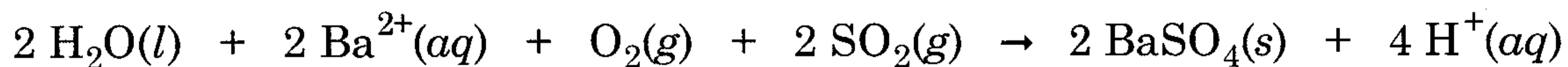


****KEEP YOUR WORK AND ANSWERS COVERED.****

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

- T Most of the volume of air which you breathe has no matter in it.
- T The pressure of an ideal gas is proportional to its concentration and temperature.
- F In general, at the same temperature, molecules of $\text{CO}_2(g)$ move faster than molecules of $\text{NH}_3(g)$.
- F For an exothermic process, the system ends with more energy than it had initially.
- F At 100°C , one mole of $\text{H}_2\text{O}(l)$ has more energy than one mole of $\text{H}_2\text{O}(g)$.
- F The combustion of $\text{H}_2(g)$ is endothermic.
- F ΔH_f° for $\text{C}(\text{diamond})$ is zero.
- T An endothermic process can absorb heat energy without changing temperature.

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



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

-448.3	-497.2	-516.9	-552.0	-623.3	-674.7
<u>-705.8</u>	-780.9	-821.8	-864.3	-938.4	-953.9

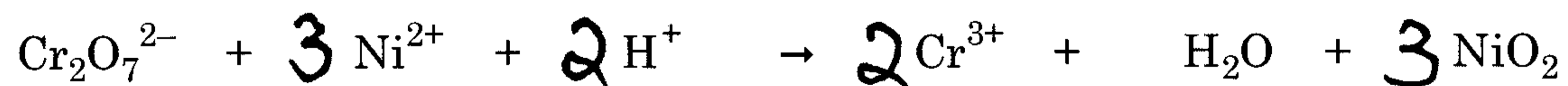
3. (5 pts) A gas is originally contained in a 15.8 L tank at $-10.^\circ\text{C}$ at 0.765 atm pressure. This gas is then transferred to a 10.0 L tank and stored at 23°C . Circle the pressure (in atm) of the gas at the final conditions.

0.503	0.619	0.773	0.862	0.980	1.03
1.17	1.28	1.36	1.45	1.50	1.61

- ** 4. (6 pts) Consider the reaction of excess tin metal with 37.6 g nitric acid to produce tin(II) nitrate and hydrogen gas. The hydrogen gas is collected in a volume of 14.6 L at a temperature of 281 K. Circle the pressure (in atm) of the hydrogen gas.

0.211	0.251	0.303	0.372	0.436	0.471
0.508	0.563	0.659	0.682	0.717	0.763

5. (6 pts) Balance the following equation. All reactants and products are shown.



- ** 6. (6 pts) Solid magnesium oxide can be prepared by direct combustion of Mg(s) with $\text{O}_2(\text{g})$. Circle the change in enthalpy (in kJ) for this reaction when 14.2 g of magnesium are reacted.

-106	-177	-235	-280.	-351	-378
-442	-479	-515	-533	-608	-670.

last name: _____

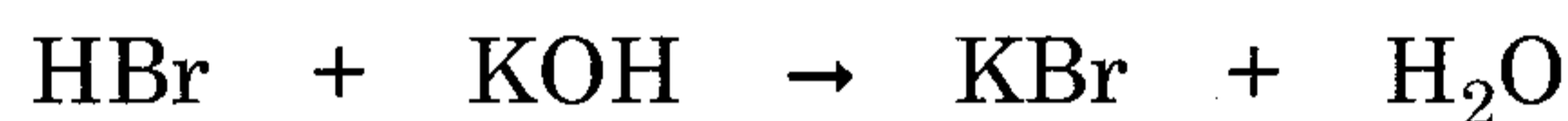
7. (5 pts) 15.0 g of $\text{H}_2\text{O}(l)$ at 18.0°C absorbs 422 J of heat energy, causing its temperature to increase. Circle the final temperature (in $^\circ\text{C}$) of the water.

18.3	19.5	20.1	21.7	22.2	23.5
24.7	25.9	26.3	27.5	28.4	29.7

- ** 8. (5 pts) Circle the gases below which are denser than $\text{CO}_2(g)$ at the same temperature and pressure.

C_2H_4 BF_3 SF_4 Ar Cl_2 HF

- ** 9. (6 pts) An 8.00 g solution of hydrobromic acid was titrated using a solution of potassium hydroxide, according to the following equation.



The potassium hydroxide solution was 0.2316 M, and the titration required 18.70 mL to reach end point. Circle the percent by mass of HBr in the sample.

4.38%	5.62%	6.19%	7.06%	8.43%	9.12%
10.6%	11.7%	12.4%	13.1%	14.7%	15.8%

10. (6 pts) Write the balanced, formation equation for solid silver acetate. Put your final answer on the line below. Be sure to include all phases!

