

Guidelines for the Preparation of Ph.D. Synopsis Report

for the award of the degree of
Doctor of Philosophy



CMR UNIVERSITY
Off Hennur- Bagalur Main Road, Chagalatti,
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SYNOPSIS

The Arrangement of Parts of the Ph.D. Synopsis

1. Cover Page / Facing Page

The title of the thesis, author, department, month and year of submission along with the emblem of CMRU should be included on the cover page. The cover page may be made in special quality paper like plastic coated paper (see the sample given below in Annexure I).

2. Inner Cover

The inner cover contents shall be same as that of the cover page, but printed on ordinary A4 size bond paper.

3. Contents of Synopsis

Layout: The following guidelines may be followed in the preparation of Ph.D. synopsis. The synopsis should give an overall outline of the thesis being prepared. The layout of the Ph.D. synopsis shall contain the following:

- (i) **Introduction:** The Introduction should at the best occupy one page. It shall justify and highlight the problem poser and define the topic and the aim and scope of the work presented in the synopsis. It may also highlight the significant contributions from the investigation.

For Example:

1. Introduction

Study of carrier kinetics is very important for characterising semiconductors and other materials for the development of devices. Several techniques are available for studying the transport properties of these materials. A few of them are given below:

- Resistivity - Linear Four Probe Method, Van Der Pauw Method
- Carrier Density and Carrier Mobility - DC Hall Effect
- Carrier Lifetime - Steady-State Photoconductivity Decay

The above-mentioned techniques require ohmic contacts, which invariably introduce impurities. So it is better to have a technique that is non-contact and non-destructive in nature. For non-destructive evaluation of the Hall mobility one can use the microwave Hall effect technique. In this technique, the charge carrier kinetics is analysed in a region, where a static magnetic field is applied perpendicular to the oscillating electric field, which generates current in the sample. The observation of this current using the cavity technique gives the measure of mobility.

1.1. Objectives and Scope of the Work

Non-contact and non-destructive experimental techniques are very important for current research, scientific and industrial applications. The study of electrical properties on semiconductor materials using these techniques is useful for *in-situ* applications and device fabrication. Microwave Hall effect is one such important technique, which gives information regarding the electrical properties of semiconductor materials. This technique is an invaluable tool to study the interesting properties such as the quantization of confined carrier motion in heterostructures. The main objectives of the present work are:

- To develop the microwave Hall effect arrangement using the bimodal cavities at X-band (8 - 12GHz) and P-band (12 – 18GHz) frequency regions.
- Microwave Hall effect studies on semiconductors and their heterostructures.
- Microwave Hall effect studies on polymer metal oxide composite films

1.1.1. State of art

The title of the synopsis should be as concise as possible. It must occur consistently in every respect, including punctuation, capitalization, and hyphenation, on the abstract and approval forms. On the title page, the identical title must appear in all capital letters with each line centered on the page. The month in which the synopsis is submitted, e.g., May, August, or January is to be printed at the bottom of the page. The title page is not numbered, but it is counted.

(ii) Problem Statement/State of Art/Motivation: The state of art should be from the area of research and not exceed one page. Trace to the point, the developments in the area, to emphasize the current status and importance of the research problem identified.

(iii) Brief Review of Earlier Work in the Same Field: Review of Literature shall present a critical appraisal of the previous work published in the literature pertaining to the topic of the investigation. The extent and emphasis of the **Literature** shall depend on the nature of the investigation.

For Example

Several researchers attempted to develop mathematical models to simulate the activated sludge process. Some of these models simulate the organic removal mechanisms in wastewater treatment field, which were included in Jorgensen and Gromiec (1985), Henze (1986), Henze et al. (1987a), Tang et al. (1987), and Van Niekerk et al. (1988). The oxygen transfer mechanism has an important place in the activated sludge process. An estimation technique for the oxygen transfer capacity is investigated by Stenstrom et al. (1989).

(iv) Overview of Ph.D. Thesis (Outline)

Brief details regarding the research problem, the solution, the solution methodologies adopted, the experiments conducted and the interpretation of the results.

Text

The text must be divided into a logical scheme that is followed consistently throughout the document. The larger divisions and more important minor divisions are indicated by suitable, consistent headings. Chapter organization as practiced by the discipline should be followed. Specific requirements for text presentation follow.

Headings and Subheadings

The scholar may use headings and subheadings to subdivide chapters or sections, but a consistent sequence of headings as identified in the style guide selected must be followed. Once the sequence is chosen, it must be followed consistently throughout the synopsis. Sections and sub-sections can be numbered using decimal points, e.g., 1.2, 1.2.1. Use only Arabic Numerals with decimals. Section numbering should be left justified using large bold print. Sub section numbering should be left justified using large bold print.

