



Student Name _____

School Name and City _____, _____



Digging Deeper into Abstracts

Alliance for Minority Participation (AMP) Conference - Optional Activity to Use with the entire MESA Club (Give credit for 1 workshop in MIMS for each student who completes)

The conference provides an opportunity for students to present their research and gain presentation experience, to serve as role models for other students, and to participate in workshops and panels that help them plan their academic and professional careers. The event also serves as a vehicle for student and faculty networking and as a forum for STEM students, instructors, and industry professionals to share information, ideas, experiences, and advice.

What's an Abstract?

- *A brief comprehensive written summary of a research project*

Purdue OWL (Online Writing Lab) provides the following descriptions of the types and qualities of a good abstract: <https://owl.english.purdue.edu/owl/resource/656/1/>

Types of abstracts - There are two types of abstracts: informational and descriptive.

Informational abstracts

- *Communicate contents of reports*
- *Include purpose, methods, scope, results, conclusions, and recommendations*
- *Highlight essential points*
- *Are short—from a paragraph to a page or two, depending upon the length of the report (10% or less of the report)*
- *Allow readers to decide whether they want to read the report*

Descriptive abstracts

- *Tell what the report contains*
- *Include purpose, methods, scope, but NOT results, conclusions, and recommendations*
- *Are always very short— usually under 100 words*
- *Introduce subject to readers, who must then read the report to learn study results*

Qualities of a good abstract

An effective abstract

- *Uses one or more well-developed paragraphs, which are unified, coherent, concise, and able to stand alone*
- *Uses an introduction-body-conclusion structure in which the parts of the report are discussed in order: purpose, findings, conclusions, recommendations*
- *Follows strictly the chronology of the report*
- *Provides logical connections between material included*
- *Adds no new information but simply summarizes the report*
- *Is intelligible to a wide audience*



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Outline of Abstract

CHEMISTRY ABSTRACT EXAMPLE

In this experiment, chromatography was used to analyze amino acids in solution. Standards were used to identify unknown amino acids in a mixture. **Ascending layer chromatography with an isopropanol-based solvent was used to separate the amino acids, which were then detected with ninhydrin. The unknown mixture analyzed was found to contain aspartate and histidine. It was observed that hydrophobic amino acids were most mobile.** This technique was shown to be an effective way of analysing unknown mixtures of amino acids. **A mechanism for ninhydrin binding to amino acids is proposed, based on observations from this experiment.**

Description aim/
objective

Method

Results

Conclusion

Further
conclusion

ENGINEERING ABSTRACT EXAMPLE

A detailed comparison of the properties and microstructures of conventionally sintered and microwave sintered samples of 3 mol% and 8 mol% yttria zirconia was performed. Identical thermal profiles were used for both types of heating. **For both materials, microwave heating was found to enhance the densification processes which occur during constant rate heating. The 3 mol% yttria zirconia material exhibited a shift in the grain size/density relationship which favours densification, resulting in higher density samples with smaller grain sizes at densities below 96% of theoretical density. At higher densities, significant grain growth occurs.** For the 8 mol% yttria zirconia material, the grain size / density relationship remained unchanged. Differences in the response of the two materials are attributed to the differences in the activation energy for grain growth, and in grain boundary mobility. **Modulus of rupture and toughness of both microwave and conventionally sintered samples were similar. Following isothermal heating at 13000C, microwave heated samples were found to be significantly more dense than conventionally heated samples. This temperature also restricted grain growth once densification was approaching completion. These findings have significant implications for the commercial application of microwave sintering. It appears that this method of sintering produces a superior product to conventional sintering.**

Aim of the research

Method

Summary of overall
results

Detailed result for one
of the experiment's
samples

Detailed result for the
other of the
experiment's samples

Further results
(comparison of two
methods of sintering)

Significance of the
results

BIOLOGY ABSTRACT EXAMPLE

Many plants in Australia have their seeds buried in order for the species to survive fires. The seeds start to germinate under the soil at certain temperatures. **Seeds of Acacia terminalis and Dillwynia floribunda were examined in this experiment. It was hypothesised that the seeds need heat for the germination to start.** Seeds of the two species were treated in hot and cold water and left to start germinating. **Acacia terminalis showed a significant response in germination after the hot water treatment while Dillwynia floribunda did not. Neither seed showed a response in germination after cold water treatment. The results for Dillwynia floribunda were unexpected but may be explained by factors such as water temperature and the length of time the seeds remained in the heated water.**

Background
Information

Outline of what was
investigated in this
experiment

Hypothesis

Summary of Method

Summary of Results

Summary of Discussion



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Outline of Abstract - Can you IDENTIFY the outline parts in the abstracts below?

