Diffraction grating experiment lab report

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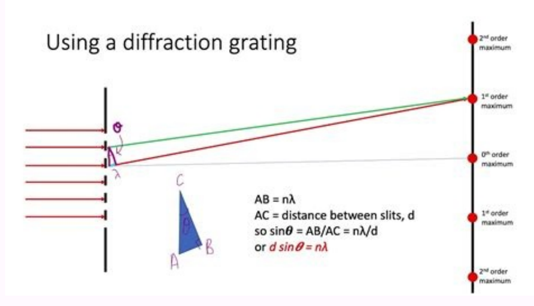

Measuring the Spacing of a Diffraction Grating

Purpose:
[illegible]

Procedure:
[illegible]

Results:
[illegible]

[illegible]

Determination of wavelength of LEDs using a grating spectrometer

Objectives

At the end of this activity, you should be able to:

1. learn to use a grating spectrometer
2. understand the concept behind a diffraction grating
3. determine the wavelengths of different LEDs

Introduction

A spectrometer is an instrument that separates light into its various component wavelengths using either a diffraction grating or a prism to do so.

Figure 1. Schematic diagram of a spectrometer. A spectrometer works by focusing a light source into a dispersing medium (a grating or prism) which separates it into its component wavelengths, which can be viewed on a screen or through a telescope.

In this experiment, you will determine the wavelength of various Light Emitting Diodes (LED). LEDs are manufactured with a variety of colors. Some LEDs can even change color depending on the voltage supplied. However, LEDs are not really monochromatic light sources but instead produce light over a certain range with peaks at a specific wavelength. By the use of a grating spectrometer, we will be able to see the different color produced by LEDs that seem to emit only one color.

Diffraction grating experiment procedure. Diffraction grating experiment lab report matriculation. Diffraction grating experiment formula. Theory of diffraction grating experiment. Diffraction grating experiment results. What is diffraction grating experiment.

If you are taking a general biology course or AP Biology, at some point you will have to do biology lab experiments. This means that you will also have to complete biology lab reports. The purpose of writing a lab report is to determine how well you performed your experiment, how much you understood about what happened during the experimentation process, and how well you can convey that information in an organized fashion. A good lab report format includes six main sections: TitleIntroductionMaterials and MethodsResultsConclusionReferences Keep in mind that individual instructors may have a specific format that they require you to follow. Please be sure to consult your teacher about the specifics of what to include in your lab report. Title: The title states the focus of your experiment. The title should be to the point, descriptive, accurate, and concise (ten words or less). If your instructor requires a separate title page, include the title followed by the name(s) of the project participant(s), class title, date, and instructors name. If a title page is required, consult your instructor about the specific format for the page. Introduction: The introduction of a lab report states the purpose of your experiment. Your hypothesis should be included in the introduction, as well as a brief statement about how you intend to test your hypothesis. To be sure that you have a good understanding of your experiment, some educators suggest writing the introduction after you have completed the methods and materials, results, and conclusion sections of your lab report. Methods and Materials: This section of your lab report involves producing a written description of the materials used and the methods involved in performing your experiment. You should not just record a list of materials, but indicate when and how they were used during the process of completing your experiment. The information you include should not be overly detailed but should include enough detail so that someone else could perform the experiment by following your instructions. Results: The results section should include all tabulated data from observations during your experiment. This includes charts, tables, graphs, and any other illustrations of data you have collected. You should also include a written summary of the information in your charts, tables, and/or other illustrations. Any patterns or trends observed in your experiment or indicated in your illustrations should be noted as well. Discussion and Conclusion: This section is where you summarize what happened in your experiment. You will want to fully discuss and interpret the information. What did you learn? What were your results? Was your hypothesis correct, why or why not? Were there any errors? If there is anything about your experiment that you think could be improved upon, provide suggestions for doing so. Citation/References: All references used should be included at the end of your lab report. That includes any books, articles, lab manuals, etc. that you used when writing your report. Example APA citation formats for referencing materials from different sources are listed below. BookName of author or authors (last name, first initial, middle initial)Year of publicationTitle of bookEdition (if more than one)Place where published (city, state) followed by a colonPublisher nameFor example: Smith, J. B. (2005). Science of Life. 2nd Edition. New York, NY: Thompson Brooks.JournalName of author or authors (last name, first initial, middle initial)Year of publicationArticle titleJournal titleVolume followed by issue number (issue number is in parenthesis)Page numbersFor example: Jones, R. B. & Collins, K. (2002). Creatures of the desert. National Geographic. 101(3), 235-248. Your instructor may require that you follow a specific citation format. Be sure to consult your teacher concerning the citation format that you should follow. Some instructors also require that you include an abstract in your lab report. An abstract is a concise summary of your experiment. It should include information about the purpose of the experiment, the problem being addressed, the methods used for solving the problem, overall results from the experiment, and the conclusion drawn from your experiment. The abstract typically comes at the beginning of the lab report, after the title, but should not be composed until your written report is completed. View a sample lab report template. Remember that lab reports are individual assignments. You may have a lab partner, but the work that you do and report on should be your own. Since you may see this material again on an exam, it is best that you know it for yourself. Always give credit where credit is due on your report. You don't want to plagiarize the work of others. That means you should properly acknowledge the statements or ideas of others in your report. If you are preparing a lab report, it may help to have a template to work from. This science fair project lab report template allows you to fill in the blanks, making the write-up process easier. Use the template with the instructions for writing a science lab report to ensure success. The PDF version of this form may be downloaded to save or to print. Generally, these are the headings you'll use in a lab report, in this order: TitleDateLab PartnersPurposeIntroductionMaterialsProcedureDataResultsConclusionReferences Here's a quick look at the types of information you should put in the parts of the lab report and a gauge of how long each section should be. It's a good idea to consult other lab reports, submitted by a different group that received a good grade or is well-respected. Read a sample report to know what a reviewer or grader is looking for. In a classroom setting, lab reports take a long time to grade. You don't want to keep repeating a mistake if you can avoid it from the start! Title: This should accurately describe the experiment. Don't try to be cute or funny.Date: This can be the date you did the experiment or the day you completed the report.Lab Partners: Who helped you with the experiment? List their full names. If they represent other schools or institutions, credit this too.Purpose: Sometimes this is called the objective. It is either a single sentence summary of why the experiment or product was performed or else a single paragraph.Introduction: Describe why the topic is of interest. The introduction is other one paragraph or a single page. Usually the last sentence is a statement of the hypothesis that was tested.Materials: List chemicals and special equipment used for this experiment. Ideally, you want this section to be sufficiently detailed another person could repeat the experiment.Procedure: Describe what you did. This can be a single paragraph or one or more pages.Data: List the data you obtained, before calculations. Tables and graphs are good.Results: If you performed calculations on the data, these are your results. An error analysis is usually here, although it may be its own section.Conclusion: State whether the hypothesis was accepted or the project was a success. It's a good idea to suggest avenues for further study.References: Cite any resources or publications you used. Did you consult a paper that somehow related to the project? Give credit. References are needed for all facts except those that are readily available to the intended audience of the report. Lab reports are time-consuming for both students and graders, so why are they so important? There are two key reasons. First, a lab report is an orderly method of reporting the purpose, procedure, data, and outcome of an experiment. Essentially, it follows the scientific method. Second, lab reports are easily adapted to become papers for peer-reviewed publication. For students serious about pursuing a career in science, a lab report is a stepping-stone for submitting work for review. Even if results aren't published, the report is a record of how an experiment was conducted, which can be valuable for follow-up research.

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