



الجامعة الإسلامية العالمية ماليزيا
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
يُونِيسْتِي اِسْلَامْ اِنْتَار اِنجِنِيَا مِلْسِيَا
Garden of Knowledge and Virtue

PROGRAMME & ABSTRACT BOOK

iCAST2021


7th International Conference on Advancement
in Science & Technology

24 - 26 August 2021

Organised by:
Kulliyah of Science,
International Islamic University
Malaysia,
Bandar Indera Mahkota, 25200
Kuantan, Pahang
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PROGRAMME SCHEDULE

PROGRAMME SCHEDULE
24 AUGUST 2021 | TUESDAY

Time (GMT +8)	
08:30 am	Registration Open
OPENING CEREMONY	
09:00 — 10:00 am	<p>National Anthem of Malaysia, 'NEGARAKU' and 'Lead the way'</p> <p>Doa recitation</p> <p>Welcoming Address by Prof. Dr. Shahbudin Saad, Advisor of iCAST 2021</p> <p>Officiating Address by Prof. Emeritus Tan Sri Dato' Dzulkipli Abdul Razak, Rector of International Islamic University Malaysia (IIUM)</p>
SESSION 1	
Chairperson: Assoc. Prof. Dr. Deny Susanti Darnis	
10:00 — 11:00 am	<p>PLENARY SESSION 1 : Assoc. Prof. Dr. Mohd Firdaus Raih National University of Malaysia (UKM)</p> <p align="center">SUBSTRUCTURE SEARCHING IN BIOLOGICAL MACROMOLECULES - NEW FUNCTIONS FROM OLD FUNCTIONS, NEW TARGETS FOR OLD DRUGS</p>
11:00 — 11:10 am	Break
11:10 — 11:30 am	<p>PRESENTATION 1: COMPUTATIONAL BIOLOGY APPROACH TOWARDS STUDYING PROTEIN-PROTEIN INTERACTION BETWEEN BREAST CANCER CELL PROTEINS AND PLANT COMPOUNDS</p> <p><i>Dr. Asita Elengoe</i> <i>Lincoln University College Malaysia</i></p>
11:30 — 11:50 am	<p>PRESENTATION 2: MOLECULAR BINDING INTERACTION OF ANGIOTENSIN CONVERTING ENZYME AND 1-GALLOYL GLUCOSE, THE MAJOR COMPOUND IN SYZYGIUM POLYANTHUM LEAVES</p> <p><i>Mr. Tuan Faiz Tuan Anuar</i> <i>International Islamic University Malaysia (IIUM)</i></p>
11:50 — 12:10 pm	<p>PRESENTATION 3: GENOME-WIDE COMPARATIVE ANALYSIS OF DROUGHT TOLERANT GENES IN RICE, MAIZE, DATE PALM AND ARABIDOPSIS</p> <p><i>Ms. Nurul Asyikin Mohd Zim</i> <i>International Islamic University Malaysia (IIUM)</i></p>

Time (GMT +8)	
12:10 — 12:30 pm	PRESENTATION 4: IN SILICO DEVELOPMENT OF CRISPR/CAS9 CONSTRUCT FOR ORYZA SATIVA SUBSP. INDICA <i>Ms. Anis Afuza binti Md Yusof</i> <i>International Islamic University Malaysia (IIUM)</i>
12:30 — 2:00 pm	Break
SESSION 2	
Chairperson: Asst. Prof. Dr. Siti Fairuz Che Osman	
2:00 — 2:20 pm	PRESENTATION 5: SYNTHESIS AND CHARACTERISATION OF SERIES OF NITRO AND CHLORO 2-ARYLBENZIMIDAZOLE DERIVATIVES <i>Ms. Mariyah Najihah bt Abdullah</i> <i>International Islamic University Malaysia (IIUM)</i>
2:20 — 2:40 pm	PRESENTATION 6: IODINE MEDIATED ONE-POT SYNTHESIS OF 3-CARBETHOXYCOUMARINS <i>Dr. Dinesh Kumar Sharma</i> <i>Kishan Lal Public College, Rewari, India</i>
2:40 — 3:00 pm	PRESENTATION 7: MULTIFUNCTIONAL LYOTROPIC LIQUID CRYSTALLINE NANOPARTICLES FOR GEMCITABINE AND THYMOQUINONE DELIVERY IN THE TREATMENT OF BREAST CANCER <i>Ms. Loo Yan Shan</i> <i>University Putra Malaysia (UPM)</i>
3:00 — 3:10 pm	Break
3:10 — 4:10 pm	PLENARY SESSION 2 : Assoc. Prof. Dr Adérito Araújo University of Coimbra, Portugal A MATHEMATICAL MODEL FOR THE CORNEAL TRANSPARENCY PROBLEM
4:10 — 4:30 pm	PRESENTATION 8: POLYMER BLENDED ALGINATE MICROBEADS FOR TARGETED DRUG DELIVERY <i>Dr. Md. Abul Kalam Azad</i> <i>AIMST University</i>
4:30 — 4:50 pm	PRESENTATION 9: GASTROINTESTINAL TRACT DISTRIBUTION OF FLUORESCENCE MODIFIED ALGINATE BEADS <i>Dr. Md. Abul Kalam Azad</i> <i>AIMST University</i>
4:50 pm	End of Day 1

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LIST OF ABSTRACTS

SYNTHESIS AND CHARACTERISATION OF SERIES OF NITRO AND CHLORO 2-ARYLBENZIMIDAZOLE DERIVATIVES

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25200 Kuantan Pahang*

**Corresponding author: shafida@iium.edu.my*

Abstract

Benzimidazoles have been shown to exhibit various biological activities due to their privileged structure. The benzimidazole scaffold can be designed by adding certain moieties or functional groups to influence its potential in particular or targeted biological activity. Previously synthesised 3-nitrophenyl benzimidazoles and 2,4-dichlorophenyl benzimidazoles were found to show significant antiproliferative activity with MDA-MB 231 cell lines. In continuation of the study, two series of N-sec and tert-butyl-2-arylbenzimidazole were designed and synthesised by substitution of chloro and nitro group at various positions of the aryl ring. All the synthesised compounds were characterised by ¹H-NMR, ¹³C-NMR, IR, and mass spectroscopy.

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THANK YOU

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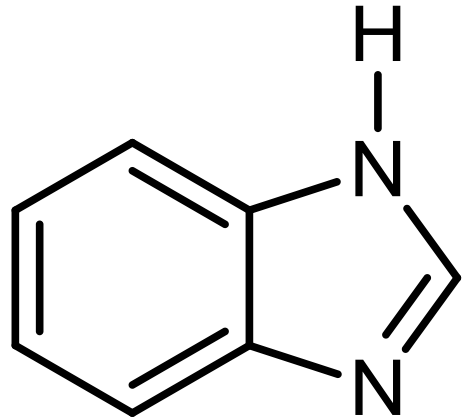
7th International Conference on
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SYNTHESIS AND CHARACTERISATION OF SERIES OF NITRO AND CHLORO 2-ARYLBENZIMIDAZOLE DERIVATIVES

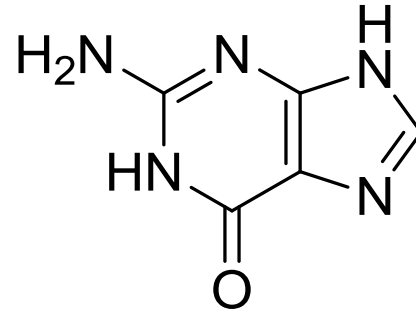
Mariyah Najihah bt Abdullah
International Islamic University Malaysia
Supervisor: Prof. Dr. Shafida bt Abd. Hamid

