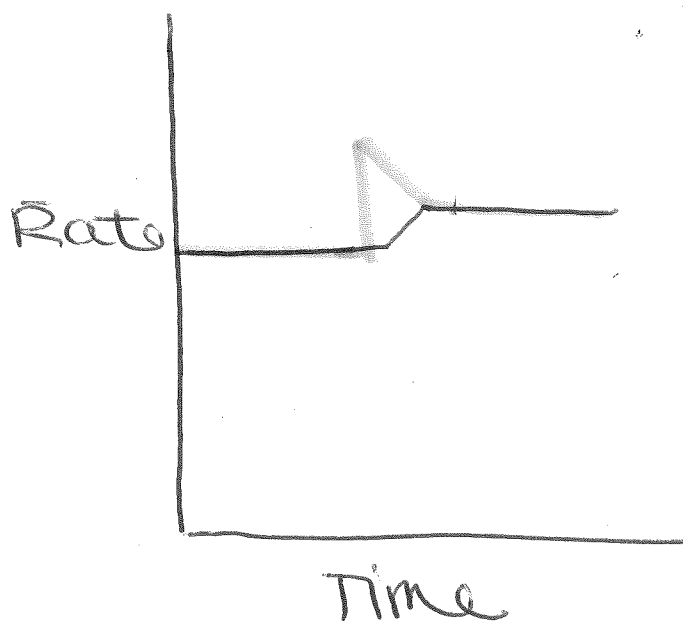


Le Chatelier - Rate Graphs



- $\uparrow [\text{H}_2]$
- forward rate \uparrow
- as extra H_2 is used $[\text{reactants}] \downarrow$ and rate \downarrow
- as more HI is made $[\text{products}] \uparrow$ and rate \uparrow
- eventually forward = reverse and equil. reached

6. Equilibrium Systems with Solids and Liquids

a) What is different with Solids and Liquids?

i) changing the amount of solid or liquid reactants or products in a reaction in equilibrium, will NOT affect the equilibrium!



Decrease or increase $[\text{CaCO}_3]$...equilibrium does not change.

Decrease or increase $[\text{CaO}]$...equilibrium does not change.

Equilibrium will only depend on $[\text{CO}_2]$!

b) Example Questions:



i) Increasing the $[\text{CO}]$ will shift the reaction to the _____
right, left, no change

ii) Decreasing the $[\text{Sn}]$ will shift the reaction to the _____
right, left, no change

iii) Decreasing the $[\text{SnO}_2]$ will shift the reaction to the _____
right, left, no change

iv) Adding some SnBr_4 will shift the reaction to the _____
right, left, no change

v) Removing some CO_2 will shift the reaction to the _____
right, left, no change

vi) Increasing the temperature will shift the reaction to the _____
right, left, no change

vii) Decreasing the temperature will shift the reaction to the _____
right, left, no change