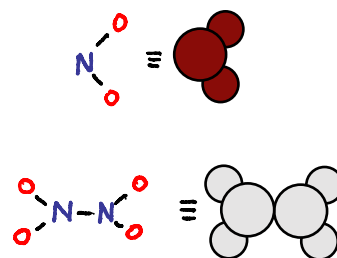
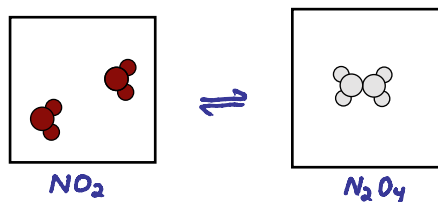
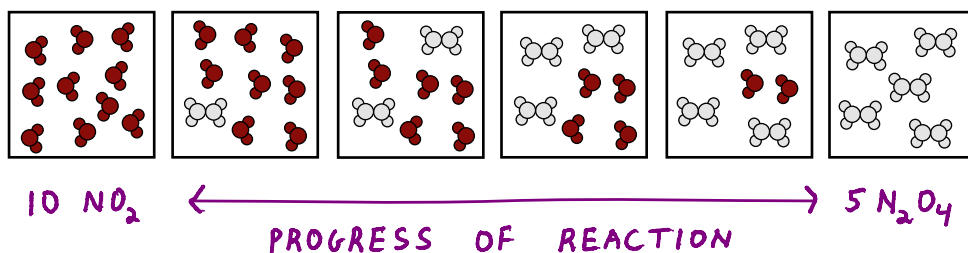


REACTION QUOTIENTS

DIMERIZATION OF NO_2



AS REACTION PROGRESSES NO_2 IS CONVERTED TO N_2O_4



REACTION QUOTIENT, Q , FOR A GENERAL REACTION $aA + bB \rightleftharpoons cC + dD$

Q CAPTURES THE PROGRESS OF THE REACTION

$$Q = \frac{\text{PRODUCTS}}{\text{REACTANTS}}$$

$$Q = \frac{[C]^c [D]^d}{[A]^a [B]^b}$$

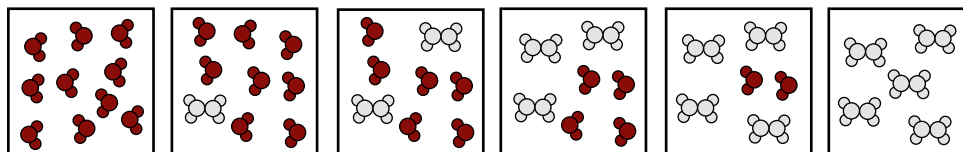
SOLUTION:
CONCENTRATIONS

$$Q = \frac{P_C^c P_D^d}{P_A^a P_B^b}$$

GASES:
PARTIAL PRESSURES

OUR EXAMPLE REACTION: $2\text{NO}_2 \rightleftharpoons \text{N}_2\text{O}_4$

$$Q = \frac{\text{PRODUCTS}}{\text{REACTANTS}} = \frac{P_{\text{N}_2\text{O}_4}}{P_{\text{NO}_2}^2}$$



REGION CHOSEN
SO THAT
1 MOLECULE
 $\equiv 1 \text{ ATM}$

$P_{\text{N}_2\text{O}_4}$	0	1	2	3	4	5
P_{NO_2}	10	8	6	4	2	0
$Q = \frac{P_{\text{N}_2\text{O}_4}}{P_{\text{NO}_2}^2}$	$\frac{0}{10^2}$	$\frac{1}{8^2}$	$\frac{2}{6^2}$	$\frac{3}{4^2}$	$\frac{4}{2^2}$	$\frac{5}{0^2}$
	0	0.0156	0.055	0.1875	1	∞

$Q \text{ INCREASES } \rightarrow$

BUT, THE EXTREMES ARE RARE IN REVERSIBLE SYSTEMS.
INSTEAD, REACTIONS REACH A STEADY STATE.