UniKL MICET FYP SEMINAR THESIS FORMATTING JANUARY 2024

Prepared by:

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3rd January 2024

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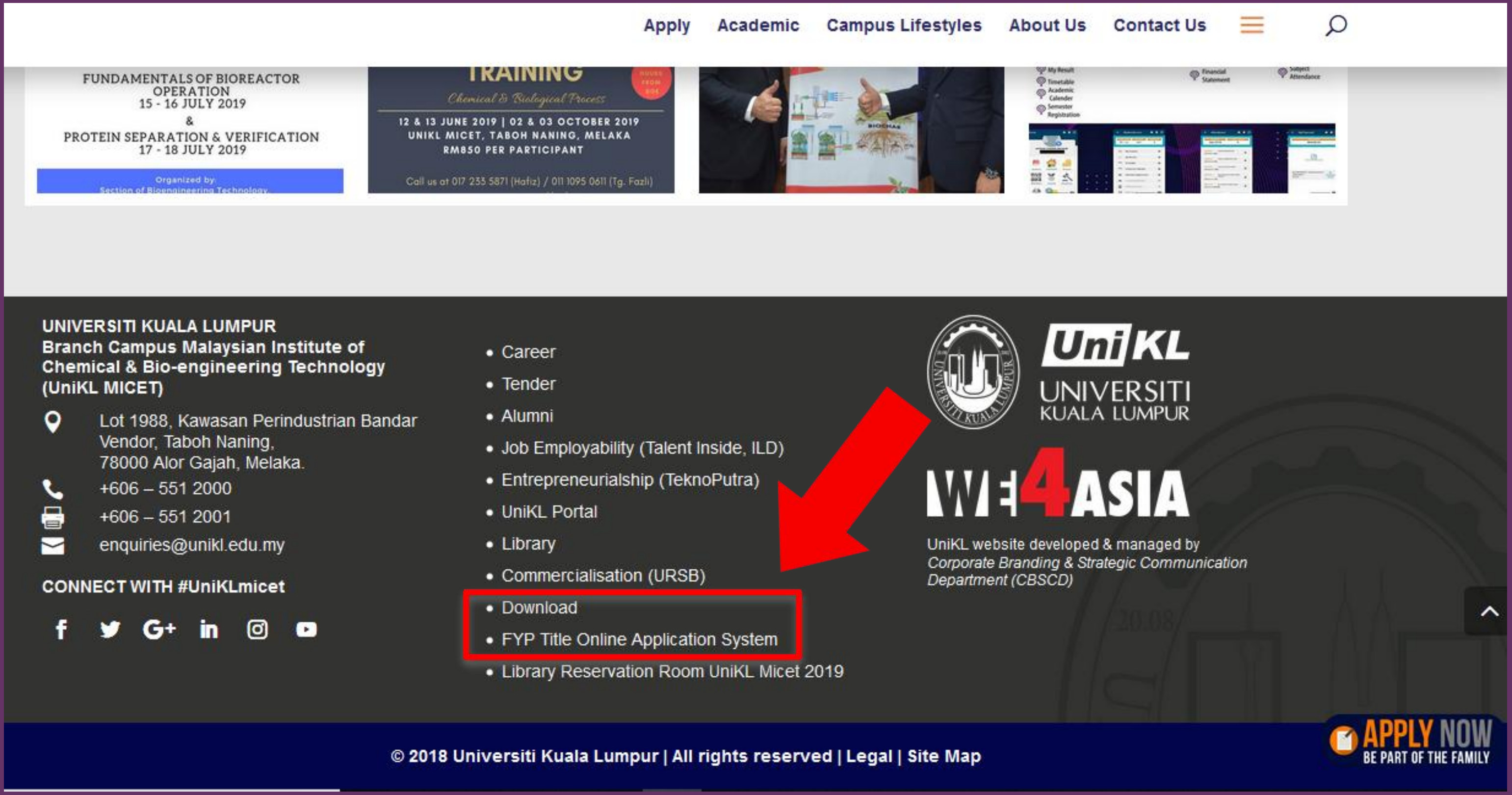
+ AGENDA

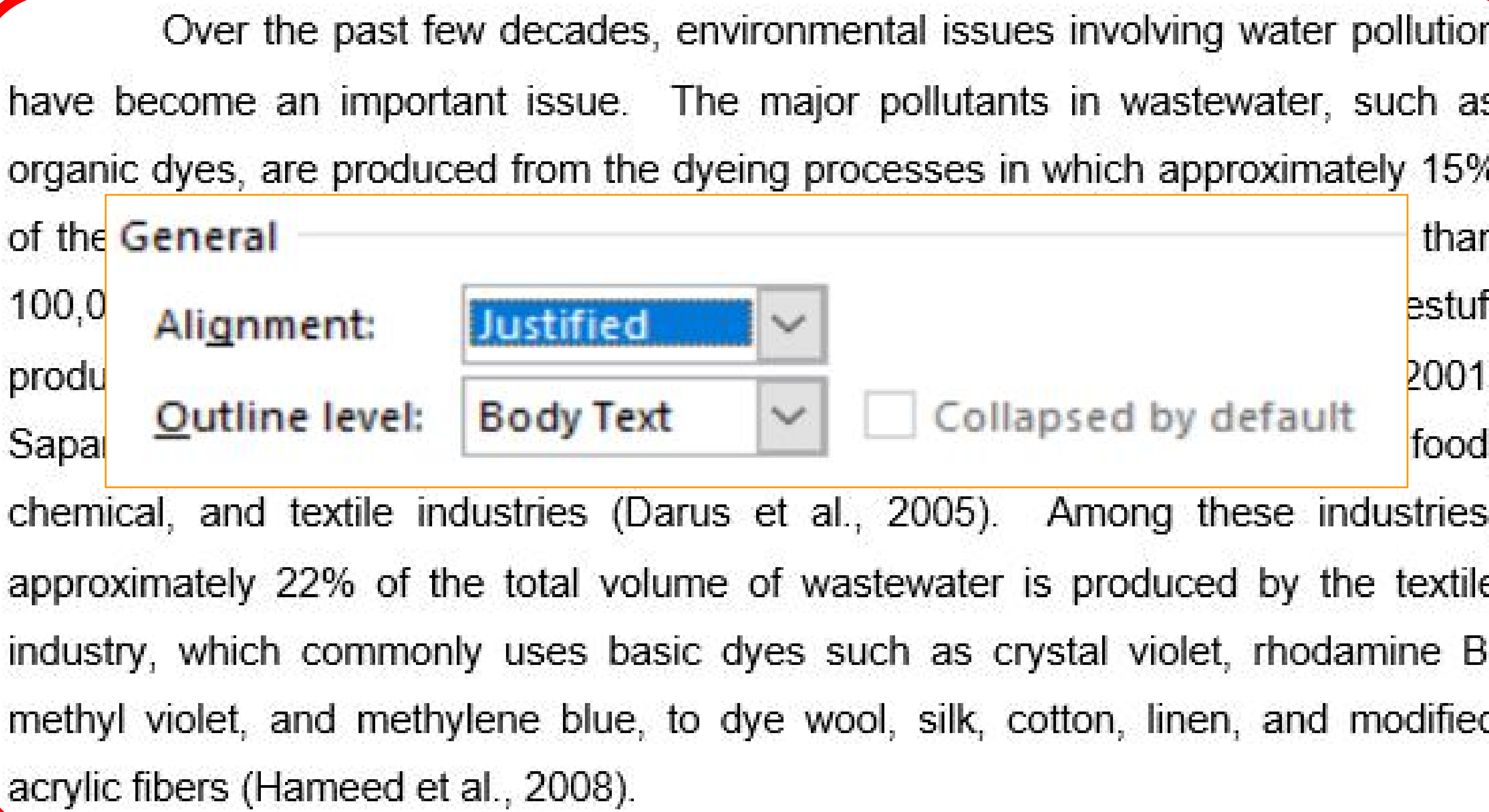
1. Typing and Font
2. Margins
3. Spacing
4. Numbering Chapters and Sub-sections
5. Pagination
6. Tables
7. Figures
8. Equations and Formula
9. Reference Style

Please refer and download from UniKL MICET homepage (https://micet.unikl.edu.my/) all the necessary guidelines & manuals



TYPING AND FONTS

Paragraphs must be **JUSTIFIED** and use font **Arial** Size **11**



Over the past few decades, environmental issues involving water pollution have become an important issue. The major pollutants in wastewater, such as organic dyes, are produced from the dyeing processes in which approximately 15% of the … than 100,0… estuff produ… 2001; Sapa… food, chemical, and textile industries (Darus et al., 2005). Among these industries, approximately 22% of the total volume of wastewater is produced by the textile industry, which commonly uses basic dyes such as crystal violet, rhodamine B, methyl violet, and methylene blue, to dye wool, silk, cotton, linen, and modified acrylic fibers (Hameed et al., 2008).

MARGINS

For the entire thesis
including appendices, references, preliminaries page, etc. the margins are:

Left (binding edge): 3.81 cm

Right: 2.54 cm

Top: 2.54 cm

Bottom: 2.54 cm

***There is 1 exception (5.08 cm margin for the top of the 1st page of NEW CHAPTER)**

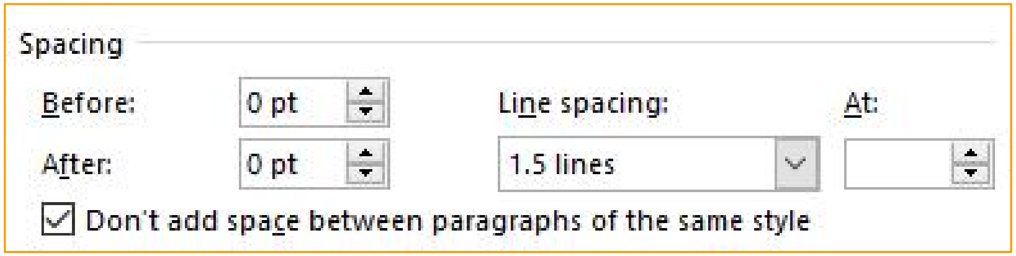
SPACING

Spacing throughout thesis must be **<u>1.5 LINE SPACING</u>**. This includes:

- Spacing between title of subsection and first line of text.
- Spacing between paragraphs.
- Spacing between last line of text and a table, or a figure or an illustration.

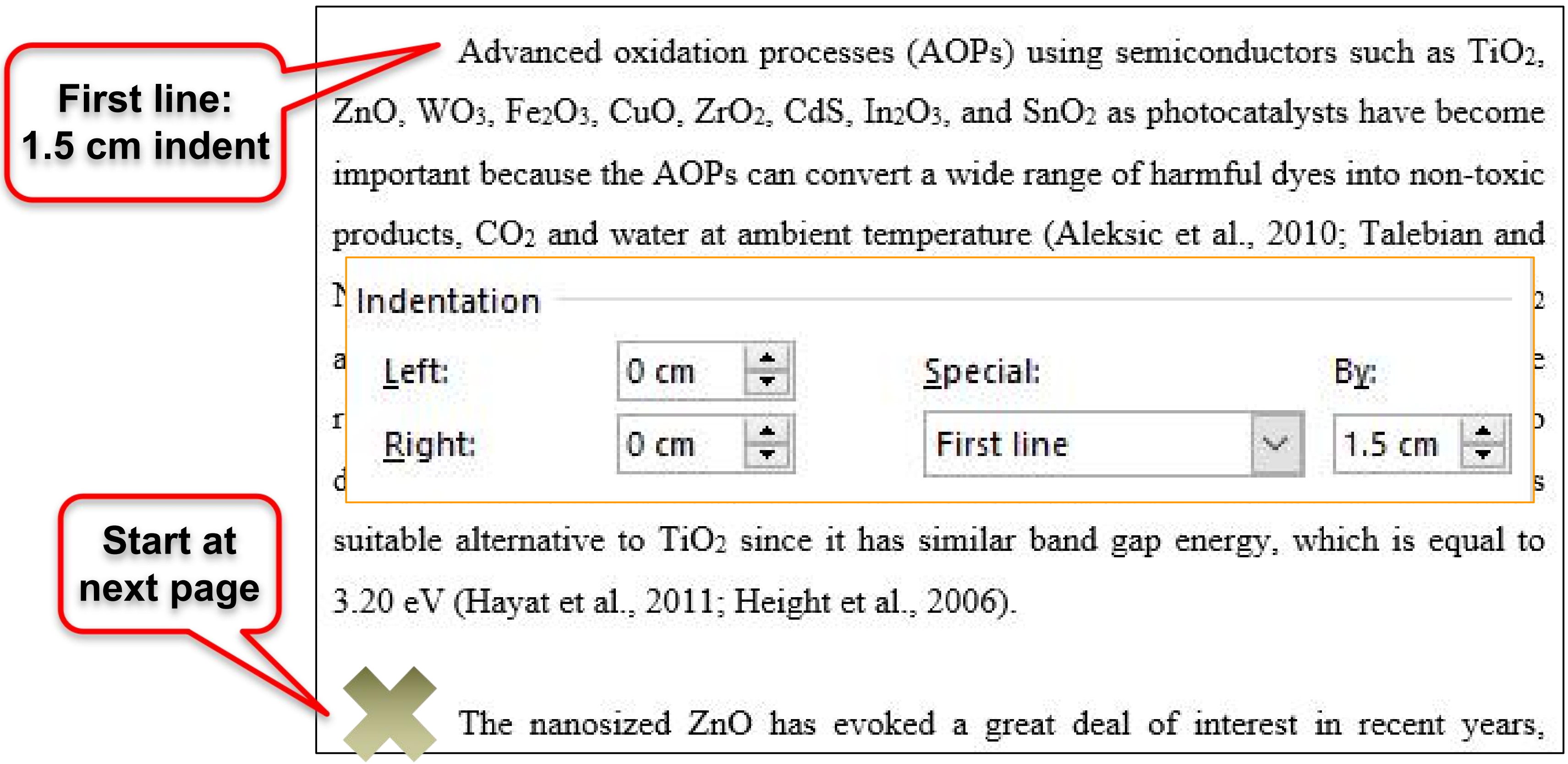
<u>2 x 1.5 line spacing</u> is needed for these cases:

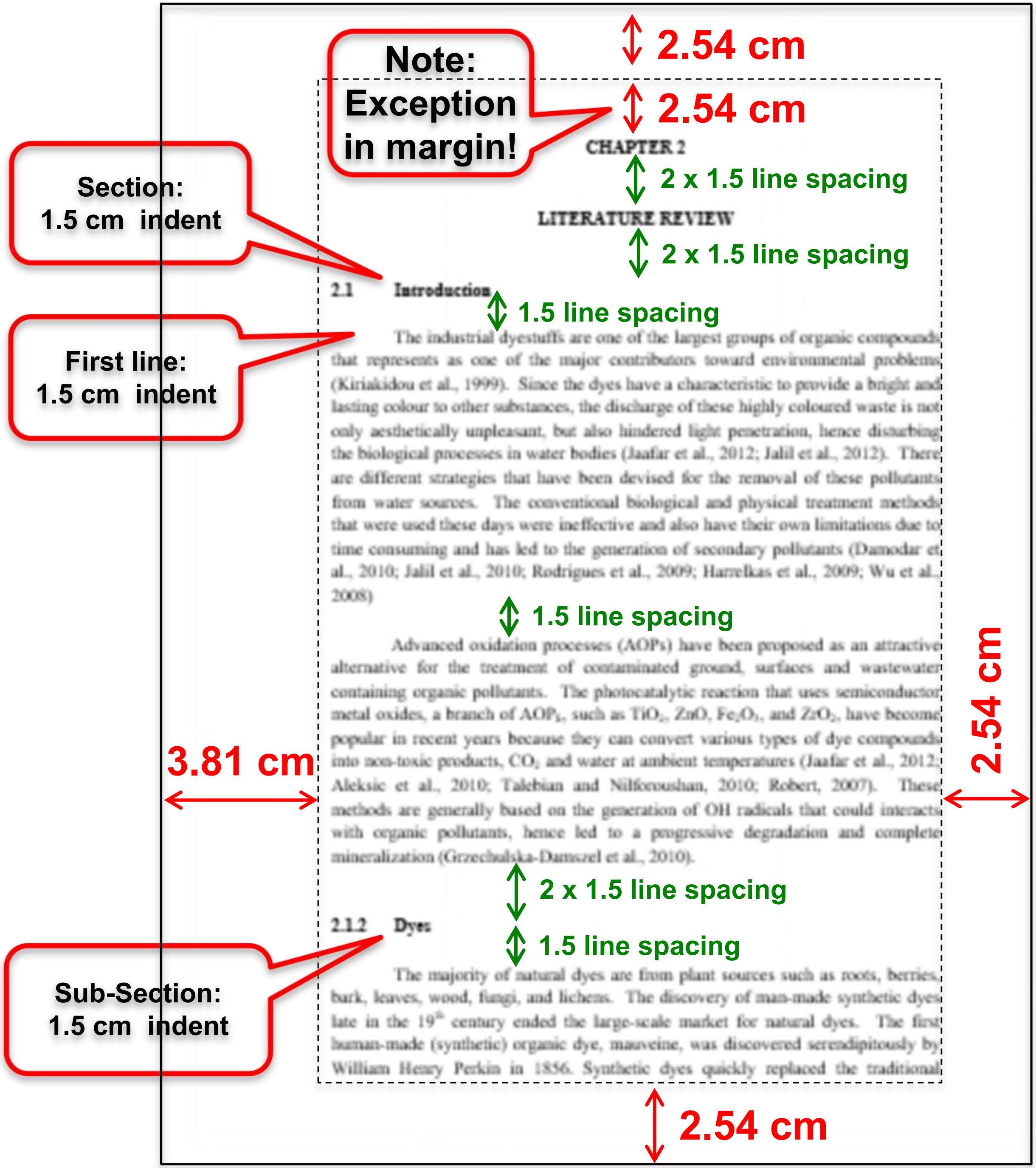
- Spacing between chapter number and title.
- Spacing between title and first line of text.
- Spacing between last line of text with title of a subsection.



