Abstract In this work, a geothermal energy assisted power plant, which is the power and heating products, is developed and analyzed based on the one and second laws of thermodynamic. The system consists of two turbines, a pump, two heat exchangers, a condenser, hot water storage, and cooling tower components. In addition, a comparative thermodynamic analysis is performed according to two different configurations which is one a single generation system (Rankine cycle), another system is cogeneration system (Rankine cycle and hot water production). The main energy source of power plant system is a geothermal reservoir. Results display that the total energy and exergy efficiencies of cogeneration plant are computed as 37.33% and 63.31%, respectively. Furthermore, it can be clearly stated that the cogeneration plant has higher energy and exergy efficiency than the single-generation cycle.
Keyword: energy, exergy, cogeneration, power, geothermal energy