Tohoku Univ. Technology

Thermoelectric material and thermoelectric module

To provide a thermoelectric material having an improved figure of merit.

Overview

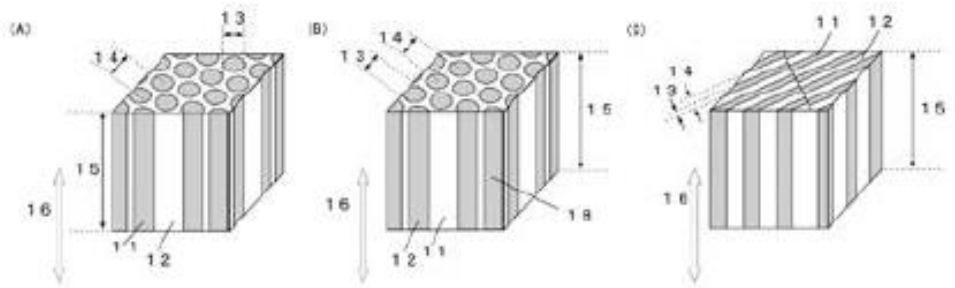
Development of thermoelectric materials and modules are promoted to effectively utilize unused thermal energy. Thermoelectric materials with nanoparticles have been developed to improve the figure of merit by lowering the thermal conductivity using phonon scattering. However, it is limited to a material in which nanoparticles can be formed, and the dispersion of nanoparticles requires a search for precise conditions and a complicated process.

It is an object of the present invention to provide a thermoelectric material and a thermoelectric module having an improved figure of merit, which do not require a process for producing a raw material of nanoparticles, can reduce thermal conductivity by scattering of phonons, can improve electrical conductivity and Seebeck coefficient by quantum confinement effect, and can be expected to be put into practical use.

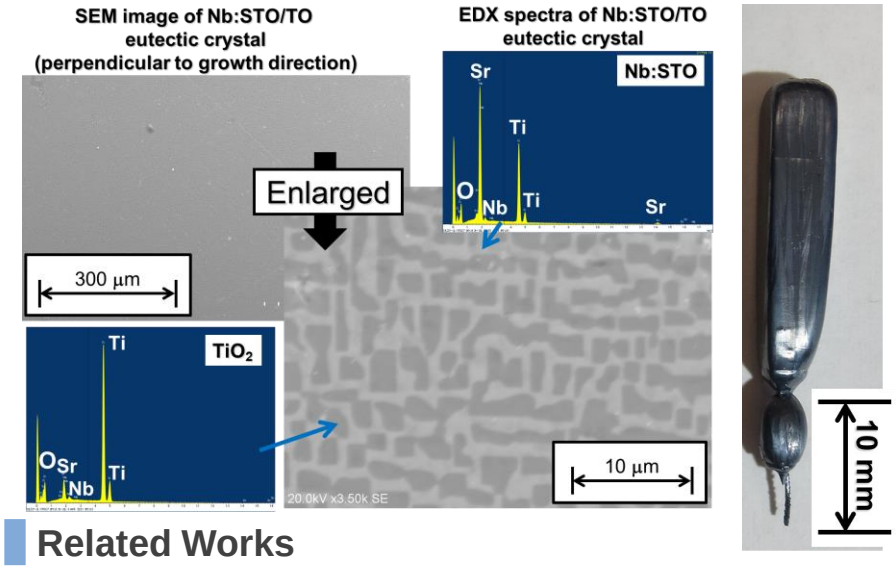
Product Application

- Thermoelectric element
- Thermoelectric generator
- Heat flow sensor

Figure



SrTiO3 – TiO2 system



Related Works

[1] Yuui Yokota, Akira Yoshikawa, et al.,
Journal of Crystal Growth Vol.583 (2022) pp.126551
[2] Yuui Yokota, Akira Yoshikawa, et al.,
Journal of Electronic Materials Vol.48 No.4 (2019) pp.1827

IP Data

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