

Information on Doctoral Thesis of Fellows Hoang Thanh Duc

1. **Full name:** Hoang Thanh Duc

2. **Sex:** Male

3. **Date of birth:** 16-01-1968

4. **Place of birth:** Ha Noi

5. **Admission decision number:** 3201/QĐ-SĐH date 08/11/2010

6. **Changes in academic process:** None

7. **Official thesis title:** Synthesis and properties of 4-acetyl- and 4-formylsydnone (per-O-acetyl- β -D-glycopyranosyl)thiosemicarbazone compounds

8. **Major:** Organic chemistry

9. **Code:** 62.44.01.14

10. **Supervisors:** Prof. Dr. Nguyen Dinh Thanh

11. Summary of the new findings of the thesis

- Having found the methods to synthesize 30 new 3-aryl-4-formylsydnone *N*-(2',3',4',6'-tetra-O-acetyl- β -D-glycopyranosyl)thiosemicarbazone compounds, by microwave-assisted heating method.

- Having found the methods to synthesize 22 new 2-(2',3',4',6'-tetra-O-acetyl- β -D-glycopyranosylamino)-5-(3"-arylsydnone-4-yl)-6*H*-1,3,4-thiadiazin compounds by microwave-assisted heating method.

- Having studied the transformation reactions of 3-aryl-4-formylsydnone *N*-(2',3',4',6'-tetra-O-acetyl- β -D-glycopyranosyl)thiosemicarbazone compounds and having synthesized 28 derivatives of thiazolidin-4-on, 1,3,4-thiadiazol and complex bis(thiosemicarbazonato)zinc(II). All these derivatives are new compounds.

- Structures of all synthesized products were confirmed by IR, NMR (such as $^1\text{H-NMR}$, $^{13}\text{C-NMR}$, COSY, HMBC, HSQC) and mass spectral data.

- The most of thiosemicarbazones, thiadiazin and complex bis (thiosemicarbazonato)zinc(II) have significant biological activities (such as antifungal activities for *Candida albicans*, antibacterial for *Klebsiella pneumonia*, *Staphylococcus epidermidis* and free-radical scavenged activity of DPPH).

12. Paratical applicability, if any:

- The research results of the thesis will contribute to find the new methods for synthesis of new thiosemicarbazone compounds with biological activity which could be studied in practical applications.
- The research results of the thesis could contribute some scientific basis for the study on synthesis, structure determination, properties and biological activity of thiosemicarbazone, thiadiazine compounds and thiazolidin-4-ones, 1,3,4-thiadiazoles and bis(thiosemicarbazonato)zinc(II) complex.

13. Further research directions, if any

- Transformation of some thiosemicarbazones into guanidine compounds
- Study on synthesis of some complex between 3-aryl-4-formylsydnone *N*-(2',3',4',6'-tetra-*O*-acetyl- β -D-glycopyranosyl)thiosemicarbazone compounds with some metal ions of Cu(II), Pd(II), Ni(II).
- Transformation of 2-(2',3',4',6'-tetra-*O*-acetyl- β -D-glycopyranosylamino)-5-(3"-arylsydnone)-6*H*-1,3,4-thiadiazines into pyrazole and pyrazoline compounds.

14. Thesis-related publications

- [1]. Hoang Thanh Duc, Nguyen Dinh Thanh, Nguyen Thi Lien (2012), "Initial synthesis of some 6-hydro-(1,3,4)-thiadiazines from 4-(tetra-*O*-acetyl- β -D-glycopyranosyl) thiosemicarbazide and substituted 4-bromoacetyl-3-(substitutedphenyl) sydnones", *Tạp chí Khoa học và Công nghệ T. 50* (No. 3E), tr. 1240–1246.
- [2]. Hoàng Thanh Đức, Nguyễn Đình Thành, Nguyễn Hoàng Minh Huệ (2013), "Tổng hợp và thăm dò hoạt tính sinh học một số hợp chất 3-aryl-4-formylsydnone (tetra-*O*-acetyl- β -D-galactopyranosyl)thiosemicarbazone", *Tạp chí KH&CN, ĐHCN Hà Nội* (Số 15), tr. 28-33.
- [3]. Nguyen Dinh Thanh, Hoang Thanh Duc, Nguyen Thi Lien, Pham Thi Ngan (2013), "Study on reaction of 3-aryl-4-bromoacetylsydnone thiosemicarbazid containing D-glucose components", *Tạp chí Hoá học T. 51* (6ABC), pp. 196-200.
- [4]. Nguyen Dinh Thanh, Hoang Thanh Duc, Bui Hong Phuong, Ly Thi Giang (2013), "Synthesis of some [2',3',4',6'-(tetra-*O*-acetyl- β -D-galactopyranosylamino)-5-[3"-arylsydnone]-6*H*-1,3,4-thiadiazines from substituted 3-acetylsydnones", *Tạp chí Hoá học T. 51* (No. 5), tr. 599–604.
- [5]. Nguyen Dinh Thanh, Hoang Thanh Duc, Vu Thi Duyen (2013), "Study on synthesis of some 3-aryl-4-formylsydnone 4-(tetra-*O*-acetyl- β -D-glycopyranosyl) thiosemicarbazones", *Tạp chí Hoá học T. 51* (No. 5A), tr. 32–37.
- [6]. Nguyen Dinh Thanh, Hoang Thanh Duc, Phan Manh Tuong (2012), "Study on synthesis of some 4-(tetra-*O*-acetyl- β -D-glycopyranosyl)thiosemicarbazones of 3-aryl-4-formylsydnones", *Tạp chí Hoá học T. 50* (No. 4A), tr. 119–122.

- [7]. Nguyen Dinh Thanh, Hoang Thanh Duc (2014), "Analysis of NMR spectra of 3-aryl-4-formylsydnone-4-(tetra-O-acetyl- β -D-lucopyranosyl)thiosemicarbazones", *Tạp chí Phân tích Hoá, Lý và Sinh học* T.19 (No. 1/2014), tr. 74–79.