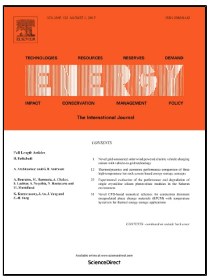
# Accepted Manuscript



Assessment of Off-design Performance of a Kalina Cycle Driven by Low-grade Heat Source

Jianyong Wang, Jiangfeng Wang, Yiping Dai, Pan Zhao

| | |
|---|---|
| PII: | S0360-5442(17)31258-6 |
| DOI: | 10.1016/j.energy.2017.07.081 |
| Reference: | EGY 11269 |
| To appear in: | *Energy* |
| Received Date: | 21 January 2017 |
| Revised Date: | 09 July 2017 |
| Accepted Date: | 12 July 2017 |

Please cite this article as: Jianyong Wang, Jiangfeng Wang, Yiping Dai, Pan Zhao, Assessment of Off-design Performance of a Kalina Cycle Driven by Low-grade Heat Source, *Energy* (2017), doi: 10.1016/j.energy.2017.07.081

# Assessment of Off-design Performance of a Kalina Cycle Driven by Low-grade Heat Source

**Jianyong Wang, Jiangfeng Wang*, Yiping Dai, Pan Zhao**

*Institute of Turbomachinery, Shaanxi Engineering Laboratory of Turbomachinery and Power Equipment, School of Energy and Power Engineering, Xi'an Jiaotong University, Xi'an 710049, China*

**Abstract:**

Kalina cycle is a promising power cycle to utilize or recover the heat of low-grade heat sources. Most of previous works focused on the thermodynamic and thermoeconomic analysis or optimization for the cycle. In this paper, an off-design mathematical model for Kalina cycle is established to examine the off-design performance of the cycle with the variation of heat source mass flow rate, heat source temperature and cooling water temperature. A modified sliding pressure regulation method, which regulates the turbine inlet pressure to keep the temperature difference between heat source temperature and turbine inlet temperature constant, is applied to control the cycle when off-design conditions occur. The results show that the modified sliding pressure regulation method keeps Kalina cycle with a good off-design performance. With the increase of heat source mass flow rate or heat source temperate, both of the net power output and thermal efficiency increase. With the increase of cooling water temperature, both of the net power output and thermal efficiency decrease. In addition, the turbine efficiency almost keeps the designed value under the off-design conditions.