BACKGROUND

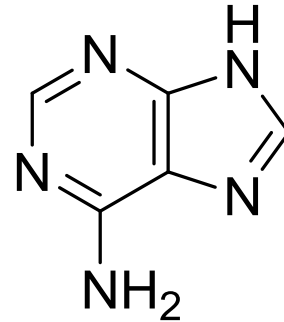


Benzimidazole

Benzene Imidazole



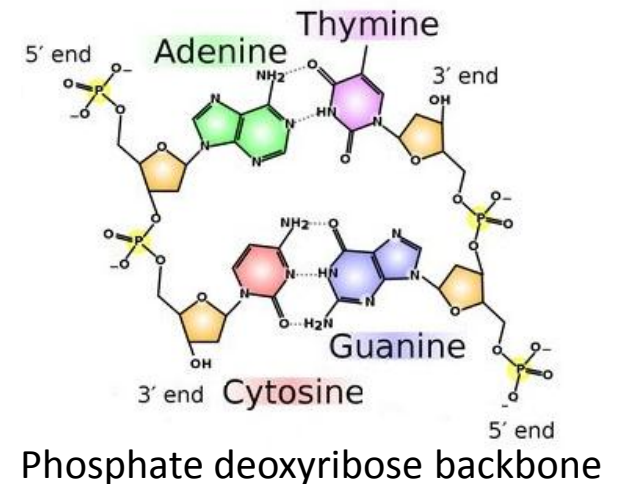
Guanine

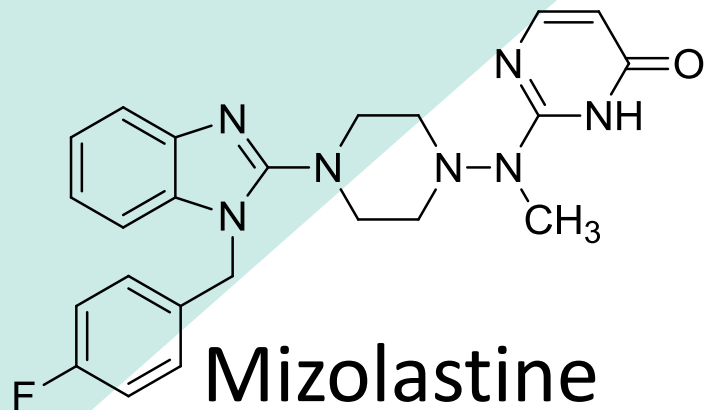


Adenine

Privilage scaffold

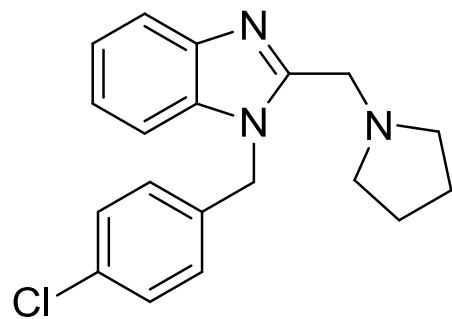
- Isostere to nucleobases adenine and guanine
- Building block of DNA and RNA (Liu *et al.*, 2018)





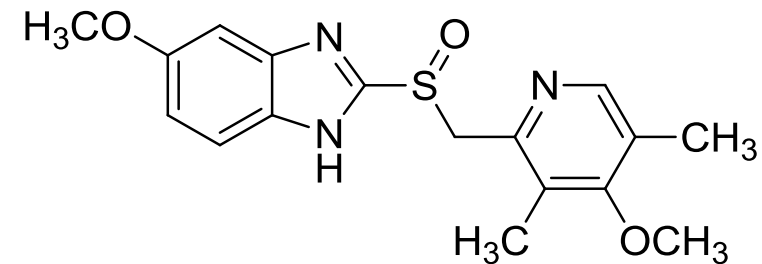
Mizolastine

(Prakash *et al.*, 1998)



Clemizole

(Siwash *et al.*, 2021)



Omeprazole

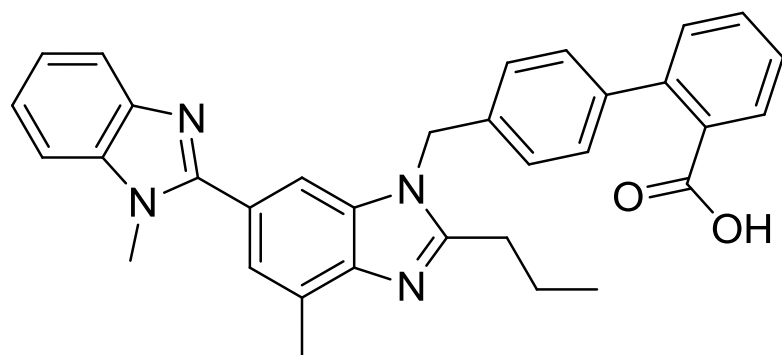
(El- Shinnawy *et al.*, 2014)

Antiulcer

Antihistamines

Benzimidazole-based Drug

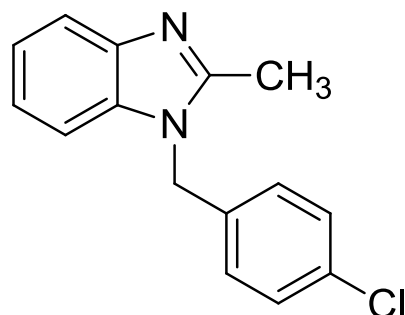
Antihypertensive



Telmisartan

(Siwash *et al.*, 2021)

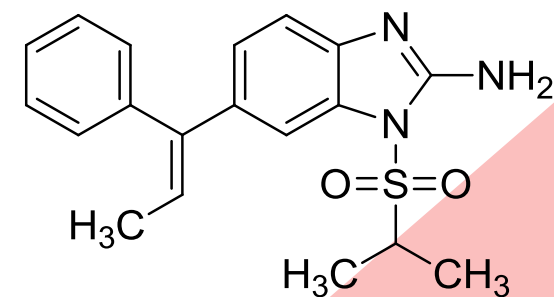
Antifungal



Chlormidazole

(Sissouma *et al.*, 2015)

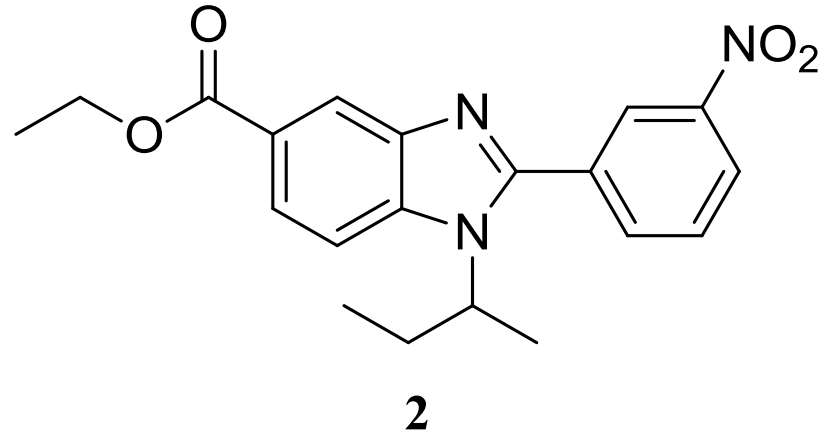
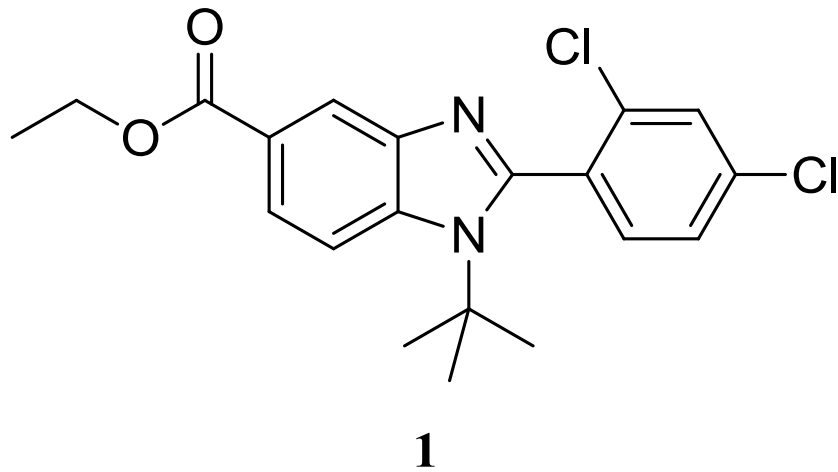
Antiviral



