KMM4000

Graduation Thesis

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2023-2024 Spring

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WHAT IS SCIENTIFIC RESEARCH?

Research is the collection of information about a topic. It is the effort made to find, develop and check the accuracy of the information.

Scientific research is the process of defining the problem in order to search for reliable solutions to the problems, collecting, analyzing, interpreting and evaluating the data of the problem in a planned and systematic manner and writing all these as reports.

In order for a research to acquire a scientific character; It should be carried out with scientific purpose, scientific methods and systematic studies.

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BASIC PRINCIPLES OF SCIENCE

1. To have professional competence in the planning and conduct of research.
2. To maintain self-criticism, honesty and openness during the conduct of the research and the analysis of the findings.
3. To fairly evaluate the contributions of other researchers who have done and are conducting research on the same topic.

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Scientific Research Process

Literature Review

Identification of the Research Problem

Reading and Summarizing Sources

Determination of Research Methods and Techniques

Data Collection and Analysis

Interpretation of the Findings

Preparation of Research Report

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Method in Research (Method)

All the work to be done in scientific research, from the selection of the subject to the conclusion of the study and its making into a report, should be carried out in a certain order. This pattern illustrates the method of research.

- Research Model
- Universe (research cluster) and sample (sample)
- Collection of data
- Analysis of data

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Scientific Misconduct

Types of unethical behavior in science:

1. Undisciplined (Careless or Careless) Research
2. Duplication
3. Falsification, Falsification
4. Manufacturing
5. Plagiarism

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Kaynak: Bilimsel Arastırmada Etik ve Sorunları,Türkiye Bilimler Akademisi Yayınları,2002

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Determining the Subject

Before putting forward a new study in a scientific sense, the researcher should collect information about the subject he has determined and review what other researchers are doing.

This stage;

* to collect information about the subject to be studied,

* to see whether the subject has been studied before, and if so, what innovations can be made,

* provides a good way of providing information when writing the report.

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Hypotheses

A hypothesis is an assumption that is accepted as true but whose truth has not been tried, untested.

It is used to express the relationships that are predicted to exist between events or variables.

A good hypothesis;

be consistent with the objectives
it should be clearly stated
must be testable
it should be understandable
must contain all variables

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Resource Review (Literature Review)

It is the most important stage of research.

Resource research;

- to have knowledge about the research subject,
- to see whether the subject has been studied before and if so, what innovations can be added to the subject,
- to use ready-made information in solving the problem, interpreting the data,
- provides a good way of providing information when preparing the research report.

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For the source scan phase to be successful:

Resource screening and source review should be carried out in accordance with research objectives and hypotheses.

Resource screening should be carried out starting from the latest studies.

It is necessary to determine how the sought source (book, periodical, etc.) can be reached.

It is necessary to reach accurate and reliable sources.

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How to scan the resource:

The research topic is determined.

Keywords related to the subject are determined.

Sources with scientific content related to the research subject are reached.

The resources are read.

Evaluated.

The sources we will use are noted and listed to create a bibliography.

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- Resources to Be Examined:
- Books
- Encyclopedias and dictionaries
- Periodicals
- National and International Scientific Indexes
- Patentler
- Theses
- Documents
- Research reports
- Conference articles, abstracts
- Press organs
- Internet research
- Contact persons

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Scientific journals;

- International (SCI, SCI-Expanded, SSCI and AHCI) journals
- National refereed journals
- Field indexed journals
- Refereed journals

Libraries and databases are used to search scientific journals and books.

sciencedirect, scopus, google academic, ulakbim

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Literature Reading

- We must mark the parts that we find important.
- We should make small notes in the parts that we find important.
- We should also investigate the references that we find important in the source we are examining.

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Avoid:

- Spending a lot of time on resource research
- Cut and paste
- Trying to sort resources instead of classifying them

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SCIENTIFIC WRITING

In transcribing scientific results, it should be taken into account what kind of publication will be.

- Thesis
- Report
- Article
- Book

It is written in accordance with scientific rules and rules given for content.

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Preparation of Scientific Writing

- Thoughts should be expressed clearly, concisely and accurately, and each paragraph should be a whole concept.
- There should be a logical transition between paragraphs.
- The format used and the presentation of the information are important.