SPACING

1. Number and title of sub-section should be aligned with the left margin.
2. First line of paragraph should be indented by **1.5 cm** from the **LEFT** margin.
3. A new paragraph should **NOT** begin on the last line of a page





Note: Exception in margin!
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CHAPTER 2
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LITERATURE REVIEW
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Section: 1.5 cm indent
2.1 Introduction
1.5 line spacing
First line: 1.5 cm indent
The industrial dyestuffs are one of the largest groups of organic compounds that represents as one of the major contributors toward environmental problems (Kiriakidou et al., 1999). Since the dyes have a characteristic to provide a bright and lasting colour to other substances, the discharge of these highly coloured waste is not only aesthetically unpleasant, but also hindered light penetration, hence disturbing the biological processes in water bodies (Jaafar et al., 2012; Jalil et al., 2012). There are different strategies that have been devised for the removal of these pollutants from water sources. The conventional biological and physical treatment methods that were used these days were ineffective and also have their own limitations due to time consuming and has led to the generation of secondary pollutants (Damodar et al., 2010; Jalil et al., 2010; Rodrigues et al., 2009; Harrelkas et al., 2009; Wu et al., 2008)
1.5 line spacing
Advanced oxidation processes (AOPs) have been proposed as an attractive alternative for the treatment of contaminated ground, surfaces and wastewater containing organic pollutants. The photocatalytic reaction that uses semiconductor metal oxides, a branch of AOPs, such as TiO2, ZnO, Fe2O3, and ZrO2, have become popular in recent years because they can convert various types of dye compounds into non-toxic products, CO2 and water at ambient temperatures (Jaafar et al., 2012; Aleksic et al., 2010; Talebian and Nilforoushan, 2010; Robert, 2007). These methods are generally based on the generation of OH radicals that could interacts with organic pollutants, hence led to a progressive degradation and complete mineralization (Grzechulska-Damszel et al., 2010).
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2.1.2 Dyes
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Sub-Section: 1.5 cm indent
The majority of natural dyes are from plant sources such as roots, berries, bark, leaves, wood, fungi, and lichens. The discovery of man-made synthetic dyes late in the 19th century ended the large-scale market for natural dyes. The first human-made (synthetic) organic dye, mauveine, was discovered serendipitously by William Henry Perkin in 1856. Synthetic dyes quickly replaced the traditional
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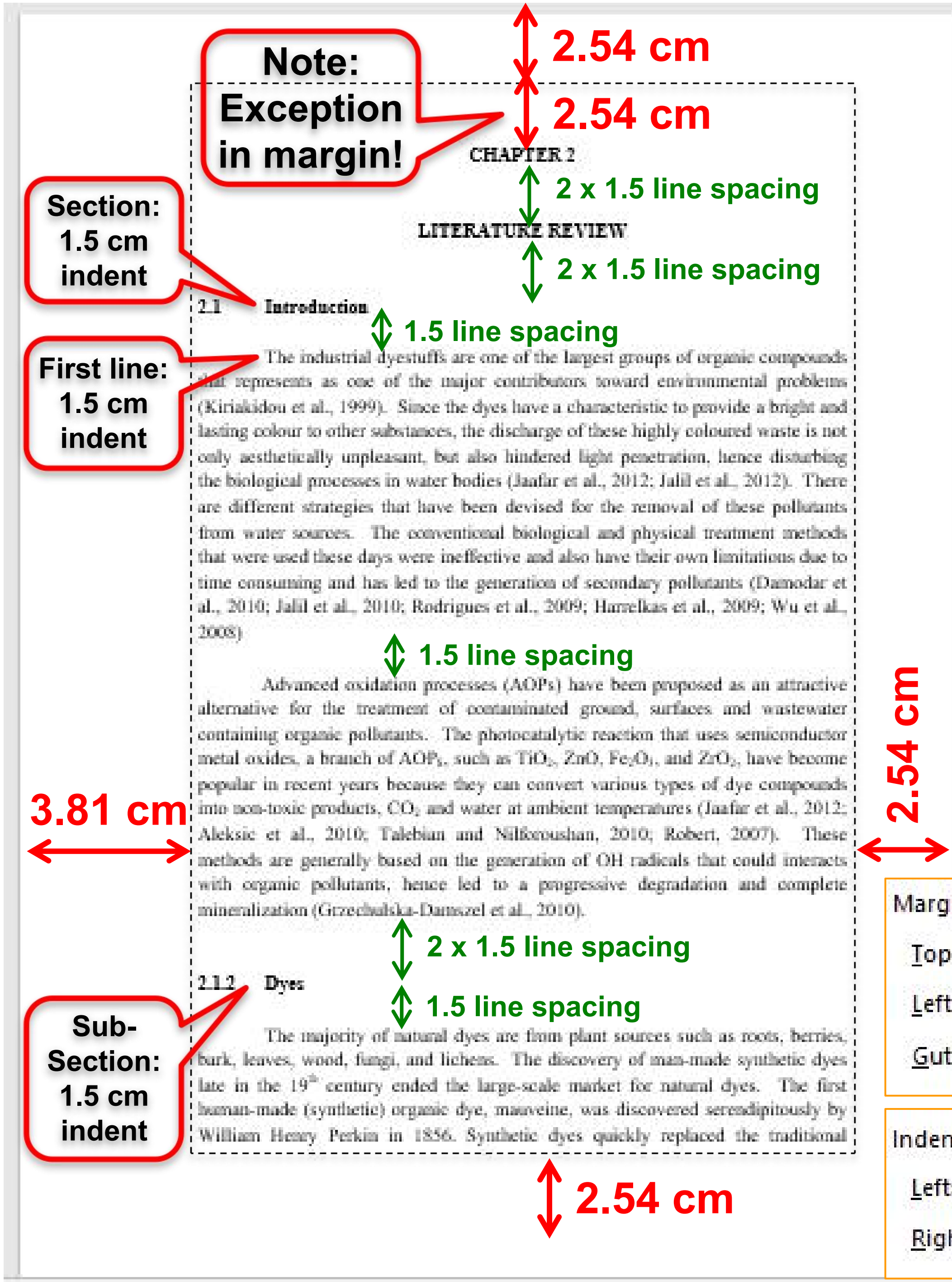


NUMBERING CHAPTERS AND SUB-SECTIONS

1. All chapters and sub-sections must be labeled and numbered.
2. The chapters are numbered using Arabic numeric (Chapter 1, Chapter 2, etc.)
3. Sub-sections must be arranged **NOT more than 4 LEVELS**:

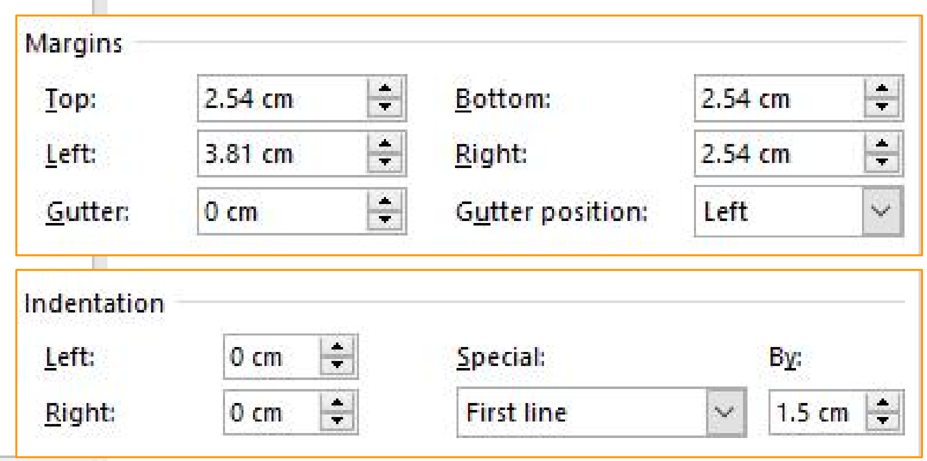
2 1st level (Title of the chapter)

2.1 2nd level (Title of the sub-section)

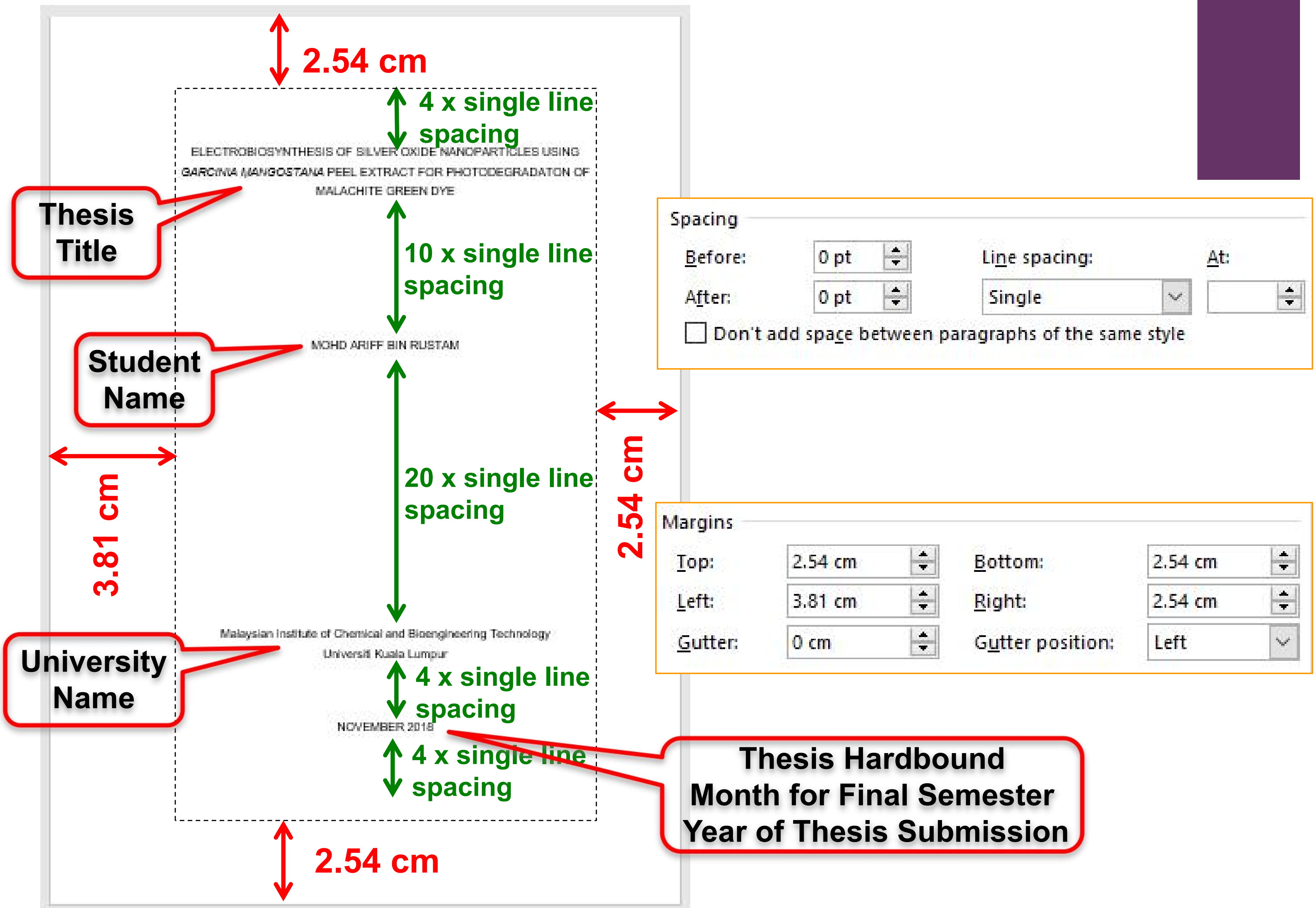
2.1.1 3rd level (Title of the sub-sub-section)

2.1.1.1 4th level (Title of the sub-sub-sub-section)

***must be aligned with the left margin.**



+ EXAMPLE: COVER PAGE



EXAMPLE: COVER PAGE

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ELECTROBIOSYNTHESIS OF SILVER OXIDE NANOPARTICLES
USING *GARCINIA MANGOSTANA* PEEL EXTRACT FOR
PHOTODEGRADATION OF MALACHITE GREEN

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MOHD ARIFF BIN RUSTAM

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Malaysian Institute of Chemical and Bioengineering Technology
Universiti Kuala Lumpur

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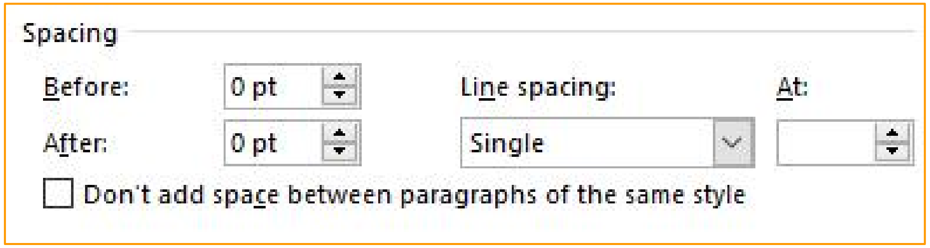
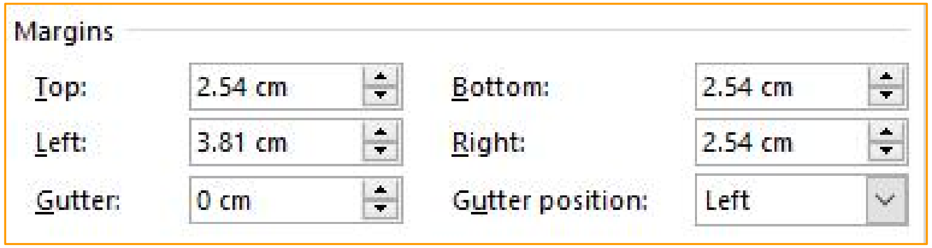
NOVEMBER 2018

4 x single line spacing





EXAMPLE: THESIS SPINE <degree>

MOHD ARIFF BIN RUSTAM   Bac. of Chem. Eng. Tech. (Food) with Hons.   2018 UniKL

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Bac. of Chem. Eng. Tech. (Food) with Hons.
Bac. of Chem. Eng. Tech. (Polymer) with Hons.
Bac. of Chem. Eng. Tech. (Process) with Hons.
Bac. of Chem. Eng. Tech. (Bioprocess) with Hons.
Bac. of Chem. Eng. Tech. (Environment) with Hons.
Bac. of Chem. Eng. with Hons.