Envirodine

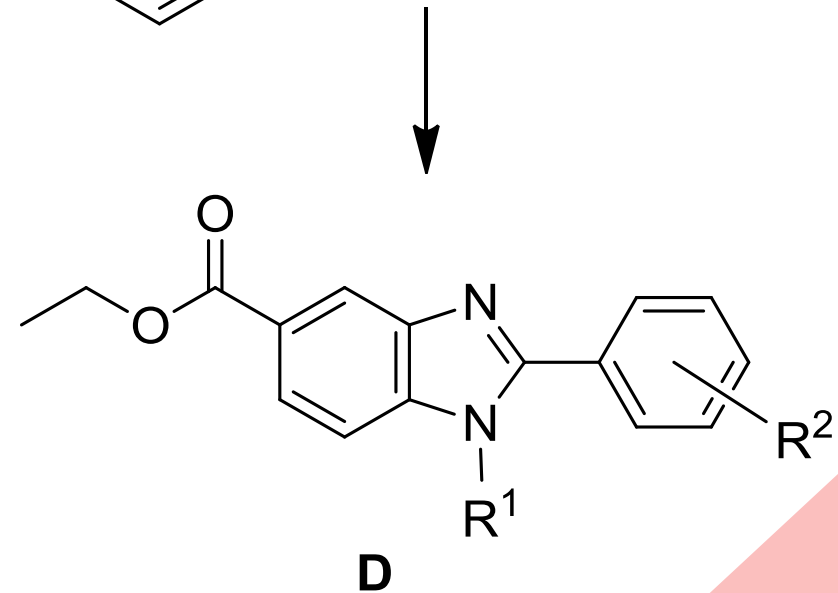
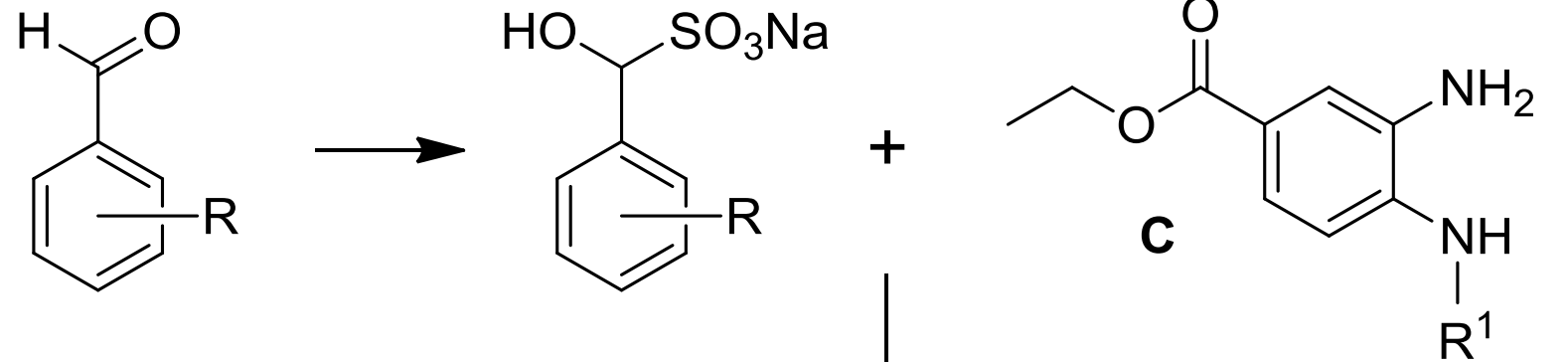
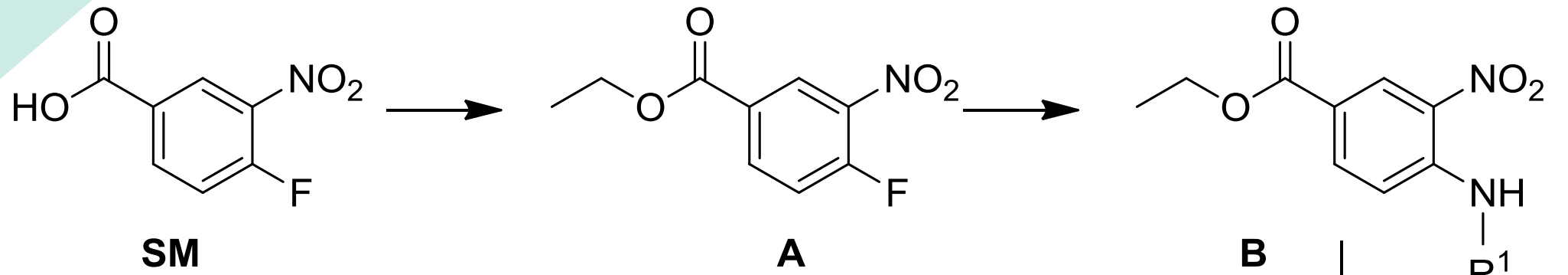
(Rasal *et al.*, 2018)

ANTI-CANCER PROPERTIES



Compound	IC ₅₀ (μM) of MDA-MB-231
1	47.6
2	36.8

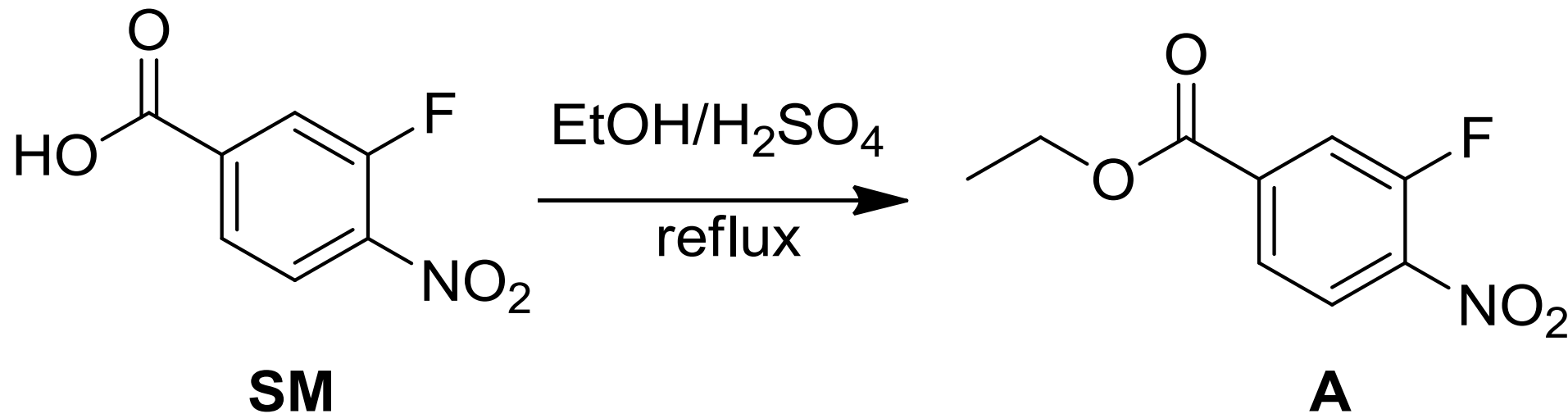
(Abdul Rahim et al., 2012)



