Unjuk kerja modul termoelektrik bertingkat pada alat cryosurgery = Performance of multistage thermoelectric module on cryosurgery device

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Abstrak

Cryosurgery is one of medical method used to destroy cancer cells that exist within and outside the human body by performing cooling repeatedly until reaching the cryo temperature at -50ºC. Typical cryosurgery device which exist in the market usually use liquid nitrogen as cooling system. The weakness of this existing systems require specially designed container to avoid evaporation and the cooling temperature cannot be controlled. The purpose of this research is focused on the development of cryosurgery device by replacing the existing cooling system with multistage thermoelectric cooler and proves whether the "direct contact mechanism" between the cold side of thermoelectric module with the probe can be used in the cryosurgery system. The insulator material used on this research is polyurethane high density with variations of CTB temperature at 0ºC and -10ºC. The lowest end probe temperature achieved is -27.24ºC. Results from this research indicate that the "direct contact mechanism" between the cold side of thermoelectric module with the probe can be used as the cooling system for cryosurgery device.