$J = N_A = \frac{\#\ \text{molecules}}{1\ \text{mol}} = 282.47\ \text{g} \times \frac{1\ \text{molecule}}{I\ (\text{mass of 1 molecule oleic acid})}$

$1\ \text{mol oleic acid} = 282.47\ \text{g} = 6.022 \times 10^{23}\ \text{molecule}$

EXPERIMENT 2 WORKSHEET

		Trial 1	Trial 2
	Data		
A	Number of drops in 1 mL	expt. ~20 drops	
B	Average number of drops in 1 mL	20 d / 1 ml	
C	Volume of 1 drop	$1\ \text{d} \times \frac{1\ \text{ml}}{20\ \text{d}} = 0.05\ \text{ml}$	
D	Diameter of oleic acid film	expt. d_{oleic} cm	
E	Average diameter of film	d_{oleic}	
	Calculation Results		
F	Area of film (cm^2)	$A = \pi \left(\frac{d_{oleic}}{2}\right)^2$	
G	Volume of film (ml)	$V = (1\ \text{drop})\left(\frac{1\ \text{ml}}{20\ \text{d}}\right)\left(\frac{0.50}{100}\right)$ (0.5% oleic acid)	
H	Thickness of film (cm) $= h = \frac{V\ cm^3}{\text{area}\ (cm^2)}$		
I	Mass of one oleic acid molecule	Ic	
J	Experimental Avogadro's number		

(H) $V_{\text{of film}} = \text{length} * \text{width} * \text{height}$ (thickness of film); length * width = area

(I) (a) for one molecule: $\frac{\text{height}}{\text{width}} = \frac{7.6}{1}$

$\text{width}_{1\ \text{molecule}} = H_{(\text{height})} \left(\frac{1\ \text{molecule}}{6.022 \times 10^{23}}\right) \times \frac{1\ \text{width}}{7.6\ \text{height}}$

(b) Volume 1 molecule = (assume width = length) $(\text{width 1 molecule})^2 (\text{height } H) = \_\_\_\ cm^3$

(c) density $= \frac{0.895\ g}{cm^3}$

$I = \text{mass}_{\text{one molecule}} = \left(\frac{I}{b}\right) * \frac{0.895\ g}{cm^3}$