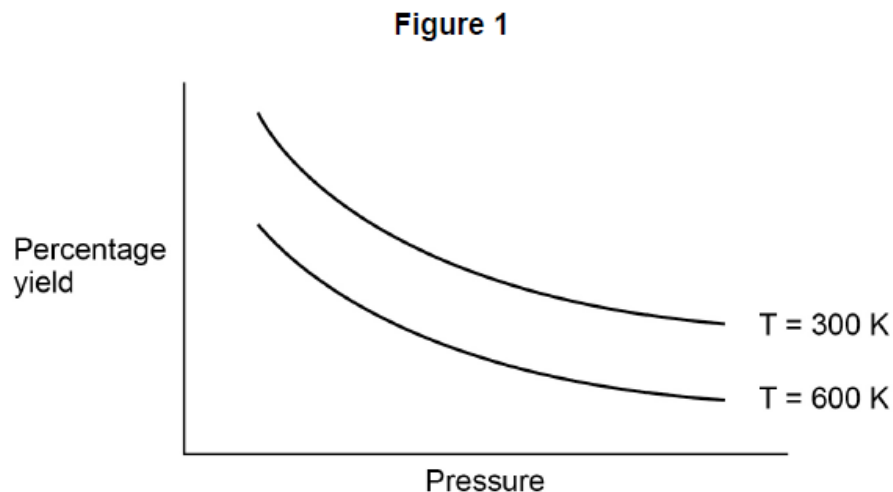**Chemical equilibria, Le Chatelier's principle and Kc – AS 2022 Chemistry P1**

1. June/2022/Paper_7404/1/No.7

| 0 | 7 |

This question is about gaseous equilibria.

Figure 1 shows the effect of pressure on the percentage yield of a reaction at equilibrium at two different temperatures.

Figure 1

| 0 | 7 |.| 1 |

Explain how **Figure 1** shows that the forward reaction in this equilibrium is exothermic.

[2 marks]

_____

_____

_____

_____

0 7 . 2 State whether the forward reaction in this equilibrium results in an increase, decrease or no change in the amount, in moles, of gas.

Explain your answer.

[3 marks]

Tick (✓) **one** box.
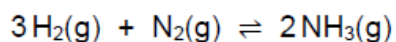
increase ☐

decrease ☐

no change ☐

Explanation _____

_____

_____

_____

_____

0 7 . 3 Explain why using a catalyst has no effect on the percentage yield.

[1 mark]

_____

_____

_____

Hydrogen and nitrogen react to form ammonia.

$$3H_2(g) + N_2(g) \rightleftharpoons 2NH_3(g)$$

At 745 K, the equilibrium constant, K_c = 0.118 mol^{-2} dm^6

0 7 . 4   At 745 K, 0.150 dm^3 of an equilibrium mixture contains 0.0285 mol of hydrogen and 0.0870 mol of nitrogen.

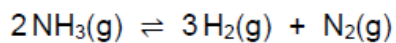Calculate the amount, in moles, of ammonia present in this equilibrium mixture.

[5 marks]

Amount of ammonia _____ mol

0 7 . 5   Calculate the value, at 745 K, for the equilibrium constant K_c for this dissociation of ammonia to give hydrogen and nitrogen.

State the units.

$$2NH_3(g) \rightleftharpoons 3H_2(g) + N_2(g)$$

[2 marks]

Value _____

Units _____

3