

ABSTRACT

Thermoelectric is commonly used as a cooler device since the hot side temperature of thermoelectric has a limit. In several conditions, high temperature which is resulted by thermoelectric can be harmful to the device itself. In fact, the half of Joule heating will counteract a fraction of cooling capacity while the other half will add to the heating capacity. Therefore thermoelectric should be more efficient while being utilized as a heater than as a cooler. In this study, thermoelectric will be utilized as a heater for small volume of water (under 200mL) with the output temperature of water up to 60°C. Enhancement of energy efficiency can be expected with the replacement of resistance heater by thermoelectric. Furthermore, on-off control system is added to increase the efficiency.