Determining the Thickness of Aluminum Foil   Name: _____

Chemistry   Date: _____

Purpose

The purpose of this experiment is to gain experience in making indirect measurements. The goal is to indirectly measure the thickness of a piece of aluminum foil in centimeters, inches, and atoms.

Materials

regular aluminum foil	metric ruler	scissors	distilled water
heavy-duty aluminum foil	electronic balance	graduated cylinders	

Procedure

A.   What questions are you trying to answer? What measurements do you need to make?

B.   What information would need to be provided in order to answer your questions?
(This information will be provided by your instructor AFTER you and your lab group have developed a written plan to answer the questions.)

C.   Use this space to write a procedure. This should be a numbered list of steps that provides enough detail so that a person unfamiliar with your task and plan could easily follow your procedure multiple trials to yield the same results. It may be helpful to include diagrams or sketches in this section to accompany your written procedure.

Data and Observations

In this section you will construct a data table to record MEASUREMENTS. Measurements are NOT calculated quantities. All data tables should be constructed using a straight edge or ruler. They should be neat and organized—no sloppiness! Be sure to include UNITS with all measured values.

Calculations

Please show ALL work, including units, for each value listed below. Where appropriate, use scientific notation to express a final quantity. Remember the questions that you were trying to answer—those questions should guide your calculations. Please label different sections of your calculations. Organization is KEY!

Results

Thickness of regular aluminum foil in cm_____

Thickness of heavy-duty aluminum foil in cm   _____

Error Analysis
   A. Describe two sources of error and explain **specifically** how they could have impacted your results.
       Human error is NOT a source of error!
       Specifically means: did the error increase or decrease the calculated value for the thickness of the foil?

   B. Given that the actual thickness of the regular foil is 1.55×10^{-3} cm, and the thickness of the heavy-duty aluminum foil is 2.30×10^{-3} cm, calculate your percent error for each type.

       Hint: the formula for percent error is **PE = (|accepted value – experimental value| \ accepted value) x 100%**

Post Questions

   1. A very thin layer of gold was electroplated on a 63.0174-g metal tray that measured 25.22 cm by 13.22 cm. The final mass of the metal tray after plating was 63.0686 g. Calculate the thickness of the gold plating in cm. The density of gold is 19.32 g/cm^3. (Show your work.)