

## Mark scheme – Equilibria (F)

Question			Answer/Indicative content	Marks	Guidance
1			D ✓	1 (AO1.1)	
			<b>Total</b>	<b>1</b>	
2		i	Idea that rate of forward reaction equals rate of backward reaction ✓	1(AO 1.1)	<p><b>ALLOW</b> balanced / becomes the same <b>IGNORE</b> stays the same</p> <p><b>Examiner's Comments</b></p> <p>That the rates become equal was well understood by higher ability candidates. Others often showed a partial understanding, suggesting 'the rates stayed the same' which is not correct. The lower ability candidates limited themselves to 'the rate increased (or decreased)'.</p>
		ii	Idea that the concentrations of the reacting substances remain constant ✓	1(AO 1.1)	<p><b>ALLOW</b> stays the same / unchanged <b>IGNORE</b> 'are' the same</p> <p><b>Examiner's Comments</b></p> <p>This was less well understood, with many candidates saying that the concentrations became the same.</p>
			<b>Total</b>	<b>2</b>	
3	a		Rate of forward reaction equals the rate of the backward reaction (1)  Concentration of reactants and products do not change (1)	2	<p><b>DO NOT ALLOW</b> concentration of reactant and products are the same</p> <p><b>ALLOW</b> concentration of reactants and products stay the same</p>
		b	<p><i>* Please refer to the marking instruction point 10 for guidance on how to mark this question.</i></p> <p><b>Level 3 (5–6 marks)</b> <b>Describes the effect of changing the temperature and pressure on the percentage yield from the table and includes clear explanations on the effect of increasing the pressure on the rate of reaction.</b> <i>There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.</i></p> <p><b>Level 2 (3–4 marks)</b></p>	6	<p><b>AO1.1: Knowledge of pressure on rate of reaction</b></p> <ul style="list-style-type: none"> <li>Increasing the pressure increases the rate of reaction.</li> <li>Increasing the pressure means particles are closer together.</li> <li>Increasing the pressure means more crowded particles / more particles in the same space.</li> <li>Increasing the pressure means more collisions between particles.</li> <li>More collisions the quicker the reaction.</li> <li>More collisions more percentage yield.</li> </ul>

		<p><b>Describes the effect of changing the temperature and pressure on the percentage yield from the table and either describes the effect of increasing the pressure on the rate of reaction or explains the effect increasing the pressure on the rate of reaction.</b></p> <p><i>There is a line of reasoning presented with some structure. The information presented is relevant and supported by some evidence.</i></p> <p><b>Level 1 (1–2 marks)</b></p> <p><b>Describes the effect of changing the temperature and pressure on the percentage yield from the table or describes the effect of increasing the pressure on the rate of reaction.</b></p> <p><i>The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.</i></p> <p><b>0 marks</b></p> <p><i>No response or no response worthy of credit.</i></p>		<p><b>AO3.1a: Analyse information in the table to interpret percentage yield</b></p> <ul style="list-style-type: none"> <li>• As temperature increases the percentage yield decreases.</li> <li>• As pressure increases the percentage yield increases.</li> <li>• The highest yield is when the temperature is low and the pressure is high.</li> </ul>
		<b>Total</b>	<b>8</b>	