EXAMPLE: THESIS SPINE <diploma>

AMROULQOIS BIN RUSLAN Dip. of Chem. Eng. Tech. (Process) 2018 UniKL

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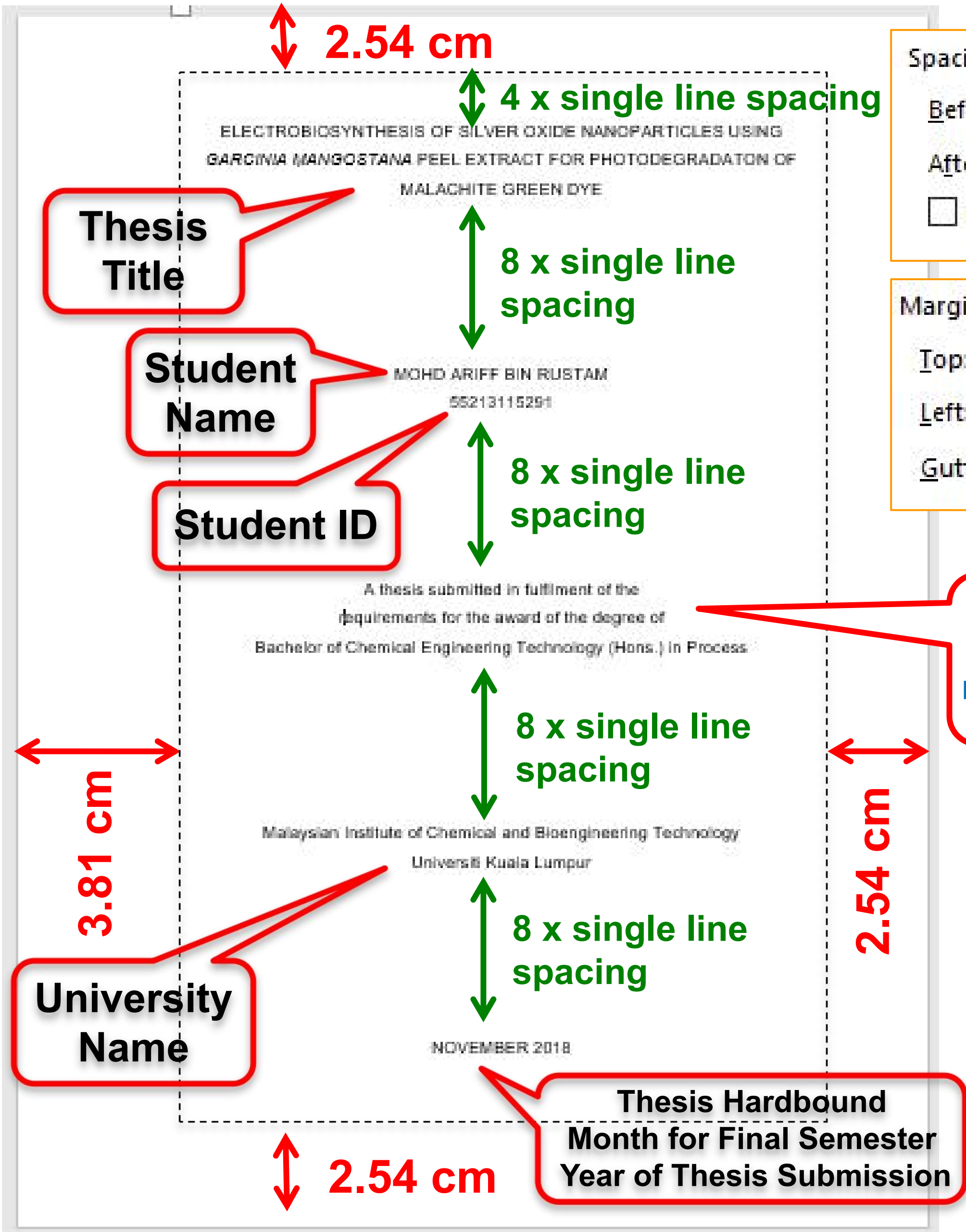
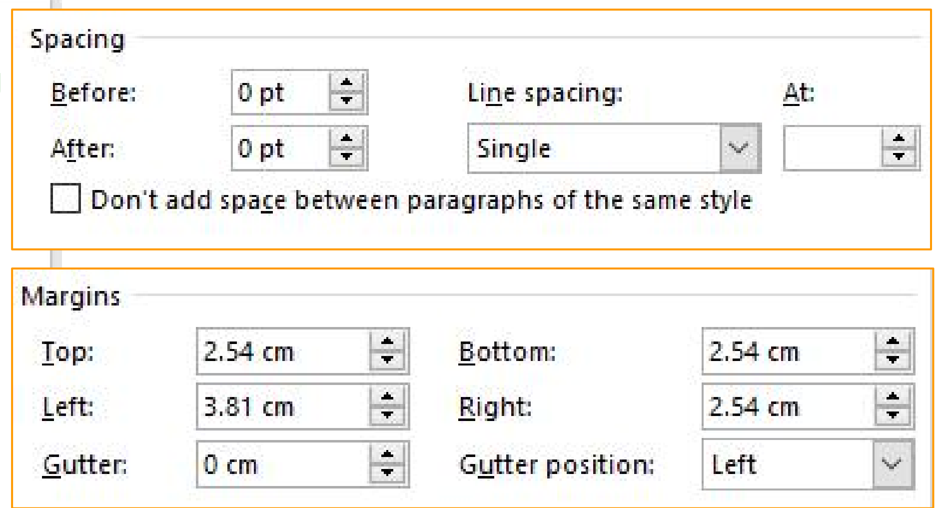
Dip. in Chem. Eng. Tech.
Dip. in Chem. Eng. Tech. (Food)
Dip. in Chem. Eng. Tech. (Polymer)
Dip. in Chem. Eng. Tech. (Process)
Dip. in Chem. Eng. Tech. (Bioprocess)
Dip. in Chem. Eng. Tech. (Environment)

EXAMPLE: FRONT PAGE





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- Bachelor of Chemical Engineering Technology (Food) with Honours
- Bachelor of Chemical Engineering Technology (Polymer) with Honours
- Bachelor of Chemical Engineering Technology (Process) with Honours
- Bachelor of Chemical Engineering Technology (Bioprocess) with Honours
- Bachelor of Chemical Engineering Technology (Environment) with Honours
- Bachelor of Engineering Technology (Hons) in Biosystem
- Bachelor of Chemical Engineering with Honours
- Bachelor of Food Safety and Quality Technology
- Bachelor of Environmental Management and Sustainability Technology with Honours

- Diploma in Chemical Engineering Technology
- Diploma in Chemical Engineering Technology (Food)
- Diploma in Chemical Engineering Technology (Polymer)
- Diploma in Chemical Engineering Technology (Process)
- Diploma in Chemical Engineering Technology (Bioprocess)
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EXAMPLE: FRONT PAGE

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ELECTROBIOSYNTHESIS OF SILVER OXIDE NANOPARTICLES USING *GARCINIA MANGOSTANA* PEEL EXTRACT FOR PHOTODEGRADATION OF MALACHITE GREEN

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55213115291

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A thesis submitted in fulfilment of the
requirements for the award of the degree of
Bachelor of Chemical Engineering Technology (Hons) in Process

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Malaysian Institute of Chemical & Bioengineering Technology
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NOVEMBER 2018

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Spacing

Before:	0 pt	Line spacing:	At:
After:	0 pt	Single	

☐ Don't add space between paragraphs of the same style

Margins

Top:	2.54 cm	Bottom:	2.54 cm
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ONLY 3 Lines

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Bachelor of Chemical Engineering Technology (Food) with Honours

Bachelor of Chemical Engineering Technology (Food) with Honours
Bachelor of Chemical Engineering Technology (Polymer) with Honours
Bachelor of Chemical Engineering Technology (Process) with Honours
Bachelor of Chemical Engineering Technology (Bioprocess) with Honours
Bachelor of Chemical Engineering Technology (Environment) with Honours
Bachelor of Engineering Technology (Hons) in Biosystem
Bachelor of Chemical Engineering with Honours

EXAMPLE: FRONT PAGE

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REMOVAL OF METHYLENE BLUE USING MANGO SEED AS AN ADSORBENT

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A thesis submitted in fulfilment of the
requirements for the award of the degree of
Diploma in Chemical Engineering Technology (Process)

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NOVEMBER 2018

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Spacing

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Margins

Top:	2.54 cm	Bottom:	2.54 cm
Left:	3.81 cm	Right:	2.54 cm
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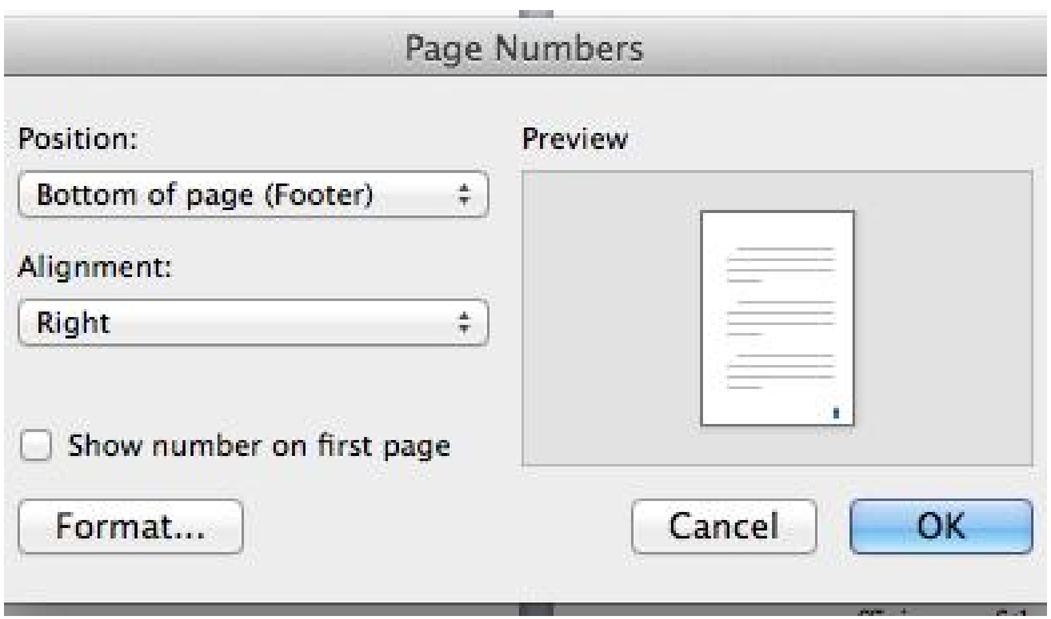
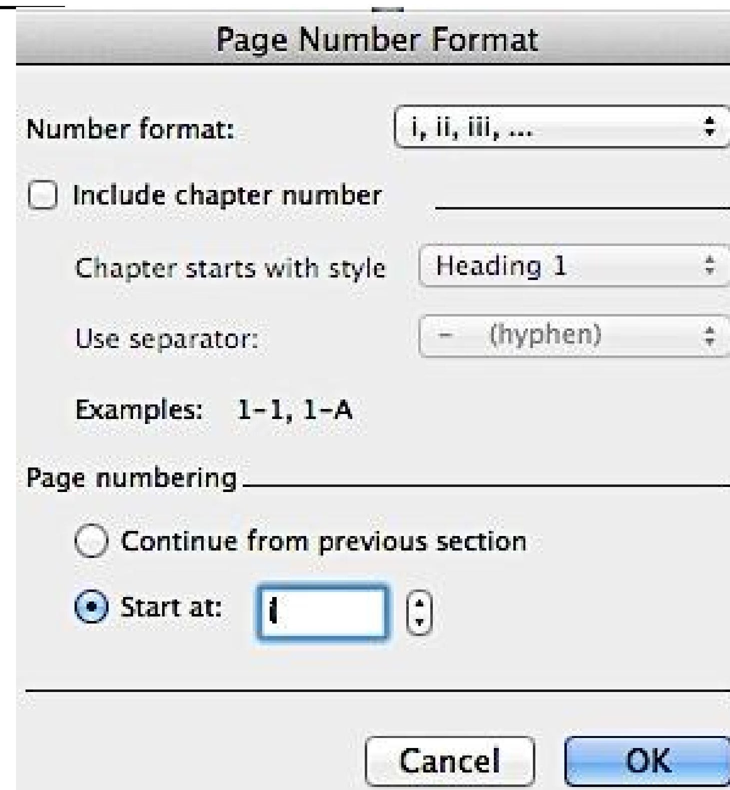
A thesis submitted in fulfilment of the
requirements for the award of the degree of
Diploma of Chemical Engineering Technology (Process)

Diploma in Chemical Engineering Technology (Food)
Diploma in Chemical Engineering Technology (Polymer)
Diploma in Chemical Engineering Technology (Process)
Diploma in Chemical Engineering Technology (Bioprocess)
Diploma in Chemical Engineering Technology (Environment)

PAGINATION: PRELIMINARY PAGES

- Page numbers should be printed at the **RIGHT** bottom of page (footer)
- Preliminary pages of a thesis, starting from title page should be numbered using small letter Roman numeric (i, ii, iii..).
- The first page should be the front page. This page should be counted "**i**" but should **NOT be printed**.





+ PAGINATION: PRELIMINARY PAGES

Preliminary Pages of a Thesis

Front Page

ELECTROBIOSYNTHESIS OF SILVER OXIDE NANOPARTICLES USING *GARCINIA MANGOSTANA* PEEL EXTRACT FOR PHOTODEGRADATION OF MALACHITE GREEN

MOHD ARIFF BIN RUSTAM
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NOVEMBER 2018

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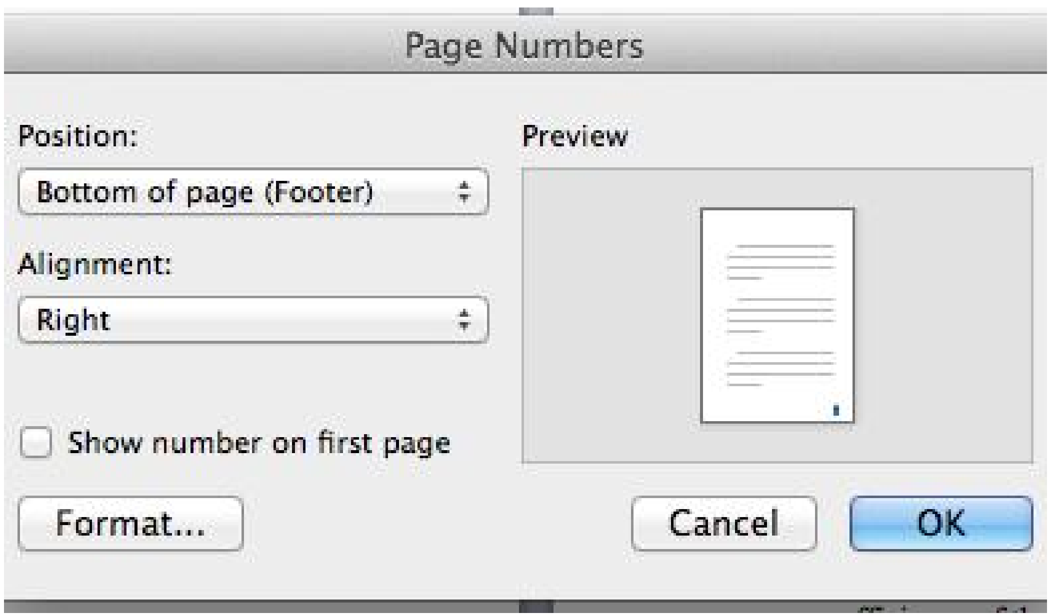
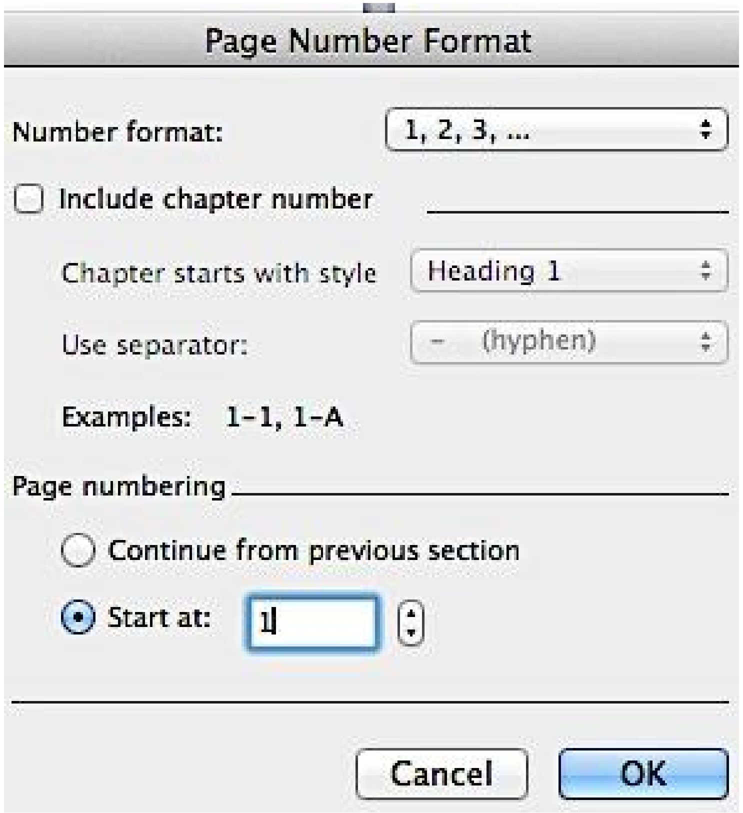
PAGINATION: TEXTS

- The texts should be numbered using Arabic numerals (1,2,3…).
- The first page of text should be counted "1".





