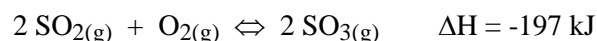


Equilibrium Questions - Set VI

1. What changes in equilibrium composition of the reaction



will occur if it experiences the following stresses ?

- At time = 10 seconds the partial pressure of $\text{SO}_3(\text{g})$ is increased.
- At time = 20 seconds some inert Ar gas is added.
- At time = 30 seconds the temperature of the system is decreased.
- At time = 40 seconds the total pressure of system is increased.
- At time = 50 seconds some $\text{O}_2(\text{g})$ is removed from the system.
- Construct a concentration versus time diagram that represents the above changes.

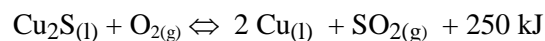
2. For the chemical equilibrium $\text{PCl}_5(\text{g}) + 92 \text{ kJ} \rightleftharpoons \text{PCl}_3(\text{g}) + \text{Cl}_2(\text{g})$

- What is the effect on K of lowering the temperature ?
- What is the effect on the equilibrium concentration of PCl_3 of adding Cl_2 ?
- What is the effect on the equilibrium concentrations of compressing the mixture to a smaller volume ?
- What is the effect on the equilibrium pressure of Cl_2 of removing PCl_3 ?

3. For the decomposition of calcium carbonate : $\text{CaCO}_3(\text{s}) \rightleftharpoons \text{CaO}(\text{s}) + \text{CO}_2(\text{g}) \quad \Delta H = 175 \text{ kJ}$
how will the amount of CaCO_3 solid change with the following stresses ?

- $\text{CO}_2(\text{g})$ is removed.
- $\text{CaO}(\text{s})$ is added.
- The temperature is raised.
- The volume of the container is decreased.

4. Copper can be extracted from its ores by heating Cu_2S in air.



Predict the direction of the equilibrium position in response to each of the following changes:

- Adding $\text{O}_2(\text{g})$
- Compressing the vessel volume in half
- Raising temperature