Tables, Figures and Equations Format

The term "Table" refers to a columnar arrangement of information, often data sets, organized to save space and convey relationships at a glance. The term "Figure" refers to graphs, drawings, diagrams, charts, maps, or photographs. All such details should be inserted in the text near where they are first mentioned. A table or figure may appear on the same page as the text that refers to it or on a separate page. Each figure or table must be numbered and have a caption. Captions are placed below figures and pictures and above tables. As far as possible tables and figures should be presented in portrait style. Small size table and figures (less than half of writing area of a page) should be incorporated within the text, while larger ones may be presented in separate pages. Table and figures shall be numbered. For example,

Figure 1:/ Table 1: Table number and title will be placed above the table while the figure number and caption will be located below the figure. Reference for Table and Figures reproduced from elsewhere shall be cited in the last and separate line in the table and figure caption, e.g. (after McGregor [12]).

All the equations should be typed in equation editor and should be properly numbered.

For Example

$$\Delta X \propto X \Delta t$$
(1)

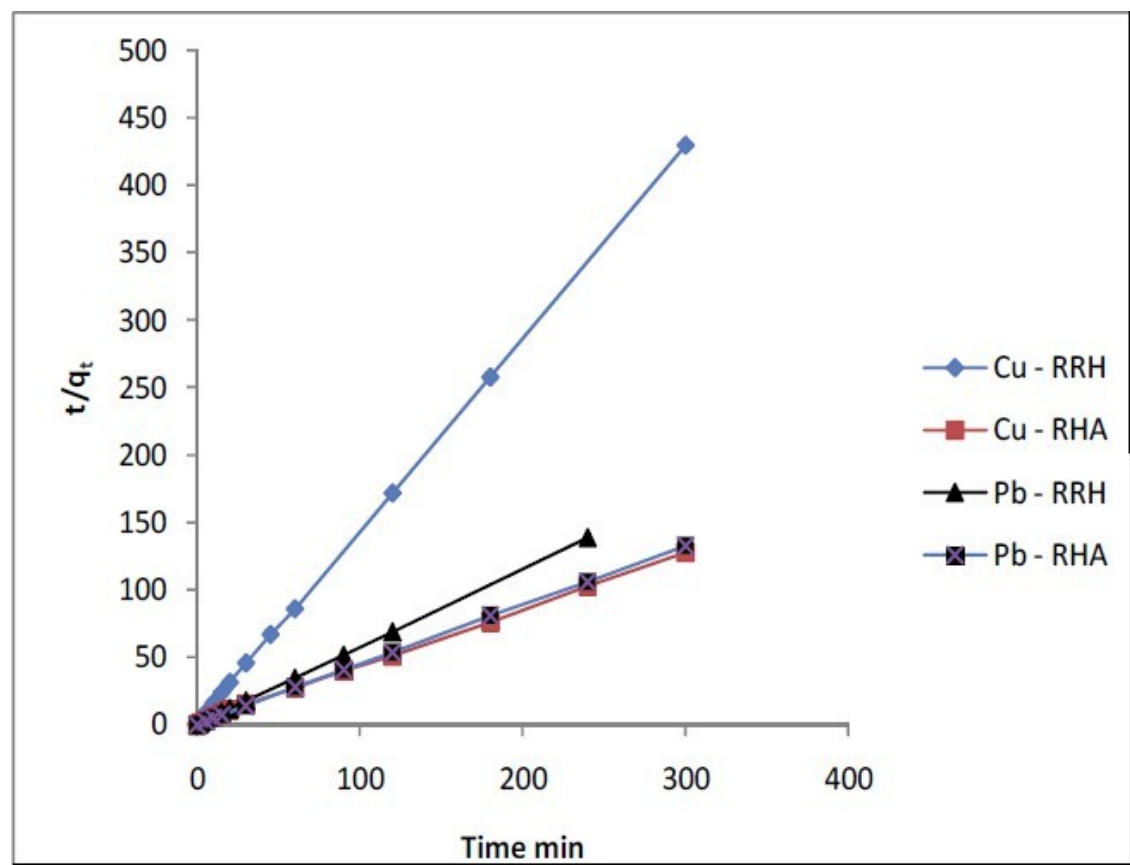


Figure 1: Pseudo Second Order Plot for Copper and Lead on RRH and RHA

Table 1: Desorption Study

Cycle	Metal/ Adsorbent	Copper		Lead	
		RRH	RHA	RRH	RHA
1	Adsorption	73%	97.5%	81%	98%
	Desorption	99%	99.5%	98.5%	99%
2	Adsorption	40%	30%	80%	38%
	Desorption	99%	99%	98%	99%

(v) Result and Discussion

This shall form the penultimate the synopsis and shall include a thorough evaluation of the investigation carried out and bring out the contributions from the study. The discussion shall logically lead to inferences and conclusions as well as scope for possible further future work.