TABLES

- All tables must be numbered using Arabic numerals.
- A caption should be positioned at the **TOP** of the table.
- If caption is in a **SINGLE** line, it should be **CENTRED**. If the caption **MORE** than a line, it should be **ALIGN to LEFT.**
- Table must be numbered with respect to the chapter.
- For example, Table 3.5 is the 5th table that appears in Chapter 3.
- The Table and number must be in **BOLD**, example:

  Table 2.1 The dye groups based on their chemical structure (Rajeshwar et al., 2008)
- Spacing between the last line of a text and a table or table with the first line of text should be **1 x 1.5 line spacing.**
- All tables must be listed in List of Tables page.

EXAMPLE: TABLES

The ranges and levels of the independent variables studied were determined through a series of preliminary evaluations and represented in Table 4.7.

1.5 line spacing

Table 4.7 Independent variables and respective coded levels used in CCD design.

Single line: Centred

Variables	Factors	Actual values for coded levels		
		−1	0	+1
pH	x_1	3	7	11
Contact time (h)	x_2	1	2	3
$EGZrO_2$–EGZnO ratio	x_3	0.3	1	3
Catalyst dosage ($g\ L^{-1}$)	x_4	0.1	0.4	1.0

2 x 1.5 line spacing

Sub-Section: 1.5 cm indent

4.4.3 Model validation and experimental confirmation

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First line: 1.5 cm indent

The mathematical model generated during RSM ... validated by conducting the actual experiment. Therefore, ... the predicted model and optimize variables, the first five s... conditions were selected and performed, in the order of su... DOE software. The experimental results are tabulated in Ta... accuracy with the predicted values using Eq. (4.1).

REMEMBER: Table and Number must be in **Bold**, example: **Table 4.7** Independent variables and respective coded levels used in CCD design

1.5 line spacing

Table 4.8 Experimental results for model validation conducted at the optimum conditions as obtained from RSM.

>1 line: Aligned to left

Runs	x_1	x_2	x_3	x_4	Experimental values (%)	Predicted values (%)
1	11	1.5	1.0	0.60	99.7	100
2	3	2.0	1.0	0.65	93.1	94.6
3	7	2.0	0.3	0.35	95.3	97.1
4	3	1.5	0.3	0.35	94.7	96.5
5	11	2.0	3.0	0.65	91.5	92.6

1.5 line spacing

An amount of 0.60 $g\ L^{-1}$ 1 wt% $EGZrO_2$–1 wt% EGZnO/HY was found to be an optimum dosage for 10 $mg\ L^{-1}$ MB, 1.5 h of contact time, and pH 11; this

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+ EXAMPLE: TABLES

Table 2.1 The dye groups based on their chemical structure (Rajeshwar *et al.,* 2008).

Type of dye	Example
Azo	Reactive Orange 16
Xanthene	Basic Violet 10
Thiazine	Methylene Blue
Anthraquinone	Reactive Blue 4
Triphenylmethane	Basic Violet 4
Phthalocynine	Reactive Blue 15
Indigo	Indigo Carmine
Quinoline	D&C Yellow 10
Phenanthrene	D&C Green 8

Table 2.1 The dye groups based on their chemical structure (Rajeshwar *et al.,* 2008).

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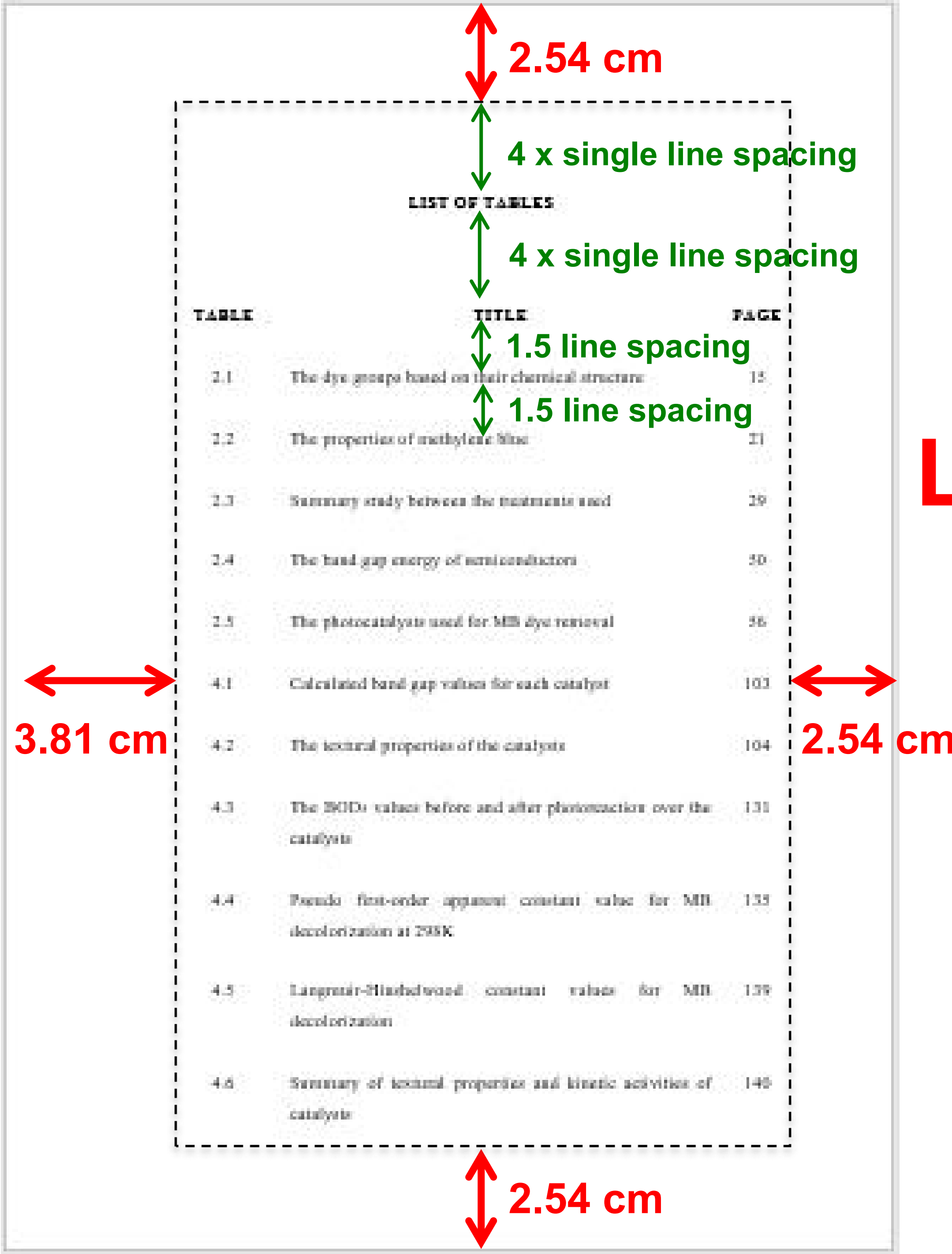
EXAMPLE: LIST OF TABLES



FIGURES

- All figures must be numbered using Arabic numerals.
- A caption should be positioned at the **BOTTOM** of the figure.
- If caption is in a **SINGLE** line, it should be **CENTRED**. If the caption **MORE than a line**, it should be **ALIGN to LEFT**.
- Figures must be numbered with respect to the chapter. For example, Figure 3.5 is the 5th Figure that appears in Chapter 3.
- The Figure and number must be in **BOLD**, example: **Figure 2.1** Congo red dye structure (Gharbani et al., 2008)
- Spacing between the last line of a text and a figure should be **1 x 1.5 line spacing.**
- All figures must be listed in List of Figures page.

EXAMPLE: FIGURES

there is no obvious band was observed corresponds to the vibration of the Si–O–Fe bond. It may be due to the overlapping with zeolitic material characteristic stretching frequencies in this region (Noorjahan et al.,2005; Scarano et al., 1993).

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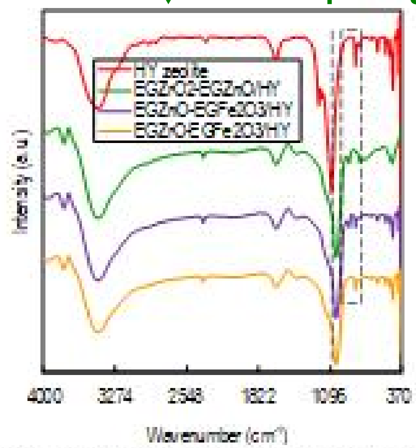

Figure 4.11 FTIR spectra of the double metal catalyst at region 4000–370 nm.

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4.2.2 Morphological properties

Sub-Section: 1.5 cm indent

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The morphological properties of $EGZrO_2$ and $EGZrO_2$/HY catalysts were examined by TEM, and the images are presented in Figure 4.12. The average ... size for $EGZrO_2$ varied in a narrow range from 8-18 nm. The theoretical val... particle size (*D*) was found to be 19.2 nm ($EGZrO_2$), assuming that the par... spherical in shape (Lucio-Ortiz *et al.*, 2010) (refer Appendix G for calc... However, the micrographs show particles with an elliptical and irregula... which may be due to the particles overlapping (Chandra *et al.*, 2010).

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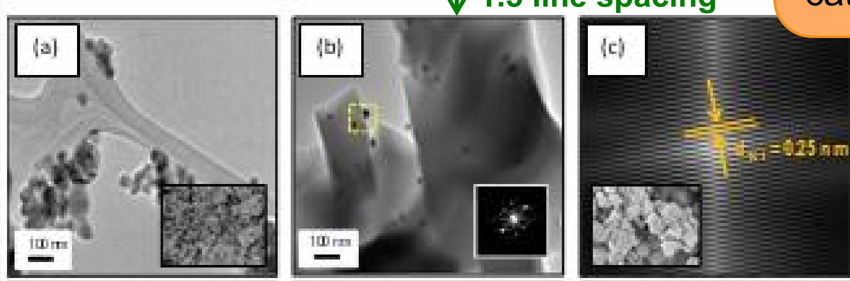

Figure 4.12 TEM micrographs of catalysts in low and high magnification for $EGZrO_2$/HY. The insets of Figures 4.12 (b) are its corresponding FFT, while Figures 4.12 (a,c) are its corresponding FE-SEM.

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In addition, the topographical properties of the bare HY, $EGZrO_2$, EGZnO, $EGFe_2O_3$, $EGZrO_2$/HY, EGZnO/HY, and $EGFe_2O_3$/HY catalysts were studied by FE-SEM, and the results are shown in the inset Figures 4.4c, 4.4d, 4.4f, 4.4g, 4.4i,

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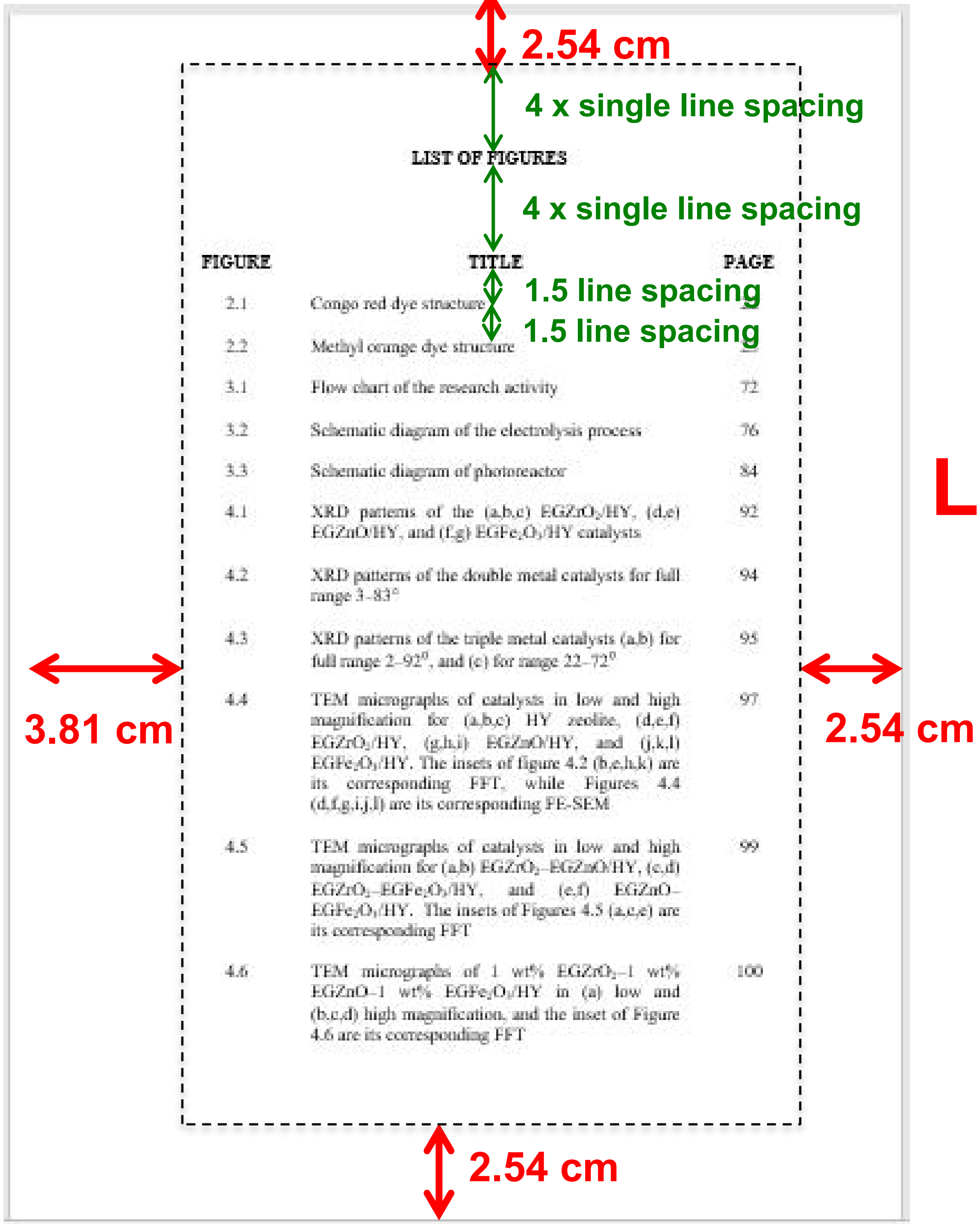
REMEMBER:
Figure and Number must be in **Bold**, example:
Figure 4.11 FTIR spectra of the double metal catalyst at region 4000–370 nm

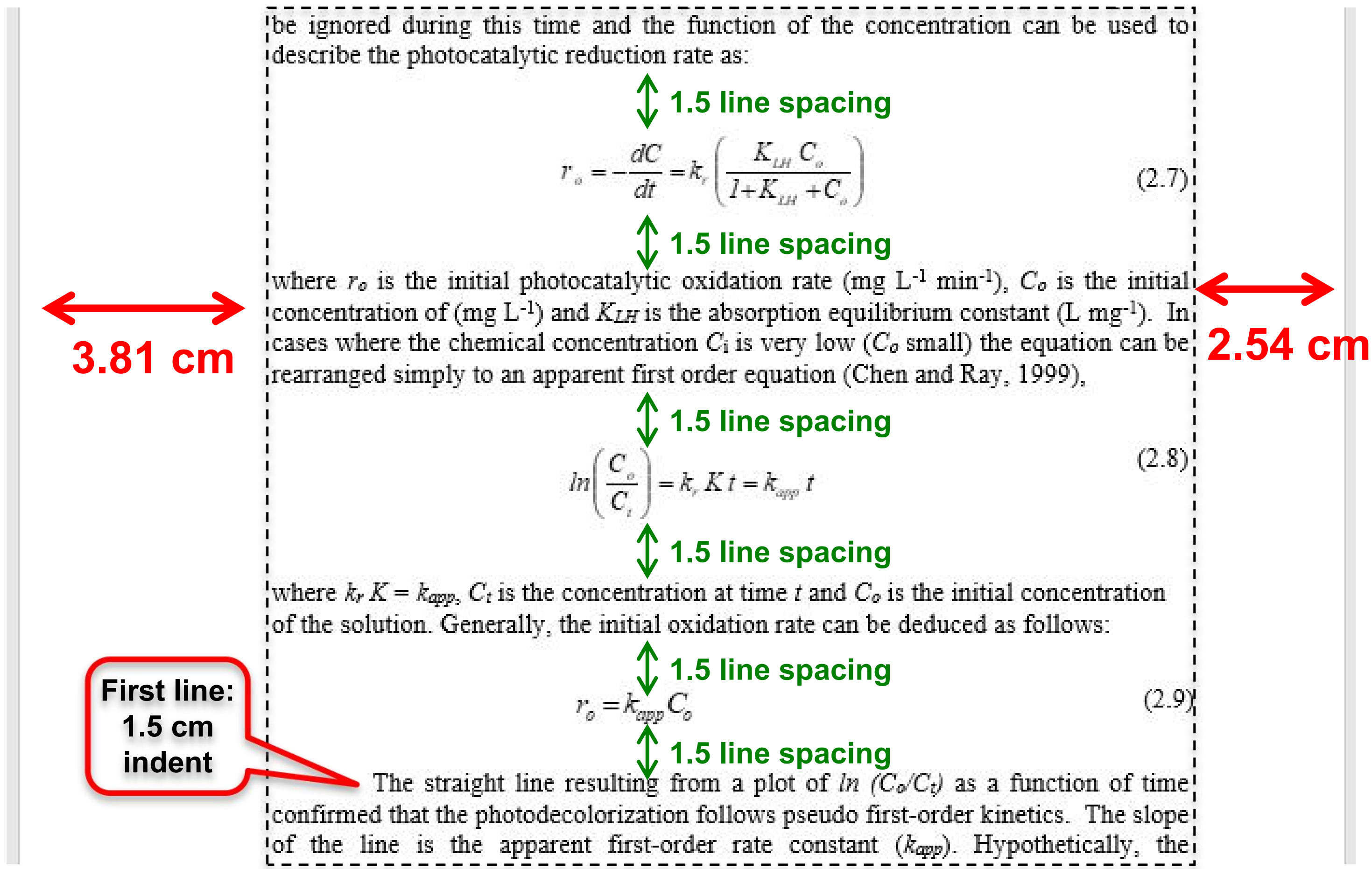
EXAMPLE: LIST OF FIGURES



LIST OF FIGURES

+ EQUATIONS AND FORMULAE

- Equations and formulae should be typed clearly using appropriate Equation editor.
- Must be numbered in order with respect to the chapter.
- For example Equation 2.8 is the 8th equation appears in Chapter 2.



