

10.43g       $\frac{0.08\text{ km}}{\text{hr}}$ ,  $\frac{0.8\text{ mol O}_2}{\text{hr} \cdot \text{g insect weight}}$ , 1 atm,  $24^\circ\text{C}$ ,  $297\text{ K}$

$\frac{\text{Moles O}_2}{\text{hr}}$       by 5.2g cockroach

$$\left| \begin{array}{c} 0.8\text{ mol O}_2 \\ \text{g Roach} \end{array} \right| \left| \begin{array}{c} 5.2\text{ g Roach} \\ \hline \end{array} \right| = \left| \begin{array}{c} 4.116\text{ mol O}_2 \\ \text{Consumed} \\ \hline \text{hr} \end{array} \right|$$

$PV = nRT$

$$(1) (4.116 \times 10^{-3} \text{ l}) = n(0.08206)(297)$$

$$n = 1.706 \text{ mol O}_2 \times 10^{-3} / \text{hr}$$

Dec 6-7:38 AM

10.43b      1st jar, same O<sub>2</sub> used. ,  $> 20\% \text{ O}_2$  in 48 hrs?

$$\left| \begin{array}{c} 1\text{ l} \\ 1.05678\text{ g} \end{array} \right| = \left| \begin{array}{c} 0.946\text{ l AIR} \\ * 0.21 \text{ % O}_2 \end{array} \right|$$

Air 21% O<sub>2</sub>

have  $\Rightarrow 0.19\text{ l O}_2$

$$\left| \begin{array}{c} 4.116 \times 10^{-3} \\ \text{hr} \end{array} \right| \left| \begin{array}{c} 48\text{ hr} \\ \hline \end{array} \right| = \left| \begin{array}{c} 0.19968\text{ l O}_2 \text{ needed} \\ \text{DEAD ROACH!} \end{array} \right|$$

Dec 6-8:04 AM

10.62  $V = 10\text{L}, T = 19^\circ\text{C}$   $P_{\text{O}_2} + P_{\text{He}}$

$$\frac{51.2\text{g O}_2}{32\text{g O}_2} \left| \frac{1\text{mole O}_2}{4\text{g O}_2} \right. = \underline{\underline{1.6\text{ mole O}_2}}$$

$$\frac{32.6\text{g He}}{4\text{g He}} \left| \frac{1\text{mole He}}{4\text{g He}} \right. = \underline{\underline{8.15\text{ mole He}}}$$