For Example

5. RESULTS AND DISCUSSION

The research work is summarized in three different sections below. The first section discusses about the details of the microwave Hall effect experimental arrangement. The second section gives the results on the semiconductor samples and hetero-structures. The third section presents the results on polymer metal oxide composite samples.

5.1. Microwave Hall Effect Experimental Arrangement

The experimental arrangement for the microwave Hall technique is shown in Figure 1. This consists of a microwave vector network analyzer (N5230A), bimodal cavity and canceling channel configuration is shown in Table 1. The canceling channel consists of Agilent 87300B (10dB) coaxial directional couplers, Agilent 8495B (0 - 70dB) and 8494B (0 - 11dB) coaxial step attenuators and a Spectrum Elecktrotechnik GmbH LS-M018-2121 coaxial phase shifter. The canceling channel is necessary to remove the non-ideal mode coupling.

5.1.1. Design and fabrication of bimodal cavities

A bimodal cavity is a resonant cavity that consists of two orthogonal modes oscillating at the same frequency. The two modes have electric fields perpendicular to each other and are called primary and secondary mode. While the primary mode is used to couple the microwave energy to the sample, the secondary mode is used to couple the microwave power to the detection system. In this thesis work, cubical, cylindrical and rectangular (with square and rectangular cross sections) bimodal cavities were designed and fabricated.

Typical schematic of the cubical and cylindrical bimodal cavities are shown in Figure 2(a) and Figure 2(b). The basic characteristics of the constructed bimodal cavities are given in Table 1 and Table 2.

(vi) Summary and Conclusions Arrived out of the Dissertation

A brief report of the work carried out shall form the first part of the Summary and Conclusions. Conclusions derived from the logical analysis presented in the Results and Discussions shall be presented and clearly enumerated, each point stated separately. Scope for future work should be stated lucidly in the last part of the Summary and Conclusions.

(vii) Important References, Limited to 15-20 (as per the Citation)

References should be numbered as per international standards and reference list has to be prepared accordingly. Only those references, which are cited in the synopsis, need to be given in the list of references. In any case, the synopsis should be self contained to the extent possible even if efforts are to be made to make it as brief as possible.

References: References to journal/conference/books/book chapter/proceedings/thesis papers shall be made strictly confirming to international format. The reference list should contain the complete details like, name of the author(s), title of the paper, name of the journal, volume number, issue number, page numbers and year of publication. Similarly, conference papers should have the name of author(s), title of the paper, name of the conference, place in which the conference was held, month and year of the conference (along with the page numbers of the paper in the conference proceedings, if available). References to books should contain name of the author(s), title of the book, name of the publisher, edition number, year and place of publication.

For Example

Journal Article

[1] C. D. Scott and R. E. Smalley, "Diagnostic Ultrasound: Principles and Instruments", Journal of Nanosci. Nanotechnology, Vol. 3, No. 2, (2003), pp. 75-80.

Book

- [2] H. S. Nalwa, Editor, "Magnetic Nanostructures", 17th Edition, American Scientific Publishers, Los Angeles, (2003).

Chapter in a Book

- [3] H. V. Jansen, N. R. Tas and J. W. Berenschot, "Encyclopedia of Nanoscience and Nanotechnology", Edited H. S. Nalwa, American Scientific Publishers, Los Angeles, Vol. 5, (2004), pp. 163-275.

Conference Proceedings

- [4] J. Kimura and H. Shibasaki, "Recent Advances in Clinical Neurophysiology", Proceedings of the 10th International Congress of EMG and Clinical Neurophysiology, Kyoto, Japan, (1995), October 15-19.

Patent

- [5] C. E. Larsen, R. Trip and C. R. Johnson, "Methods for Procedures Related to the Electrophysiology of the Heart", U.S. Patent 5,529,067, (1995), June 25.

Thesis

- [6] J.L. Johnson, "Densification, Microstructural Evolution, and Thermal Properties of Liquid Phase Sintered Composites," Ph.D. Thesis, The Pennsylvania State University, University Park, PA, USA, 1994.