be ignored during this time and the function of the concentration can be used to describe the photocatalytic reduction rate as:

$$r_o = -\frac{dC}{dt} = k_r\left(\frac{K_{LH}\,C_o}{1+K_{LH}+C_o}\right) \qquad (2.7)$$

where r_o is the initial photocatalytic oxidation rate (mg L^{-1} min^{-1}), C_o is the initial concentration of (mg L^{-1}) and K_{LH} is the absorption equilibrium constant (L mg^{-1}). In cases where the chemical concentration C_i is very low (C_o small) the equation can be rearranged simply to an apparent first order equation (Chen and Ray, 1999),

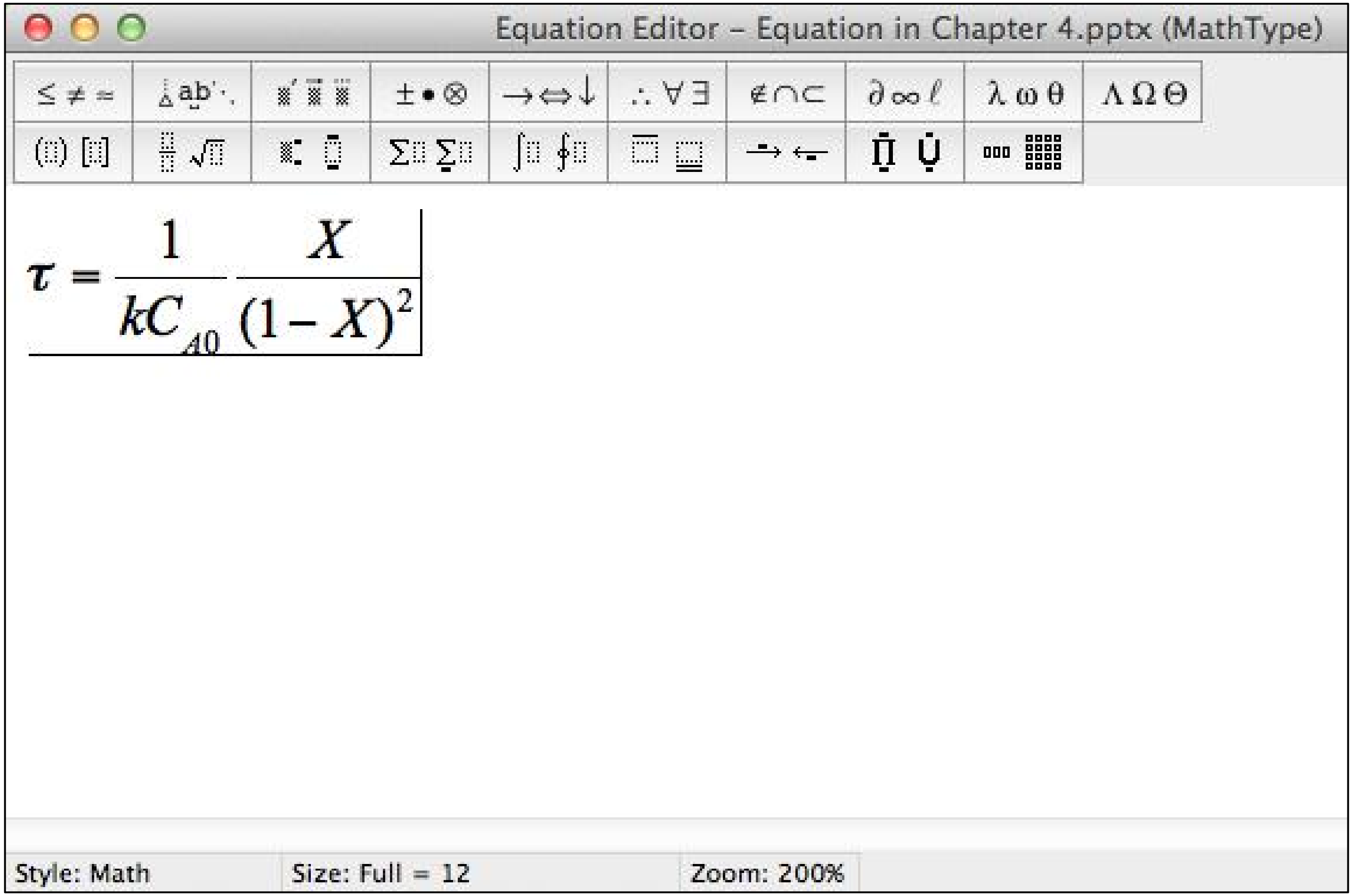
$$ln\left(\frac{C_o}{C_t}\right) = k_r\,K\,t = k_{app}\,t \qquad (2.8)$$

where $k_r K = k_{app}$, C_t is the concentration at time t and C_o is the initial concentration of the solution. Generally, the initial oxidation rate can be deduced as follows:

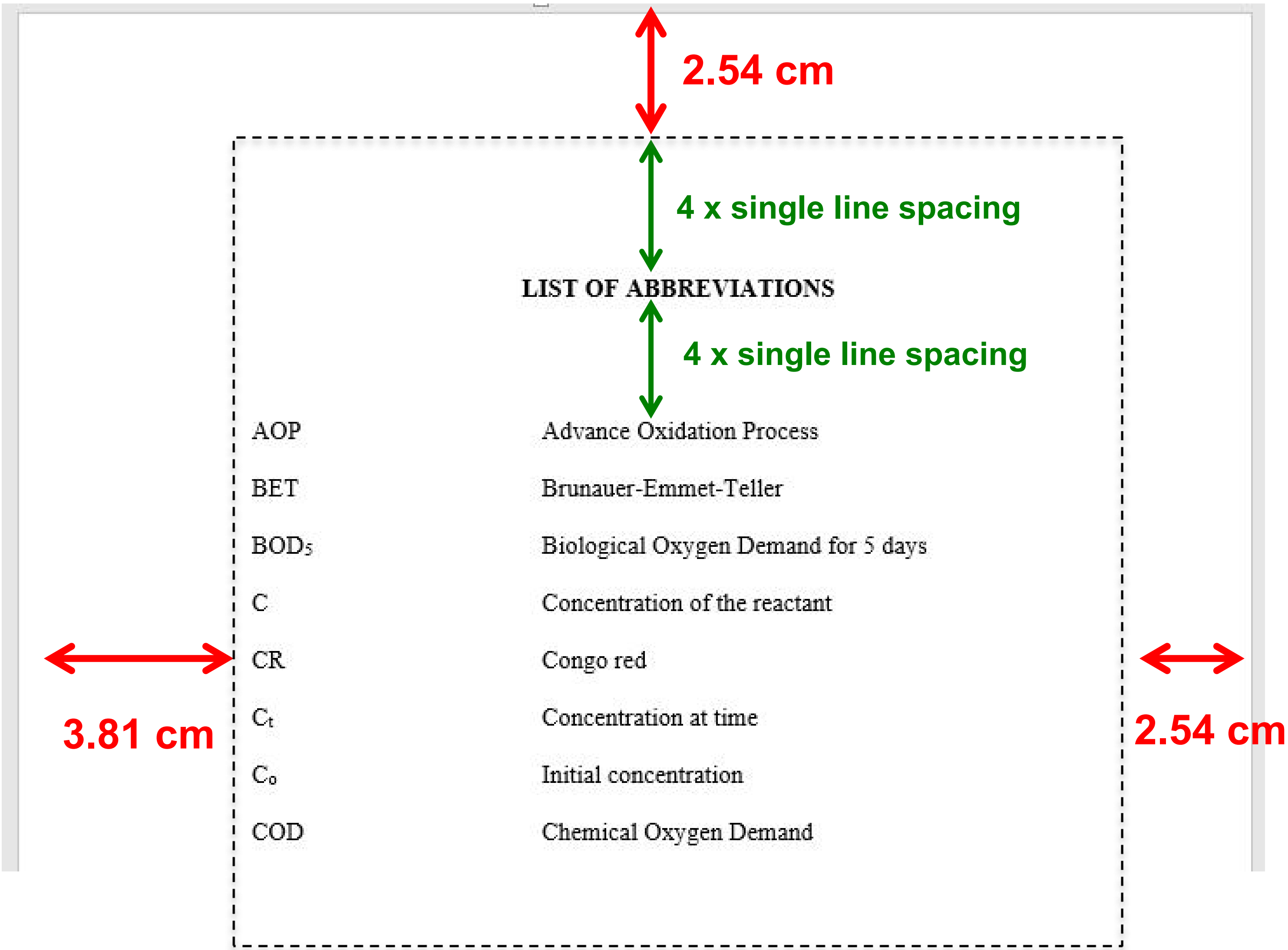
$$r_o = k_{app}C_o \qquad (2.9)$$

The straight line resulting from a plot of ln (C_o/C_t) as a function of time confirmed that the photodecolorization follows pseudo first-order kinetics. The slope of the line is the apparent first-order rate constant (k_{app}). Hypothetically, the

+ Equation Editor



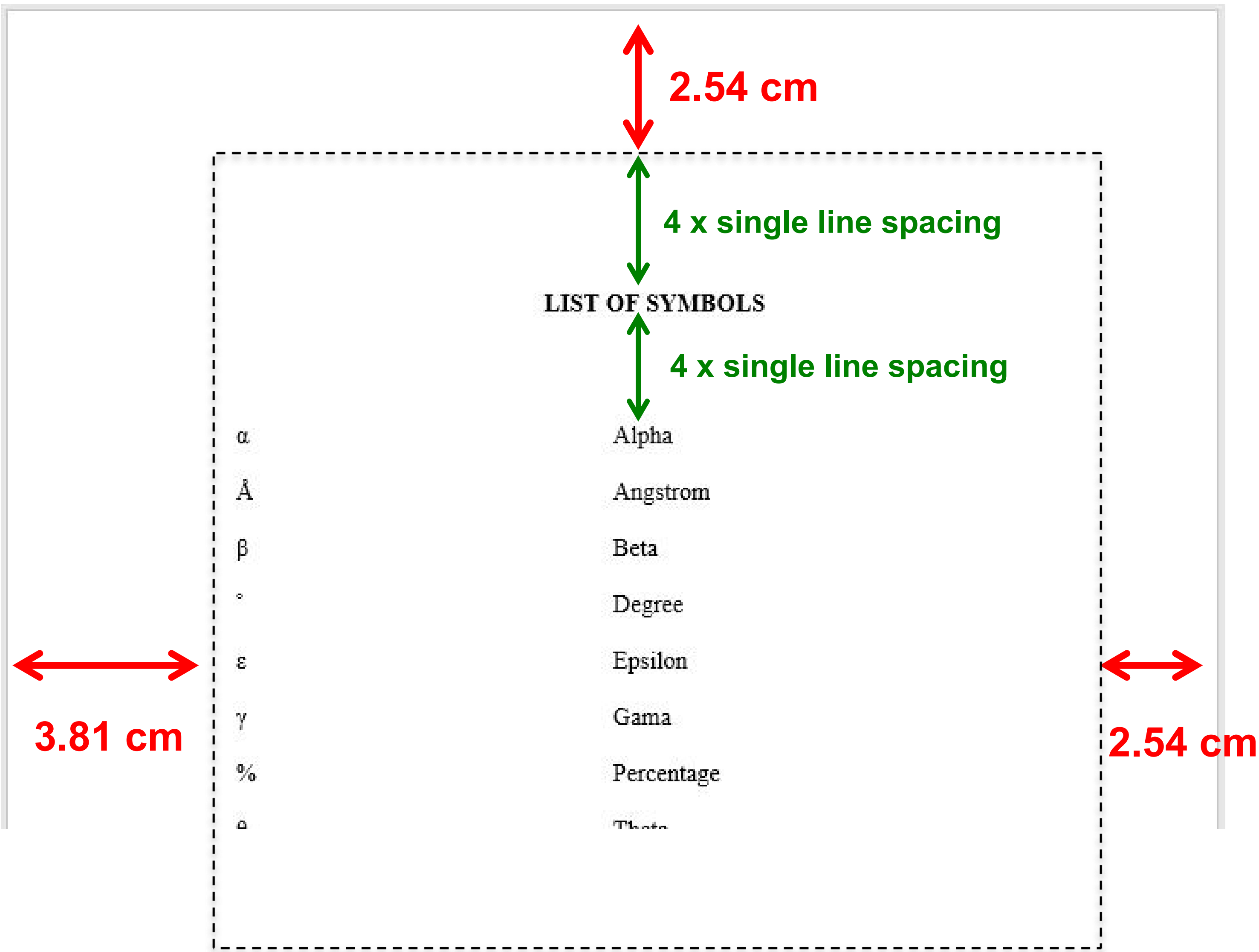
+ EXAMPLE: LIST OF ABBREVIATIONS



LIST OF ABBREVIATIONS

AOP	Advance Oxidation Process
BET	Brunauer-Emmet-Teller
BOD_5	Biological Oxygen Demand for 5 days
C	Concentration of the reactant
CR	Congo red
C_t	Concentration at time
C_o	Initial concentration
COD	Chemical Oxygen Demand

+ EXAMPLE: LIST OF SYMBOLS



+ EXAMPLE: LIST OF APPENDICES

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LIST OF APPENDICES

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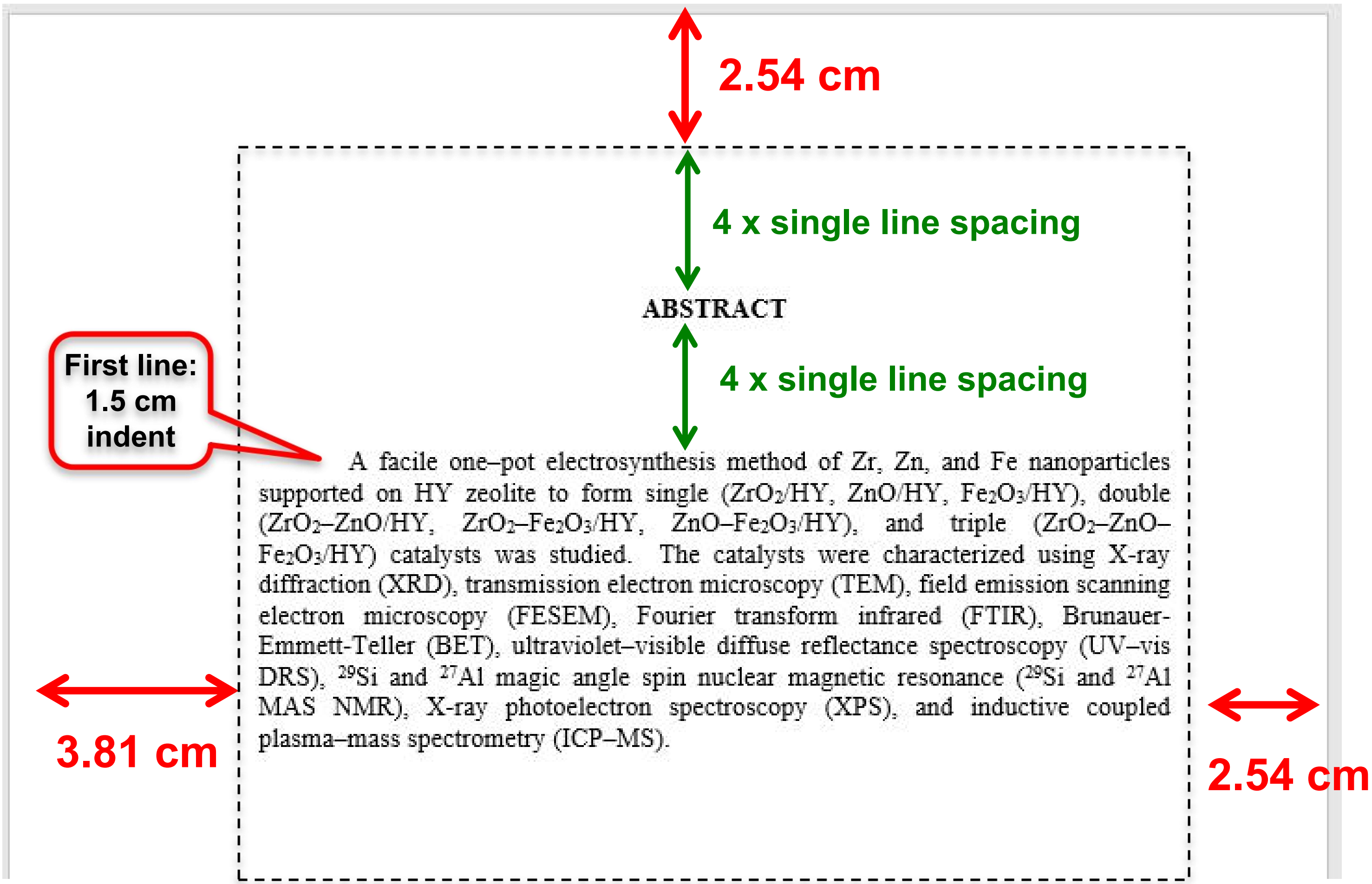
+ EXAMPLE: ABSTRACT