(Q)  $PV = nRT$

$$P(10) = 1.6(0.0821)(292)$$

$$\underline{\underline{P_{\text{O}_2} = 3.84\text{ atm}}}$$

(He)  $PV = nRT$

$$P(10) = 8.15(0.0821)(292)$$

$$\underline{\underline{P_{\text{He}} = 19.54\text{ atm}}}$$

$$P_{\text{O}_2} = X_{\text{O}_2} P_T$$

$$3.84 = X_{\text{O}_2} 23.38$$

$$\underline{\underline{X_{\text{O}_2} = 0.161}}$$

$$P_T = P_{\text{O}_2} + P_{\text{He}}$$

$$= 3.84 + 19.54$$

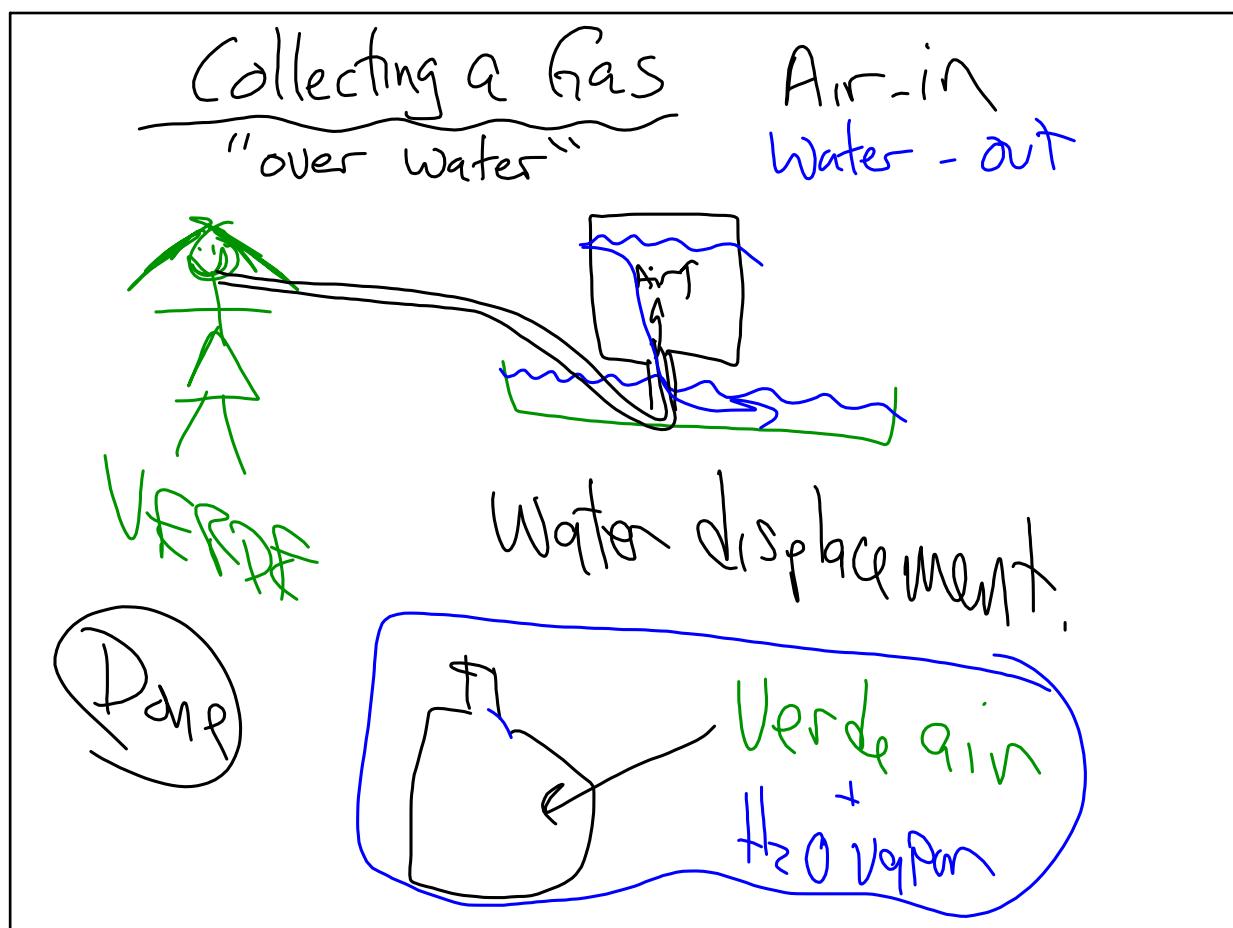
$$\underline{\underline{P_T = 23.38\text{ atm}}}$$

