Determining Physical Properties of Metals Lab

In industry metals have been used for a variety of things, including packaging. Since metals have similar properties, many different metals can be used interchangeably to lessen production costs. For example, following WWII, Al replaced Sn in food packaging since aluminum was a much cheaper material. Tight parameters surround the thickness of sheet metals in order to minimize production costs.   This can pose an issue to manufactures as the thickness of sheet metals can be almost impossible to measure. The thickness of any given sheet of metallic metal is often measured in nanometers, and are virtually impossible to physically determine.

During this lab you will be using both direct and indirect measurements in order to determine the thickness of a piece of sheet metal. A ***direct measurement*** comes from a piece of laboratory equipment like a balance or a ruler. A value that is calculated from a measurement is said to be an ***indirect value***.

Your goal in this lab is to design a procedure that will help you to determine the width of a single sheet piece of sheet metal. You will first need to do outside research to determine the physical properties of the metallic element, in this case Sn. After your research is complete you will be provided with scissors, a ruler, and a balance to complete your experiment. Once your experiment you will be asked to write a formal lab report outlining your procedure, reporting your data, and discussing your results.

Your lab report must include the following sections:

Introduction

In this section you will introduce the purpose of the lab and must provide background information about your provided element. This background information will be imperative to designing your procedure and should be completed first. You will be required to provide the melting point, boiling point, and density on Sn. Be sure to include units.

Materials

Even though your materials for this lab are set, this section should still be included as a bulleted list in your lab report. You will be provided with a ruler, a balance, a pair of scissors, and a piece of Sn sheet metal.

Procedure

Write out a formal procedure outlining how you plan on completing your investigation. Be sure to write in the third person, use a numbered list, and be as descriptive as possible.

Results

You will be responsible for for designing your own data tables in this lab Record any measurements you make during the lab in what ever means you find most fitting. You will also need to include a section outlining any calculations you completed when reaching your conclusion.

A reminder that taking repeated measurements is considered to be much more accurate then taking just one.

Discussion

In this section you want to discuss any major findings as well as the validity of your results.

Be sure to include:
• Major findings, including researched, measured, and calculated
• Sources of error in your design
• Improvements you would make to your lab for next time
• Any new questions and if your procedure can be generalized to other types of metals

Conclusion

Your conclusion should be brief and will summarize your lab. Restate your experiment, explain the purpose of the lab, explain the results, account for uncertainties or errors, and discuss any new questions that emerged from the experiment.

Marking Rubric

Use the following marking rubric to be sure that you are including all sections in your lab report.

Introduction

Lab purpose is outlined					0	1
Physical properties of Sn are provided				0	1	2

Materials

Materials section included					0	1

Procedure

Procedure is efficient at providing correct width of Sn	0	1	2	3	4
Procedure is detailed and correctly written				0	1	2

Results

Results are accurate				0	1	2
Results are reported in a logical manner				0	1	2
Calculations are included				0	1	2

Discussion

Includes major findings		0	1	2	3
Discusses sources of error		0	1	2	3
Included improvements for next time			0	1	2
New questions and generalizations			0	1	2

Conclusion

Conclusion accurately summarizes lab	0	1	2	3	4

Total Marks   /30