ABSTRACT

A facile one–pot electrosynthesis method of Zr, Zn, and Fe nanoparticles supported on HY zeolite to form single (ZrO_2/HY, ZnO/HY, Fe_2O_3/HY), double (ZrO_2–ZnO/HY, ZrO_2–Fe_2O_3/HY, ZnO–Fe_2O_3/HY), and triple (ZrO_2–ZnO–Fe_2O_3/HY) catalysts was studied. The catalysts were characterized using X-ray diffraction (XRD), transmission electron microscopy (TEM), field emission scanning electron microscopy (FESEM), Fourier transform infrared (FTIR), Brunauer-Emmett-Teller (BET), ultraviolet–visible diffuse reflectance spectroscopy (UV–vis DRS), ^{29}Si and ^{27}Al magic angle spin nuclear magnetic resonance (^{29}Si and ^{27}Al MAS NMR), X-ray photoelectron spectroscopy (XPS), and inductive coupled plasma–mass spectrometry (ICP–MS).

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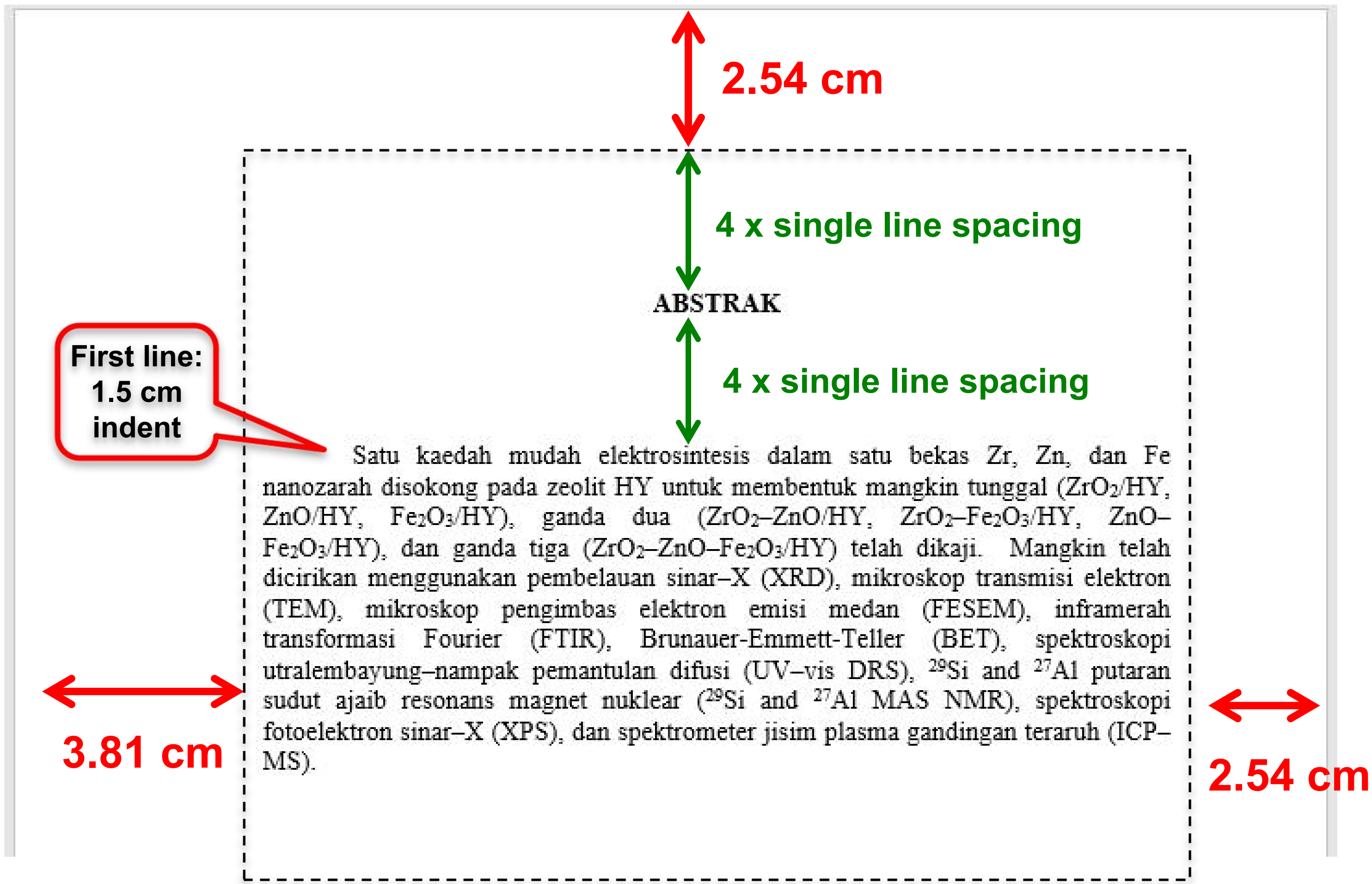

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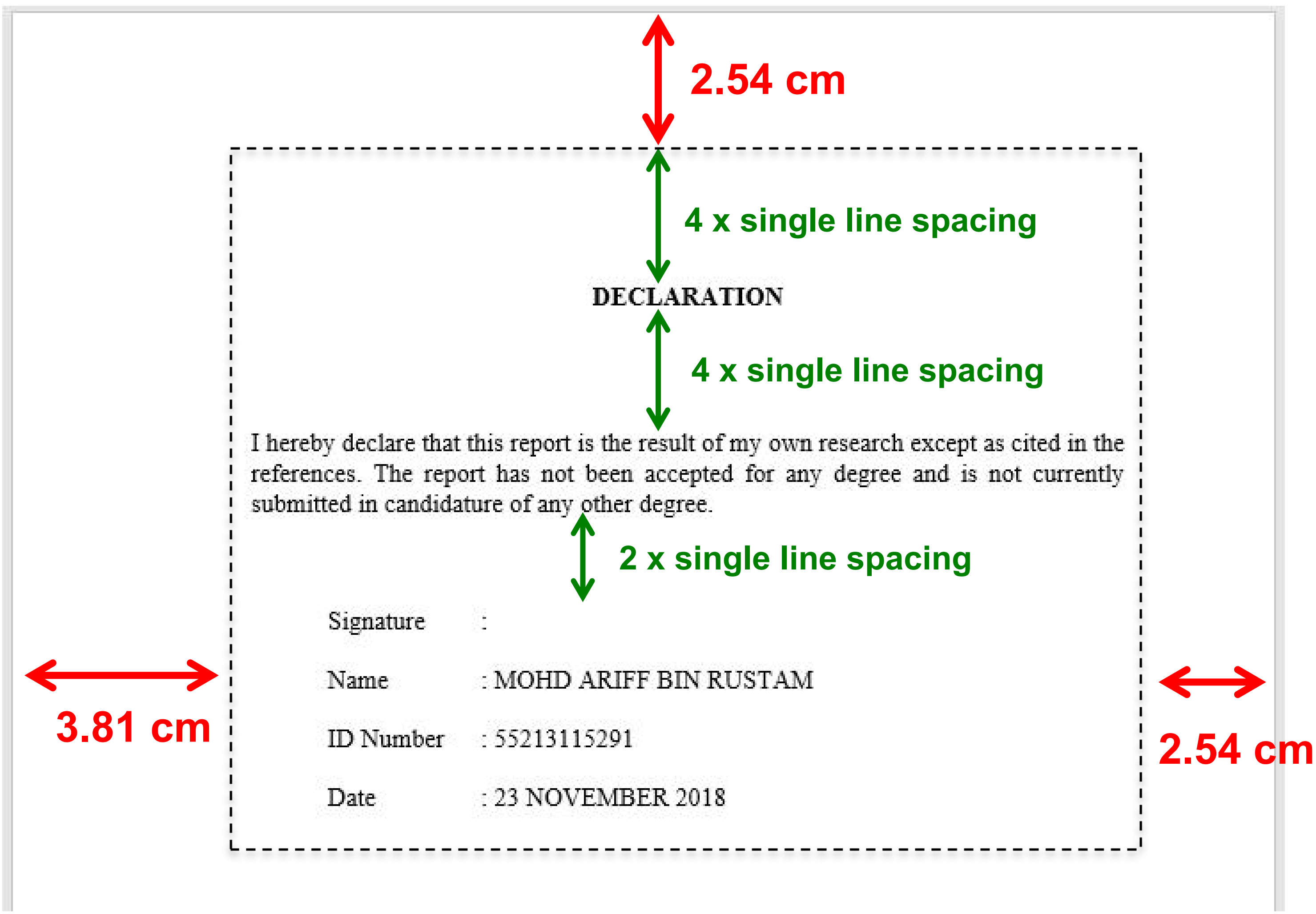

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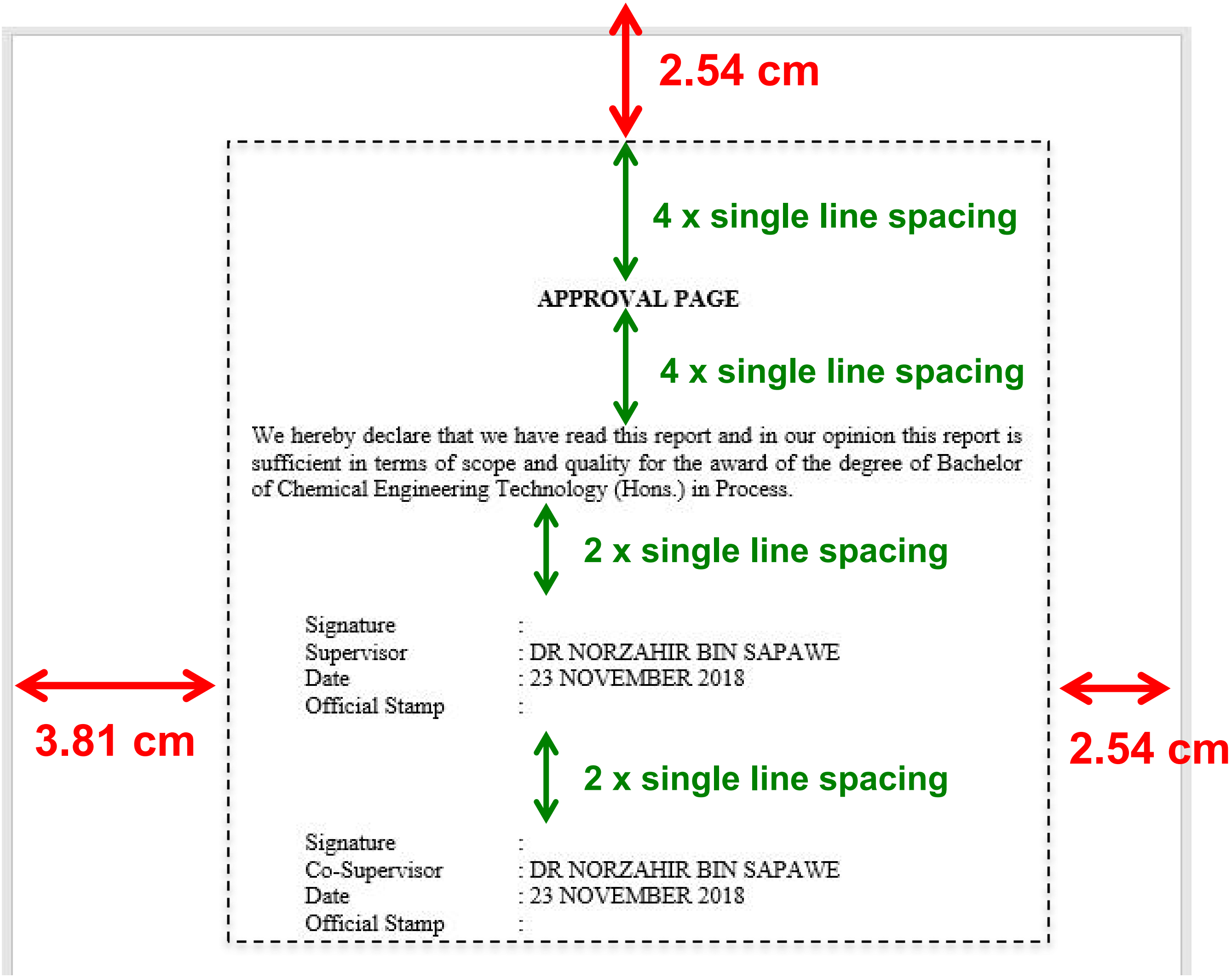

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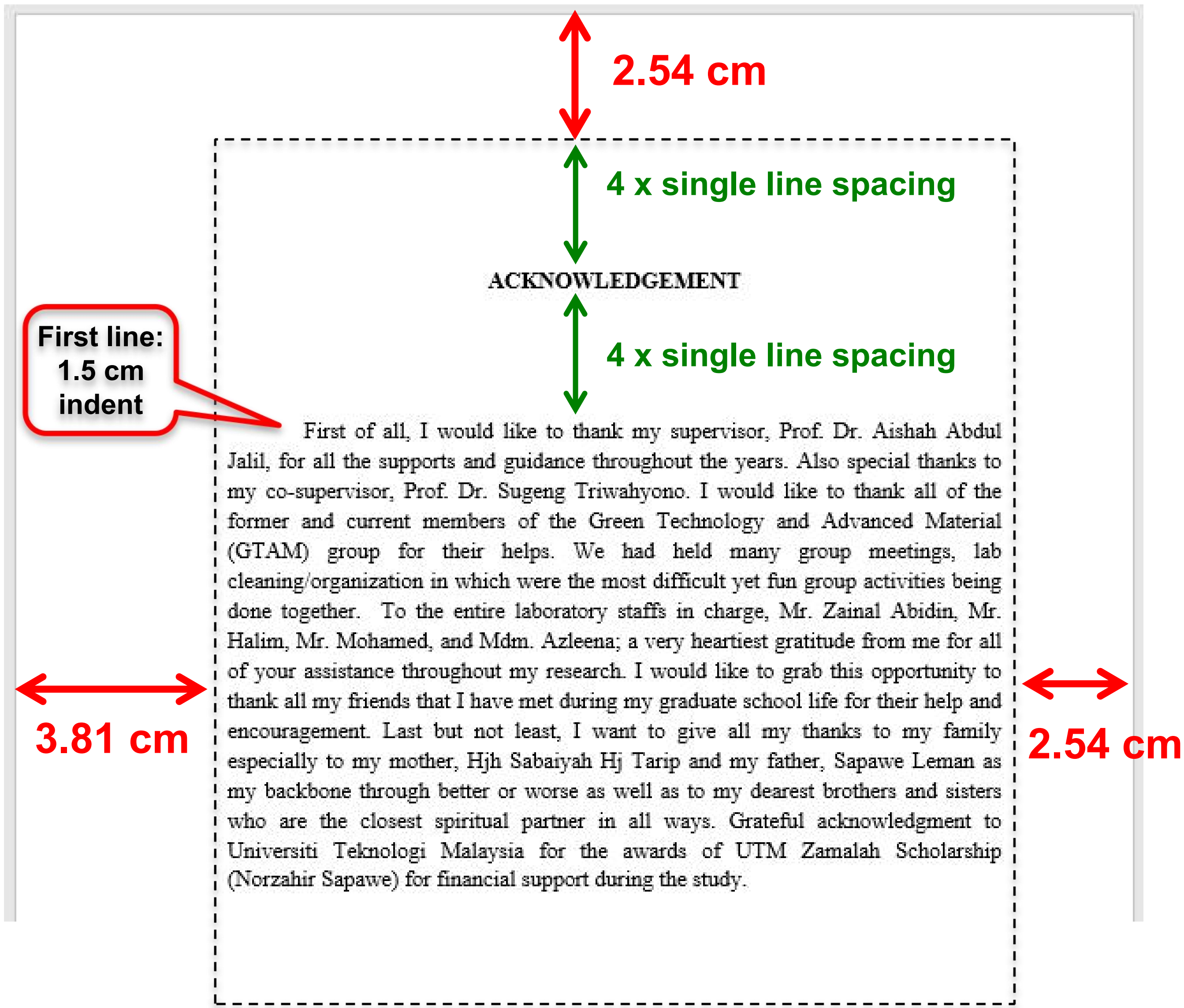

ACKNOWLEDGEMENT

First of all, I would like to thank my supervisor, Prof. Dr. Aishah Abdul Jalil, for all the supports and guidance throughout the years. Also special thanks to my co-supervisor, Prof. Dr. Sugeng Triwahyono. I would like to thank all of the former and current members of the Green Technology and Advanced Material (GTAM) group for their helps. We had held many group meetings, lab cleaning/organization in which were the most difficult yet fun group activities being done together. To the entire laboratory staffs in charge, Mr. Zainal Abidin, Mr. Halim, Mr. Mohamed, and Mdm. Azleena; a very heartiest gratitude from me for all of your assistance throughout my research. I would like to grab this opportunity to thank all my friends that I have met during my graduate school life for their help and encouragement. Last but not least, I want to give all my thanks to my family especially to my mother, Hjh Sabaiyah Hj Tarip and my father, Sapawe Leman as my backbone through better or worse as well as to my dearest brothers and sisters who are the closest spiritual partner in all ways. Grateful acknowledgment to Universiti Teknologi Malaysia for the awards of UTM Zamalah Scholarship (Norzahir Sapawe) for financial support during the study.

