Determining the Thickness of Aluminum Foil

Many products such as aluminum foil are too thin to measure easily. However, it is important for manufacturers to know how thick these products are. They wouldn't be cost-effective if they were too thick and wouldn't be as useful if they were too thin. They must be in the just right category for the manufacturer to make money and the consumer to satisfied with the product. In this lab, you will use the same method that manufacturers use to determine the thickness of aluminum foil. You will also calculate how many atoms thick a piece of foil is.

Problem How can you determine the thickness of aluminum foil?

Materials

metric ruler aluminum foil scissors balance

Skills Measuring, Calculating

Procedure

- 1. Record the Title, Purpose, Materials, a Prediction for how many atoms thick a sheet of foil is, procedure and result in a sheet of paper.
- 2. Construct a data table with the headings listed below.

Length of square (cm), Area of square (cm²), Mass of Al square (g), Volume of Al piece (cm³), thickness of foil (cm), and the number of atoms in the thickness of foil.

- Cut out three squares of aluminum foil with sides of the following lengths:
 4.0 cm, 7.0 cm, and 10.0 cm. Record the sizes in the data table
- 4. Determine the area of the squares and record them in the data table.
- 5. Measure the mass of each of the squares of foil and record in the data table.
- **6**. The density of Aluminum is 2.70 g/cm^3 . You will need this to determine the volume.
- 7. Determine the volume of each foil square. Divide it's mass by it's density. Record the volume in the data table.
- 8. Volume is determined by $V = I \times w \times h$. Use this formula and what you know about each foil square to calculate the height or thickness of the foil.
- **9.** An aluminum atom has a diameter of 2.5×10^{-8} cm. Use this information to calculate how many atoms thick a piece of foil is.