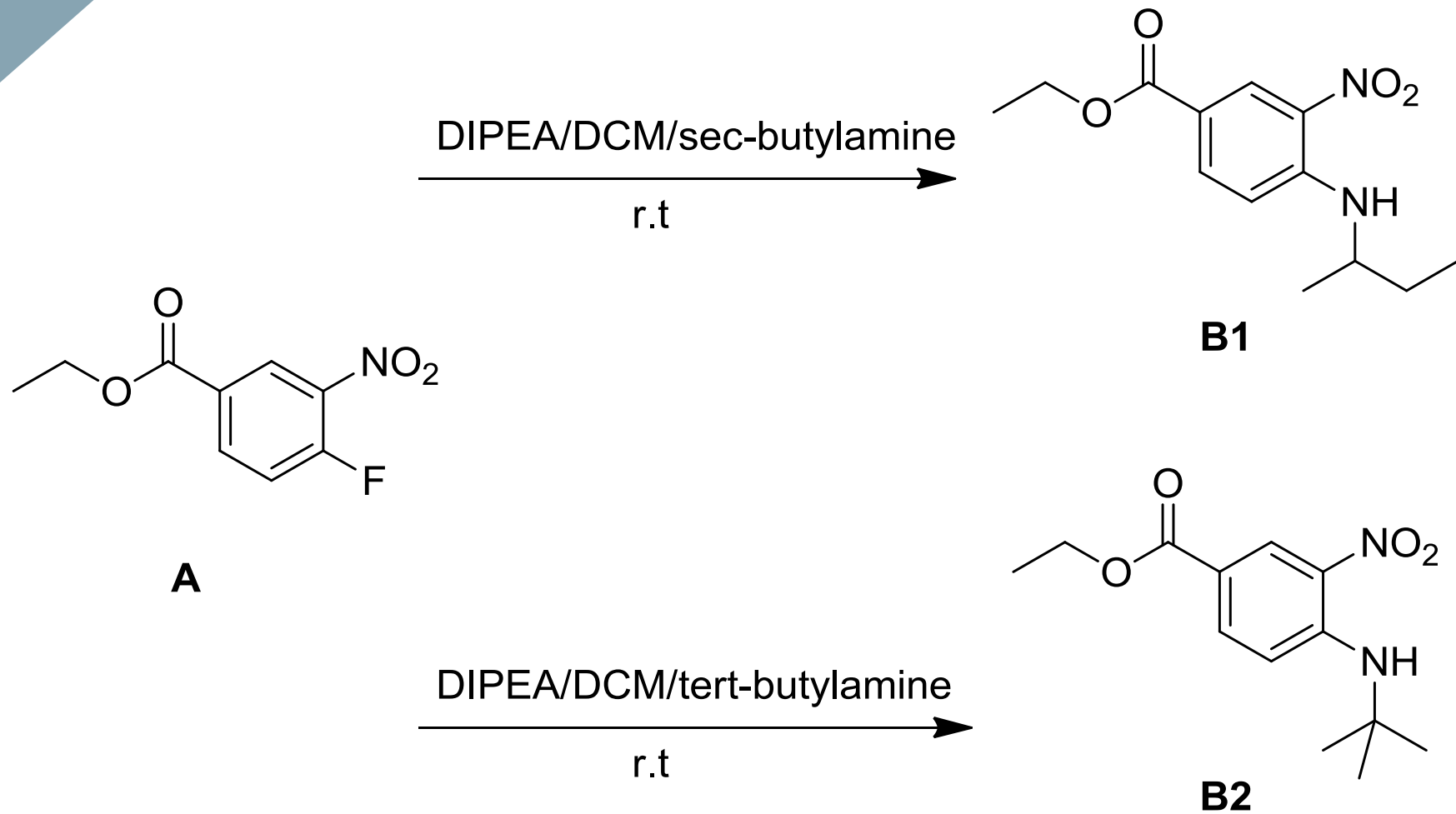
METHODOLOGY

(Yoon et al., 2013)