$$P_{\text{He}} = X_{\text{He}} P_T$$

$$19.54 = X_{\text{He}} (23.38)$$

$$\underline{\underline{X_{\text{He}} = 0.836}}$$

Dec 6-8:11 AM



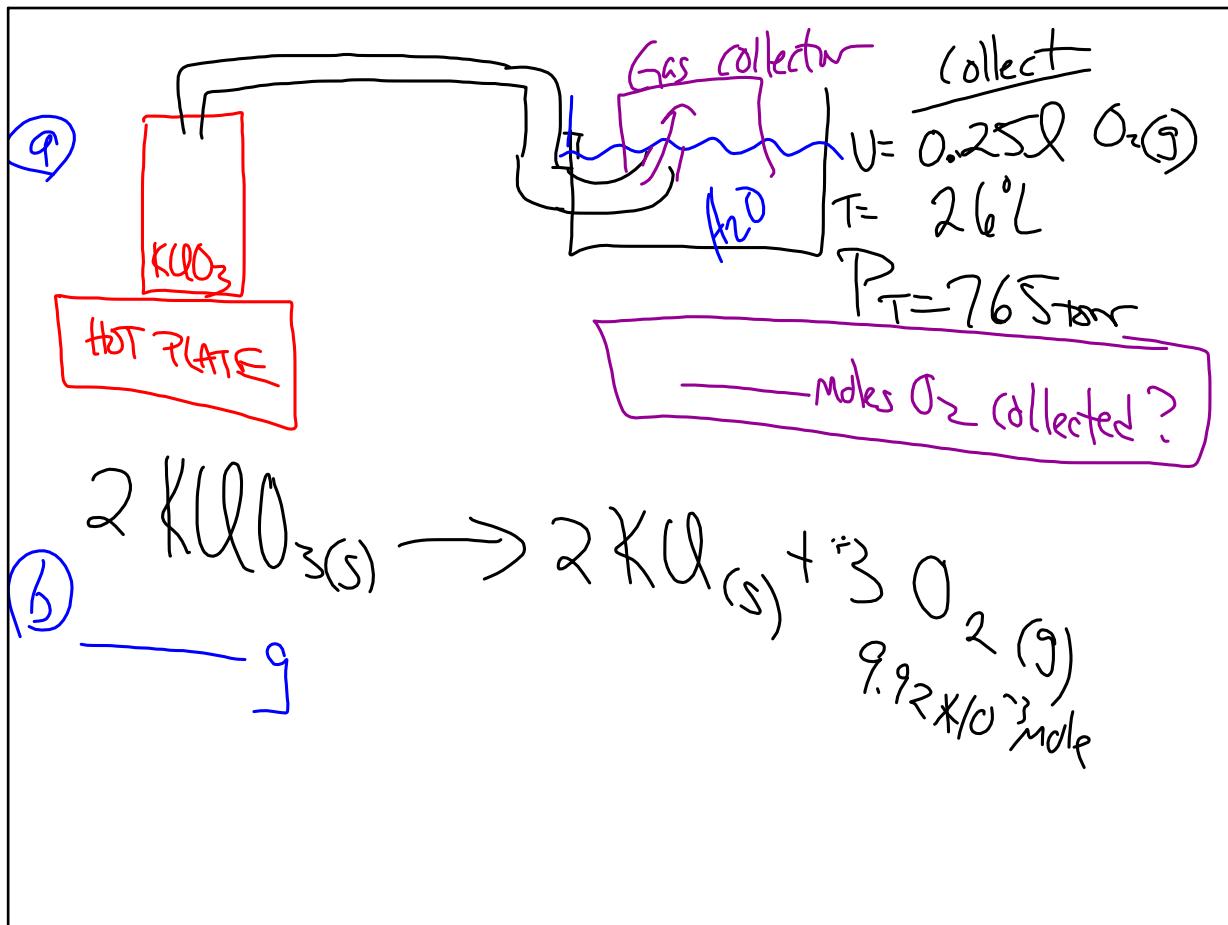
Dec 6-8:22 AM

Calc.  $P_{\text{Verde air}}$