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Thesis

You may find the Fkhp lfdo#Hqjlqhhulqj#Ludgxdwlrq#Wkhvlv#Jxlghodqhv dqg doowkh uhodwhg irup v l**n the web-site:**

YTU DEPARTMENT OF CHEMICAL ENGINEERING (yildiz.edu.tr)

The evaluation criteria of the theses prepared are as specified in the FR-1579 (Faculty Of Chemical And Metallurgical Engineering Department Of Chemical Engineering Graduation Thesis Interim Report Evaluation Form), FR-1583 (Faculty Of Chemical And Metallurgical Engineering Department Of Chemical Engineering Graduation Thesis Evaluation Form And Jury Report)

Chemical Engineering Graduation Thesis Guidelines

Graduation Thesis Inner and Outer Cover Format

2022-2023 Spring Graduation Thesis Subject and Student List

According to the current regulation, the dissertations are submitted to the student office on the first day of the exam period after the completion of the semester with the approval of the consultant instructor on the CD and with the form of FR-0745.

According to the current regulation, the dissertations are submitted to the student office on the first day of the exam period after the completion of the semester.

2022-2023 Spring Graduation Thesis Callendar

FR coded döcuments are available on https://kalite.yildiz.edu.tr/sayfa/Kalite-Dok%C3%BCmanlar%C4%B1/Formlar/339 website.

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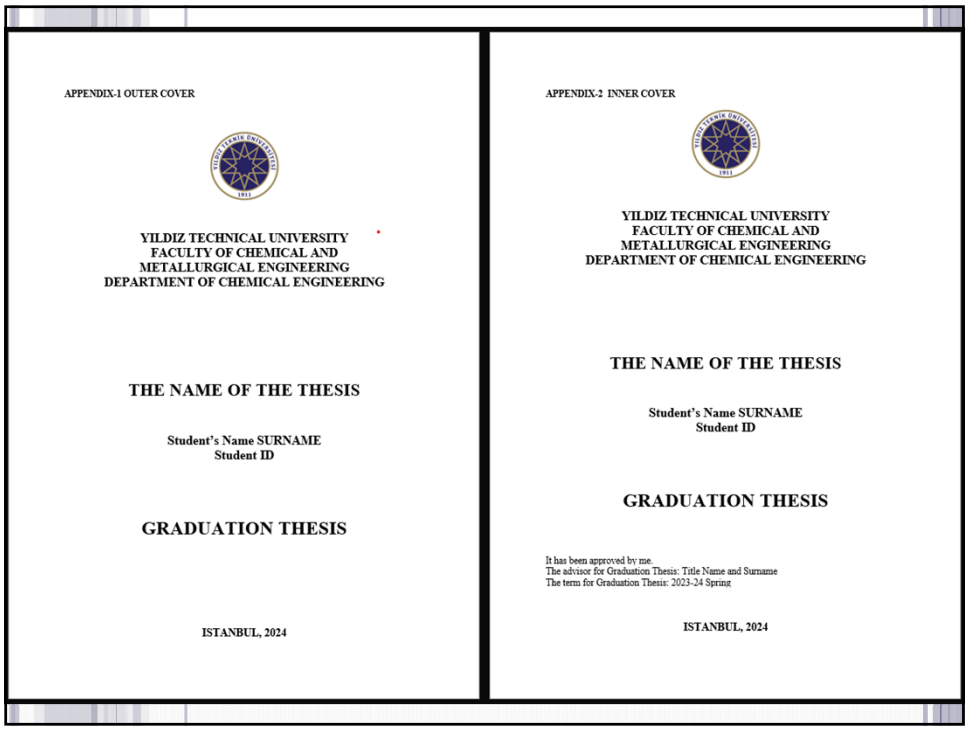

APPENDIX-1 OUTER COVER

YILDIZ TECHNICAL UNIVERSITY
FACULTY OF CHEMICAL AND
METALLURGICAL ENGINEERING
DEPARTMENT OF CHEMICAL ENGINEERING

THE NAME OF THE THESIS

Student's Name SURNAME
Student ID

GRADUATION THESIS

ISTANBUL, 2024

APPENDIX-2 INNER COVER

YILDIZ TECHNICAL UNIVERSITY
FACULTY OF CHEMICAL AND
METALLURGICAL ENGINEERING
DEPARTMENT OF CHEMICAL ENGINEERING

THE NAME OF THE THESIS

Student's Name SURNAME
Student ID

GRADUATION THESIS

It has been approved by me.
The advisor for Graduation Thesis: Title Name and Surname
The term for Graduation Thesis: 2023-24 Spring

