Accepted Manuscript

Combined fluidized bed retorting and circulating fluidized bed combustion system of oil shale: 3. Exergy analysis

Mao Mu, Xiangxin Han, Xiumin Jiang

PII: S0360-5442(18)30509-7

DOI: 10.1016/j.energy.2018.03.100

Reference: EGY 12558

To appear in: Energy

- Received Date: 04 February 2018
- Accepted Date: 18 March 2018

Please cite this article as: Mao Mu, Xiangxin Han, Xiumin Jiang, Combined fluidized bed retorting and circulating fluidized bed combustion system of oil shale: 3. Exergy analysis, *Energy* (2018), doi: 10.1016/j.energy.2018.03.100

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.



Combined fluidized bed retorting and circulating fluidized bed combustion system of oil shale: 3. Exergy analysis

Mao Mu, Xiangxin Han*, Xiumin Jiang

Institute of Thermal Energy Engineering, School of Mechanical Engineering, Shanghai Jiao Tong University, Shanghai 200240, China

Abstract

Exergy analysis as well as energy analysis is applied to Chinese comprehensive utilization system, in which oil shale is firstly introduced to fluidized bed (FB) retort for obtaining oil and resulting semicoke is fed to circulating fluidized bed (CFB) reactor for further utilization. During the calculation, linear programming helps optimize the efficiency of FB retort in the system. In the light of the results, the process flow diagram of the whole system is redrawn. Also, this paper discusses how three operating parameters (the retorting temperature, the mass of burned fuel gas and the temperature of circulating ash) influence the system, especially exergy efficiency. With the retorting temperature increasing, the exergy efficiency first increase and then decrease, and the highest exergy efficiency is in the temperature range 460-490 °C. Compared with retorting temperature, the mass of burned fuel gas and circulating ash temperature have less effect on the exergy efficiency of the whole system. But it is a good strategy for stable operation of the system to burn more fuel gas to provide more energy and exergy to FB retorting unit. This work could give further detailed suggestions and more reference data to operate the system stably and efficiently.

^{*} To whom correspondence should be addressed. E-mail: hanxiangxin@sjtu.edu.cn

Download English Version:

https://daneshyari.com/en/article/8071795

Download Persian Version:

https://daneshyari.com/article/8071795

Daneshyari.com