

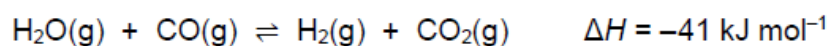
AQA – Equilibrium constant K_p for homogeneous systems – A2 Chemistry P1

1. No.4

0	4
---	---

This question is about some gas mixtures at equilibrium.

This reaction can be used to make hydrogen.



0	4	.	1
---	---	---	---

A mixture of 2.00 mol of $\text{H}_2\text{O}(\text{g})$ and 2.00 mol of $\text{CO}(\text{g})$ is allowed to reach equilibrium at a constant temperature in a 20 dm^3 container.
At equilibrium, there are 0.92 mol of $\text{H}_2(\text{g})$.

Calculate the mole fraction of $\text{H}_2(\text{g})$ in the equilibrium mixture.

[2 marks]

Mole fraction of $\text{H}_2(\text{g})$ _____

0	4	.	2
---	---	---	---

State why the equilibrium constant (K_p) for this reaction has no units.

[1 mark]

0 4 . 3

The temperature of the equilibrium mixture formed in Question 04.1 is increased.

How does the amount of $\text{H}_2(\text{g})$ change when the new position of equilibrium is reached?

[1 mark]

Tick (✓) **one** box.

The amount decreases.

☐

The amount does not change.

☐

The amount increases.

☐

Ethanol can be made from ethene and steam.

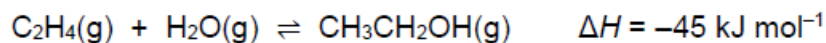


Table 2 shows the mole fractions of each of the gases in an equilibrium mixture at 6000 kPa

Table 2

Gas	Mole fraction
Ethene	0.645
Steam	0.323
Ethanol	0.0321

0 4 . 4

Give an expression for K_p for this reaction.

Calculate the value of K_p at 6000 kPa

State the units.

[4 marks]

K_p

Units _____

0 4 . 5

State the effect, if any, of an increase in volume of the container on the value of K_p for this reaction at a constant temperature.

[1 mark]
