

Name _____ Period _____

College Prep Chemistry of the Earth

Assignment 6K – Ideal Gas Law Review

20 Points

Complete the following problems based on the ideal gas law

Ideal Gas Law Forms	$P = \frac{nRT}{V}$	$V = \frac{nRT}{P}$	$n = \frac{PV}{RT}$	$T = \frac{PV}{nR}$
$PV = nRT$				
Ideal Gas Constant [R]	$R = 0.0821 \frac{\text{L}\cdot\text{atm}}{\text{mol}\cdot\text{K}}$	Don't forget Units! ☺		

Ideal gas law
P, V, n, T

$P = 0.84\text{atm}, V = 28.46\text{L},$ $n = 1.22\text{mol}, T = \underline{\hspace{1cm}}\text{K}$
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T =	$0.84\text{atm} \cdot 28.46\text{L}$
	$0.0821 \frac{\text{L}\cdot\text{atm}}{\text{mol}\cdot\text{K}} \cdot 1.22\text{mol}$
T =	238.67K

$P = \underline{\hspace{1cm}}\text{atm}, V = 41.37\text{L},$ $n = 2.57\text{mol}, T = 357.14\text{K}$
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P =	
P =	1.82atm

$$P = \frac{nRT}{V}$$

Two Steps

$P = 1.35\text{atm}, V = 32.78\text{L},$ $n = \underline{\hspace{1cm}}\text{mol SO}_3, T = 428.45\text{K}$

n =	$1.35\text{atm} \cdot 32.78\text{L}$
	$0.0821 \frac{\text{L}\cdot\text{atm}}{\text{mol}\cdot\text{K}} \cdot 428.45\text{K}$
n =	1.26mol

Molar Mass $\text{SO}_3 = 80.07\text{g/mol}$ mass $\text{SO}_3 = \underline{\hspace{1cm}}\text{g SO}_3$
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mass $\text{SO}_3 =$	1.26mol	80.07g
		1mol
mass $\text{SO}_3 =$	100.89g	

Molar Mass
mol $\rightarrow$ g

① Find mol

② Find P, V, or T

mass HF = 42.57g, n = $\underline{\hspace{1cm}}$ mol HF Molar Mass HF = 20.01g/mol

n =		
n =	2.13mol	

$P = 1.27\text{atm}, V = \underline{\hspace{1cm}}\text{L},$ $n = \underline{\hspace{1cm}}\text{mol HF}, T = 427.42\text{K}$
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V =	
V =	58.85L

Solve for V
 $V = \frac{nRT}{P}$

① Find P_{Total}
 $P_{\text{Total}} = P_a + P_b + P_c$

$P_{\text{CO}_2} = 3.61 \text{ atm}, P_{\text{H}_2} = 2.84 \text{ atm}$ $P_{\text{O}_2} = 1.35 \text{ atm}, P_{\text{Total}} = \underline{\hspace{2cm}} \text{ atm}$	
$P_{\text{Total}} =$	$3.61 \text{ atm} + 2.84 \text{ atm}$ $+ 1.35 \text{ atm}$
$P_{\text{Total}} =$	7.80 atm

$P_{\text{Total}} = \underline{\hspace{2cm}} \text{ atm}, V = 24.62 \text{ L}$ $n = 1.31 \text{ mol}, T = \underline{\hspace{2cm}} \text{ K}$	
$T =$	$7.80 \text{ atm} \cdot 24.62 \text{ L}$ $1.31 \text{ mol} \cdot 0.0821 \frac{\text{L} \cdot \text{atm}}{\text{mol} \cdot \text{K}}$
$T =$	1785.53 K

Solve for $n, V, \text{ or } T$

$$T = \frac{PV}{nR}$$

$P_{\text{N}_2} = \underline{\hspace{2cm}} \text{ atm}, V = 31.45 \text{ L}$ $n = 1.27 \text{ mol}, T = 327.24 \text{ K}$	
$P_{\text{N}_2} =$	
$P_{\text{N}_2} =$	

$P_{\text{N}_2} = \underline{\hspace{2cm}} \text{ atm}, P_{\text{H}_2} = 1.84 \text{ atm}$ $P_{\text{CO}_2} = 5.21 \text{ atm}, P_{\text{Total}} = \underline{\hspace{2cm}} \text{ atm}$	
$P_{\text{Total}} =$	
$P_{\text{Total}} =$	