**Semester 2 Final Review**

*Free Response Part 2*

1. Consider the following equilibrium:

$$2 SO\_{2} \left(g\right)+ O\_{2}\left(g\right)+197\frac{kJ}{mol}\leftrightarrow 2SO\_{3}(g)$$

* 1. The reaction is \_\_\_\_\_\_\_thermic and $∆H$ = \_\_\_\_\_\_\_\_\_
	2. Which substances would have a heat of formation of zero? \_\_\_\_\_
	3. Give the direction of the shift for each of the following:
		1. Increase temperature
		2. Increase [$SO\_{2}$]
		3. Increase volume
		4. Decrease [$O\_{2}$]
		5. Increase pressure
	4. Write the Keq expression for the equilibrium.
	5. Calculate the value of the Keq if at equilibrium

[$SO\_{2}$]=0.20 M, [$O\_{2}$]=0.028 M, and [$SO\_{3}$]=0.56 M

Keq =\_\_\_\_\_\_\_\_\_\_\_\_

1. Sulfuric acid reacts with sodium hydroxide.
	1. Give the balanced equation for this reaction.
	2. If 20.00 mL of sodium hydroxide react with 40.00 mL of 0.050 M sulfuric acid, what is the concentration of sodium hydroxide?

= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. What mass of the salt is produced?

= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. What is the pH of the sulfuric acid?

= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. A flask contains 672 mL of F2O at STP.
	1. Calculate the moles present.

= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Calculate the mass present.

= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Calculate the molecules present.

= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Name each of the following molecules.

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| --- | --- |
| * 1.
 | * 1.
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| * 1.
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1. Match each molecule with its functional group.

**Functional Groups:**

1. Alcohol
2. Aldehyde
3. Amide
4. Amine
5. Carboxylic acid
6. Ester
7. Ether
8. ketone

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