.compchemeng.2017.01.038>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Strategy to synthesize integrated solar energy
coproduction processes with optimal process
intensification. Case study: Efficient solar thermal
hydrogen production

Emre Gençer^a, Rakesh Agrawal^{a,*}

^a*School of Chemical Engineering, Purdue University, West Lafayette, IN 47906*

Abstract

The development and implementation of alternative energy conversion techniques using renewable energy sources is critical for a sustainable economy. Among renewable energy sources, solar energy is prominent due to its abundance. Towards a sustainable economy, this paper presents a process design concept to synthesize Solar Electricity, Water, Food and Chemical (SEWFAC) processes. The proposed approach entails systematic synthesis of energy efficient, synergistic processes incorporating process intensification for optimal utilization of resources. The objective is the development of coproduction processes around the clock on an as-needed basis. A general strategy and detailed analysis to synthesize efficient solar thermal hydrogen production processes through solar thermal power cogeneration. Process simulations and optimizations are performed using an integrated MATLAB and Aspen Plus modeling environment. The proposed process designs are

*Corresponding author

Email address: agrawalr@purdue.edu (Rakesh Agrawal)

URL: www.agrawalrakesh.org (Rakesh Agrawal)

Download English Version:

<https://daneshyari.com/en/article/4764633>

Download Persian Version:

<https://daneshyari.com/article/4764633>

[Daneshyari.com](https://daneshyari.com)