Technical Reports

- [7] E.G. Zukas, P.S.Z. Rogers, and R.S. Rogers, "Experimental Evidence for Spheroid Growth Mechanisms in the Liquid Phase Sintered Tungsten Based Composites," Informal Report: Los Alamos Scientific laboratory, USA, 1976, pp. 1-35.

Do not use the phrases "**et al.**" and "**ibid.**" in the reference section. Instead, the names of all authors in a reference must be listed.

1. For Papers by Single Author,

- [1] C. D. Scott, "Diagnostic Ultrasound: Principles and Instruments", Journal of Nanosci. Nanotechnology, Vol. 3, No. 2, (2003), pp. 75-80.

2. For Papers by Two Authors,

- [2] C. D. Scott and R. E. Smalley, "Diagnostic Ultrasound: Principles and Instruments", Journal of Nanosci. Nanotechnology, Vol. 3, No. 2, (2003), pp. 75-80.

3. For Papers by More Than Two Author,

- [3] Capodaglio, A.G., H.V. Jones, C. D. Scott and R. E. Smalley, "Diagnostic Ultrasound: Principles and Instruments", Journal of Nano-science Nanotechnology, Vol. 3, No. 2, (2003), pp. 75-80.

(viii) Proposed Contents of the Thesis: In synopsis, thesis outline must be added at the end. In thesis outline, include only chapter and section titles. Maximum one page only could be allotted for this section of the synopsis.

For Example

CHAPTER - 1 INTRODUCTION

- 1.1 General
- 1.2 Objectives

CHAPTER – 2 LITERATURE REVIEW

- 2.1 Membrane
- 2.2 Membrane Separation Technology
- 2.3 Types of Membranes
- 2.4 Membrane Separation Process
- 2.5 Liquid Emulsion Membrane
- 2.6 Types of Extraction Mechanism

CHAPTER – 3 METHODOLOGIES

- 3.1 Materials
 - 3.1.1 Span 80
 - 3.1.2 n- Hexane
 - 3.1.3 Sodium hydroxide
- 3.2 Experimental Procedure
 - 3.2.1 Emulsion preparation
 - 3.2.2 Extraction process
- 3.3 Operating Conditions

CHAPTER – 4 RESULTS AND DISCUSSION

- 4.1 General
- 4.2 Effect of Span 80
- 4.3 Effect of NaOH Concentration
- 4.4 Effect of n-Hexane
- 4.5 Effect of Stirring Speed during Extraction
- 4.6 Effect of Feed Concentration

CHAPTER – 5 SUMMARY AND CONCLUSION

- 5.1 Summary
- 5.2 Conclusions
- 5.3 Scope for Future Work

REFERENCES

(ix) List of Publications Out of the Ph.D. Work (Journal and Conference Papers Separately)

List of publications: At the end of the synopsis, a list the publications from the research work shall be provided. Only published or accepted papers need be listed, indicating title of the paper, name of the journal/conference, volume and page numbers, month and year, etc. Under-preparation/communicated manuscripts are not allowed.

Format: The general format of the Ph.D. synopsis should be similar to that of the thesis (refer the format for preparation of Ph.D. thesis), except that, detailed nomenclature, figures, tables etc. may not be essential in the synopsis.

4. Number of Copies

Two copies of the synopsis are to be submitted to the University.

5. Size of Synopsis

Length: The synopsis is considered as an extended summary of the work with important results, highlighting the original contributions in the thesis to be submitted. It shall be limited to 15-20 pages (including title page) typed in 1½ spacing with font ‘Times New Roman’ size 12 on A4 size bond paper. For the synopsis submission, edge should be covered with a BLACK tape.

6. Paper Specification

Use high-quality acid-free A4-size (297 mm x 210 mm) executive bond paper.

7. Text Font & Spacing

Font & Letter Size: Font: Times New Roman. Font size of the Ph.D. synopsis materials shall be 12 with bold for section headings. Latex or any other equation editor should be used for preparing the equations. The thesis or report must be 1.5-spaced.

8. Margins

Left, 4 cm; top, bottom and right 2.5 cm. These are necessary to allow for binding and trimming.

9. Binding Specifications

Two copies of synopsis should be bound with black calico cloth, using flexible cover of thick white art paper. The cover should be printed in black letters and the text for printing should be identical to what has been prescribed for the title page. Soft copy of the synopsis with/without front page (.pdf and .doc files) in CD form (one No) with proper labeling should be submitted along with the hard copy of the synopsis.

