

INFORMATION ON DOCTORAL THESIS

1. Full name: **Le Hong Viet**
2. Sex: Male
3. Date of birth: 23 January 1977
4. Place of birth: Ha Noi
5. Admission decision number: 1618/QĐ-ĐHSPHN2
6. Changes in academic process: Extension of time for thesis work
7. Official thesis title: **Study on thermodynamic properties of defective ternary and binary interstitial alloys with face-centered cubic and body-centered cubic structures**
8. Major: Mathematical and theoretical physics
9. Code: 9 44 01 03
10. Supervisors: Associate Professor, PhD Nguyen Quang Hoc
PhD Pham Thi Minh Hanh

11. Summary of the new findings of the thesis:

Building analytic expressions of thermodynamic quantities, the melting temperature and the structural phase transition temperature for defective ternary and binary interstitial alloys with CC and FCC structures by the statistical moment method.

Numerical calculation of obtained theoretical results for thermodynamic quantities, the melting temperature and the structural phase transition temperature of some defective ternary and binary interstitial alloys with BCC and FCC structures. Numerical results for interstitial alloy materials are compared with experiments and calculation results from other theoretical methods.

Numerical results of thermodynamic quantities, the melting temperature and the structural phase transition temperature under high pressure, the concentration of components and the concentration of equilibrium vacancies are used to anticipate, orient experiments in the future together to take part in supplementing and perfecting the theory on equilibrium vacancies and interstitial alloys with cubic structure.

12. Practical applicability, if any: To explain or to anticipate, orient the experimental results on thermodynamic properties, melting temperature and structural phase transition temperature of ternary and binary interstitial alloys with BCC and FCC structures.

13. Further research directions, if any: Defective binary interstitial alloys with HCP structure. Numerical calculation of thesis theoretical results for other ternary and binary interstitial alloys apart from iron's and gold's interstitial alloys calculated in the thesis.

14. Thesis-related publications:

[1] Nguyen Quang Hoc, Vu Dinh Lam, Pham Thi Minh Hanh, Tran Dinh Cuong and **Le Hong Viet** (2018). Heat capacity at constant pressure of defective FCC substitutional alloy AB with interstitial atom C, *Proc.the 9th International Workshop on Advanced Materials Science and Nanotechnology (IWAMSN 2018)*, Ninh Binh province, Vietnam, 7-11th November 2018, pp.49-56.

[2] Nguyen Thi Hoa, Nguyen Quang Hoc, Gelu Coman, Tran Dinh Cuong and **Le Hong Viet** (2018). Thermodynamic property of FCC interstitial alloy AuSi with defects, *Proceedings of the 8th International Conference on Material Science and Engineering (UGALMAT 2018)*, 11-13 October, 2018, “Dunarea de Jos” University of Galati, Romania, *IOP Conference Series: Materials Science and Engineering* **485**, 012018.

[3] Nguyen Quang Hoc, Bui Duc Tinh, Tran Dinh Cuong and **Le Hong Viet** (2019). Study on the melting of defective interstitial alloys TaSi and WSi with BCC structure. *Journal of the Korean Physical Society* **71**(8), pp.801-805.

[4] Nguyen Quang Hoc, Dinh Quang Vinh, **Le Hong Viet**, Ta Dinh Van and Pham Thanh Phong (2019), Study on Structural Phase Transitions in Defective and Perfect Substitutional Alloys AB with Interstitial Atoms C under Pressure, *HNUE JOURNAL OF SCIENCE, Natural Sciences*, **64**(6), pp.57-67.

[5] Nguyen Quang Hoc, **Le Hong Viet** and Nguyen Trong Dung (2019), On the melting of defective FCC interstitial alloy γ -FeC under pressure up to 100 GPa, *Journal of Electronic Materials*, **49**(2), pp.910-916.

[6] **Le Hong Viet** and Nguyen Quang Hoc (2021), Equilibrium vacancy concentration and thermodynamic quantities of FCC defective alloys AuCuSi and PtCuSi under pressure, *HNUE JOURNAL OF SCIENCE, Natural Sciences*, **66**(3), pp.38-51.

Date: 20th September 2022

Supervisor

PhD Student

Assoc. Prof. PhD. Nguyen Quang Hoc

Le Hong Viet