- **Background/Objective**
- **Methods**
- **Results**
- **Conclusion**

<p>THE EFFECTS OF POSITIVE AND NEGATIVE SPACE REVERSAL ON VISUAL PERCEPTION IN CHILDREN WITH AND WITHOUT DYSLEXIA: PHASE III</p> <p>The purpose of this study was to determine if children between the ages of nine and twelve with dyslexia are able to read and understand with more accuracy passages presented when the positive and negative space is reversed (black background with white letters). It was hypothesized that the reading accuracy and comprehension of the dyslexic students would be improved with this reversal of positive and negative space. A test was created consisting of four paragraphs (two presented normally and two reversed) and two reading comprehension questions per passage. A total of 37 dyslexic students and 34 non-dyslexic students were tested. The students were given 90 seconds to read each passage; the reading comprehension questions were given and answered orally.</p> <p>It was found that the dyslexic students made less error when reading the passages presented on the black background. The reading comprehension of the dyslexic students was slightly improved by the reversal of positive and negative space. The reversal of the positive and negative space had no effect on the non-dyslexic students reading accuracy or comprehension. A chi-square test was completed comparing the black and white background reading accuracy for the dyslexic students. This test yielded a P-value of 3.46E-20 (a highly significant value). In addition a Comparison of Two Means test was also completed comparing background color, which also yielded significant results. Finally a 99% Confidence Interval was established, from which can be said with a 99% confidence that the mean reading errors of the dyslexic students will be 1.65 less when reading reversed passages. Thus, it can be concluded that it is beneficial for dyslexic students to read passages presented when the positive and negative space is reversed.</p>	<p>Example #1</p> <p>Rank this Abstract</p> <p><input type="checkbox"/> EFFECTIVE</p> <p><input type="checkbox"/> BETTER</p> <p><input type="checkbox"/> INEFFECTIVE</p>
<p>SYNTHESIS AND EVALUATION OF A MOLECULARLY IMPRINTED POLYMER FOR THE ENANTIOMERIC RESOLUTION OF L- AND-D- PHENYLALANINE</p> <p>Molecularly imprinted polymers (MIPs) are synthesis network polymers that contain recognition sited for specific molecules. MIPs are designed to bind the molecule that they have been imprinted with over other structurally similar molecules. The goal of this project was to create a beta- Cyclodextrin (BCD) based MIP imprinted with the amino acid L-Phenylalanine (L-Phe).</p> <p>MIPs, which are prepared based on relatively weak intermolecular attractions between the template molecule and pre-polymer components, have decreased binding abilities in polar solvents. However, to be used in many practical applications in the future, MIPs will need to be able to function in polar solvents such as water. In this project, the goal was to synthesize a MIP that could bind L-Phe in an aqueous solution by using the hydrophobic attraction provided by the B-CD cavity.</p> <p>MIPs were formed by polymerizing (crosslinking) B-CD with m-xylylene disocyanate (XDI) in the presence of L-Phe (template molecule). CuCl₂ was used to increase the solubility of L-Phe in DMSO (dimethyl sulfoxide, solvent). Control polymers were formed in the same way, but in the absence of L-Phe and CuCl₂. All polymers were thoroughly washed and dried to prepare them for rebinding studies and analysis.</p> <p>The polymer obtained from the synthesis described was analyzed with IR spectroscopy, and the structure of the polymer was proposed.</p> <p>Due to difficulties in removing background UV-V is absorption caused by the polymer or other contaminants in rebinding study solutions, the efficacy of the polymer in binding L-Phe over D-Phe in aqueous media was not confirmed, and will be the focus of future studies.</p>	<p>Example #2</p> <p>Rank this Abstract</p> <p><input type="checkbox"/> EFFECTIVE</p> <p><input type="checkbox"/> BETTER</p> <p><input type="checkbox"/> INEFFECTIVE</p>
<p>DEVELOPMENT BY DESIGN AND TESTING OF A MINIATURE TO HARNESS KINETIC ENERGY FROM AIRFLOW AROUND A MOVING AUTOMOBLE</p> <p>This project presents a summary of a successful design, fabrication and testing of wind turbines mounted on a car roof for the purpose of extracting power from the kinetic energy (dynamic pressure) contained in the wind flow around the car. The placement of the turbine was based on aerodynamic considerations. Various design concepts were tested and evaluated. Drag tests were conducted that showed the turbine did not negatively impact vehicle performance. NACA (National Advisory Committee for Aeronautics) ducts were evaluated and shown to offer additional choice for turbine design and placement. The results obtained from the tests conducted in this research demonstrate the feasibility for the efficient extraction of energy from wind flow around an automobile. Literature research consisting mainly of a review of NACA reports supported the findings of this study.</p>	<p>Example #3</p> <p>Rank this Abstract</p> <p><input type="checkbox"/> EFFECTIVE</p> <p><input type="checkbox"/> BETTER</p> <p><input type="checkbox"/> INEFFECTIVE</p>