Research Subject

Pioneering indium nitride based semiconductor potential for thermoelectric device application

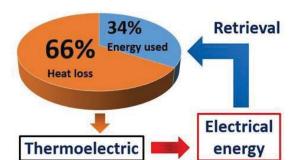


Power plants





Automobiles Industry



Microprocessors



Microprocessors

Mobile devices

Indium nitride

- Small bandgap energy
- Small effective mass
- · High mobility
- High Seebeck coefficient

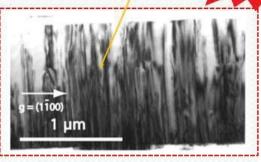
Potential applications

- Long-wavelength optoelectronic
- High speed electronic
- Thermoelectric

Threading dislocations observed by transmission electron microscopy

Issues

High density of threading dislocations in indium nitride



C. S. Gallinat et.al., J. Appl. Phys., 107, 053517 (2010)

Low crystalline quality of indium nitride

Low electrical conductivity

Low thermoelectric efficiency

PROPOSAL!!

To reduce threading dislocations density

Novel method: In situ Surface Reformation by Radical Beam Irradiation

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- In situ process
- Simple and easy
- Large area
- Repeatable
- To clarify indium nitride performance as thermoelectric devices and pursue its applicability