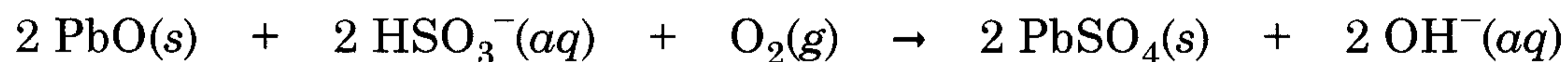


**\*\*KEEP YOUR WORK AND ANSWERS COVERED.\*\***

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

- F One atm of  $\text{H}_2\text{O}(g)$  has a greater density than  $\text{H}_2\text{O}(l)$  at the same  $T$ .
- T Pressure of an ideal gas is proportional to its concentration times  $T$ .
- F As  $V$  of a gas increases (at constant  $n$  and  $T$ ), then  $P$  also increases.
- F At the same  $T$  and  $P$ , the density of methane( $g$ ) is greater than the density of propane( $g$ ).
- T As the temperature of a gas increases (at constant  $n$  and  $V$ ), the pressure increases because the gas molecules are hitting harder and more often.
- T A gas at 100. atm and at 25 °C will deviate more from ideal behavior than the same gas at 10.0 atm and 200. °C.
- T The combustion of gasoline is exothermic.
- T When an object cools, both  $q$  and  $\Delta T$  are negative.

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



Circle the  $\Delta H^\circ$  (in kJ) for this reaction.

-311.62	-358.31	-402.24	-463.11	-547.92	-580.17
<u>-608.60</u>	-653.88	-742.47	-768.08	-822.80	-840.06

- \*\* 3. (5 pts) An effusion measurement is done on an unknown gas. Relative to the effusion of  $\text{N}_2$  under the same conditions, the ratio of the effusion rates (unknown/ $\text{N}_2$ ) was 0.488. Circle the molar mass of the unknown gas.

73.1	78.6	84.9	89.0	92.6	96.1
103	108	113	<u>118</u>	121	124

- \*\* 4. (6 pts) The following equation is balanced.



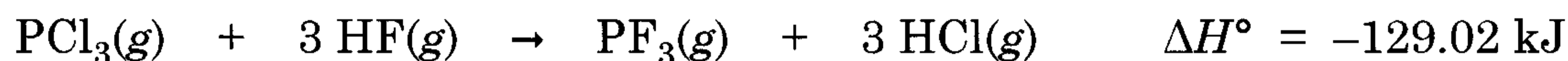
For a reaction to produce 45.6 g  $\text{H}_2\text{SO}_4$ , circle the volume (in L) of  $\text{O}_2(g)$  which is required at STP.

5.03	<u>5.21</u>	5.54	5.87	6.19	6.38
6.70	6.92	7.33	7.52	7.66	7.93

5. (6 pts) Consider a 40.0 L mixture of  $\text{N}_2(\text{g})$  and  $\text{Ne}(\text{g})$  with a total pressure of 806 Torr at 78 °C. The mol% of  $\text{N}_2$  is 55.4%. Circle the total density (in g/L) of the mixture.

0.168	0.331	0.499	0.572	0.830	<u>0.903</u>
1.071	1.234	1.402	1.569	1.733	1.973

6. (5 pts) Using the following two equations,

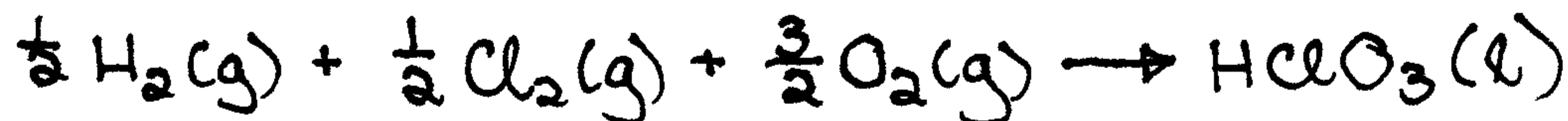


find (and circle below) the  $\Delta H^\circ$  (in kJ) for the following reaction.



-411.62	-458.31	-502.24	-563.11	-647.92	-680.17
-718.60	-753.88	<u>-835.44</u>	-868.08	-922.80	-940.06

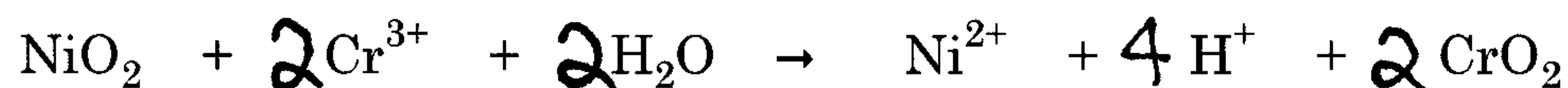
- \*\* 7. (6 pts) Write the formation equation for  $\text{HClO}_3(\text{l})$ .



- \*\* 8. (5 pts) A container contains 6.86 g Kr in a volume of 2.00 L at 17 °C. Circle the pressure of the gas sample (in atm).

0.418	0.552	0.619	0.779	0.843	<u>0.974</u>
1.03	1.16	1.28	1.30	1.44	1.52

9. (6 pts) Balance the following equation. All reactants and products are shown.



- \*\* 10. (6 pts) 25.0 mL of a solution of 1.04 M  $\text{Ba}(\text{OH})_2$  are added to 30.0 mL of a solution of 1.64 M  $\text{HClO}_3$ . Circle the mass (in g) of salt which can be produced.

6.03	6.37	6.84	7.23	<u>7.48</u>	7.80
8.16	8.41	8.79	9.06	9.35	9.62