$A \rightarrow B$

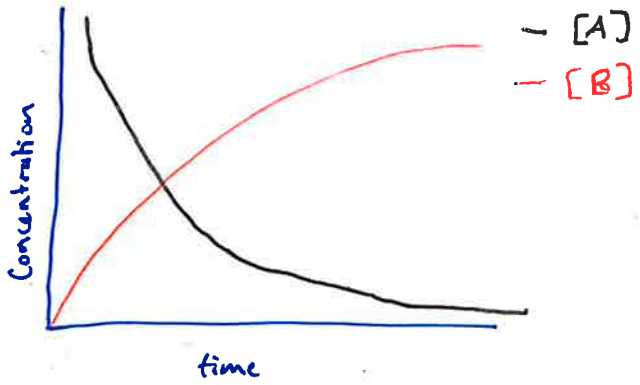
$$\text{rate of rxn} = -\frac{\Delta A}{\Delta t} = \frac{\Delta B}{\Delta t}$$

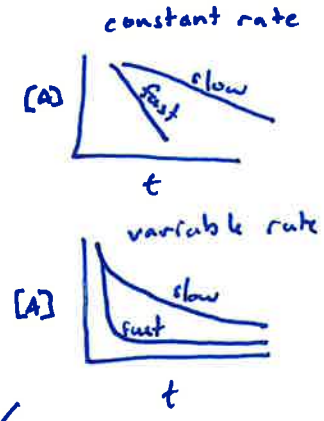
$-\frac{\Delta A}{\Delta t}$: rate of disappearance of A (−)

$\frac{\Delta B}{\Delta t}$: rate of appearance of B (+)

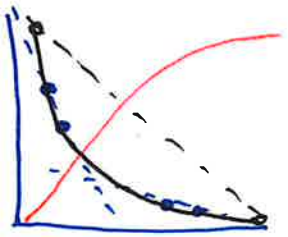
$A_{(aq)} \rightarrow B_{(aq)}$

$$\text{rate} = -\frac{\Delta [A]}{\Delta t} = \frac{\Delta [B]}{\Delta t}$$



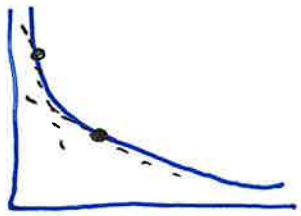


AVG RATE



$\frac{\Delta [A]}{\Delta t}$

Instant Rate



$\frac{d[A]}{dt}$ "a little bit"

$$\frac{d[A]}{dt} = \lim_{\Delta t \to 0} \frac{\Delta [A]}{\Delta t}$$

$A_{(aq)} \rightarrow 2B_{(aq)}$

"[B] appears twice as fast as [A] disappears"

"[A] disappears ~~at twice~~ half as fast as [B] appears"

$$\text{rate of rxn} = -\frac{\Delta [A]}{\Delta t} = \frac{1}{2}\frac{\Delta [B]}{\Delta t}$$

2 ("Rate of disappearance of [A]") = "rate of appearance of B"

$$\therefore \quad -2\frac{\Delta [A]}{\Delta t} = \frac{\Delta [B]}{\Delta t}$$