AQA Chemistry A-level
Topic 1.10 - Kp

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?

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Partial pressure p = mole fraction x 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 ÷ total number of moles of gas in the mixture

A reaction is represented by aA (g) + bB (g) $\rightleftharpoons$ cC (g) + dD (g), what Kp for the system?

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For the reaction: aA + bB ⇌ cC + dD

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

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

How do you calculate the units for Kp?

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

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

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

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

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

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Pressure does not affect Kp as, if moles of gas are not the same on each side), either top or bottom of Kp 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.