Lab: Thickness of a thin layer

In this activity you will use information learned from prior labs to accurately determine the thickness of sheet of aluminum foil. For obvious reasons the rulers used to measure height in our volume lab would not be an acceptable option, but you could determine this value indirectly.

Remember the equations, Volume = length x width x height

Area = length x width

Volume = Area x height

Solve this equation to determine the height (thickness) of our foil.

The density of aluminum is 2.70 g/cm3. Remember how you have used density as a factor to convert between mass and volume.

Procedure:

1. Use ruler to measure the width and length of your foil sample.
2. Carefully fold the foil into a small square so that it fits neatly on your balance pan.
3. Mass your sample of foil to nearest .01 g.
4. Carefully unfold the foil to its original shape.
5. Begin calculations

Data table:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Mass (g) | Length (cm) | Width (cm) |
| Regular |  |  |  |
| Heavy duty |  |  |  |

Calculations( show units for each sheet of foil, label answers):

1. Calculate the Area (length x width)of the foil (appropriate number of sf’s).

Regular:

Heavy duty:

2. From the mass and density, calculate the volume of the foil.

Regular:

Heavy duty:

3. From the volume and the area, determine the thickness of the foil.

Regular:

Heavy duty:

Conclusion:

1. Why would the use of a ruler not be effective to measure the thickness of your foil?

2. In the Lab: Mass and Volume , we used water displacement to measure volume. Could

this method of measurement have been used to find the volume of your foil? Explain.

3. Is the Heavy duty 50% thicker than the regular aluminum foil as advertised? Prove it!