Data Tables

Table 1. Calibration of the Drop Counter

Data	Trial 1	Trial 2
Initial volume of cyclohexane in the graduated cylinder (mL)	5.20	6.20
Final volume of cyclohexane in the graduated cylinder (mL)	6.20	7.20
Volume of cyclohexane added (mL)	1.00	1.00
Number of drops of cyclohexane added	83	83
Volume/drop cyclohexane (mL/drop)	0.012	0.012

4/4

Observations:

Cyclohexane is a clear, colourless solution and has a mild odour.

4/4

During the first trial, when we were dropping cyclohexane into the graduated cylinder, I accidently squirted a stream of solution. Since we were unable to count the number of drops in that stream, we had to redo the first trial.

Tip: always write in 3rd person not 1st person.

Table 2. Calculation of the Length of the Stearic Acid Molecule

Data	Trial 1	Trial 2
Diameter of the water surface in the dish (cm)	8.10	8.45
Number of drops required to make a monolayer	4	5
Concentration of stearic acid from bottle (g/mL)	1.36×10^{-4}	1.36×10^{-4}
Density of stearic acid (g/mL)	0.847	0.847
Volume of solution required to form a monolayer (mL)	0.0480	0.0600
Mass of stearic acid in that volume (g)	6.53×10^{-6}	8.16×10^{-6}
Volume of stearic acid, V (mL)	7.71×10^{-6}	9.63×10^{-6}
Area of the monolayer, A (cm^2)	51.5	56.1
Thickness of the monolayer, t (cm)	1.50×10^{-7}	1.72×10^{-7}

4/4

Stearic acid is a clear, colourless solution and has a strong odour.

Each time a drop of stearic acid was dropped, the time it took to dissolve increased. An exception to this was when the stearic acid drop touched the side of the Petri dish, the time it took to dissolve significantly decreased.

When observing the drop of stearic acid dissolve on the surface of the water, a small amount of the solution would stream away from the drop, decreasing its size and then we could see a visible layer forming on the surface.

Table 3. Calculation of the Volume of a Carbon Atom and Avogadro's Number

Data	Trial 1	Trial 2
A. Volume of a Carbon Atom Based Upon a Linear Array		
Diameter of a carbon atom assuming the 20 balls are joined in a straight line (cm)	7.50×10^{-9}	8.60×10^{-9}
Volume of a carbon atom using this diameter (cm^3)	2.21×10^{-25}	3.33×10^{-25}
B. Volume of a Carbon Atom Based Upon the Actual Bond Angle		
Value of e from Figure in Step 10 of calculations in Lab 1 (cm)	7.50×10^{-9}	8.60×10^{-9}
Diameter of a carbon atom using the value of e (cm)	9.16×10^{-9}	1.05×10^{-8}
Volume of a carbon atom using this diameter (cm^3)	4.02×10^{-25}	6.06×10^{-25}
Volume per mol of carbon atoms (cm^3/mol)	3.42	3.42
Avogadro's Number from A. (mol^{-1})	1.55×10^{25}	1.03×10^{25}
Percent Error	2470 %	1610 %
Avogadro's Number from B. (mol^{-1})	8.51×10^{24}	5.64×10^{24}
Percent Error	1310 %	837 %

4/4