

Case Study

Research and Development in Nanomaterials used for Thermoelectric Generators

CUSTOMER: U.S. Department of Energy (DoE)
CONTRACT #: DE-FG02-07ER86296
PROJECT NAME: STTR Phase I and Phase II Project, "High Efficiency Cost Effective Thermoelectric Materials/Devices for Industrial Process Refrigeration and Waste Heat Recovery"
PROJECT DURATION: 2008-2009

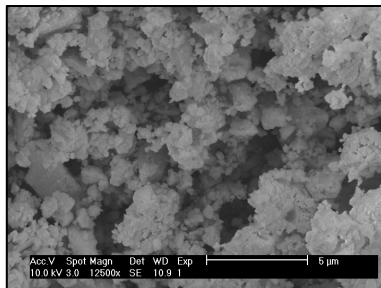
OVERVIEW

The US Department of Energy solicited a SBIR/STTR request for proposal (RFP) for the development of thermoelectric materials for use in waste heat recovery applications. In this project, Aegis Technology developed high performance, thermoelectric, nanocomposite materials comprising of PbTe, PbSe, Bi₂Te₃, and Bi₂Se₃. These new thermoelectric nanocomposite materials allow for enhanced energy efficiency, smaller size, and provide for light weight thermoelectric devices. Aegis Technology was awarded the project in 2008 and completed the project in 2009.

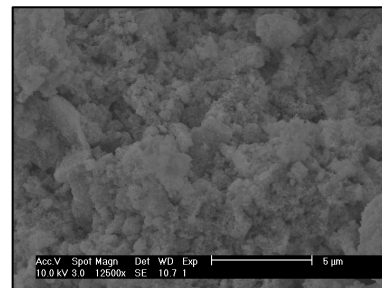
DELIVERABLES

Aegis Technology delivered several thermoelectric material samples. In the process, Aegis Technology conducted:

- Processing
- Scanning Electron Microscope (SEM) Characterization
- Energy-dispersive X-Ray Spectroscopy (EDS)
- X-ray diffraction characterization (XRD)



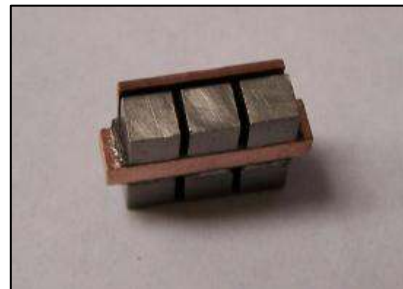
(a)



(b)



(c)



(d)

(a) SEM image of PbTe/PbSe nanomaterials, (b) SEM image of Bi₂Te₃/Bi₂Se₃ nanomaterials,
(c) Consolidated (into bulk form) PbTe/PbSe thermoelectric materials, (d) Thermoelectric module

CONTACT

For more information, please contact:
Dr. Timothy Lin, Technical Director, Aegis Technology Inc.
(714) 554-5511
timlin@aegistech.net
www.aegistech.net