

Method for Fabricating Thermoelectric Device using Chemically Transformed Nanowires on Porous Mambrane

Application Number: 202411060641

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ABSTRACT

Embodiments disclose a method for fabricating a flexible thermoelectric device having a flexible thermoelectric film made using chemically transformed nanowires (NWs) on a porous membrane, said method comprising the steps of: synthesizing thermoelectric material using a solution method; and fabricating a flexible thermoelectric device utilizing the nanowire based thermoelectric film.

KEY APPLICATION AREAS

- 1.Flexible Thermoelectric Energy Harvesting.
- 2.Wearable Electronics.
- 3.Healthcare & Medical Devices.
- 4.Internet of Things (IoT) & Remote Sensors.
- 5.Automotive Waste Heat Recovery.
- 6.Renewable Energy & Industrial Energy Harvesting.

POTENTIAL USE

- 1.Powering wearable electronics (smartwatches, earbuds, fitness trackers, health monitors) using body heat.
- 2.Self-powered healthcare devices and human temperature sensing for continuous health monitoring.
- 3.Harvesting waste heat from industrial equipment, hot pipes, boilers, and chimneys to generate electricity.
- 4.Recovering heat from vehicle engines and passenger body heat to improve automotive energy efficiency.
- 5.Building-integrated energy harvesting using indoor-outdoor temperature differences across walls.
- 6.Battery-free power for military wearables, remote sensors, and space systems operating in challenging environments.
- 7.Portable power generation for remote and off-grid IoT devices without requiring charging.