Specification of Bi_2Te_3-Based Thermoelectric Ingot (TIG-BiTe-P/N-1)

Description

The Bi_2Te_3-based thermoelectric ingot is grown by Thermonamic with the alloy of Bi, Sb, Te, Se, special doping and our unique crystallizing processes. The Bi_2Te_3-based thermoelectric ingot is used to produce thermoelectric modules for cooling and heating applications, and converting heat into electricity. Generally, the figure of merit *ZT* of our p-type and n-type ingots is larger than 1 at 300 K, and the good feature attracts many high-end customers. Meanwhile, our ingot is featured with good mechanical strength and highly stable property, providing the key stone for producing the high performance and reliable Peltier cooling and power generation modules.

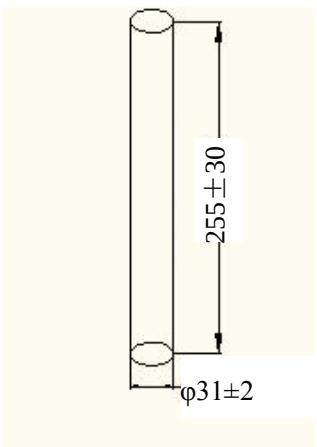
Features and Application

- Silver-white Color
- p-Type and n-type ingot $ZT \geq 1.0$ @ 300 K
- High performance and reliable Peltier cooling and power generation modules

Peformance Specification Sheet

Performance Specification	p-Type	n-Type	Note
Type Number	TIG-BiTe-P-1	TIG-BiTe-N-1	
Diameter (mm)	31 ± 2	31 ± 2	
Length (mm)	250 ± 30	250 ± 30	
Density (g cm^{-3})	6.8	7.8	
Electrical Conductivity σ (10^2S m^{-1})	850 ~ 1250	850~1250	300 K
Seebeck Coefficient α (μV K^{-1})	190 ~ 230	190 ~ 230	300 K
Thermal Conductivity κ (W m^{-1} K^{-1})	1.2 ~ 1.6	1.2 ~ 1.6	300 K
Power Factor P (W m K^{-2})	≥ 0.005	≥ 0.005	300 K
***ZT* value**	≥ 1.0	≥ 1.0	300 K

Geometric Characteristics (in millimeters)



p-type Ingot

n-type Ingot

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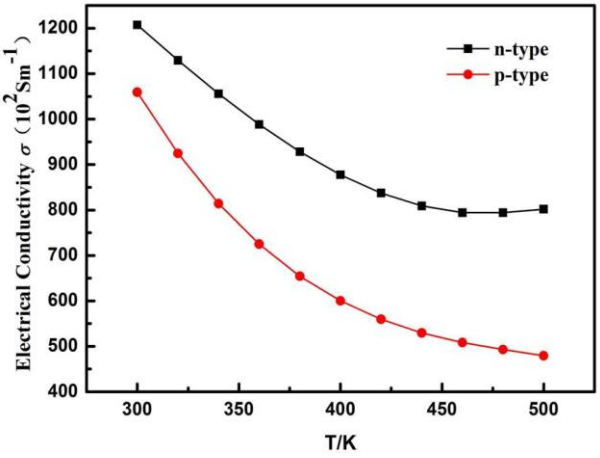
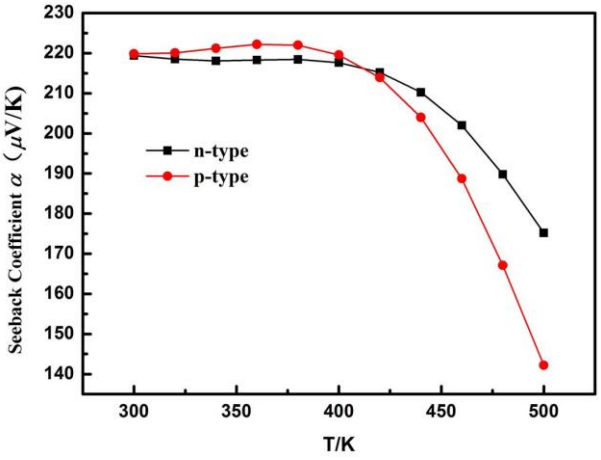
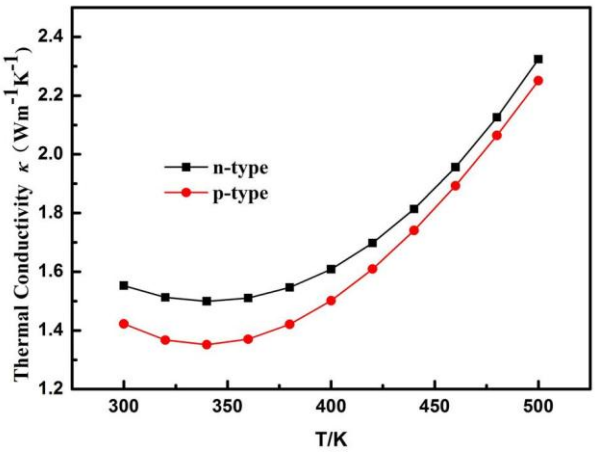