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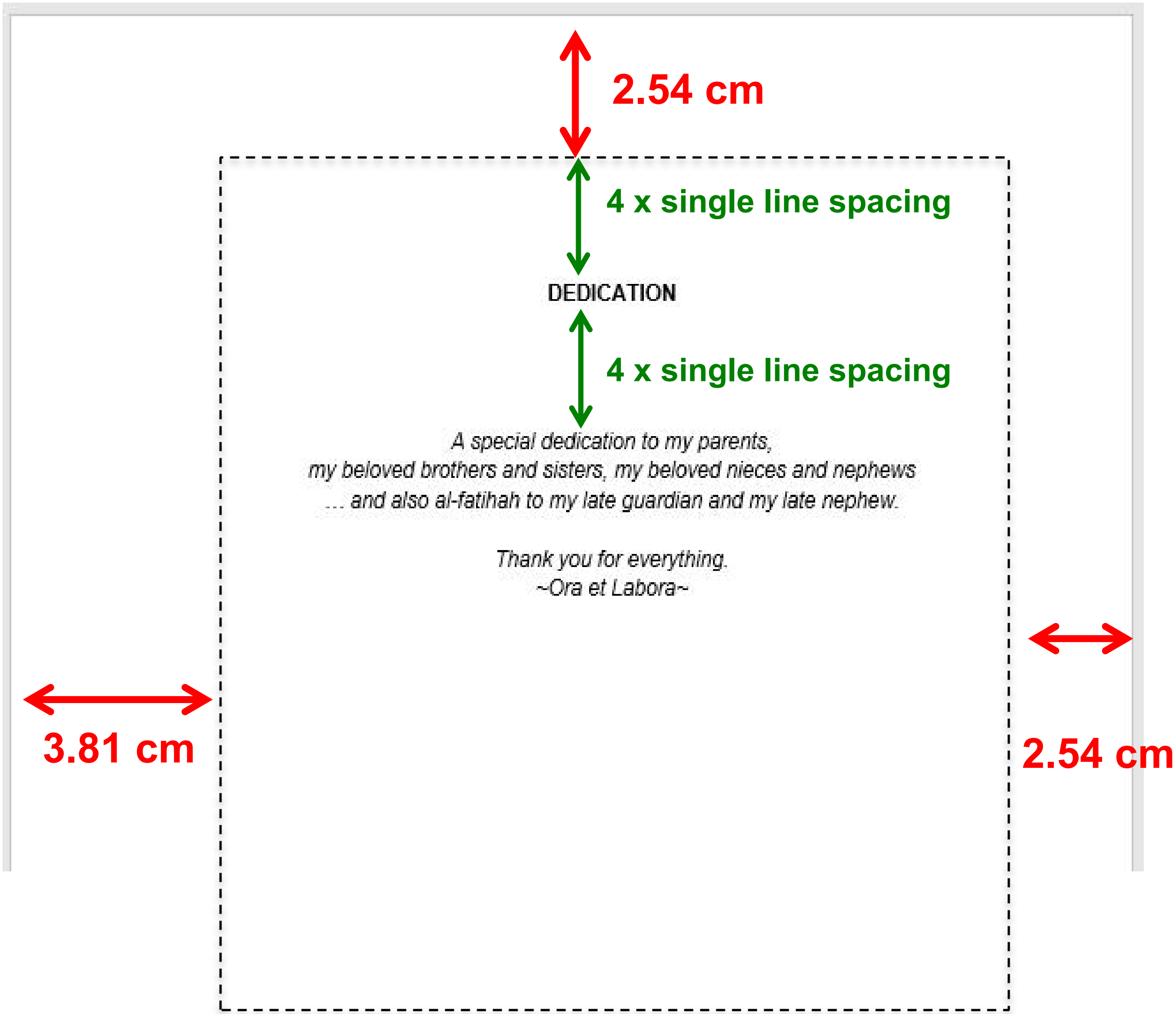

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- Author's names are listed using surname (Family name) followed by initials.
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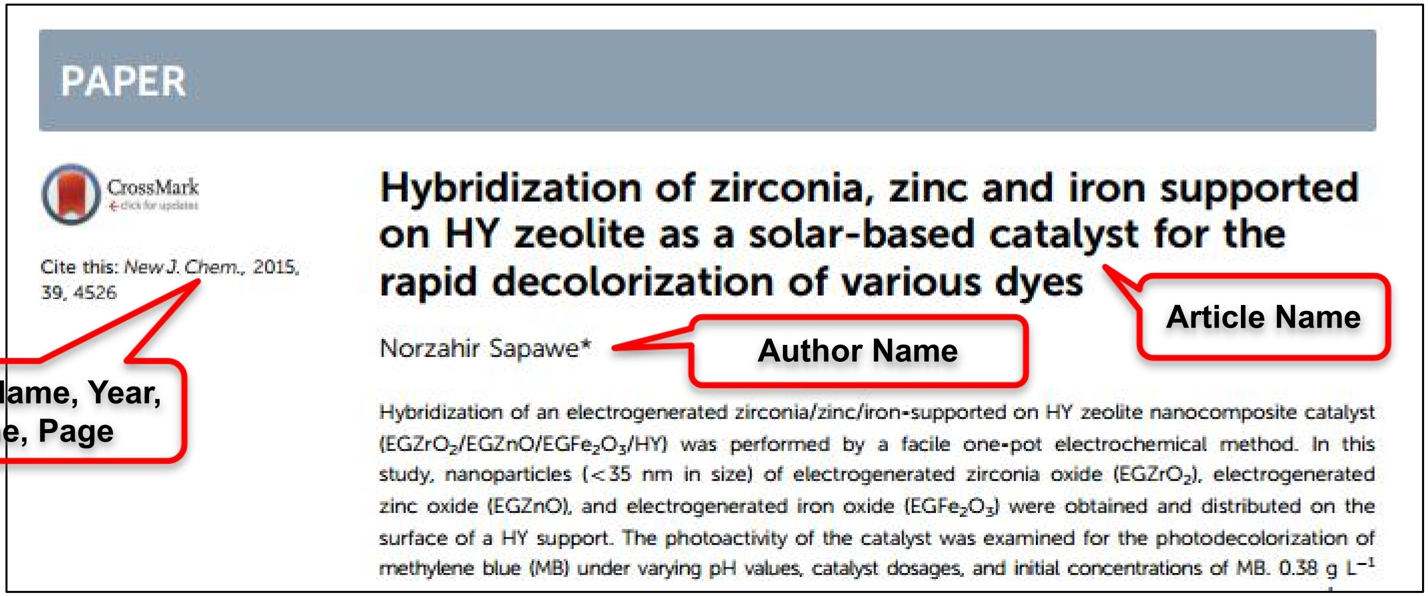
REFERENCES: JOURNAL ARTICLES

In journal articles, the given names will most commonly be written first, followed by the family name (or surname). For example below, the surname is **Sapawe**. This journal only has **1 author**.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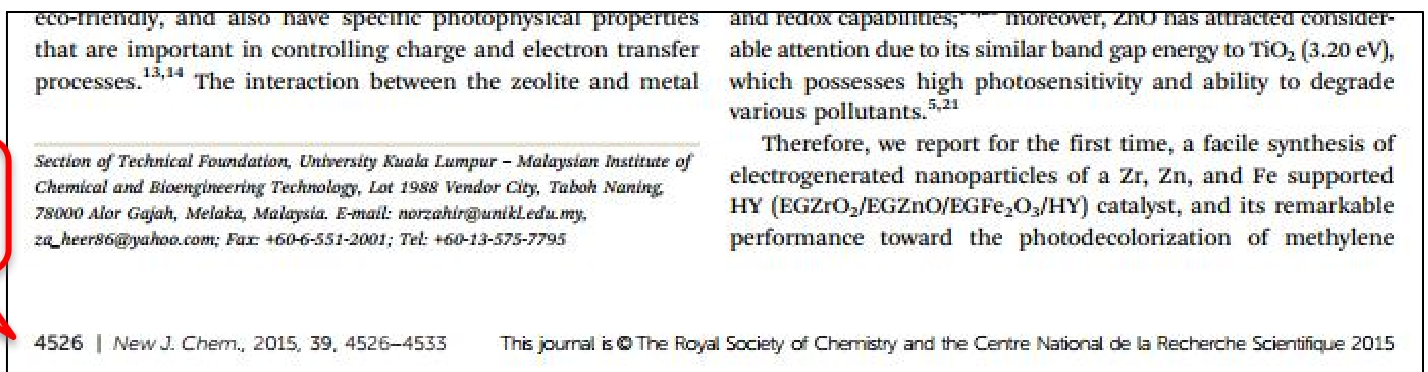
Hybridization of zirconia, zinc and iron supported on HY zeolite as a solar-based catalyst for the rapid decolorization of various dyes

Norzahir Sapawe*

Hybridization of an electrogenerated zirconia/zinc/iron-supported on HY zeolite nanocomposite catalyst ($EGZrO_2/EGZnO/EGFe_2O_3/HY$) was performed by a facile one-pot electrochemical method. In this study, nanoparticles (<35 nm in size) of electrogenerated zirconia oxide ($EGZrO_2$), electrogenerated zinc oxide (EGZnO), and electrogenerated iron oxide ($EGFe_2O_3$) were obtained and distributed on the surface of a HY support. The photoactivity of the catalyst was examined for the photodecolorization of methylene blue (MB) under varying pH values, catalyst dosages, and initial concentrations of MB. 0.38 g L^{-1}


eco-friendly, and also have specific photophysical properties that are important in controlling charge and electron transfer processes.[13,14] The interaction between the zeolite and metal

Section of Technical Foundation, University Kuala Lumpur – Malaysian Institute of Chemical and Bioengineering Technology, Lot 1988 Vendor City, Taboh Naning, 78000 Alor Gajah, Melaka, Malaysia. E-mail: norzahir@unikl.edu.my, za_heer86@yahoo.com; Fax: +60-6-551-2001; Tel: +60-13-575-7795

and redox capabilities; moreover, ZnO has attracted considerable attention due to its similar band gap energy to TiO_2 (3.20 eV), which possesses high photosensitivity and ability to degrade various pollutants.[5,21]

Therefore, we report for the first time, a facile synthesis of electrogenerated nanoparticles of a Zr, Zn, and Fe supported HY ($EGZrO_2/EGZnO/EGFe_2O_3/HY$) catalyst, and its remarkable performance toward the photodecolorization of methylene

4526 | *New J. Chem.*, 2015, 39, 4526–4533

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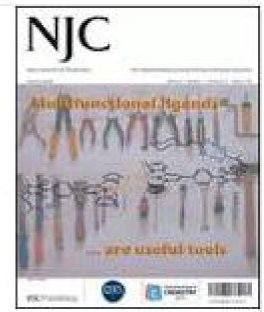

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References: Journal Articles

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Sapawe (2015) reported that highly photoreactive electrogenerated zirconia/ zinc/iron-supported on HY zeolite nanocomposite catalysts shows an efficient degradation of methylene blue (MB).

OR

Efficient degradation of methylene blue (MB) was achieved using highly photoreactive electrogenerated zirconia/zinc/iron-supported on HY zeolite nanocomposite catalysts **(Sapawe, 2015)**.

Reference List:

Sapawe, N. (2015). Hybridization of zirconia, zinc and iron supported on HY zeolite as a solar-based catalyst for the rapid decolorization of various dyes. *New Journal of Chemistry, 39*, 4526–4533.

References: Journal Articles

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Facile one-pot electrosynthesis of high photoreactive hexacoordinated Si with Zr and Zn catalyst†

Norzahir Sapawe* and Muhammad Farhan Hanafi

Received 9th July 2015
Accepted 28th August 2015

DOI: 10.1039/c5ra13471d

In Text Citation:

Sapawe and Hanafi (2015) established a new structural model of photocatalyst which give an excellent photodecolorization of methylene blue.

OR

Excellent photodecolorization of methylene blue was observed which may contribute from the formation of a new structural model of catalyst **(Sapawe and Hanafi, 2015)**.

Reference List:

Sapawe, N., & Hanafi, M.F. (2015). Facile one-pot electrosynthesis of high photoreactive hexacoordinated Si with Zr and Zn catalyst. *RSC Advances, 5*, 75141–75144.

References: Journal Articles

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Applied Catalysis B: Environmental 125 (2012) 311–323

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Applied Catalysis B: Environmental

journal homepage: www.elsevier.com/locate/apcatb

Isomorphous substitution of Zr in the framework of aluminosilicate HY by an electrochemical method: Evaluation by methylene blue decolorization

N. Sapawe[a], A.A. Jalil[a,*], S. Triwahyono[b], S.H. Adam[a], N.F. Jaafar[b], M.A.H. Satar[a]

[a] Institute of Hydrogen Economy, Faculty of Chemical Engineering, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Johor, Malaysia

[b] Ibnu Sina Institute for Fundamental Science Studies, Faculty of Science, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Johor, Malaysia

In Text Citation:

Sapawe et al. (2012) discovered that the presence of more Si-O-Zr bonds in the HY framework through isomorphous substitution inhibits the photoreaction.

OR

The presence of Si-O-Zr bonds in the HY framework inhibits the photodegradation of methylene blue in aqueous solution **(Sapawe et al., 2012)**.

Reference List:

Sapawe, N., Jalil, A.A., Triwahyono, S., Adam, S.H., Jaafar, N.F., & Satar, M.A.H. (2012). Isomorphous substitution of Zr in the framework of aluminosilicate HY by an electrochemical method: Evaluation by methylene blue decolorization. *Applied Catalysis B: Environmental, 125*, 311–323.

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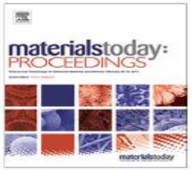


Biodiesel production from waste cooking oil using nickel doped onto eggshell catalyst

Muhammad Farid Fitri Kamaronzaman, Haniza Kahar, Nazatulshima Hassan, Muhammad Farhan Hanafi, Norzahir Sapawe *

Universiti Kuala Lumpur Branch Campus Malaysian Institute of Chemical and Bioengineering Technology (UniKL MICET), Lot 1988 Vendor City, Taboh Naning, 78000 Alor Gajah, Melaka, Malaysia

In Text Citation:

Kamaronzaman and his co-worker (2020) found that high yield of biodiesel production was observed when adding some amount of nickel metal onto the calcined eggshell.

