

Sayna Lufts -

Eg. ⑨ LeChatelier's Principle.

Q① Consider the following reaction:
 $\text{PCl}_5(\text{g}) \rightleftharpoons \text{PCl}_3(\text{g}) + \text{Cl}_2(\text{g}) \quad \Delta H^\circ = +92.5 \text{ kJ/mol}$

Predict the direction of the eq. under the following change of conditions.

- | | |
|----------------------------------|---|
| ① Temp. is increased | ① $\Delta H = \text{endothermic}$, heat in reactant.
rxn will move forward $\rightarrow$ |
| ② more Cl_2 is added | ② Cl_2 is product
rxn back to reactant $\leftarrow$ |
| ③ some PCl_5 is removed | ③ PCl_5 is reactant.
rxn backward to reactant $\leftarrow$ |
| ④ Pressure is increased | ④ $\frac{\text{mols react} = 1}{\text{P increase Vol. decreased}}$ $\frac{\text{mol prod} = 2}{\text{so go to direction of less mols.}}$
$\therefore$ reactant side rxn $\leftarrow$ |
| ⑤ A catalyst is added | ⑤ no change b/c forward & reverse reactions are increased. |
| ⑥ add inert gas | ⑥ no effect $\rightarrow$ |

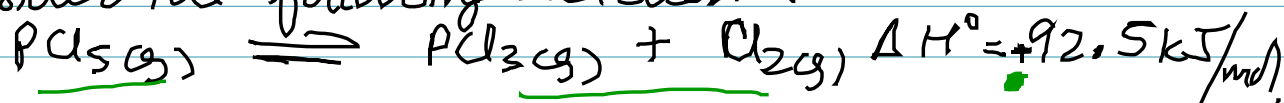
Q2 Give all the conditions that will shift the following reaction forward.
 $\text{O}_2(\text{g}) + 2\text{SO}_2(\text{g}) \rightleftharpoons 2\text{SO}_3(\text{g}) \quad \Delta H^\circ = -198.2 \text{ kJ/mol}$

- ① increase reactants: O_2 and SO_2
- ② remove products: SO_3
- ③ ~~decrease~~ increase P. b/c products has less mols
 $\therefore$ requires less vol.
- ④ if heat is part of product - so remove heat.
- cool the reaction.

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Eg. ⑨ LeChatlier's Principle.

Q. ① Consider the following reaction:



Predict the direction of the eq. under the following change of conditions.

① Temp. is increased - ① $\Delta H = \text{shares}$ endothermic, heat in reactant. rxn will move forward $\rightarrow$

② more Cl_2 is added. ② Cl_2 is product rxn back to reactant $\leftarrow$

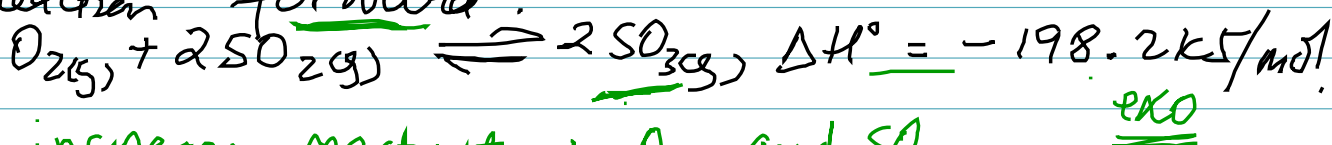
③ some PCl_5 is removed. ③ PCl_5 is reactant. rxn backward to reactant $\leftarrow$

④ Pressure is increased ④ $\text{mols react} = 1$ $\text{mol prod} = 2$
 P increase Vol. decreased
so go to direction of less mols.
 $\therefore$ reactant side rxn $\leftarrow$

⑤ A Catalyst is added. ⑤ no change b/c forward & reverse reactions are increased.

⑥ add inert gas - ⑥ no effect - !

* Q. 2 Give all the conditions that will shift the following reaction forward.



① increase reactants : O_2 and SO_2

② remove products : SO_3

③ ~~decrease~~ increase P . b/c products has less mols
 $\therefore$ requires less vol.

④ if heat is part of product - so remove heat.
- cool the reaction.