Honors Chem Hour\_\_\_\_ Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
Dr. Wexler  
Determining the Thickness of Aluminum foil  
Date assigned:

The purpose of this lab is to learn how to rearrange and use two formulas: the density formula (d = m/V)  
 and the volume formula (V = LWH). These will be used sequentially to solve a single problem.

Your data is as follows:  
- the density of aluminum is 2.7g/cm3   
- the mass of your approximately 10cm x 10cm square of heavy duty aluminum foil is \_\_\_\_\_\_\_\_\_ g.

Step 1: The first step of your plan is to use the density formula (d = m/V) to calculate the volume of the aluminum foil in cubic centimeters (cm3).  
Step 2: The second step of your plan is to use the volume formula (V = LWH) to calculate thickness (which we will arbitrarily call H).

**Calculate volume**  
**Part A)** Rearrange the density formula (d = m/V) to solve for V. This means we want “V =”, not “d =” .  
1. Cross-multiply the density formula:  
 d/1 = m/V becomes dxV = mx1, which simplifies to dV = m   
 Note – it helps to first rewrite fractions with horizontal lines instead of slanted lines.   
 **Do this yourself:**  
 1. Rewrite the equation as two fractions using horizontal lines

2. Cross-multiply and simplify

2. Use the “law of opposite operations” to isolate the V in the equation dV = m  
The opposite of multiply is divide, so you have to divide both sides by d.   
 **Do this yourself:**   
 Rearrange dV = m into V = m/d, showing your work.

**Part B)** In the space below, use the rearranged density formula (V = m/d) to calculate volume from the known density of aluminum (2.7g/cm3) and from the measured mass of aluminum (0.67g).   
Note: Always show your measurement units! (for example, the mass is not 0.67 - it is 0.67g, and the density is not 2.7 – it is 2.7g/cm3)  
When showing your calculations, be sure to show how the gram units cancel out so that you end up with cm3, the unit of volume.

**Calculate thickness**  
**Part A)** Rearrange the volume formula (V = LWH) to solve for H. Show all work. In this case, just use the “law of opposite operations” to isolate H.

**Part B)** Use the rearranged volume formula (H = \_\_\_\_\_\_\_\_ to solve for thickness. When showing your calculations, be sure to show how the units cancel out so that you end up with cm.

**Summarize your results:**

|  |  |  |
| --- | --- | --- |
| Type of Aluminum Foil | Thickness (cm) | Thickness (mm) |
| Heavy Duty |  |  |

Note that you are being asked to do a simple unit conversion from centimeter (cm) to millimeter (mm). (1 cm = 10 mm)