

AQA Chemistry A-level

Topic 1.10 - K_p

Flashcards



What is partial pressure?



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Each gas's contribution to the total pressure



How would you calculate
the partial pressure of a
gas?



How would you calculate the partial pressure of a gas?

Partial pressure $p = \text{mole fraction} \times \text{total pressure}$



What is the mole fraction?



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Mole fraction of gas X = number of moles of gas X in the mixture \div total number of moles of gas in the mixture



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For the reaction: $aA + bB \rightleftharpoons cC + dD$

$$K_p = \frac{p_C^c p_D^d}{p_A^a p_B^b}$$

Where p_A = partial pressure of A
and a = number of moles of A



How do you calculate the units for K_p ?



How do you calculate the units for K_p ?

Write out the units for the partial pressures in the same arrangement as the K_p equation and cancel out/multiply together.

Usually in Pa, kPa, atm etc. **DO NOT CHANGE UNITS**



What is the effect of increasing temperature on K_p for an endothermic reaction?



What is the effect of increasing temperature on K_p for an endothermic reaction?

Equilibrium shifts to the right, so partial pressures of products increase, so K_p increases



What is the effect of increasing the overall pressure on K_p for this reaction?

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$$K_p = \frac{pC^c pD^d}{pA^a pB^b}$$

Pressure does not affect K_p as, if moles of gas are not the same on each side), either top or bottom of K_p expression will have a total pressure term that does not cancel.



What will be the kinetic effect of increasing the temperature and pressure for any reaction?



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Increasing both will increase the rate of reaction as:

Temperature - many more particles have energy greater than or equal to the activation energy → more successful collisions per second

Pressure - more particles in the same volume → more successful collisions per second.

