

****KEEP YOUR WORK AND ANSWERS COVERED.****

1. (24 pts) Indicate whether each statement is true (T) or false (F). Be certain T or F is clearly indicated.

T One Torr and one mmHg are equal.

F As n of a gas increases (at constant V and T), then P decreases.

T If a gas mixture contains one mol He and one mol Ar, then each gas has the same pressure.

F At the same T and P , humid air is denser than dry air.

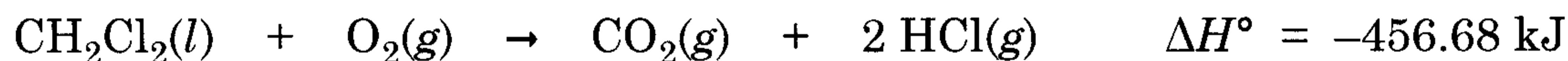
T Melting a sample of wax is endothermic.

F It takes more heat to raise the temperature of one gram of dichloromethane (CH_2Cl_2) than it takes for one gram of ethanol ($\text{C}_2\text{H}_5\text{OH}$).

T Reversing a process changes the sign for a ΔH .

T $\text{CO}_2(\text{g})$ has a negative ΔH_f° .

- ** 2 (6 pts) The following equation is balanced.



For the reaction which uses 25.0 g CH_2Cl_2 , circle the ΔH° (in kJ).

-115	<u>-134</u>	-157	-187	-231	-258
-272	-296	-307	-322	-361	-389

3. (5 pts) The density of an unknown gas was measured to be 1.021 g/L at 88 °C and 336 Torr. Of the gases below, circle the one that best fits the measurement.

NF_3 $\text{C}_2\text{H}_4\text{F}_2$ Cl_2 C_5H_{10} H_2SiF_2 SO_2

- ** 4. (5 pts) A 9.4 g sample of ethyl alcohol, $\text{C}_2\text{H}_5\text{OH}$, originally at 18 °C, was heated to 33 °C. Circle the number of calories which were transferred in the process. The specific heat capacity for $\text{C}_2\text{H}_5\text{OH}$ in this temperature range is 2.4 J/(g · K).

32	36	43	48	54	59
62	66	73	76	<u>81</u>	88

- ** 5. (5 pts) A 15.4 L container holds a gas at 38 °C and 2.19 atm. The gas is transferred to a new container with a volume of 19.7 L and the new temperature is 87 °C. Circle the new pressure (in atm) of the gas.

1.31	1.46	1.57	<u>1.98</u>	2.18	2.31
2.66	2.87	3.02	3.25	3.48	3.71

6. (6 pts) Consider a 23.0 L mixture of SO₂(g) and CO₂(g) with a total pressure of 683 Torr at 57 °C. The mol% of SO₂ is 46.5%. Circle the total mass (in g) of the mixture.

12.8	18.0	22.7	28.3	30.8	35.5
<u>40.7</u>	46.3	51.0	53.5	63.4	66.3

7. (6 pts) Balance the following equation. All reactants and products are shown.



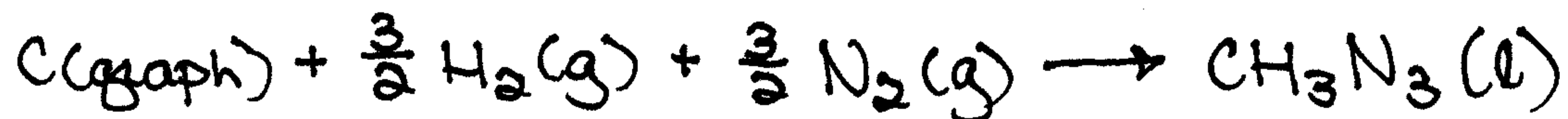
8. (6 pts) The following equation is balanced.



Circle the ΔH° (in kJ) for this reaction.

-322.2	-388.3	-432.4	-468.1	<u>-558.5</u>	-580.1
-622.0	-663.8	-732.7	-778.0	-812.1	-863.6

- ** 9. (6 pts) Write the formation equation for CH₃N₃(l).



- ** 10. (6 pts) 240. mL of a solution of 0.163 M AgClO₄ are added to a solution containing excess Li₃PO₄. After all steps were completed, the actual yield of precipitate was 2.8 g. Circle the percent yield for this process.

<u>51%</u>	53%	58%	62%	65%	69%
70%	75%	79%	81%	84%	87%