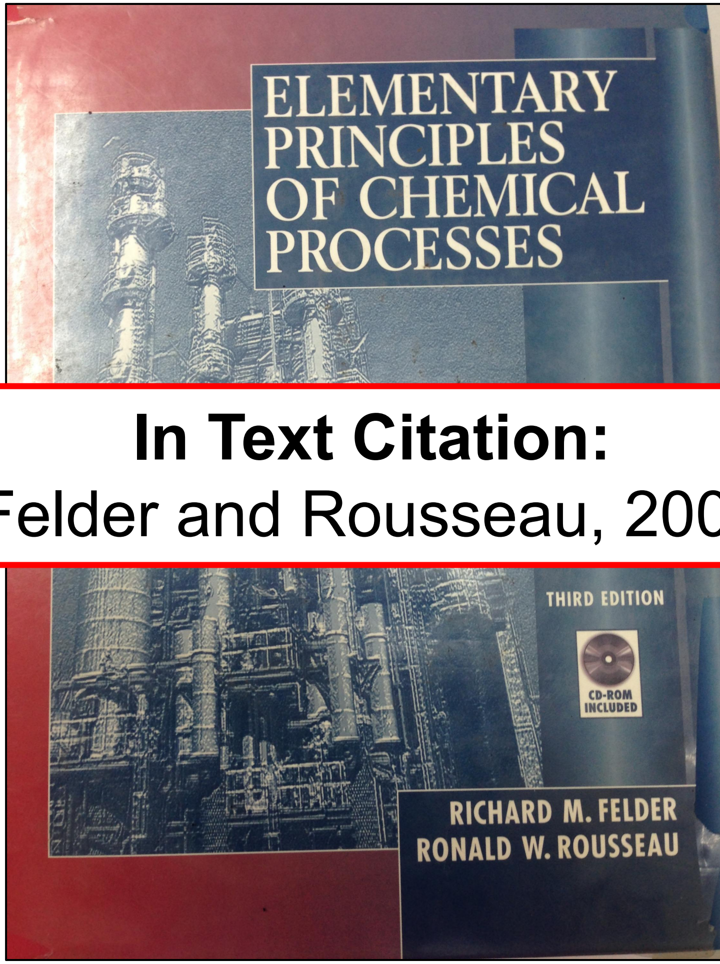
OR

High production of biodiesel was observed when some amount of nickel metal added onto the calcined eggshell **(Kamaronzaman et al., 2020)**.

Reference List:

Kamaronzaman, M.F.F., Kahar, H., Hassan, N., Hanafi, M.F., & Sapawe, N. (2020). Biodiesel production from waste cooking oil using nickel doped onto eggshell catalyst. *Materials Today: Proceedings, 31(1)*, 342–346.

REFERENCES LIST: BOOK



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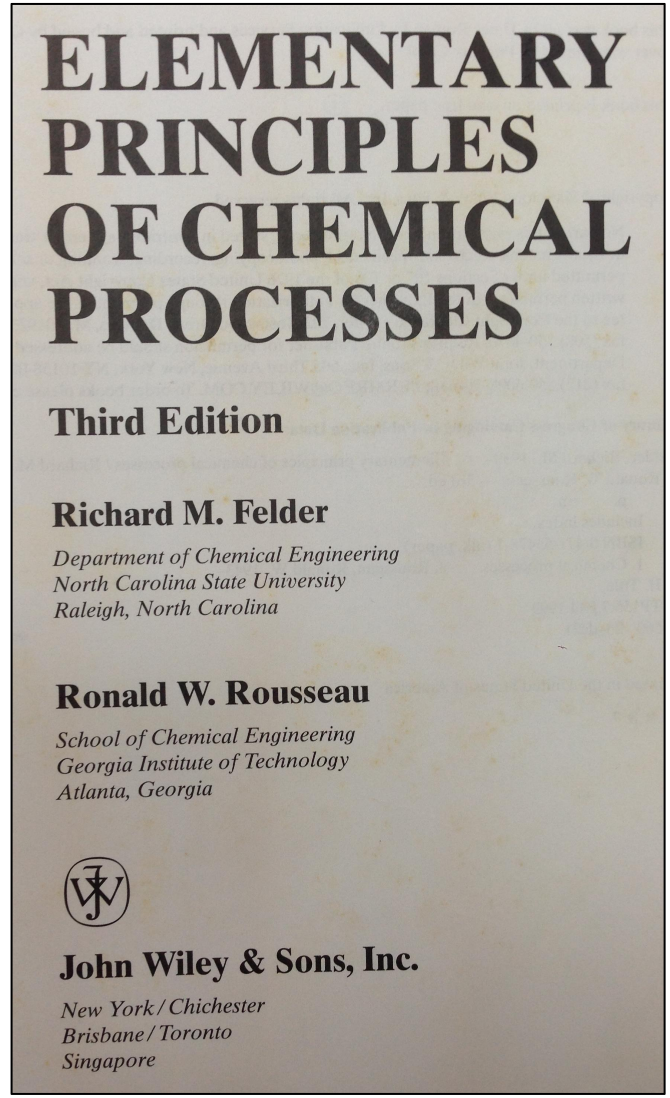

Reference List:

Felder, R.M., & Rousseau, R.W. (2000). *Elementary Principles of Chemical Processes* (3rd Edition). New York: John Wiley & Sons, Inc.

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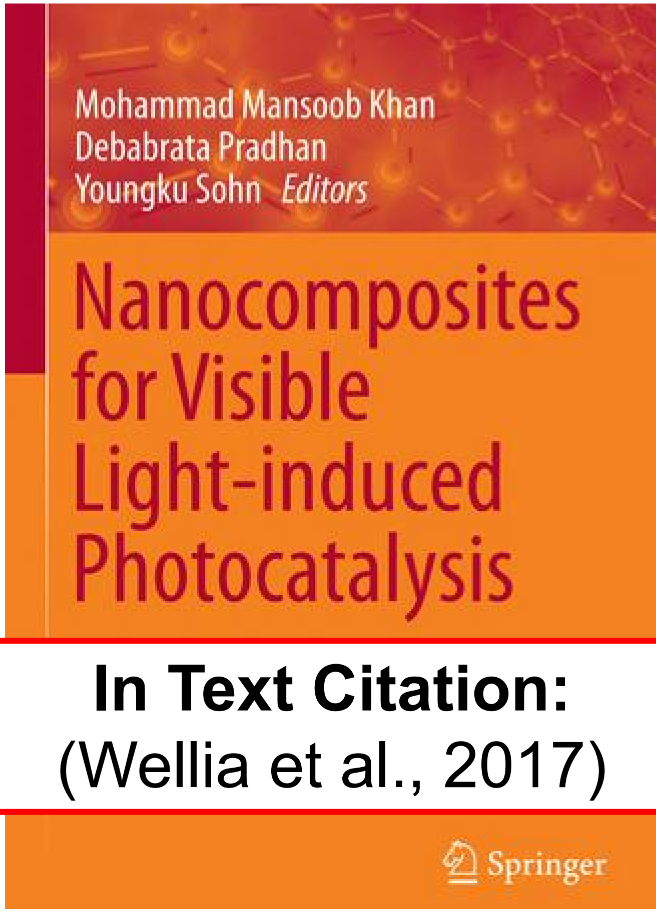

In Text Citation:
(Wellia et al., 2017)

Chapter 1
Introduction of Nanomaterials for Photocatalysis

Diana Vanda Wellia, Yuly Kusumawati, Lina Jaya Diguna and Muhamad Ikhlasul Amal

Abstract This introductory chapter discusses the rapid development of nanotechnology for the application of visible light-induced photocatalysis, which is driven by the unique material properties arising from the nanoscale dimensions. It includes the description of the carbon-based nanomaterials developed first in the early development such as fullerene, carbon nanotube, and graphene. Conductive polymers were then described as photocatalysts with different dimensional nanostructures. Moreover, semiconductors were presented as potential materials for photocatalysis. For the practical visible light applications, photocatalysts need to be modified either by narrowing the band gap or by inhibiting the recombination of charge carriers via the formation of heterojunction nanocomposites. As the focus of this book, nanocomposites have been reported as a promising strategy for high-activity visible light-driven photocatalysis. This chapter is also complemented with some examples of industrial applications of photocatalysis for practical use.

Keywords Visible light-induced photocatalyst · Photocatalysis · Nanocomposite · Nanoparticle · Nanomaterial

Reference List:

Wellia, D.V., Kusumawati, Y., Diguna, L.J., & Amal, M.I. (2017). Introduction of nanomaterials for photocatalysis. In M.M. Khan, D. Pradhan & Y. Sohn (Eds.), *Nanocomposites for visible light-induced photocatalysis* (pp. 1–18). New York: Springer

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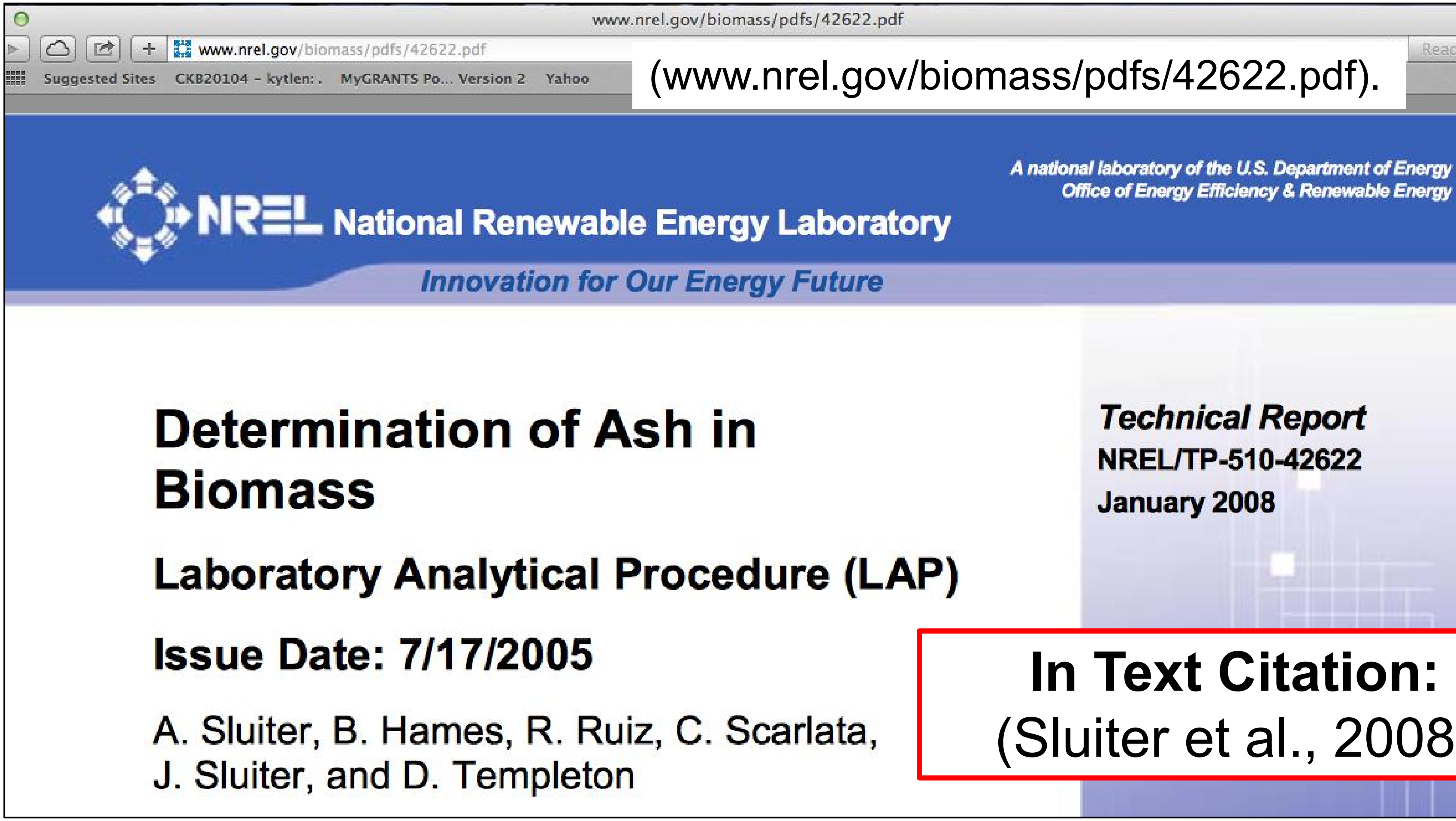

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Laboratory Analytical Procedure (LAP)

Issue Date: 7/17/2005

A. Sluiter, B. Hames, R. Ruiz, C. Scarlata, J. Sluiter, and D. Templeton

Technical Report
NREL/TP-510-42622
January 2008

(www.nrel.gov/biomass/pdfs/42622.pdf).

In Text Citation:
(Sluiter et al., 2008)

Reference List:

Sluiter, A., Hames, B., Ruiz, R., Scarlata, C., Sluiter, J., & Templeton, D. (2008, January). *Determination of ash in biomass*. Retrieved from http://www.nrel.gov/biomass/pdfs/42622.pdf.

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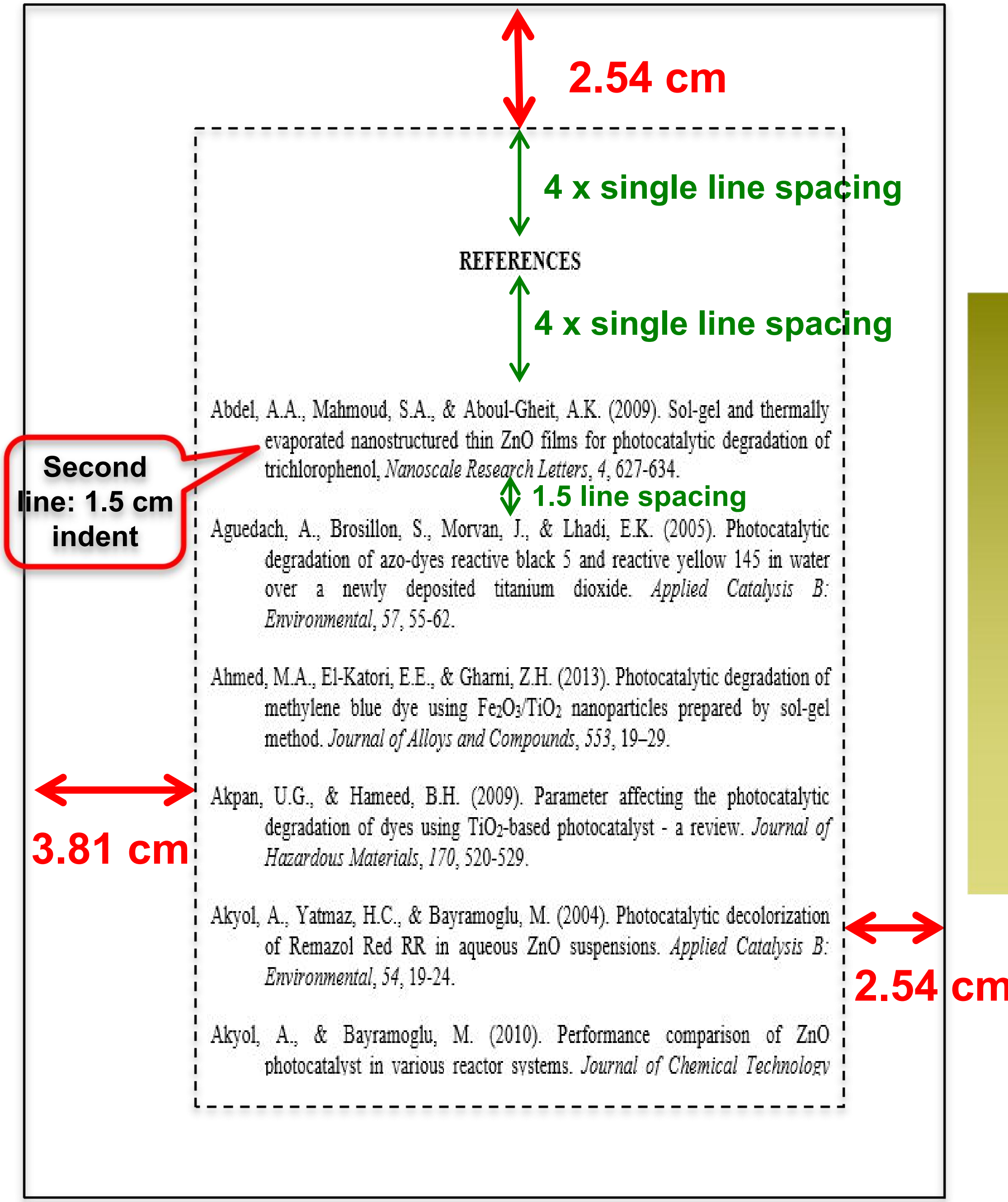

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Good Luck!