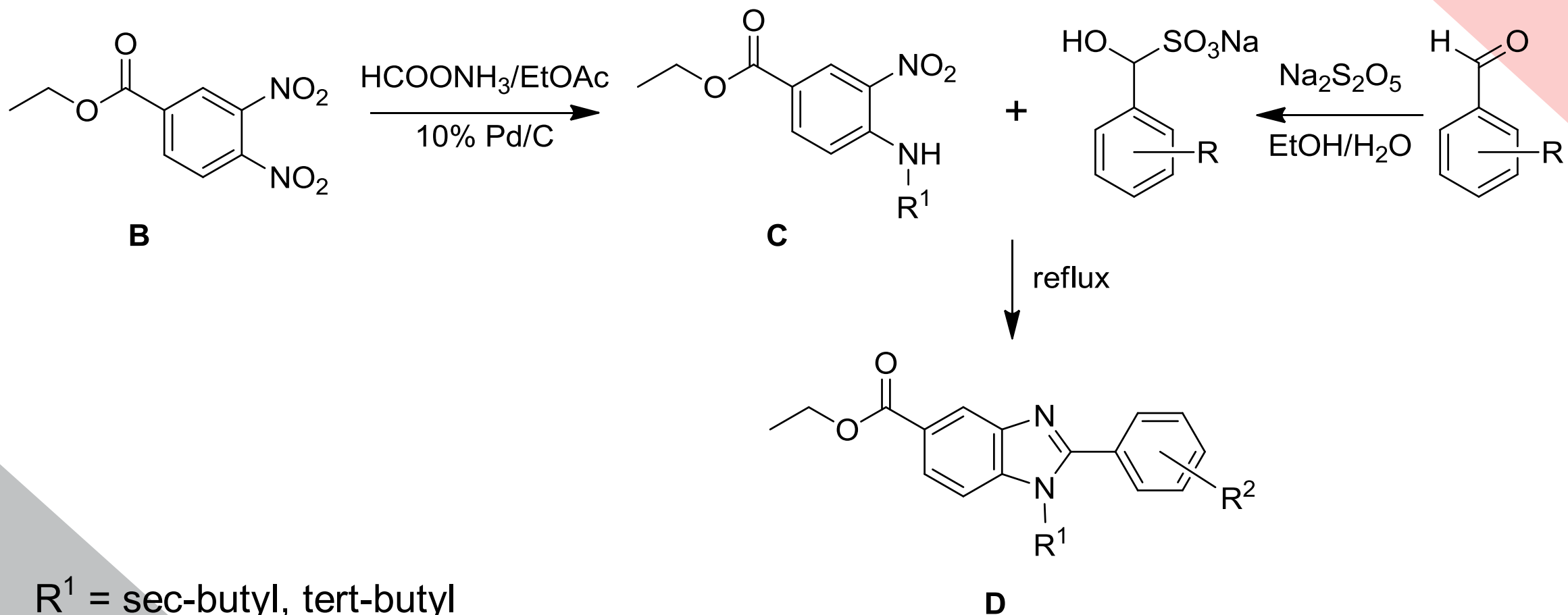
Scheme 1



Scheme 2



Scheme 3

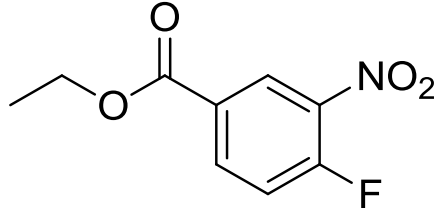
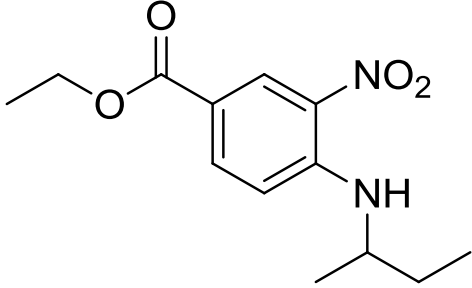
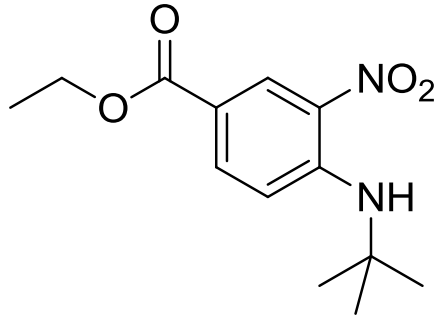


R^1 = sec-butyl, tert-butyl

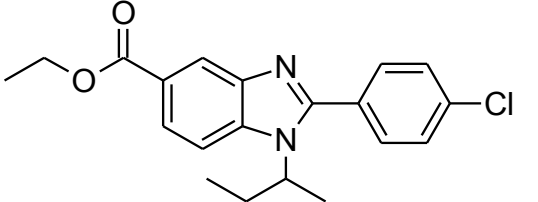
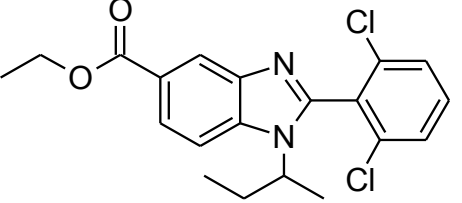
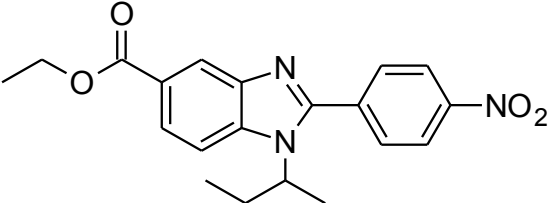
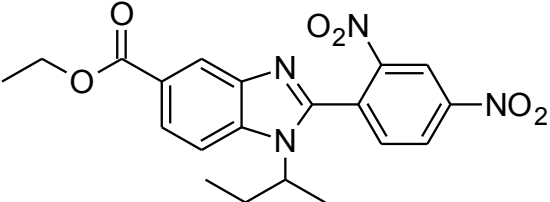
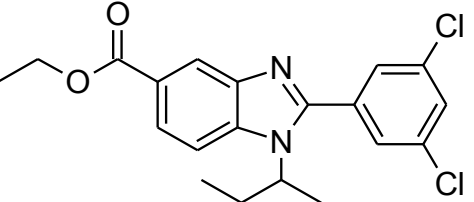
R^2 = chloro and dichloro series (2-Cl, 3-Cl, 4-Cl, 2,3-Cl, 2,4-Cl, 2,5-Cl, 2,6-Cl, 3,5-Cl)

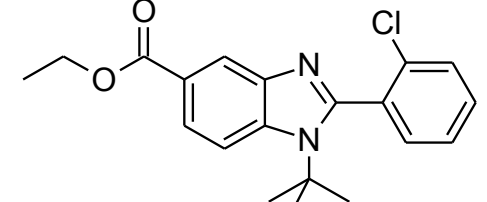
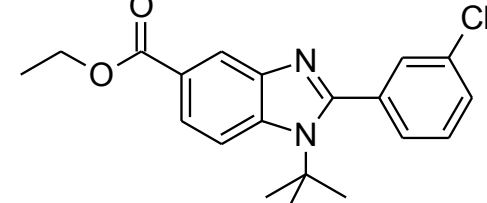
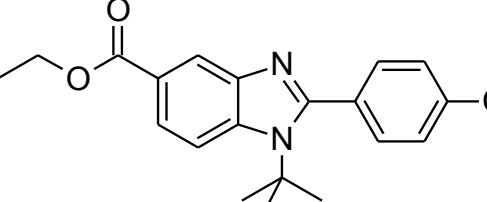
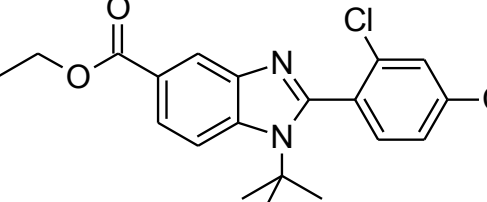
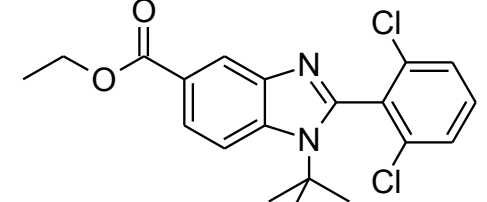
= nitro and dinitro series (2-NO₂, 4-NO₂, 2,4-NO₂, 2,6-NO₂, 3,5-NO₂)

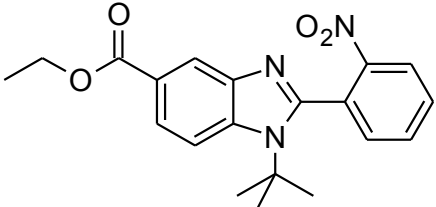
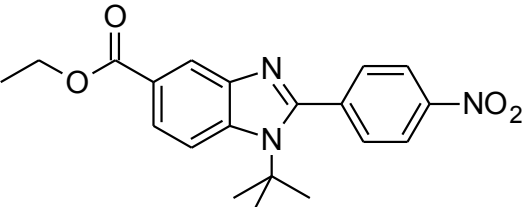
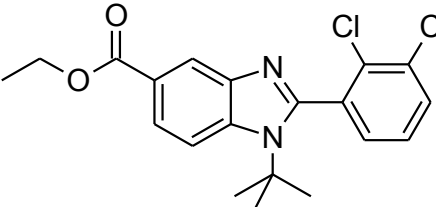
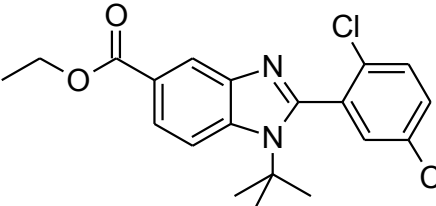
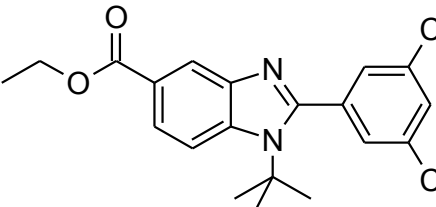
RESULTS AND DISCUSSION

ID Comp.	Structure	Mass (g)	Percentage yield (%)	Physical State
A	 <chem>CCOC(=O)c1ccc(F)c([N+](=O)[O-])c1</chem>	2.006	= 87.06%	- Solid Crystal - Pale Yellow
B1	 <chem>CCOC(=O)c1ccc(NCC)cc1[N+](=O)[O-]</chem>	1.315	= 95.7%	- Liquid - Orange
B2	 <chem>CCOC(=O)c1ccc(NC(C)(C)C)cc1[N+](=O)[O-]</chem>	0.3424	= 85.6%	- Solid Crystal - Orange

