NOV 10, 2014

PURPOSE WHAT INVISIBLE STUFF CAUSES MOST CHANGES TO MATTER?

WARMUP: SOLVE THE "Practice Practice Practice"

WE'LL SOLVE THESE

Practice! Practice!Practice!

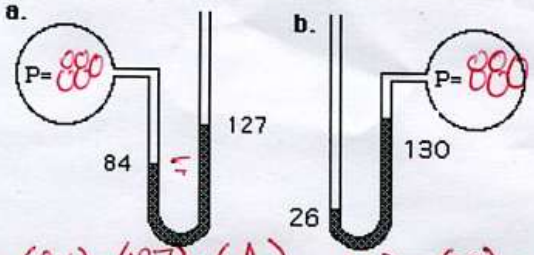
1. A closed flask of air (0.600L) contains 1.3 moles of particles. The pressure probe on the flask reads 113 kPa. A student uses a syringe to add an additional 0.4 moles of air through the stopper. Find the new pressure inside the flask.

$113\text{kPa} \times \left(\frac{1.7\text{mol}}{1.3\text{mol}}\right) = 150\text{ kPa}$

2. A 3.1 mole sample of gas occupies 150. mL at 0.00 °C. What is its new volume when the temperature is increased to 50.00°C and the moles of gas increase to 9.3 moles?

$150\text{mL} \times \left(\frac{9.3\text{mol}}{3.1\text{mol}}\right) \times \left(\frac{323\text{K}}{273\text{K}}\right) = 530\text{mL}$

3. In each case, assume pressure inside the flask is 880mmHg. Solve for the ambient pressure.



$(880) + (84) = (127) + (A)$ $\quad A = 837\text{ mmHg}$

$(A) + (26) = (130) + (880)$ $\quad A = 984\text{ mmHg}$

Go back and check all your problems!

- ✓ *never use Celsius for temperature*
- ✓ *Don't use PV = nRT at all on this test. We only learned that yesterday. It won't work here.*

MOVIE NOTES: "ABSOLUTE ZERO"

WHO	WHAT
DREBBEL	WHEN SALT IS ADDED TO ICE THE ICE GETS EVEN COLDER.
BOYLE	FILLED A BARREL WITH WATER, FROZE IT, AND THE WEIGHT DIDN'T CHANGE. THIS SHOWED THAT "FRIGERIC" DOESN'T EXIST

(KNOW THESE FOR THURSDAYS QUIZ)

The Ideal Gas Law

CheMistry: http://genest.weebly.com

Stop in for help every day at lunch and Tues, Weds., &Thurs after school!

After-hours question? Email me at home: sgenest@madison.k12.wi.us

ANSWERS

Name_____

Period_____

1. What volume will 0.693 moles of oxygen be at STP?

(check one) This problem's type is: ☐*before-and-after* ☒*now*

It can be solved using ☐*ratios* ☒*PV=nRT*

$PV = nRT \qquad V = \frac{nRT}{P} \qquad V = \frac{(0.693\,mol)(0.0831\,\frac{L\,atm}{mol\,K})(273\,K)}{(1.0\,atm)}$

$V = 15.7\,L$

2. What will be the new volume if 250 mL of gas at STP changes to 4.0 atmospheres pressure and 30°C temperature?

(check one) This problem's type is: ☒*before-and-after* ☐*now*

It can be solved using ☒*ratios* ☐*PV=nRT*

$250\,mL \times \left(\frac{1.0\,atm}{4.0\,atm}\right) \times \left(\frac{303\,K}{273\,K}\right) = 69\,mL$

3. A 9.0L sample of gas is at STP. When the temperature is raised to 273°C and the pressure remains constant, what will be the new volume of the gas?

(check one) This problem's type is: ☒*before-and-after* ☐*now*

It can be solved using ☒*ratios* ☐*PV=nRT*

$9.0\,L \times \left(\frac{546\,K}{273\,K}\right) \times \left(\frac{1.00\,atm}{1.00\,atm}\right) = 18.0\,L$

4. Carbon monoxide, a poisonous gas, has a formula of.CO. How many moles of carbon monoxide occupy a volume of 0.445 L at STP?

(check one) This problem's type is: ☐*before-and-after* ☒*now*

It can be solved using ☐*ratios* ☒*PV=nRT*

$PV = nRT \qquad n = \frac{PV}{RT} \qquad n = \frac{(1.00\,atm)(0.445\,L)}{(0.0831\,\frac{L\,atm}{mol\,K})(273\,K)}$

$n = 0.0196\,mol$

5. Ammonia gas occupies a volume of 450 mL at a pressure of 720 mm Hg. What volume will it occupy at standard pressure?

(check one) This problem's type is: ☒*before-and-after* ☐*now*

It can be solved using ☒*ratios* ☐*PV=nRT*

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

$450\,mL \times \left(\frac{720\,mmHg}{760\,mmHg}\right) = 426\,mL \approx 430\,mL$

6. A gas filled weather balloon with a volume of 30.0 L is released at sea level at 100.1 kPa and 18.0°C. Find the volume the balloon will be at maximum altitude where the temperature is 241.0 kelvins and the pressure is 0.604 atm.

(check one) This problem's type is: ☒*before-and-after* ☐*now*
It can be solved using ☒*ratios* ☐*PV=nRT*

$100.1\,kPa \times \left(\frac{1.00\,atm}{101.3\,kPa}\right) = 0.988\,atm$

$$30.0\,L \times \left(\frac{0.988\,atm}{0.604\,atm}\right) \times \left(\frac{241.0\,K}{273\,K}\right) = 43.3\,L$$

7. A gas filled weather balloon with a volume of 80.0 L is released at sea level at 102.0 kPa pressure and 27.0°C. The balloon expands to final volume of 835.0L at maximum altitude, where the temperature is 0.00°C. What will be the pressure at this time?

(check one) This problem's type is: ☒*before-and-after* ☐*now*
It can be solved using ☒*ratios* ☐*PV=nRT*

$$102.0\,kPa \times \left(\frac{80.0\,L}{835.0\,L}\right) \times \left(\frac{273\,K}{300.00\,K}\right) = 8.89\,kPa$$

8. A gas filled weather balloon contains 33.0 L of air at 10.0°C at a pressure of 745. Torr. How many moles of gas are in the balloon?

(check one) This problem's type is: ☐*before-and-after* ☒*now*
It can be solved using ☐*ratios* ☒*PV=nRT*

$PV = nRT \qquad \frac{PV}{RT} = n$

$$\frac{(0.980\,atm)(33.0\,L)}{\left(0.0831\,\frac{L\,atm}{mol\,K}\right)(283\,K)} = n$$

$$1.37\,moles = n$$

9. At what temperature would you need to have He to have 5.75 moles occupy a volume of 45.0L at standard pressure?

(check one) This problem's type is: ☐*before-and-after* ☒*now*
It can be solved using ☐*ratios* ☒*PV=nRT*

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

$$\frac{(1.00\,atm)(45.0\,L)}{(5.75\,moles)\left(0.0831\,\frac{L\,atm}{mol\,K}\right)} = T \qquad 94.2^{K} = T$$

10. A sample of oxygen gas occupies a volume of 250 mL at 23.8 psi. What volume will it occupy at 19.5 psi pressure?

(check one) This problem's type is: ☒*before-and-after* ☐*now*
It can be solved using ☒*ratios* ☐*PV=nRT*

$$250\,mL \times \left(\frac{23.8\,psi}{19.5\,psi}\right) = 305 \approx 310\,mL$$