ISTANBUL, 2024

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Formal Structure

A scientific report consists of the following sections:

- FRONT MATTER
  - Title Page
  - Preface
  - Table of Contents
  - List of Tables and Figures
  - Abbreviations and Symbols
- BODY TEXT
  - Introduction
  - Sections
    - *Theory and Principles*
  - Method
    - *Materials*
    - *Procedure*
  - Results
  - Discussion
  - Conclusion
- BACK MATTER
  - References
  - Appendix

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APPENDIX-4 EXAMPLE OF TABLE OF CONTENTS (EXPERIMENTAL STUDY)

TABLE OF CONTENTS

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LIST OF ABBREVIATIONS iii
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Table: The presentation of information in a specific order. Tables include table number, title, frame, content, footnotes, and sources. The table number and title are located above the table.

Table 3.1 Kinetic parameters calculated according to the second-order model for the samples

Samples	$q_{e,\ experiment}$ (g/g)	$q_{e,\ calculated}$ (g/g)	k_2 (1/h)	R^2
S_1	8,151	8,048	0,09	0,9977
S_2	5,080	5,116	0,80	0,9995
S_3	4,627	4,742	0,93	0,9995
S_4	1,436	1,437	5,03	0,9996

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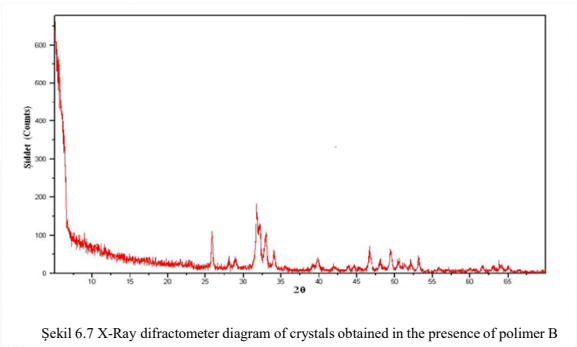
Figure: Any type of graphic, image, or the like, excluding tables, is referred to as a figure. Figures include figure number, title, frame, content, and sources. Figure numbers and titles are located below the figure.



Şekil 6.7 X-Ray difractometer diagram of crystals obtained in the presence of polimer B

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Source Usage, Bibliography and Reference Display

When preparing a scientific study, it is essential to cite the sources of all information used in the study.

- This is crucial from a scientific ethics perspective.
- It is important to acknowledge the authors' efforts.
- It is crucial for the responsibility of the provided information.
- The sources used also serve as an indicator of the reliability of the study.

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Things to Consider When Creating a Bibliography

1. Every scientific study must have a bibliography section.
2. Each source referred to in the text should be included in the bibliography.
3. Each source listed in the bibliography must be cited in the text.
4. All sources listed in the bibliography should be those the author has found and examined.
5. The bibliography should be created in accordance with citation writing rules.
6. Sources should be provided in full and accurately

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Citation within the Text

1) Single-author citation

Perfect geometric symmetry is rarely observed in crystals (Myerson, 2002).

2) Two-author citation

It has been demonstrated through research that regions on the surface possess different energy levels, and particles will preferentially choose the location where the most energy is released upon their interaction with the surface (Nyvlt and Ulrich, 1995).

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Citation within the Text

3) Citation with more than two authors:

Parameters such as supersaturation, pH, temperature, and impurities are factors influencing crystal growth (Doğan et al., 2010).

4) Simultaneous citation of multiple sources:

In studies examining the effect of additives on the crystallization process (Doğan et al., 2010; Aydeniz et al., 2008).....

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Citation within the Text

5) Citation of different publications by the same author with different dates:

Controlling the structure, size, and morphology of inorganic crystals is crucial in material production with specific dimensions and morphology (Doğan, 2006, 2008).

6) Citation of publications by the same author in the same year:

Controlling the structure, size, and morphology of inorganic crystals is crucial in material production with specific dimensions and morphology (Doğan, 2006a, 2006b).

