

University of Groningen

Effect of morphology and microstructure on the thermal conductivity of chalcogenide thermoelectric materials

Lian, Hong

DOI:

[10.33612/diss.180380682](https://doi.org/10.33612/diss.180380682)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version

Publisher's PDF, also known as Version of record

Publication date:

2021

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Lian, H. (2021). *Effect of morphology and microstructure on the thermal conductivity of chalcogenide thermoelectric materials*. [Thesis fully internal (DIV), University of Groningen]. University of Groningen. <https://doi.org/10.33612/diss.180380682>

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

Propositions

accompanying the dissertation

Effect of morphology and microstructure on the thermal conductivity of chalcogenide thermoelectric materials

1. Preparation methods that involve quenching from high temperature are able not only to stabilize phases that appear at high-temperature in the phase diagram but also to obtain complex microstructures. (Chapter 3)
2. The macroscopic properties of substances are expressed by microscopic atoms, and it is the laws of the microscopic physical world that are the essential laws of the macroscopic world. Elucidating the microstructure and morphology of materials is therefore of great importance to understand the macroscopic properties of materials. (Chapter 3, 5 and 6)
3. The process of spinodal decomposition can be of great influence on the microstructure during material preparation, and can be used to obtain materials with high performance. (Chapter 3)
4. Have the courage to doubt previous studies, respect bad results, and then keep researching further. Unexpected results are interesting results and it is worth trying to explain them, thus expanding your knowledge by exploring an ongoing process. (Chapter 4, 6)
5. It is somewhat surprising that there is still no widely accepted, simple, general description of the structure and morphology of Cu-enriched Cu_{2+x}Se materials. (Chapter 6)
6. Collaboration requires trust, but more importantly, independent thinking. It is also important to think critically and to be willing to express opinions.
7. Scientific research is not easy; it requires the fear of failure to be conquered, indefatigability, persistence, the ability to overcome difficulties, dedication, independence, hard work, as well as curiosity and enthusiasm.
8. 学习是一条通往世界的路, “欲穷千里目, 更上一层楼”。(Learning is a way to the world, “To enjoy a grander sight, climb to a greater height”.)