Requirements: It is expected that at the time of submission of the synopsis no work is yet to be completed except writing the thesis and all other academic requirements such as course work, comprehensive examinations, open seminars and all the suggestions by members of the DC have been incorporated.

10. Submission of Synopsis

The submission of Ph.D. synopsis to the research section should as per the forwarding note or check list (Sample Attached).

Ph.D. scholars Synopsis/ Thesis Application Submission Checklist

Research Scholar Name:	
Reg No.	
Discipline:	

1. Tuition Fees Payment:

I Yr	II Yr	III Yr	IV Yr	V Yr	VI Yr

2. Course Work Classes: Attended/Not Attended

Course Work I	Course Work II	
Research Methodology	Research & Publication Ethics	Domain Specific Course

3. Term End Exams: Completed/Not Completed

Course Work I	Course Work II	
Research Methodology	Research & Publication Ethics	Domain Specific Course

4. Research Advisory Meeting (RAC): Attended/Not Attended

I	II	III	IV	V	VI

5. Research Progress Report: submitted/not submitted

I	II	III	IV	V	VI

6. Research Supervisor: Allotted/Not Allotted

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7. Guide Allotment Letter to Student: Sent/Not Sent

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8. Guide Allotment Letter to Research Supervisor: Sent/Not Sent

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9. Finalization of Research Topic: Approved/ Not Approved

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10. Research Proposal: Submitted/ Not Submitted

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11. Conference Paper Presentation: Submitted/ Not Submitted

I	II	III	IV	V	VI

12. Research Paper Published in peer reviewed Journals (UGC Care List): Submitted/ Not Submitted

I	II	III	IV	V	VI

13. Submission of Synopsis (01 Copy) & Draft Thesis (01 Copy) Submitted/ Not Submitted

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14. Pre-Thesis submission colloquium: Completed/Not Completed

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15. Submission of panel of examiners by research supervisor: Submitted/ Not Submitted

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16. Selection of examiners by the Vice Chancellor: Submitted/ Not Submitted

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17. Soft copy of the Thesis submitted for plagiarism check in CD form: Submitted/ Not Submitted

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18. Application submitted for Thesis submission with payment of submission fees: Submitted/ Not Submitted

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19. Submission of Final thesis & Synopsis (03 Copies): Submitted/ Not Submitted

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20. Thesis forwarded to Examiners: Forwarded/ Not Forwarded

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21. Submission of report on thesis by examiners: Submitted/ Not Submitted

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22. Submission of Final thesis incorporating corrections/suggestions (02 Copies): Submitted/ Not Submitted

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23. Date of Viva-Voce examination

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24. Issue of PhD Declaration Notification by Registrar (E): Issued/ Not Issued

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25. Recommendations by the RAC to the Academic Council for awarding PhD. Submitted/ Not Submitted

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26. Issue of Provisional Certificate of PhD in accordance with UGC Regulations: Issued/ Not Issued

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27. Submission of Soft Copy of Thesis to UGC Depository (INFLIBNET): Submitted/ Not Submitted

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Note*: Original Documents are verified

Director

Directorate of Research & Innovation
CMR University

ANNEXURE I

SYNOPSIS OF THESIS

**INDUCTION MOTOR SPEED CONTROL USING
SPACE VECTOR PULSE WIDTH MODULATION**

 <1.5 line spacing>

A SYNOPSIS

Submitted by

 <Italic>

MUTHU. S.

Registration Number:

 <Italic>

in partial fulfilment for the award of the degree of

 <Italic> <1.5 line spacing>

DOCTOR OF PHILOSOPHY

Under the Supervision of

Name of the Supervisor



SCHOOL OF MANAGEMENT

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CMR UNIVERSITY

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Off Hennur- Bagalur Main Road, Chagalatti,

Bangalore - 562149, Karnataka

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MONTH – YEAR

ANNEXURE II (Thesis Front Page)

LOREM IPSUM DOLOR SIT AMET, CONSECTETUR

ADIPISCING ELIT.

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A Thesis

Submitted by

** <Italic>**

AUTHOR

Registration Number:

** <Italic>**

in partial fulfilment for the award of the degree of

** <Italic> <1.5 line spacing>**

DOCTOR OF PHILOSOPHY

Under the Supervision of

Name of the Supervisors

Supervisor 1

Supervisor 2



SCHOOL OF MANAGEMENT

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CMR UNIVERSITY

<1.5 line spacing>

Off Hennur- Bagalur Main Road, Chagalatti,

Bangalore - 562149, Karnataka

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**MONTH – YEAR **