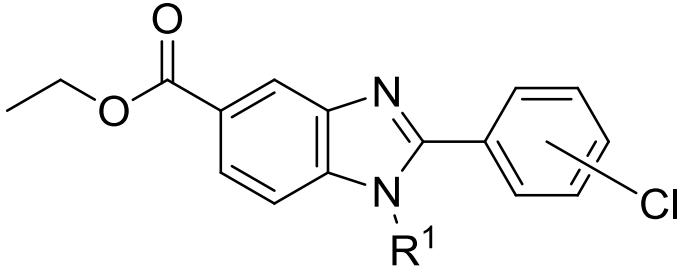
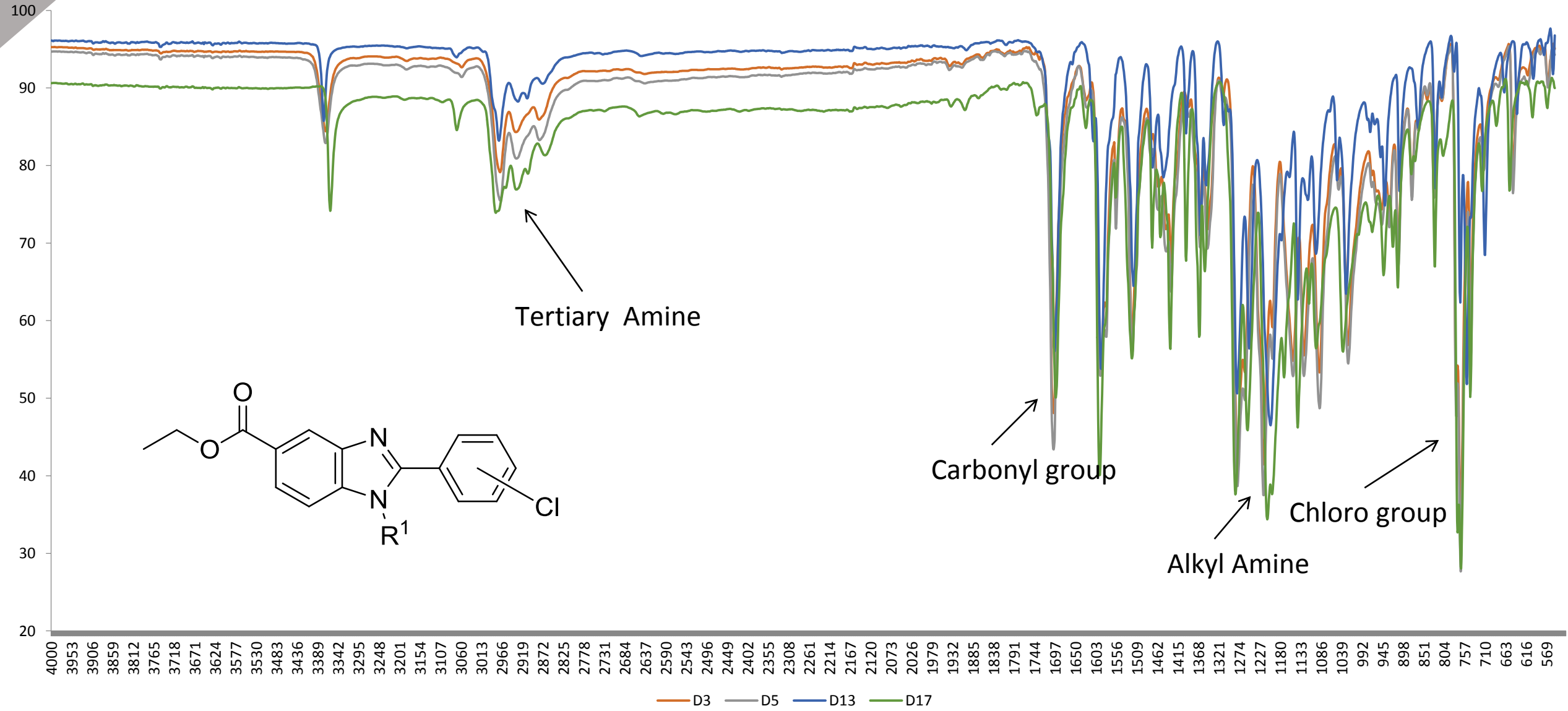
RESULTS

ID Comp.	Structure	Mass (g)	Percentage yield (%)	Physical state
D3		0.2073	= 82.9	- Solid
D5		0.1820	= 72.8	- Solid
D7		0.0673	= 26.9	- Solid
D8		0.0929	= 37.2	- Solid
D11		0.1322	= 52.9	- Solid

ID Comp.	Structure	Mass (g)	Percentage yield (%)	Physical state
D13		0.0195	= 7.8	- Solid
D14		0.0947	= 37.88	- Solid
D15		0.2854	= 95.1	- Solid
D16		0.0540	= 21.6	- Solid
D17		0.0620	= 24.8	- Solid

ID Comp.	Structure	Mass (g)	Percentage yield (%)	Physical state
D18		0.2540	= 84.7	- Solid
D19		0.2727	= 90.9	- Solid
D21		0.1024	= 40.96	- Solid
D22		0.1514	= 60.56	- Solid
D23		0.3037	= 86.8	- Solid

FTIR (CHLORO SERIES)



