Gas Law Questions

For S.T.P.:

If it is a gas at S.T.P. use this style of conversion factor if your starting point is a volume of gas. This will convert to mole and then the mole/mole sandwich would be your next step

$$\text{x } \frac{1 \text{ mol } CH_4}{22.414 \text{ L } CH_4}$$

If you are asked to find a volume at the end of a calculation stop converting after the mole/mole sandwich. (In other words don't keep going to find mass). Use the moles that you have and this style of conversion factor to find the volume at S.T.P.

$$\text{x } \frac{22.414 \text{ L } CH_4}{1 \text{ mol } CH_4}$$

If you are asked to convert from volume to a volume all at S.T.P. you will need to use both styles of conversion factors with a mole sandwich in the middle!

For Ideal Gas Law:

If you have understood the difference in the two different uses of 22.414 L = 1 mol above, it may help you understand how to approach ideal gas law questions.

If you are starting with ideal gas law questions, use PV = nRT to find n (moles) and then write this down again for a conversion sequence starting with a mole sandwich.

If you are asked to determine P,V or T at the end of problem, you will need to find moles first. Stop at you mole sandwich (don't keep going to find mass). Use the result of the mole/mole sandwich as n in your data table and carry on.

It is possible to have a problem that is a double PV = nRT with a mole sandwich in the middle!

Be sure to use a data table and the CORRECT UNITS!

Note: Since all gases occupy the same volume per mole (or molecule if you like), it is useful to add gas amount together. In other words:

4 mol CO_2 added to 3 mol O_2 could be replaced by 7 mol