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Citation within the Text

7) Simultaneous citation of multiple sources:

Various approaches have been developed to control the nucleation and crystal growth stages (Dogan et al., 2008; Akyol et al., 2004; Öner et al., 1998).

8) Citation for unidentified or Anonymous information:
(Anonymous, 2020)

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Examples of Citation within the Text

Doğan (2017) investigated the effect of experimental conditions and additives on the specific surface area of crystals in his study.

In their research, Doğan and Kirboğa (2017) ……

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Representation of Equations within the Text

- calculated using Fourier Equation (Equation 2.1).
- calculated using Equation (2.1).
- calculated using Equation 2.1.

This analysis provides information regarding the mass density distribution (Equation 2.1)."

$$A = \pi r^2 \qquad (2.1)$$

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Representation of Tables and Figures within the Text

Experiments and reaction conditions are provided in Table 6.1.

Particle size variation against solubility is illustrated in Figure 3.1.

The conductivity of the solution has changed over time (Figure 3.2).

The temporal evolution of solution conductivity is depicted in Figure 3.2.

As seen in Figure 7.1, ……

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Representation of References within the Text

For this purpose, various approaches have been developed to control the nucleation and crystal growth stages of mineral formation by adjusting solution pH, altering aging time, and using organic or inorganic additives (Li et al., 2002; Manoli et al., 2002; Yu et al., 2004; Butler et al., 2006).

The vaterite fraction in the crystal structure of specimens subjected to a 1-day aging process was calculated using Rao's Equation (Equation 1), revealing that the obtained crystals had a composition of 45% vaterite and 55% calcite (Wei et al., 2003; Han et al., 2006).

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References

- Journals and E-Journals:

İnci, N., (2017), İş Sağlığı ve Güvenliğinde Risk Faktörlerinin Analizi, http:/İş Sağlığı ve Güvenliği dergisi.net/yıl/2016/0504005.pdf

- Single author article in periodical publications:

Coren, S. (1986). An efferent component in the visual perception of direction and extent. Psychological Review, 93 (4), 391- 411.

- Chapter of an edited book:

Pinker, S. (1998). Language acquisition. In M. I. Posner, (Ed.). Foundations of cognitive science (6th ed.) (359-400). Massachusetts: MIT Press.

- Book, translated book or editored Book:

Richey, R. C., & Klein, J. D. (2008). Research on design and Developmen. In J. M. Spector, M. D. Merrill, J. Van Merrienboer, & M. P. Driscoll (Eds.), Handbook of Research for Educational Communications and Technology (3rd ed., pp. 748-757). Newjersey: Lawrence Erlbaum associates, Publishers.

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References

- Formal publications: The name of the institution in which the formal publication is published. (Year). Name of the publication (Publication serial number). Publication place: Publishing house.

National Institute of Mental Health. (1990). Clinical training in serious mental illness (DHHS Publication No. ADM 90-1679). Washington, DC: U. S. Government Printing Office.

- Thesis: Author, M. M. (2017). The name of the M.S. or Ph.D. Thesis (M.S. Thesis or Ph.D. Thesis). Obtained from www. database. (access date or sequence number)

Ünal, A., (2016), İş Sağlığı ve Güvenliği eğitiminde Eğitim Yöntemlerinin kullanımı. Yayınlanmamış Yüksek Lisans Tezi. Gedik Üniversitesi. Sosyal Bilimler Enstitüsü, İstanbul. htpp:/www. yök.gov.tr. (Aralık, 2016).

- Internet site: Author's surname, The initial of the author's name. (Publication or update date). Name. access date, internet address.

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Walker, J. R. (1995). MLA – style citations of electronic sources. Retrieved October 26, 1995, from http://www.cas.usf.edu/english/walker/mla.html.

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1. Pugh, J.W., Sukan, F.V. (1994).Technical and Formal Writing. İzmir: Ege Üniversitesi Basımevi.
2. Cebeci, S. (2010). Bilimsel Araştırma ve Yazma Teknikleri (3. Baskı). İstanbul: Alfa Yayınları.
3. Bilimsel Arastırmada Etik ve Sorunları,Türkiye Bilimler Akademisi Yayınları,2002

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