Tertiary Amine

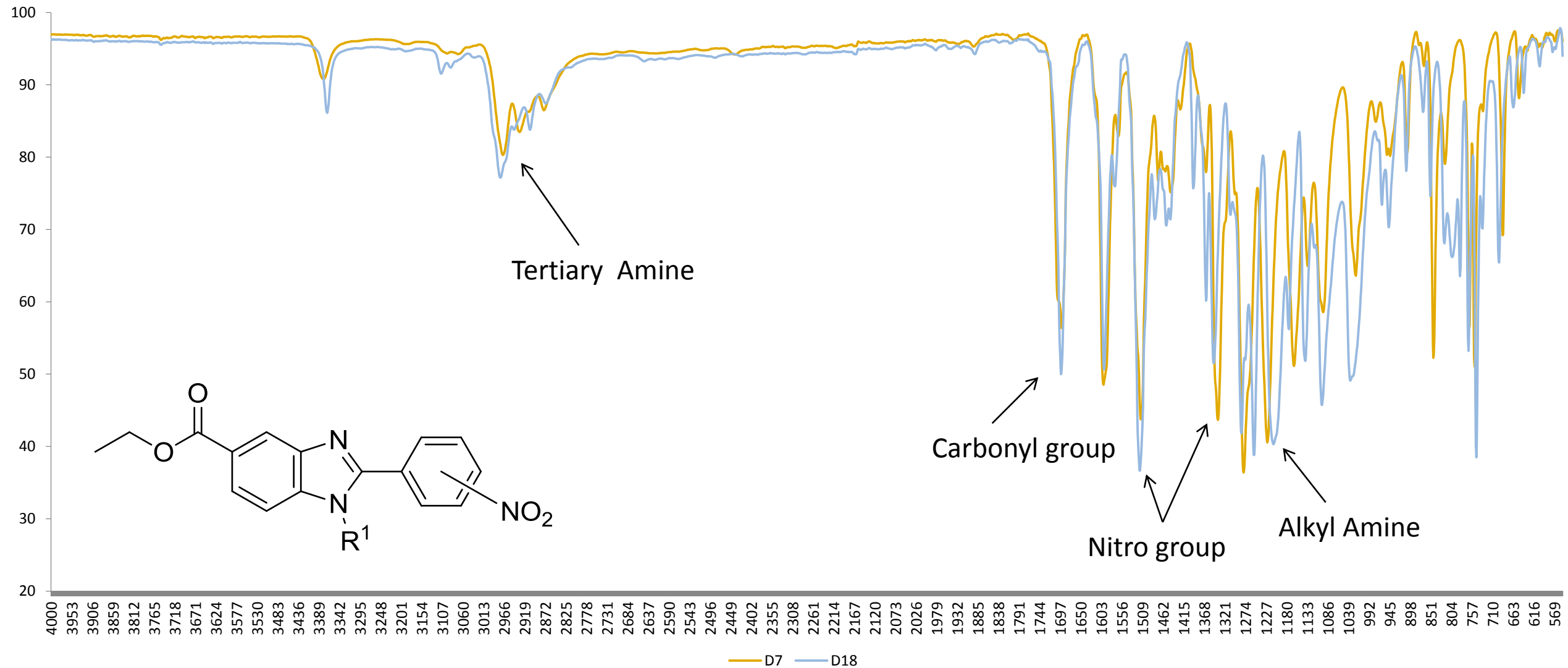
Carbonyl group

Alkyl Amine

Chloro group

D3 D5 D13 D17

FTIR (NITRO SERIES)

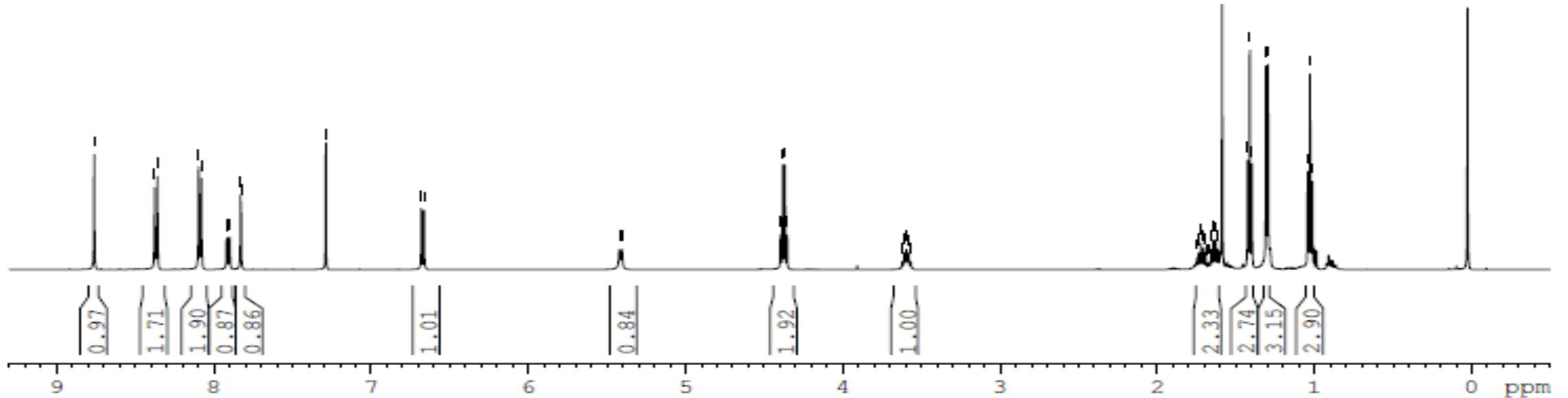
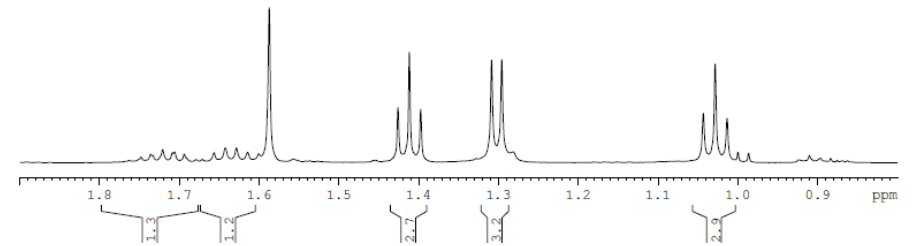
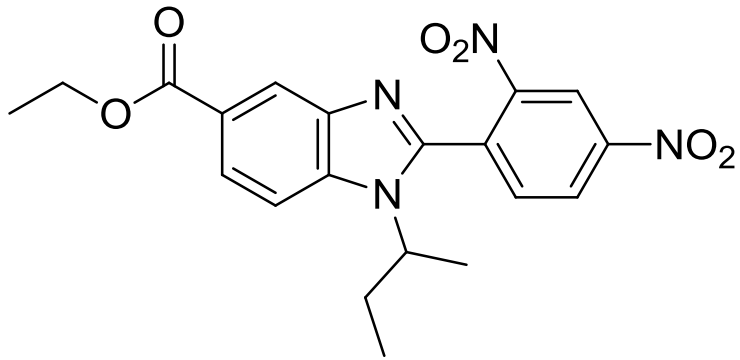


H-NMR (Sec-butyl)

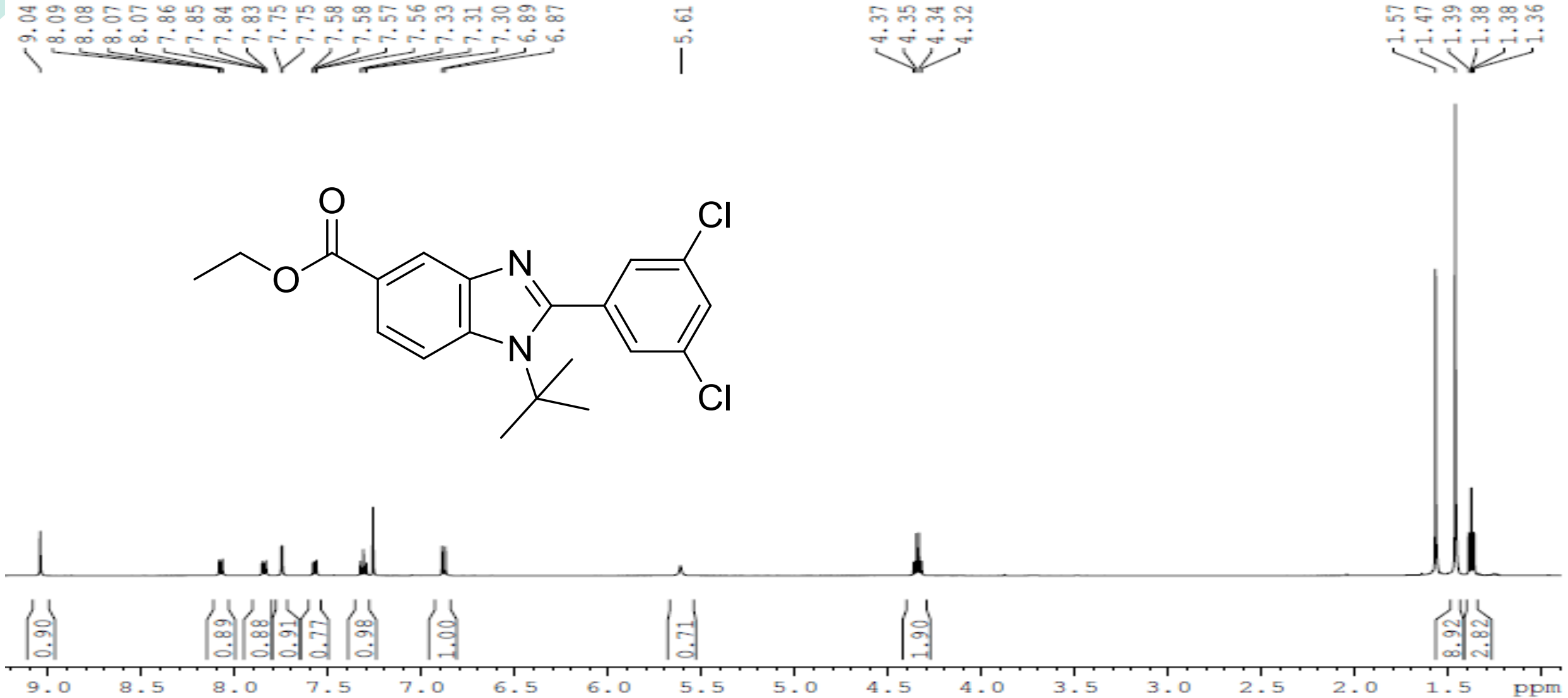
8.76
8.38
8.36
8.36
8.10
8.08
8.08
7.92
7.92
7.90
7.90
7.83
7.83
7.29
6.68
6.66

