

A study on the Design and Efficiency of Organic Rankine Cycle

양재현, 이철진^{1,†}

중앙대학교; ¹중앙대학교 화학신소재공학부

(cjlee@cau.ac.kr[†])

This paper presents preliminary results for development of Organic Rankine Cycle (ORC) systems under 50kWe that is capable of generating electric power using a low-grade temperature heat source. The ORC system is consist of a turbine-generator unit, a regenerator, a condenser, a pump, an evaporator. As a working fluid R-245fa is adopted, considering operation condition of cycle and environmental friendly characteristic. The heat source conditions are 70~350°C, low-grade of waste heat is considered in this work. The computed simulations to analyze the operation characteristics for the ORC are conducted. To investigate the effects of various operation conditions, such as mass flow rate of R-245fa, the turbine saturated pressure and temperature are selected as the main parameters of the performance of cycle efficiency. The results show that for a low-grade of waste heat source temperature cycle efficiency affects turbine inlet/outlet pressure and temperature.