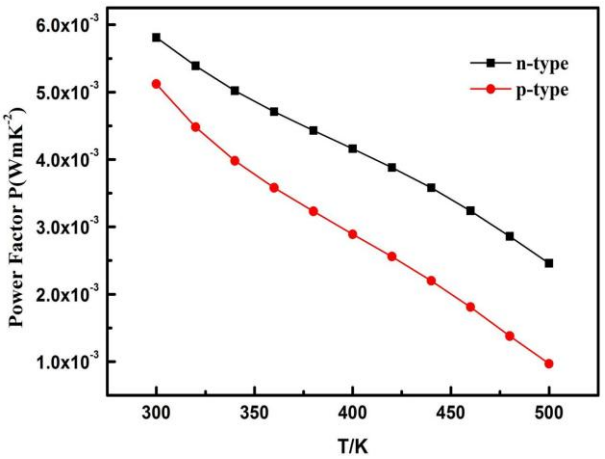
Electrical conductivity of the Bi_2Te_3-based ingot



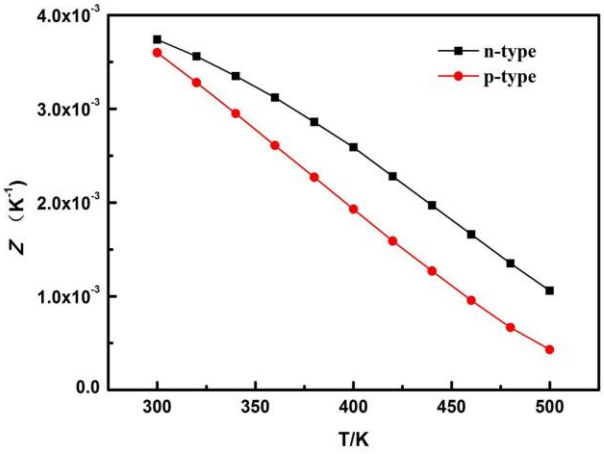
Seeback coefficients of the Bi_2Te_3-based ingot



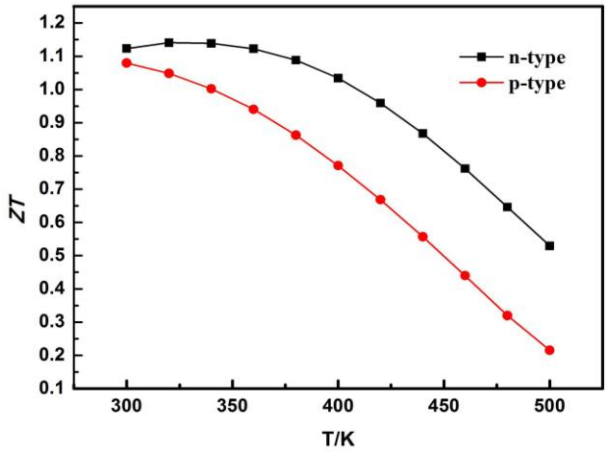
Thermal conductivity of the Bi_2Te_3-based ingot



Thermal conductivity of the Bi_2Te_3-based ingot



Z values of the Bi_2Te_3-based ingot



ZT values of the Bi_2Te_3-based ingot

Operation Cautions

- Caution on handling
- Storage in dry environment

Remarks:

Electrical conductivity (σ) and Seebeck coefficient (α) are measured by using a ZEM-1apparatus (Japan Vacuum Tech) in the temperature range from 300 to 500 K. The thermal conductivity (κ) is obtained from the measured thermal diffusivity (*D*), specific heat *Cp* and density (*d*) according to the relationship $\kappa = D \times Cp \times d$. Thermal diffusivity and specific heat are determined using a laser flash method (NETZSCH: LFA 457) and a power-compensation differential scanning calorimeter (TA:DSCQ20), respectively. All measurements are performed in the temperature range from 300 to 500 K.