5.42
5.41

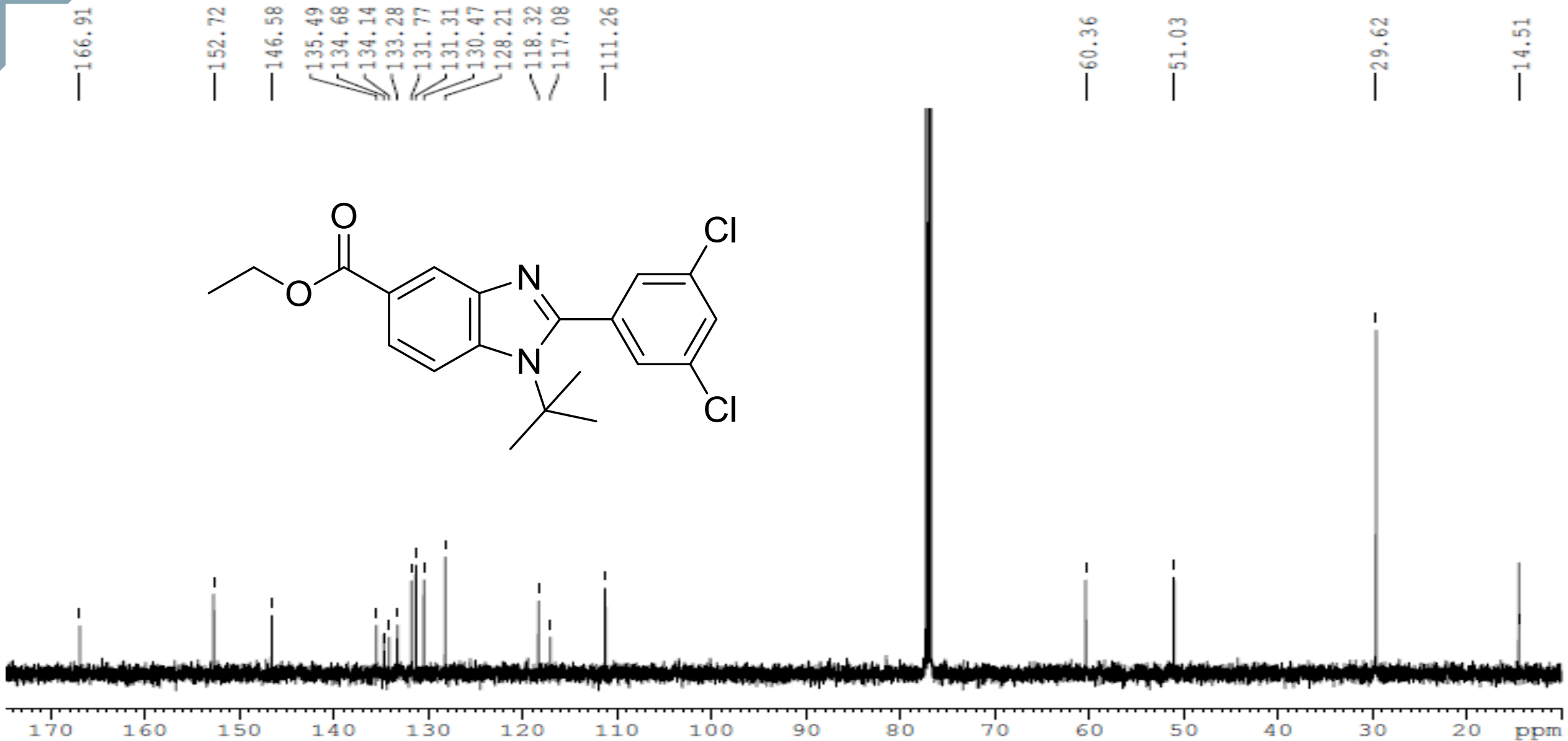
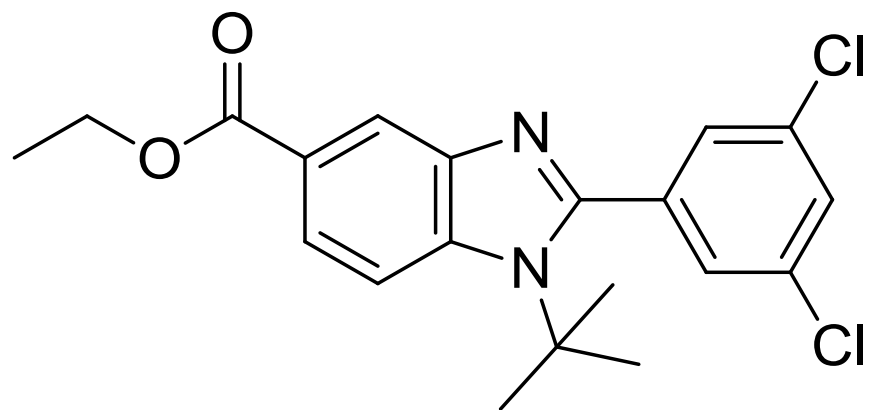
4.40
4.38
4.37
4.35
3.62
3.61
3.60
3.58
3.57
1.75
1.74
1.73
1.72
1.71
1.71
1.69
1.68
1.67
1.66
1.64
1.63
1.61
1.43
1.41
1.40
1.31
1.30
1.04
1.03



H-NMR (Tert-butyl)



C-NMR



CONCLUSION

- The targeted compounds were successfully synthesised.
- The functional groups of compounds were confirmed by FTIR by the present of chloro and nitro group band.
- The formation of benzimidazole was confirmed by NMR analysis.

REFERENCE

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4. El-Shinnawy NA, Abd-Elmageid SA, Alshailabi EMA. Evaluation of antiulcer activity of indole-3-carbinol and/or omeprazole on aspirin-induced gastric ulcer in rats. *Toxicol Ind Health*. 2014;30(4): 357–75. [10.1177/0748233712457448](https://doi.org/10.1177/0748233712457448)

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7. Abdul Rahim, A. S., Salhalmi, S. M., Arumugan, N., Pin, L. C., Yee, N. S., Muttiah, N. N., Keat, W. B., Abdul Hamid S., Osman H., Mat, I. (2012). Microwave-assisted synthesis of sec/tert-butyl 2-arylbenzimidazoles and their unexpected antiproliferative activity toward ER negative breast cancer cells. *Enzyme Inhibition and Medicinal Chemistry*, 28(6), 1255–1260.
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THANK YOU