

NAME: _____

LAB QUIZ 13: THE SIZE OF A MOLECULE

Complete the following right on this quiz paper. You must submit this paper before you leave to receive credit.

1. (3 points) Use the ruler to measure the length and width of your aluminum foil. Measure the mass on the balance.

	LENGTH (CM)	WIDTH (CM)	MASS (GRAMS)
Aluminum Foil			

2. (2 points) If the density of aluminum is 2.7g/cm^3 , what is the volume of the foil sheet?

$$\text{volume} = \frac{\text{mass}}{\text{density}} =$$

3. (2 points) Calculate the thickness (height) of the foil:

$$\text{height} = \frac{\text{volume}}{\text{length} \times \text{width}} =$$

4. (2 points) True or false: Calculating the thickness of the foil is a waste of time, because it could be easily measured using the ruler!
5. (2 points) True or false: The foil sheet is much more than one aluminum atom thick.
6. (12 points) Measure the size of the oleic acid molecule following the instructions in the lab handout. Record your data in the table:

	DIAMETER (MM)			AVERAGE DIAMETER (MM)	RADIUS (MM)	VOLUME (MM ³)
Spherical Droplet	Measure three values			$d_s = \frac{1}{3}(d_1 + d_2 + d_3)$	$r_s = \frac{1}{2}d_s$	$V_s = \frac{4}{3}\pi r_s^3$
Your Data						
Spread-out Cylinder	Measure three values			$d_c = \frac{1}{3}(d_1 + d_2 + d_3)$	$r_c = \frac{1}{2}d_c$	$V_c = (0.005)V_s$
Your Data						

7. (2 points) Calculate the height of the spread-out cylinder, which corresponds to the diameter of the molecule:

$$h = \frac{V_c}{\pi r_c^2} =$$