

## Accepted Manuscript

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PII: S0167-577X(18)31068-1  
DOI: <https://doi.org/10.1016/j.matlet.2018.07.037>  
Reference: MLBLUE 24603

To appear in: *Materials Letters*

Received Date: 23 May 2018  
Accepted Date: 9 July 2018

Please cite this article as: X. Tong, G. You, Y. Ding, H. Xue, Y. Wang, W. Guo, Effect of Grain Size on Low-temperature Electrical Resistivity and Thermal Conductivity of Pure Magnesium, *Materials Letters* (2018), doi: <https://doi.org/10.1016/j.matlet.2018.07.037>

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**Effect of Grain Size on Low-temperature Electrical Resistivity and Thermal Conductivity of Pure****Magnesium**

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**Abstract**

The electrical resistivity and thermal conductivity of as-cast pure Mg with different grain sizes prepared by ultrasonic treatment were measured in the temperature range of 2-320 K. The grain size has little effect on residual electrical resistivity, but the different samples exhibit different temperature coefficients of resistance. The maximum of thermal conductivity 665 W/(m•K) appears at ~20 K where the different grain sizes shows the biggest difference. Less effect of grain size on the thermal conductivity can be observed at room temperature.

**Key words:** *Thermal conductivity; Electrical resistivity; Grain boundaries; Pure magnesium; Cast*

**1. Introduction**

Mg alloys are usually used as lightweight structural materials in automation, transportation, and electronics because of their low density, high specific strength and stiffness [1]. Recently, their good ability to conduct and spread heat has also attracted considerable attention for potential cryogenic and aerospace applications [2].

However, the incompatibility between strength and transport property has always limited the

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