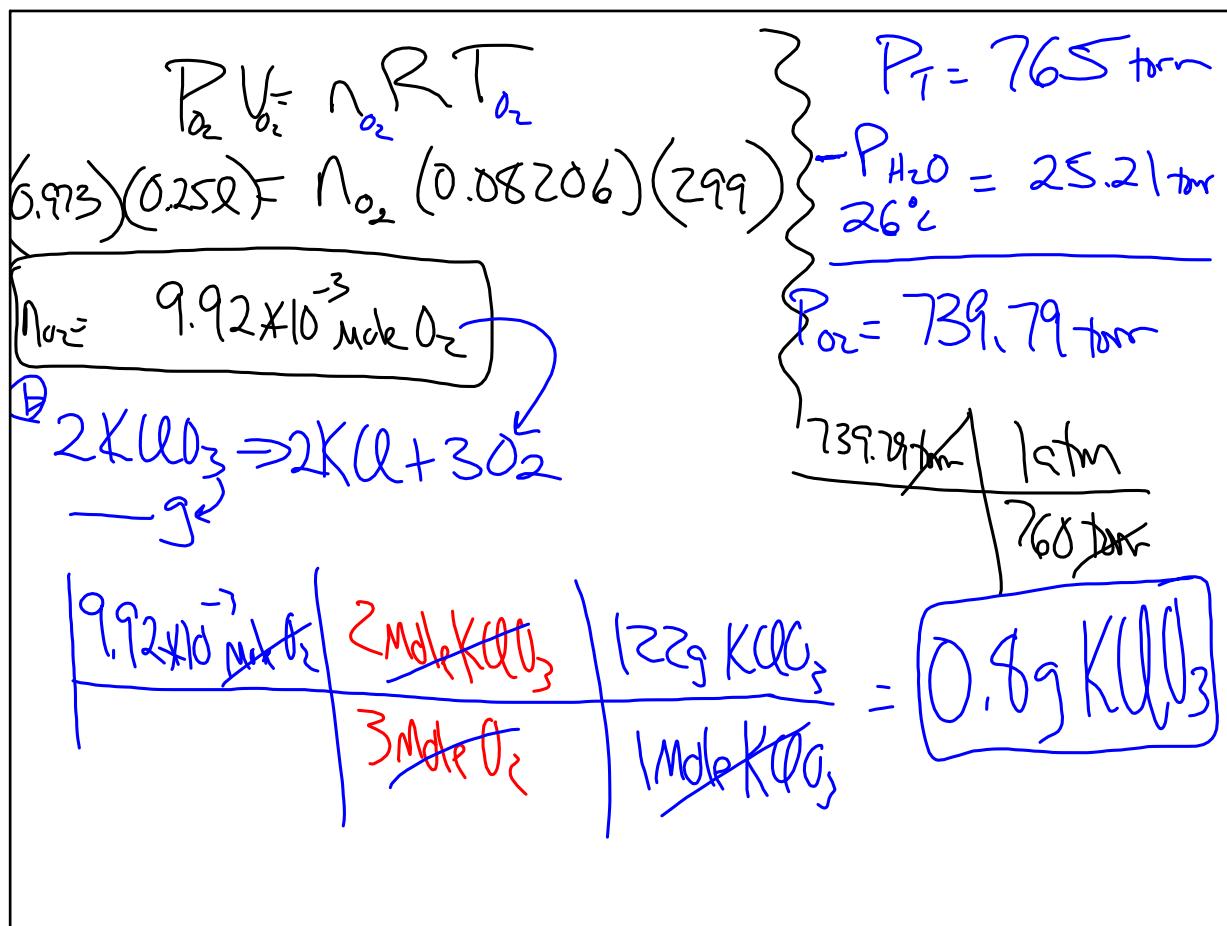
Constant at each Temp

$$P_{\text{dry Verde air}} = P_{\text{TOTAL}} - P_{\text{H}_2\text{O vapor}}$$

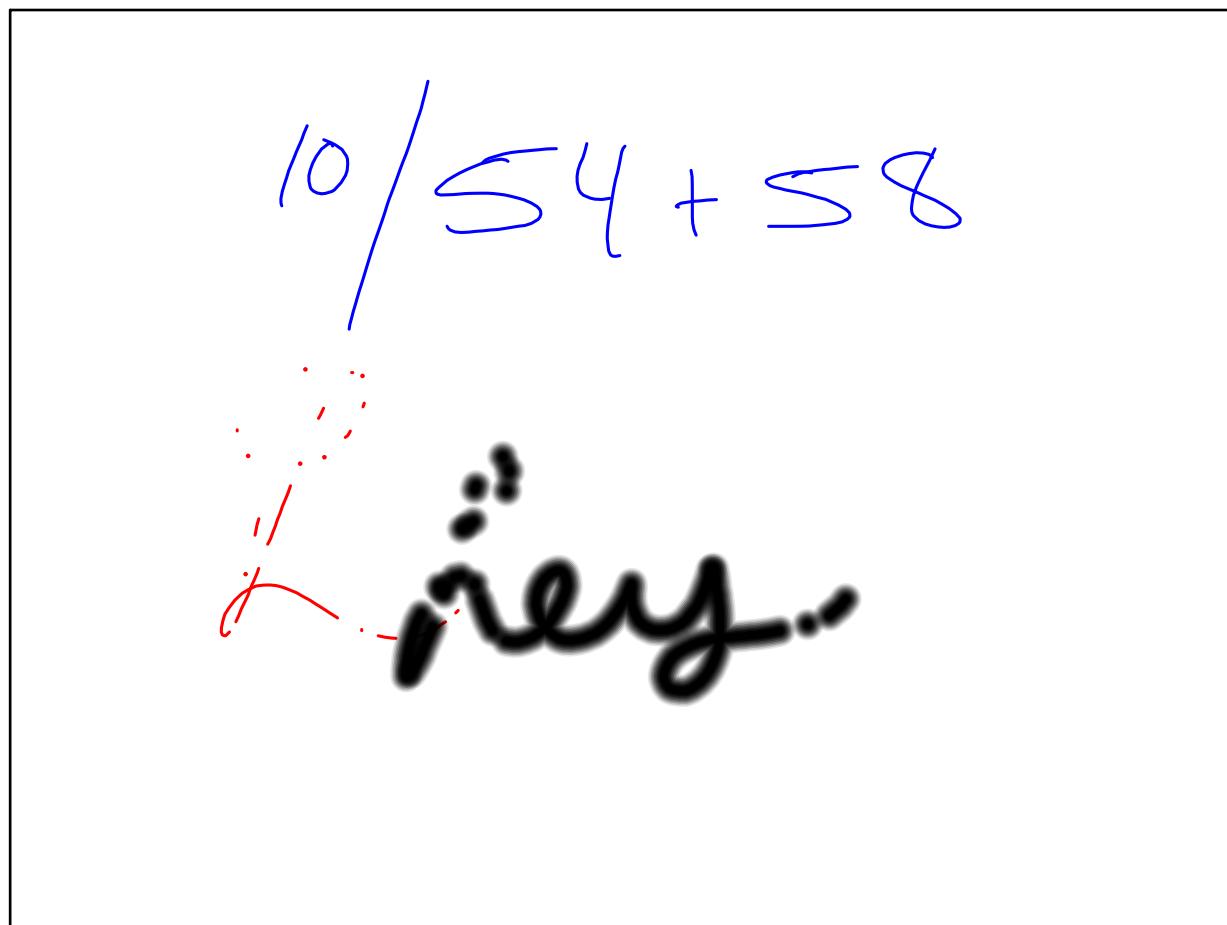
Dec 6-8:50 AM



Dec 6-8:55 AM



Dec 6-9:00 AM



Dec 6-9:16 AM